



GAYATRI VIDYA PARISHAD COLLEGE OF ENGINEERING FOR WOMEN

(Autonomous)

(Approved by AICTE, New Delhi and Permanently Affiliated to Andhra University, Visakhapatnam)

Madhurawada :: Visakhapatnam – 530 048

COURSE STRUCTURE

(Applicable for the Academic Year 2024-25 onwards)

DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

B.Tech. Computer Science and Engineering

SCHEME AND SYLLABI

(With effect from 2024-25 admitted batch)

I Year - I Semester								
Course Code	Category	Course Title	Hours per Week		Internal Marks	External Marks	Total Marks	Credits
			L	P				
24BM11RC01	BS	Calculus and Differential Equations	3	0	30	70	100	3
24BC11RC01	BS	Green Chemistry	3	0	30	70	100	3
24HE11RC01	HSS	English	3	0	30	70	100	3
24CT11RC01	ES	Fundamentals of Computers	3	0	30	70	100	3
24CT11RC02	ES	Problem Solving using C	3	0	30	70	100	3
24HE11RC02	HSS	Communication Skills Lab	0	3	50	50	100	1.5
24CT11RC03	ES	Computer Engineering Workshop	0	3	50	50	100	1.5
24CT11RC04	ES	Problem Solving using C Lab	0	3	50	50	100	1.5
Total Credits								19.5
I Year - II Semester								
Course Code	Category	Course Title	Hours per Week		Internal Marks	External Marks	Total Marks	Credits
			L	P				
24BM11RC02	BS	Linear Algebra and Vector Calculus	3	0	30	70	100	3
24BP11RC01	BS	Engineering Physics	3	0	30	70	100	3
24EC11RC05	ES	Digital Logic Design	3	0	30	70	100	3
24EC11RC04	ES	Elements of Electronics Engineering	3	0	30	70	100	3
24CT11RC06	ES	Python Programming	3	0	30	70	100	3
24BP11RC02	BS	Engineering Physics Lab	0	3	50	50	100	1.5
24CT11RC07	ES	Python Programming Lab	0	3	50	50	100	1.5
24CT11RC08	ES	Web Technologies Fundamentals Lab	0	3	50	50	100	1.5
Total Credits								19.5



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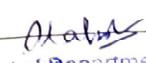
Madhurawada, Visakhapatnam - 530 048
 (Approved by AICTE, New Delhi and Permanently Affiliated to Andhra University, Visakhapatnam)
 Accredited by NAAC with 'A' from 2022 to 2027
 CSE, ECE and IT Courses Accredited by NBA (2019-2022) and Re-Accredited by NBA (2022-2025)
 EEE Course Accredited by NBA (2023-2026)
 Ph : 0891-2739144, 2526639 Email : gvpcew@gmail.com Website : www.gvpcew.ac.in

Course Outcomes

1st Semester Theory Courses

Course Code	Course Title	Course Outcomes	
C111 24BM11 RC01	Calculus and Differential Equations	CO1	Examine the functional dependency and estimate function of two variables using Taylor's theorem. L4
		CO2	Determine extrema of multivariable functions. (L5)
		CO3	Utilize double and triple integrals to evaluate areas of plane curves and the volumes of solids. (L5)
		CO4	Solve the first order differential equations and higher order differential equations with constant coefficients, apply the techniques to solve problems related to various engineering fields. (L3)
		CO5	Find the Laplace Transforms of various functions and apply it to solve ordinary differential Equations with initial conditions. (L3)
C112	Green Chemistry	CO1	To develop the knowledge about water and its treatment for industrial and potable purpose
		CO2	Utilize the theory of construction and discharge reactions of various types of batteries are used in commercial society
		CO3	Explain the importance of working principle, fabrication of electrodes and other components, advantages, disadvantages and environmental aspects of fuel cells
		CO4	Classify the corrosion mechanism of metals and factors influenced by rate and extent of corrosion and categorize the reasons for corrosion control methods
		CO5	Apply green chemistry technology processes the knowledge for solving existing challenges faced in various engineering and societal areas
	English	CO1	Develop moral values and inner peace(L3), Demonstrate the use of




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C113			LSRW skills, Vocabulary and basic grammar concepts.(L3)
		CO2	Identify the impact of different social backgrounds (L3), recognize the poet's insights. (L4), Demonstrate the use of LSRW skills, Vocabulary and basic grammar concepts.(L3)
		CO3	Illustrate Verbal & Non-verbal communication through the One-Act play; practice Time Management skills; demonstrate the use of LSRW skills, Vocabulary and basic grammar concepts.
		CO4	Analyze the contributions of eminent personalities for societal development; demonstrate the use of LSRW skills, Vocabulary and basic grammar concepts.
		CO5	Interpret the Political implications of language use and cultural revival; demonstrate the use of LSRW skills, Vocabulary and basic grammar concepts.
C114	Fundamentals of Computers	CO1	Identify different I/O devices and their usage.
		CO2	Compare different computer memory with their efficiency.
		CO3	Relate different computer software's and programming languages for solving problems.
		CO4	Summarize the use of operating system, database system, and computer network in the field of computing in engineering.
		CO5	Infer the methods and applications of artificial intelligence (AI), machine learning (ML) and data science.
C115	Problem Solving Using C	CO1	Explain about basics of computer, importance of various data types and identify decision statements and loops for various problems.
		CO2	Understand the concepts of arrays and strings to familiarize matrices and string handling functions.
		CO3	Utilize functions and pointers with different scopes, types of returns and pointer expressions to solve math problems.
		CO4	Identify the importance of structures and unions and their applications in suitable fields.
		CO5	Apply the concepts of file handling and command line arguments.

Laboratory Courses

Course Code	Course Title	Experiment No	CO. No.	Course Outcomes
C116	Communication skills Lab	1,2	CO1	Identify and pronounce the sounds of English; choose the accurate stress in connected speech for proper intonation (L3)
		3,4	CO2	Apply the main theme and ideas of the audio/video to take notes and summarize (L3)
		5,6,7	CO3	Develop speaking skills by taking part in Just A Minute (JAM) – Narratives-Role Play (L3)
		8,9	CO4	Practice discussions and debates(L3)
		10	CO5	Demonstrate Presentation Skills(L3)
C117	Computer Engineering Workshop Lab	1,2	CO1	Identify the peripherals of a computer.
		3,4	CO2	Demonstrate the installation process of operating systems like MS Windows, LINUX.
		5	CO3	Make use of MS-Office suite that comprises of various applications to create documents, organizes & analyses data and captivating presentations.
		6,7	CO4	Categorize various UNIX/LINUX Commands to work on a modern operating system
		8	CO5	Experiment with GIT Commands and make use of LaTeX to prepare research articles.
C118	Problem Solving Using using C lab	1,2	CO1	Understand the C-Programs on basic concepts like variables, datatypes
		3,4	CO2	Experiment with Selection, Decision control statements, Loop control statements Using C.
		5,6,7,8	CO3	Develop the C-Programs on the Arrays, Strings Concepts
		9,10,11, 12,13	CO4	Make use of Structures, Pointers, Dynamic Memory Allocation in C
		14,15,16	CO5	Develop the programs on the Functions, Files concepts using C




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2nd Semester

Theory Courses

Course Code	Course Title	Course Outcomes	
C121	Linear Algebra and Vector Calculus	CO1	Test for the consistency and solve linear system of equations, also determine unknown currents in the electrical circuits. (L5)
		CO2	Find the Eigen values and Eigen vectors of a matrix, and apply Cayley- Hamilton theorem to find the inverse of a matrix. (L3)
		CO3	Reduce quadratic form to canonical form and examine the nature of quadratic form. (L4)
		CO4	Interpret the meaning and evaluate gradient, curl and divergence. (L5)
		CO5	Apply line integrals, surface integrals, volume integrals and their relations using Green's theorem, Stoke's theorem, Gauss Divergence theorems in various engineering applications. (L3)
C122	Engineering Physics	CO1	Apply the principles of interference, diffraction, and polarization in wave optics, and utilize optical instruments for practical applications
		CO2	Familiarize the basic concepts of Thermodynamics relevant to engineering applications.
		CO3	Introduce the knowledge of basic principles of Electromagnetism and EM Waves.
		CO4	Learn basic principles of lasers, optical fibres and their use in technological applications.
		CO5	Understand the intuitive ideas of the Quantum physics and apply them to different quantum mechanical systems to realize the free electron theory and band theory of solids. Understand the processing methods of materials in Nano phase.
C123	Elements of Electronics Engineering	CO1	Comprehend the characteristics of semiconductors, devices, and their applications.
		CO2	Understand the working of rectifiers with filters.
		CO3	Analyze the transistor operation with different biasing techniques.
		CO4	Analyze the working of low power transistor amplifier designs.
		CO5	Understand the characteristics of FET.
C124	Python Programming	CO1	Understand the historical development, necessity, applications, and basic concepts of python programming.(L2)

2nd Semester

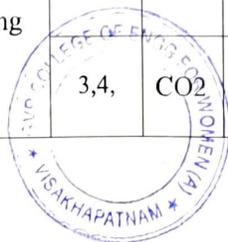
Theory Courses

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		CO5	Understand the characteristics of FET.
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		CO2	Identify and implement appropriate control structures to solve a particular programming problem.(L3)
		CO3	Examine various data structures and apply to solve real world problems.. (L3)
		CO4	Build simple functions and packages used in python for solving real world problems. (L3)
		CO5	Outline Object Oriented concepts in python and illustrate Exception handling.(L2)
C125	Digital Logic Design	CO1	Interpret the significance of number systems, conversions, binary codes and understand Boolean algebra theorems.
		CO2	Make use of different simplification methods for minimizing Boolean functions.
		CO3	Build simple combinational digital circuits using logic gates.
		CO4	Develop Asynchronous and Synchronous Sequential digital circuits using the logic functions.
		CO5	Construct combinational circuits using PLD's and understand the basics of VHDL.

Laboratory Courses

Course Code	Course Title	Experiment No	CO. No.	Course Outcomes
C126	Engineering Physics Lab	1 & 6	CO1	Operate travelling microscope to study the thin film interference.
		2,4,5 &15	CO2	Determine wavelengths of light from discharge lamps and laser source by operating spectrometer, prism and diffraction grating.
		3	CO3	Study the variation of magnetic field with Stewart Gee apparatus and calculate the Planck's constant using LED.
		7 & 8	CO4	Calibrate a DC moving coil voltmeter and ammeter
		12	CO5	Estimate the vibrational frequency due to tuning fork.
C127	Python Programming Lab	1,2	CO1	Understand core programming basics and various Operators of Python.
		3,4,	CO2	Implement programs using conditional statements and loops



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		5,6	CO3	Develop functions and strings to perform simple tasks
		7,8,9	CO4	Make Use of Various Data Structures like lists,tuples,sets,dictionaries
		10,11	CO5	Implement Python Programs with files,classes and objects
C128	Web Technologies Fundamentals Lab	1,2	CO1	Build HTML-based web pages using standard HTML elements .
		3,4,	CO2	Apply CSS (inline, internal, external) for layout and responsive design .
		5,6	CO3	Use JavaScript for interactivity, DOM manipulation, and validation .
		7,8,9	CO4	Use arrays, objects, and OOP concepts in JavaScript to render dynamic content .
		10,11	CO5	Create XML documents and DTD for validation .

**B.Tech & B.Tech + M.Tech
(Computer Science & Engineering)
II Year - I Semester**

Course code	Category	Course Title	Hours per week		Internal Marks	External Marks	Total Marks	Credits
			L	P				
CS2101	ES	Discrete Mathematical Structures	4	0	30	70	100	3
CS2102	PC	Computer Organization and Architecture	4	0	30	70	100	3
CS2103	BS	Probability, Statistics and Queuing theory	4	0	30	70	100	3
CS2104	PC	Operating Systems	4	0	30	70	100	3
CS2105	PC	Object Oriented Programming Through Java	4	0	30	70	100	3
CS2106	PC	Computer Organization & Architecture Lab	0	3	30	70	100	1.5
CS2107	PC	Object Oriented Programming Through Java Lab	0	3	50	50	100	1.5
CS2108	PC	Operating Systems Lab	0	3	50	50	100	1.5
CS2109	SC	Intellectual Property Rights (Internal)	1	2	100	0	100	2
CS2110	MC	Environmental Science	0	0	-	100	100	0
Total credits								21.5

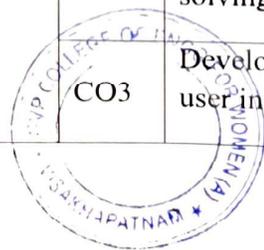
**B.Tech & B.Tech + M.Tech
II Year - II Semester**

Course code	Category	Course Title	Hours per week		Internal Marks	External Marks	Total Marks	Credits
			L	P				
CS2201	ES	Microprocessors	4	0	30	70	100	3
CS2202	PC	Design and Analysis of Algorithms	4	0	30	70	100	3
CS2203	PC	Database Management Systems	4	0	30	70	100	3
CS2204	PC	Formal Languages & Automata Theory	4	0	30	70	100	3
CS2205	HSS	Managerial Economics	4	0	30	70	100	3
CS2206	PC	Algorithms Lab through C++.	0	3	50	50	100	1.5
CS2207	PC	Database Management Systems Lab	0	3	50	50	100	1.5
CS2208	SC	Web Technologies	1	2	50	50	100	2
CS2209	MC	Professional Ethics & Universal Human Values	0	0	0	100	100	0
CS2210	MC	NCC/NSS	0	2	-	-	-	0
Total credits								20
Internship-I								

3rd Semester
Theory Courses

<i>Course Code</i>	<i>Course Title</i>	<i>Course Outcomes</i>	
C211	Discrete Mathematical Structures	CO1	Rewrite mathematical arguments using logical connectives and quantifiers and verify the validity of logical flow of arguments using propositional, predicate logic and describes the fundamental properties of the Number Theory
		CO2	Ability to solve problems using mathematical induction, recursion, permutations and combinations.
		CO3	Construct generating functions, recurrence relations and the solve recurrence relations, identify and give examples of various types of relations and describe various properties of the relations.
		CO4	Determine isomorphism of graphs and spanning tree of a given graph using BFS/DFS algorithms. Also determine minimal spanning tree of a given graph.
		CO5	Students will be able to use the concepts of Boolean Algebra for the analysis and design of various combinational and sequential Finite State Machines.
C212	Computer Organization & Architecture	CO1	Demonstrate design of a major components of a basic computer such as register transfer microoperations, registers, instruction codes, timing and control unit and arithmetic logic shift unit.
		CO2	Differentiate micro-programmed from hard-wired control unit and analyze the design of microprogrammed control unit
		CO3	Evaluate central processing units (CPUs), including register organization, instruction formats, and addressing modes, and understand 8085 microprocessor along with

			parallel processing
		CO4	Interpreting different ways of communication with I/O devices and standard I/O interfaces
		CO5	Understand memory hierarchy and the basics of memory systems for efficient data storage and retrieval in computer systems.
C213	Probability, Statistics and Queuing theory	CO1	Define and explain basic concepts in probability theory and how to translate real-world problems into probability models
		CO2	Solve standard problems that include random variables, discrete and continuous probability distributions
		CO3	Compute and interpret the results of Correlation Analysis, Multivariate Regression, Chi-Square test for Independence and Goodness of Fit
		CO4	Perform Test of Hypothesis and construct a confidence interval to estimate population parameters
		CO5	Explain basic concepts in Markov processes, M/M/1 and M/M/C queuing systems.
C214	Operating Systems	CO1	Summarize the Types, Structures, Services and System calls of Operating Systems and Operating System Design and Implementation.
		CO2	Outline various Process Concepts, Operations, IPC and Threads and make use of CPU Scheduling algorithms.
		CO3	Summarize various Process synchronization concepts and Deadlocks Identify the causes and effects of deadlocks in Operating system.
		CO4	Outline Memory Management concepts and Apply various Page Replacement Algorithms to manage the memory efficiently.
		CO5	Make use of File System Interface, File System Implementation and Mass Storage Structure and Examine Linux and Microsoft Windows Operating Systems.
C215	Object Oriented Programming Through Java	CO1	Explain the basic concepts of java programming constructs including Program Structure, Tokens, Control Statements and their representation.
		CO2	Demonstrate the use of classes and objects, Inheritance, Interfaces and also their behavior and implementation in solving specific problems.
		CO3	Develop java applications by using event based graphical user interfaces and I/O programming



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		CO4	Illustrate the concept of multi-threading and exception handling
		CO5	Make use of Java Database Connectivity (JDBC) to build connection with database

Laboratory Subjects

Course Code	Course Title	Experiment No	Course Outcomes	
C216	Computer Organization & Architecture Lab	Module 1:1,2	CO1	Simulate the logic gates, decoder, and multiplexer using VHDL programming.
		Module1: 3,4	CO2	Develop the VHDL programming for D,S-R flip flops, and up-down counter.
		Module1: 5,6,7	CO3	Design 4-bit shift register, ALU, and 4-bit binary adder and subtractor using VHDL programming.
		Module2: 1	CO4	Formulate the assembly language programs for arithmetic operations using 8086 microprocessor
		Module2: 2	CO5	Implement assembly language programs for string operations using the 8086 microprocessor.
C217	Object Oriented Programming Through Java Lab	1	CO1	Identify classes, objects, members of a class and the relationship among them needed for a specific problem using basic java programming language constructs.
		2	CO2	Explain the usage of strings in Java by developing suitable applications.
		3,4,5,6,8	CO3	Solve real world problems using OOPs concepts.
		7,9	CO4	Build Java applications by handling exceptions.
		10,11,12	CO5	Develop concurrent applications by applying Multithreading and AWT concepts in the design of GUI based applications.
C218	Operating Systems Lab	Linux-1,2,3,4	CO1	Experiment with different Linux commands and develop shell programs for basic control statements.
		OS-1	CO2	Develop programs for various CPU Scheduling Algorithms
		OS-2,4	CO3	Build programs for Memory Management Techniques and Page Replacement Algorithms.
		OS-3,5	CO4	Construct programs for various disk scheduling algorithms, Deadlock detection and Avoidance Techniques.
		Linux-	CO5	Develop programs related to multiprogramming and

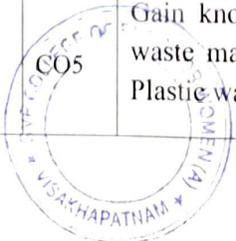
	5,6,7,8		multitasking capabilities of Linux and using system calls for process management, inter process communication
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Skill Oriented Courses

Course Code	Course Title	Course Outcomes	
C2109	Intellectual Property Rights	CO1	Outline the concept of Intellectual property rights, IPR tool kit and its importance in the global scenario and drive themselves towards the path of entrepreneurship through their creative innovations.
		CO2	Explain and gain knowledge on patents, patent registration process and recent developments in patent system.
		CO3	Demonstrate and understand about copyright and trademark protection, the registration process and legal remedies available in case of infringement
		CO4	Understand the principles of trade secrets and their maintenance, industrial design registration and remedies for infringement.
		CO5	Gain knowledge about the concept of IP commercialization, licensing, technology transfer and emerging areas in IP

Mandatory Courses

Course Code	Course Title	Course Outcomes	
	Environmental Science	CO1	Understand the importance of Ecosystem and Biodiversity for maintaining ecological balance.
		CO2	Identify the characteristics of various natural resources and can implement the conservation practices.
		CO3	Analyze the sources of pollutants and their effects on atmosphere.
		CO4	Understand the elements of sustainable development, energy and environmental management
		CO5	Gain knowledge on environmental protection acts, solid waste management, new generation waste like e –waste, Plastic waste.




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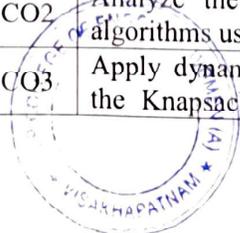
4th Semester
Theory Courses

<i>Course Code</i>	<i>Course Title</i>	<i>Course Outcomes</i>	
C221	Microprocessors	CO1	Outline the architecture and instruction set of 8085 and 8086 microprocessors
		CO2	Describe interfacing of different semiconductor memories and I/O devices with 8086 microprocessor
		CO3	Implement parallel i/o interface , serial i/o interface , and timer interface with 8086 microprocessor
		CO4	Develop applications using keyboard/display interface, interrupt controller interface and data converters with 8086 microprocessor
		CO5	Outline the architecture and instruction set of 8051 microcontroller
C222	Design and Analysis of Algorithms	CO1	Analyze the time and space complexities of algorithms using asymptotic notations.
		CO2	Apply divide and conquer and greedy paradigm to solve real time applications.
		CO3	Make use of Dynamic programming paradigm to solve real world applications.
		CO4	Utilize Backtracking techniques, Branch and Bound to analyze engineering applications.
		CO5	Classify NP-Hard and NP-Complete problems to solve real world applications.
C223	Database Management Systems	CO1	Outline the architecture of DBMS and provide the knowledge on levels of abstraction
		CO2	Construct the E-R model to represent databases, Model the database by Creating, maintaining and manipulating a relational database using SQL and convert ER to relational model using the concepts of Logical database design.
		CO3	Experiment with Relational Algebra, Basic SQL, nested queries, triggers, Embedded SQL, JDBC on real world problems and work with several operators like join, set, and aggregate.
		CO4	Relate and Plan the concept of data planning and database design using normalization
		CO5	Make use of the ACID properties in transaction

			management with Concurrency Control, Recoverability and Crash Recovery mechanisms.
C224	Formal Languages & Automata Theory	CO1	Compare different types of grammars and machines, distinguishing their definitions and classifications, to construct grammars and analyze finite state machines (FSMs) for optimization and realworld applications
		CO2	Utilize algebraic laws to examine regular expressions and their correlation with finite automata, showcasing comprehension of their characteristics, such as pumping lemma, closure properties, decision properties, and equivalence, pertaining to regular languages.
		CO3	Inspect Context-Free Grammars (CFGs) and Parse Trees, apply them in various applications, identify and resolve ambiguity in grammars and languages, understand normal forms, and evaluate properties such as pumping lemma, closure, and decision for CFLs
		CO4	Examine the relationship between PDAs and CFGs, demonstrate language recognition, establish equivalence, convert between representations, and assess Deterministic Pushdown Automata (DPDAs).
		CO5	Analyze Turing Machine concepts, including design and language acceptability, and explore undecidability, encompassing recursively enumerable problems and the Post Correspondence Problem.
C225	Managerial Economics	CO1	Utilize the knowledge of demand for their products and can assess various utility stages
		CO2	Analyze Production function & economies of scale and can identify the cost of the product.
		CO3	Identify the nature of competitive market situations.
		CO4	Utilize the knowledge of various pricing strategies.
		CO5	Identify various stages of Business cycles.

Laboratory Subjects

Course Code	Course Title	Experiment No	Course Outcomes	
C226	Algorithms Lab through C++.	1,2,3	CO1	Demonstrate the object-oriented concepts such as class, inheritance, Exception and Multithreading.
		4,5	CO2	Analyze the performance of merge sort and quick sort algorithms using divide and conquer technique.
		6	CO3	Apply dynamic programming and greedy methods to solve the Knapsack problem and evaluate their performance in



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				optimization scenarios.
		7,8,9,10	CO4	Construct and apply graph algorithms to solve optimization problems, including shortest paths, spanning trees, all-pairs shortest paths, and the Travelling Salesperson problem.
		11,12	CO5	Develop and implement solutions using backtracking and dynamic programming to analyze and solve the subset sum problem and evaluate all Hamiltonian cycles in a connected undirected graph.
C227	Database Management Systems Lab	a, b	CO1	Define schemas and Apply DDL commands to Create the Database
		c, d, e, f	CO2	Make use of SQL to write queries for performing data manipulation operations, Creating Views and Triggers
		G	CO3	Design a Database by applying Normalization rules
		h, i	CO4	Develop Interfaces with Embedded SQL by using Host Languages
		j, k	CO5	Apply tools to Build forms and Generate reports in SQL

Skill Oriented Courses

<i>Course Code</i>	<i>Course Title</i>	<i>Course Outcomes</i>	
C228	Web Technologies	CO1	Design and develop static web pages using HTML, demonstrating the ability to create interactive, well-structured web forms, and utilize essential form elements.
		CO2	Implement and apply inline, internal, and external CSS for styling static web pages, achieving a responsive and visually appealing user interface.
		CO3	Utilize JavaScript to enhance the functionality of web pages by adding client-side validation for user inputs in registration forms, ensuring data integrity.
		CO4	Demonstrate proficiency in building dynamic registration forms with JavaScript validation, ensuring correct format validation for fields such as name, password, email, and phone number.
		CO5	Evaluate the performance and usability of web pages by integrating interactive features such as form validation, pop-up alerts, and customized error messages in a dynamic registration form.

Manadatory Courses

<i>Course Code</i>	<i>Course Title</i>	<i>Course Outcomes</i>	
-	Professional Ethics & Universal	CO1	Apply the moral template to inculcate the core human values for transformation into an ethical human being
		CO2	Learn about the ethical responsibilities of the engineers and

	Human Values		their professional roles
		CO3	Acquire knowledge about engineering ethics, code of conduct for the development of professionalism in solving moral as well as ethical dilemmas
		CO4	Evaluate the responsibility and accountability of a professional engineer towards design, operation, safety, by adopting risk benefit analysis and create awareness about IPR
		CO5	Develop knowledge about global issues, have awareness on computer and environmental ethics, ethical problems in research



(With effect from 2022-23 AB)
B. Tech & B. Tech + M. Tech
(Computer Science and Engineering)
III year - I semester

Course Code	Category	Course Title	Hours per week		Internal Marks	External Marks	Total Marks	Credits
			L	P				
CS3101	PC	Data Communications & Computer Networks	4	0	30	70	100	3
CS3102	PC	Artificial Intelligence	4	0	30	70	100	3
CS3103	PC	Compiler Design	4	0	30	70	100	3
CS3104	PE	Professional Electives - I	4	0	30	70	100	3
CS3105	OE	Open Electives - I	4	0	30	70	100	3
CS3106	PC	Data Communications & Computer Networks Lab	0	3	50	50	100	1.5
CS3107	PC	Python Programming Lab	0	3	50	50	100	1.5
CS3108	SC	Soft Skills	1	2	50	50	100	2
CS3109	INT	Internship - I	0	0	50	50	100	2
Summer Internship 2 Months (Mandatory) after 2nd year (to be evaluated during III year I semester)								
Total Credits								22



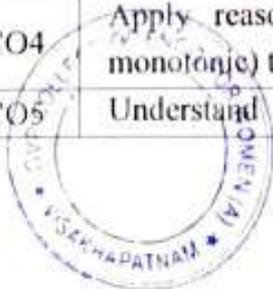
(With effect from 2022-23 AB)
B. Tech & B. Tech + M. Tech
(Computer Science and Engineering)
III year - II semester

Course code	Category	Course Title	Hours per Week		Internal Marks	External Marks	Total Marks	Credits
			L	P				
CS3201	PC	Object Oriented Software Engineering	4	0	30	70	100	3
CS3202	PC	Machine Learning	4	0	30	70	100	3
CS3203	PC	Cryptography & Network Security	4	0	30	70	100	3
CS3204	PE	Professional Elective - II	4	0	30	70	100	3
CS3205	OE	Open Elective - II	4	0	30	70	100	3
CS3206	PC	Object Oriented Software Engineering Lab	0	3	50	50	100	1.5
CS3207	PC	Machine Learning Lab	0	3	50	50	100	1.5
CS3208	PC	Cryptography & Network Security Lab	0	3	50	50	100	1.5
CS3209	SC	Embedded Systems Design	1	2	50	50	100	2
Industrial / Research Internship 2 months								
Total Credits								21.5

5th Semester

Theory Courses

Course Code	Course Title	Course Outcomes	
C311	Data Communications & Computer Networks	CO1	Understand the concepts of Data Communications and Network reference models (OSI and TCP/IP reference models).
		CO2	Understand the Data Communications interface and Signal Encoding Techniques.
		CO3	Interpret Data link layer Framing Techniques like FDM, TDM and MAC Sublayer.
		CO4	Make use of the Network Layer routing algorithms, Internet protocols to perform better network communication.
		CO5	Analyze the Transport layer protocols- TCP, UDP protocol working mechanism in Client – Server Data communication and Application layer protocols- SNMP.
C312	Artificial Intelligence	CO1	Characterize AI problems in state-space search and identify production system categories.
		CO2	Understand & evaluate heuristic search strategies and apply them appropriately.
		CO3	Represent domain knowledge using predicate logic and apply inference techniques.
		CO4	Apply reasoning methods (statistical, fuzzy, non-monotonic) to handle uncertainty.
		CO5	Understand concepts of NLP, planning, and expert




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			systems.
C313	Compiler Design	CO1	Demonstrate compiler phases, the role of lexical and syntax analyzer and Develop a lexical analyzer for a programming language using regular expressions, finite automata and LEX generator.
		CO2	Compare the pros and cons of top-down and bottom-up parsing techniques and assess their constraints, while evaluating the efficiency of syntax analysis parsing
		CO3	Analyze the different syntax-directed translation techniques and their effectiveness in generating intermediate code for a programming language.
		CO4	Apply efficient code optimization techniques to intermediate code.
		CO5	Build a code generator for a programming language and understand issues related to register allocation and assignment.
C314	Data Warehousing & Data Mining) (Professional Elective-1)	CO1	Understand the fundamental concepts of data mining and data warehousing, including data types, patterns, techniques, applications, and challenges.
		CO2	Perform data preprocessing tasks such as data cleaning, integration, reduction, transformation, and visualization to prepare quality data for mining applications..
		CO3	Apply OLAP operations and multidimensional data modeling concepts using data cubes for effective data warehouse design and analysis.
		CO4	Implement frequent pattern mining, association rule mining, and classification techniques (e.g., Decision Trees, Naïve Bayes, k-NN, Backpropagation) and evaluate model performance.
		CO5	Analyze datasets using various clustering techniques (partitioning, hierarchical, density-based, grid-based) and assess clustering results based on evaluation metrics.
C315	Mobile Cellular Communication (MCC) (Open Elective-	CO1	Outline and analyze the concepts of cellular systems and the effect of co-channel Interference reduction.
		CO2	Illustrate different types of antennas used at cell site and

	D)		mobile stations.
		CO3	Outline various frequency management, channel assignment algorithms in cellular systems and illustrate various propagation effects in cellular environment.
		CO4	Compare various types of handoff techniques and summarize the concepts of dropped calls.
		CO5	Understand the principle and features of 5G technology in cellular systems

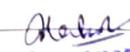
Laboratory Courses

Course Code	Course Title	Experiment No	Course Outcomes	
C316	Data Communications & Computer Networks Lab	1,2,8	CO1	Understand the Packet tracer Software, Network Cables and Network Configuration Commands.
		3,9,12	CO2	Make use of Data link Elementary protocols for Error Detection and Correction.
		4,7,10,11,15	CO3	Apply High-Level Data Link Control protocols.
		5,13,14	CO4	Experiment Transport layer protocols in Client –Server communication.
		6,16	CO5	Apply the Network Simulators for Congestion Control Algorithms.
C317	Python Programming Lab	1,2,3	CO1	Implement searching, sorting and handle text and files using Python data structures such as lists and dictionaries
		4,6	CO2	Calculate statistical measures using Python such as measures of central tendency, correlation
		5,7,8,9	CO3	Use Python data related libraries such as Numpy and Pandas and create data visualizations
		10,11,12	CO4	Implement basic machine learning tasks pre-processing data, compressing data, clustering, PCA
		13,14	CO5	Develop Programs to Implement classification and cross-validation

Skill Oriented Courses

Course Code	Course Title	Course Outcomes	
C318	Soft Skills	CO1	Apply verbal and non-verbal communication to real life situations.
		CO2	Utilize goal-setting and time management strategies to improve productivity
		CO3	Develop leadership and team management skills for effective collaboration
		CO4	Take part in group discussions.
		CO5	Construct effective resumes and prepare for interviews to successfully navigate in job market.




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Summer Internship

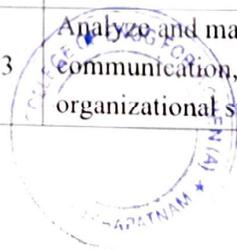
<i>Course Code</i>	<i>Course Title</i>	<i>Course Outcomes</i>	
C319	Internship	CO1	Skill Development: Learning and improving skills such as Writing, verbal communication, research, technology, teamwork and leadership
		CO2	Real World Applications: Understand the workplace, operating procedures, company profile and its products in addition to the existing class room knowledge
		CO3	Career Awareness: To provide the opportunity to learn about the career positions and occupations along with the qualities and training required
		CO4	Professional Ethics: Demonstrate professional values and ethical standards
		CO5	Personal Development: To develop the self - confidence, assertiveness and basic work habits

6th Semester

Theory Courses

<i>Course Code</i>	<i>Course Title</i>	<i>Course Outcomes</i>	
C321	Object Oriented Software Engineering	CO1	Relate the techniques of Machine Learning with the Statistical Learning Concepts.
		CO2	Demonstrate Various Classification and Regression techniques
		CO3	Analyze various Ensembling Learning Methods
		CO4	Illustrate the Clustering Techniques and Dimensionality Reduction Models in Machine Learning..
		CO5	Understand the basics of Software Engineering, its process models and the idea of Requirements Engineering
C322	Machine Learning	CO1	Understand different types of ML, applications of ML in different domains, VC dimension and PAC learning for concept learning and supervisory model selection
		CO2	Create Bayesian discriminant functions for decision regions with maximum likelihood estimation of

			parameters considering bias-variance tradeoff and Apply methods for missing value imputation, parameter estimation and dimensionality reduction on Multi-variate datasets
		CO3	Apply various Clustering approaches like Expectation Maximization, K-Means, Hierarchical to form clusters
		CO4	Solve classification and regression problems with Non Parametric methods, Decision Trees and Assess Classification Algorithms
		CO5	Utilize linear discriminants and SVMs to solve real time classification problems and analyze the performance of classification algorithms
C323	Cryptography & Network Security	CO1	Classify various Security attacks, Services, Mechanisms and Mathematics of Cryptography
		CO2	Relate Mathematics of Symmetric Key Cryptography and Apply the Symmetric key Cryptography like DES, AES.
		CO3	Relate Mathematics of Asymmetric Key Cryptography and Apply the Asymmetric key cryptography.
		CO4	Make use of Data Integrity, Digital Signature Schemes & Key Management for verifying the authenticity of digital messages
		CO5	Select protocols like PGP, S/MIME in Application layer and SSL, TLS in Transport layer to Secure the Network during data transmission and Select Internet protocol security (IPsec) at the Network Layer to provide security for Internet Protocol
C324	Software Project Management (Professional Elective-II)	CO1	Understand the fundamental concepts of software project management, project lifecycle models, roles of project manager, and business case development for IT projects.
		CO2	Apply project scope, time, and cost management techniques including WBS, scheduling with CPM/PERT, Gantt charts, EVM, and cost estimation models like COCOMO.
		CO3	Analyze and manage project human resources, communication, and change through appropriate organizational structures, motivation theories, conflict



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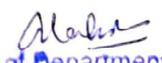
			resolution, and communication strategies
		CO4	Identify, assess, and control project risks using qualitative and quantitative risk analysis methods, and implement suitable risk response and evaluation plans.
		CO5	Demonstrate knowledge of project procurement, leadership, ethics, quality management, and effectively manage project execution through closure and evaluation processes.
	Cloud Computing (Professional Elective-II)	CO1	Articulate the main concepts, key technologies, strengths, and limitations of cloud computing and the possible applications for state-of-the-art cloud computing
		CO2	Identify the architecture and infrastructure of cloud computing, including SaaS, PaaS, IaaS, public cloud, private cloud, hybrid cloud, etc.
		CO3	Classify the Levels of Virtualization and mechanism of tools and Analyze Cloud Architectures.
		CO4	Assess Control Storage Systems.
		CO5	Get an idea and set up Private Clouds.
C325		Data Science (Open Elective-II)	CO1
	CO2		Identify suitable ML techniques for data modeling, and apply them for decision support to solve real-world data science problems.
	CO3		Apply big data solutions (e.g., Hadoop framework, NoSQL databases) to manage large datasets and support data-driven decisions using distributed storage and processing systems
	CO4		Make use of appropriate tools (Neo4j, nltk, SQLite) for text mining and graph-based analytics, integrating Python libraries for real-world data science applications.
	CO5		Analyze data visualization techniques, interactive dashboard development(dc.js, crossfilter), and the end-to-end data science process to create prototype applications for engineering problem-solving.
	Block Chain Technologies (Open Elective-II)	CO1	Understand the basic concepts of blockchain technology and explain the driving force behind Bitcoin.
		CO2	Differentiate the methods of decentralization using Blockchain and various Bitcoins and Altcoins

		CO3	Explain Ethereum and demonstrate applications using Smart Contracts and Blockchain-based solutions
		CO4	Develop familiarity with future digital currencies and create a basic crypto token.
		CO5	Utilize simple crypto token or smart contract to gain practical familiarity with blockchain-based application development.

Laboratory Subjects

Course Code	Course Title	Experiment No	Course Outcomes	
C326	Object Oriented Software Engineering	1,2	CO1	Understand the Requirements & Prepare Documentation.
		3	CO2	Make use of various design diagrams for the gathered requirements.
		4,5	CO3	Construct the UML Diagrams.
		7,8,9	CO4	Analyse the quality in object-oriented software engineering.
		6	CO5	Understand the testing problems and test whether all the requirements specified have been achieved or not.
C327	Machine Learning Lab	1,2,3	CO1	Perform exploratory data analysis (EDA) in R including data loading, statistical summary computation, data normalization, visualization, and evaluation of variable characteristics.
		4,5,6	CO2	Implement and work with various R data structures and apply functional programming concepts (apply family) for data transformation such as normalization and discretization.
		7,8	CO3	Build, analyze, and interpret regression models in R including evaluation using residuals, R^2 , F-statistics, correlation, and parameter significance.
		9,10	CO4	Develop classification models such as Decision Trees and evaluate them using performance metrics like confusion matrix, accuracy, and error rate.
		11,12,13,14,15	CO5	Utilize WEKA tools for preprocessing, performing classification, association rule mining, and applying different evaluation strategies to extract insights from datasets.
C328	Cryptography & Network	Exp1,2	CO1	Understand and apply foundational encryption concepts, including XOR operations and bitwise manipulation in C programming.




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	Security Lab	Exp 3	CO2	Implement cryptographic algorithms, such as Ceaser Cipher, Substitution Cipher, and Hill Cipher, using Java programming.
		Exp 4,5,6	CO3	Implement the DES ,RijnDael,Blowfish algorithm in Java, showcasing understanding and application of public-key cryptography.
		Exp 8,10	CO4	Implement the Rivest-Shamir-Adleman (RSA) ,SHA algorithm in Java, showcasing understanding and application of public-key cryptography.
		Exp 9	CO5	Implement secure communication mechanisms, including the Diffie-Hellman Key Exchange in HTML and JavaScript, emphasizing principles of secure key exchange.

Skill Oriented Courses

<i>Course Code</i>	<i>Course Title</i>	<i>Course Outcomes</i>	
-	Embedded System Design	CO1	Learn the basics of electronics, including reading schematics (electronics diagrams) and how to prototype circuits with a breadboard.
		CO2	Learn the Arduino programming language and IDE
		CO3	Acquire knowledge on how to program basic Arduino/ RASPBERRY Pi/8051/MSP430 using assemble language or C language.
		CO4	students able to learn how to build prototype models and interfacing various sensor to Arduino/ RASPBERRY Pi/8051/MSP430



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KAKINADA – 533 003, Andhra Pradesh, India

DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

IV B. Tech –I Semester						
S.No	Course Code	Course Title	Hours per week			Credits
			L	T	P	C
1	PE	Professional Elective-III 1.Cloud Computing 2.Neural Networks and Soft Computing 3.Ad-hoc and Sensor Networks 4.Cyber Security & Forensics	3	0	0	3
2	PE	Professional Elective-IV 1. Deep Learning Techniques 2. Social Networks & Semantic Web 3. Computer Vision 4.MOOCs-NPTEL/SWAYAM%	3	0	0	3
3	PE	Professional Elective-V 1.Block-Chain Technologies 2.Wireless Network Security 3.Ethical Hacking 4.MOOCs-NPTEL/SWAYAM%	3	0	0	3
4	Open Elective /Job Oriented	Open Elective-III Open Electives offered by other departments/ API and Microservices (Job Oriented Course)	3	0	0	3
5	Open Elective /Job Oriented	Open Elective-IV Open Electives offered by other departments/ Secure Coding Techniques (Job Oriented Course)	3	0	0	3
6	HS	Universal Human Values 2: Understanding Harmony	3	0	0	3
7	SO	1.PYTHON: Deep Learning OR 2.MEAN Stack Technologies-Module II- Angular JS and MongoDB OR 3.APSSDC offered Courses	0	0	4	2
8	PR	Industrial/Research Internship 2 months (Mandatory) after third year (to be evaluated during VII semester)	0	0	0	3
Total credits						23
11	Minor	Software Engineering ^{\$} / any other from PART-B (For Minor)	3	0	2	3+1
12	Honors	Any course from the Pool, as per the opted track	4	0	0	4
Minor course through SWAYAM						2

\$- Integrated Course

% - MOOC Course



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KAKINADA – 533 003, Andhra Pradesh, India

DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

IV B. Tech –II Semester						
S.No	Course Code	Course Title	Hours per week			Credits
			L	T	P	C
1	Project	Major Project Work, Seminar Internship	-	-	-	12
Total credits						12

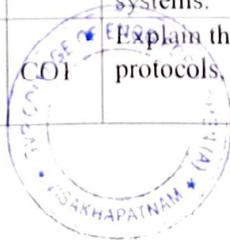
Note:

1. **For integrated courses:** Theory and laboratory exams will be conducted separately, and the student concern will get credits if successfully completes both theory and laboratory. Only external exam will be conducted for Laboratory component. Credit based weightage shall be considered while awarding the grade.
2. **For MOOC courses:** Based on the students interest, student can register and complete a 12 week course one year in advance, by prior information to the concern.

7th Semester
Theory Courses

<i>Course Code</i>	<i>Course Title</i>	<i>Course Outcomes</i>	
C411	Cloud Computing	CO1	Make use of the System models, Clustering and Virtualization for distributed and parallel systems, Scalable computing over the Internet.
		CO2	Identify the features of Virtual machines and Virtualization of clusters and data centers, Virtualization of CPU, Memory and I/O devices.
		CO3	Extend the Cloud Platform Architecture Cloud computing

			through Delivery models and Services. The services offered by Google App Engine, AWS and MS-Azure.	
		CO4	Apply Cloud Resource Management and scheduling , Scheduling algorithms for computing cloud	
		CO5	Analyze Storage Systems in Cloud Computing like DFS, GFS.	
		Cyber Security & Forensics	CO1	Explain the Cyber Crime Fundamentals
			CO2	Describe the types of attacks on networks
	CO3		Analyze various tools available for Cyber Crime Investigation	
	CO4		Explain the various Forensics and Investigation fundamentals and tools	
	CO5		Analyze the legal perspectives of Cyber Crime	
	C412	Deep Learning Techniques	CO1	Demonstrate the fundamental concepts learning techniques of Artificial Intelligence, Machine Learning and Deep Learning.
			CO2	Summarize the Deep learning concepts for training and improving the deep networks
CO3			Make use of Keras, TensorFlow, Theano and CNTK to perform binary and multiclass classifications.	
CO4			Classify the Concepts of CNN and RNN	
CO5			Interpret the concepts to Develop Interactive Applications of Deep Learning.	
C413	Block Chain Technologies	CO1	Enumerate the basic concepts, technology and Crypto currency used for blockchain	
		CO2	Understand hashing, differentiate private/public blockchains and able to describe the primitives of the distributed computing and cryptography related to block chain.	
		CO3	Illustrate the concepts of Bit coin and their usage.	
		CO4	Illustrate about advanced blockchain concepts like Ethereum, IOTA, consensus, private blockchains like Hyperledger, diverse cryptocurrencies, and adoption strategies.	
		CO5	Understand blockchain challenges, business models, regulations, and versatile applications in E-Governance, land registration, and healthcare systems.	
	Ethical Hacking	CO1	Explain the Concepts related to hacking, ports and protocols, Pen testing and Virtualization	



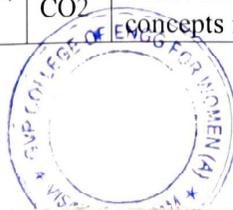

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		CO2	Determine the applicable footprinting techniques and scanning methods
		CO3	Explain the process of system hacking and Explain the concepts Trojans, backdoors, worms and Virus and its Counter Measures
		CO4	Demonstrate System Understanding of the concepts of Sniffing, Social Engineering and its attacks
		CO5	Determine the applicable methods of Cryptography, Steganography and Vulnerability Assessment
C414	API and MICRO Services	CO1	Demonstrate an understanding of the Spring Framework, IoC container, and Java-based configuration, and apply AutoScanning for component discovery
		CO2	Develop Spring Boot applications with annotations, Autowiring, and AOP advices, following best practices.
		CO3	Analyze Spring Data JPA with Spring Boot for handling pagination, sorting, queries, transactions, and custom repository implementation.
		CO4	Distinguish between SOAP-based and RESTful web services, and construct RESTful web services adhering to industry standards.
		CO5	Analyze annotations for parameter injection, handle exceptions and data validation, contrast REST endpoint versioning strategies, and categorize methods for configuring CORS securely in Spring RESTful services.
C415	Digital Logic Design	CO1	Represent different number systems, perform binary arithmetic, Apply Boolean theorems to minimize logic functions and Realize any logic gates with NAND and NOR gates.
		CO2	Manipulate Boolean expressions using Karnaugh Maps in both SOP and POS forms. Model combinational logic circuits using gates.
		CO3	Model combinational logic circuits using PLD's
		CO4	Outline the concept of latches and flip-flops. Construct

			sequential logic circuits like counters and registers using flip-flops.
		CO5	Model Finite State Machines using Mealy and Moore
	Data Communication s	CO1	Outline the functions of various layers of OSI/TCP reference model ,the Categories and functions of various Data communication Networks
		CO2	Understand and explain various datalink layer protocols.
		CO3	Explain the network layer protocols& Demonstrate the mechanism of routing the data in networklayer
		CO4	Explain significance of transport layer and know the various Flow control and Congestion control Mechanisms
		CO5	Understand the Functioning of various Application layerProtocols.
C416	Universal Human Values	CO1	Classify Course Introduction, Need, Basic guidelines, Content and Process for Value Education
		CO2	Demonstrate harmony in human being harmony in myself
		CO3	Explain harmony in the family and society, harmony in human relationship
		CO4	Summarize harmony in nature and existence-whole existence as co existence
		CO5	Assume the above holistic understanding of harmony in professional ethics.

Skill Oriented Courses

Course Code	Course Title	Experiment No	Course Outcomes	
C417	Deep Learning	1,2,4,8	CO1	Apply the concepts of ANN to Build a convolutional neural network and Recurrent Neural Networks for Classification, Image Recognition, Prediction applications.
		3,5,7,11, 12	CO2	Make use of Optimization and hyper parameter tuning concepts in developing Deep Learning applications.



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		6	CO3	Develop Object Detection applications by utilizing advanced Deep learning architectures.
		9	CO4	Build advanced Deep Learning applications by using autoencoders.
		10	CO5	Construct advanced Deep Learning applications by using Generative Adversal Networks..
C418	Mean Stack Technologies-Module II-Angular JS and MongoDB	1,2,3,6	CO1	Build a component-based application using Angular components and enhance their functionality using directives
		4,7,8	CO2	Utilize data binding for developing Angular forms and bind them with model data.
		5	CO3	Apply Angular built-in or custom pipes to format the rendered data.
		9,10	CO4	Develop a single page application by using synchronous or asynchronous Angular routing.
		11,12	CO5	Make use of MongoDB queries to perform CRUD operations on document database.

Summer Internship

<i>Course Code</i>	<i>Course Title</i>	<i>Course Outcomes</i>	
C419	Industrial/ Research Internship	CO1	Skill Development: Learning and improving skills such as Writing, verbal communication, research, technology, teamwork and leadership
		CO2	Real World Applications: Understand the workplace, operating procedures, company profile and its products in addition to the existing class room knowledge
		CO3	Career Awareness: To provide the opportunity to learn about the career positions and occupations along with the qualities and training required
		CO4	Professional Ethics: Demonstrate professional values and ethical standards
		CO5	Personal Development: To develop the self - confidence, assertiveness and basic work habits

8th Semester

<i>Course Code</i>	<i>Course Title</i>	<i>Course Outcomes</i>	
C421	Project	CO1	Demonstrate the technical knowledge to identify problems in the field of Computer Science and 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.



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COURSE STRUCTURE

(Applicable for the Academic Year 2024-25 onwards)

DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING [ARTIFICIAL INTELLIGENCE AND MACHINE LEARNING]

B.TECH. COMPUTER SCIENCE AND ENGINEERING - AIML

SCHEME AND SYLLABI

(With effect from 2024-25 admitted batch)

I Year - I Semester								
Course Code	Category	Course Title	Hours per Week		Internal Marks	External Marks	Total Marks	Credits
			L	P				
24BM11RC01	BS	Calculus and Differential Equations	3	0	30	70	100	3
24BP11RC01	BS	Engineering Physics	3	0	30	70	100	3
24EC11RC04	ES	Elements of Electronics Engineering	3	0	30	70	100	3
24CT11RC01	ES	Fundamentals of Computers	3	0	30	70	100	3
24CT11RC02	ES	Problem Solving using C	3	0	30	70	100	3
24BP11RC02	BS	Engineering Physics Lab	0	3	50	50	100	1.5
24CT11RC03	ES	Computer Engineering Workshop	0	3	50	50	100	1.5
24CT11RC04	ES	Problem Solving using C Lab	0	3	50	50	100	1.5
Total Credits								19.5
I Year - II Semester								
Course Code	Category	Course Title	Hours per Week		Internal Marks	External Marks	Total Marks	Credits
			L	P				
24BM11RC02	BS	Linear Algebra and Vector Calculus	3	0	30	70	100	3
24BC11RC01	BS	Green Chemistry	3	0	30	70	100	3
24HE11RC01	HSS	English	3	0	30	70	100	3
24EC11RC05	ES	Digital Logic Design	3	0	30	70	100	3
24CT11RC06	ES	Python Programming	3	0	30	70	100	3
24HE11RC02	HSS	Communication Skills Lab	0	3	50	50	100	1.5
24CT11RC07	ES	Python Programming Lab	0	3	50	50	100	1.5
24CT11RC08	ES	Web Technologies Fundamentals Lab	0	3	50	50	100	1.5
Total Credits								19.5



GAYATRI VIDYA PARISHAD COLLEGE OF ENGINEERING FOR WOMEN

KOMMADI, MADHURAWADA, VISAKHAPATNAM - 530 048

(APPROVED BY AICTE, NEW DELHI, AFFILIATED TO ANDHRA UNIVERSITY, VISAKHAPATNAM)

(ACCREDITED BY NATIONAL BOARD OF ACCREDITATION [NBA] FOR B.TECH CSE, ECE AND IT - VALID FROM 2019-22 AND 2022-25)

(ACCREDITED BY NATIONAL BOARD OF ACCREDITATION [NBA] FOR B.TECH EEE VALID FROM 2023-24 TO 2025-2026)

(ACCREDITED BY NATIONAL ASSESSMENT AND ACCREDITATION COUNCIL [NAAC] WITH A GRADE- VALID FROM 2022-27)

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Department of Computer Science and Engineering (AI&ML)

Course Outcomes Academic Year 2024-25

1st Semester Theory Courses

Course Code	Course Title	Course Outcomes	
C111	Calculus and Differential Equations	CO1	Examine the functional dependency and utilize Taylor's theorem to expand the function of two variables theorem. (L4)
		CO2	Determine extrema of multivariable functions. (L5)
		CO3	Utilize double and triple integrals to evaluate areas of plane curves and the volumes of solids. (L5)
		CO4	Solve the first order differential equations and higher order differential equations with constant coefficients, apply the techniques to solve problems related to various engineering fields. (L3)
		CO5	Find the Laplace Transforms of various functions and apply it to solve ordinary differential Equations with initial conditions. (L3)
C112	Engineering Physics	CO1	Apply the principles of interference, diffraction, and polarization in wave optics, and utilize optical instruments for practical applications. (L3)
		CO2	Familiarize the basic concepts of Thermodynamics relevant to engineering applications. (L2)
		CO3	Outline the knowledge of basic principles of Electromagnetism and EM Waves. (L2)
		CO4	Describe the basic principles of lasers, optical fibres and their use in technological applications. (L2)
		CO5	Understand the basic principles of Quantum mechanics, Quantum computing. (L2)
C113	Elements of Electronics Engineering	CO1	Outline the concepts of semiconductor devices. (L2)
		CO2	Understand the characteristics of different semiconductor diodes and their applications. (L2)
		CO3	Apply various biasing techniques for design of BJT circuits. (L3)
		CO4	Apply hybrid models to understand the operation of BJT amplifier. (L3)
		CO5	Understand the characteristics of FET. (L2)

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C114	Fundamentals of Computers	CO1	Identify different I/O devices and their usage. (L3)
		CO2	Compare different computer memory with their efficiency. (L3)
		CO3	Relate different computer software's and programming languages for solving problems. (L2)
		CO4	Summarize the use of operating system, database system, and computer network in the field of computing in engineering. (L2)
		CO5	Infer the methods and applications of artificial intelligence (AI), machine learning (ML) and data science. (L3)
C115	Problem Solving using C	CO1	Explain the basic constructs of C through the use of simple applications. (L2)
		CO2	Demonstrate the utilization of arrays and 'strings' in the development of C programs. (L2)
		CO3	Utilize functions and pointers to construct various applications in C. (L3)
		CO4	Apply concepts of structures and unions to build and implement C applications. (L3)
		CO5	Develop applications using sequential and random-access file processing techniques. (L3)

Laboratory Courses

Course Code	Course Title	Experiment No	CO. No.	Course Outcomes
C116	Engineering Physics Lab	1, 6	CO1	Operate travelling microscope to study the thin film interference.
		2, 4, 5, 15	CO2	Determine wavelengths of light from discharge lamps and laser source by operating spectrometer, prism and diffraction grating.
		3	CO3	Study the variation of magnetic field with Stewart Gee apparatus and calculate the Planck's constant using LED.
		7, 8	CO4	Calibrate a DC moving coil voltmeter and ammeter
		12	CO5	Estimate the vibrational frequency due to tuning fork.
C117	Computer Engineering Workshop	1, 2	CO1	Identify the peripherals of a computer. (L3)
		3, 4	CO2	Demonstrate the installation process of operating systems like MS Windows, LINUX. (L3)
		5	CO3	Make use of MS-Office suite that comprises of various applications to create documents, organizes & analyses data and captivating

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				presentations. (L3)
		6, 7	CO4	Categorize various UNIX/LINUX Commands to work on a modern operating system. (L3)
		8	CO5	Experiment with GIT Commands and make use of LaTeX to prepare research articles. (L3)
C118	Problem Solving using C Lab	1,2	CO1	Outline the use of basic constructs of C for simple applications. (L2)
		3,4	CO2	Develop C programs for simple applications using Arrays and Strings. (L3)
		5,6,7,8	CO3	Illustrate concepts such as functions, recursion, and pointers with suitable examples. (L2)
		9,10,11, 12, 13	CO4	Build C programs involving Structures and Unions. (L3)
		14,15,16	CO5	Develop applications using sequential and random-access file processing. (L3)

**2nd Semester
Theory Courses**

Course Code	Course Title	CO1	Course Outcomes
C121	Linear Algebra and Vector Calculus	CO1	Test for consistency and solve linear system of equations, also determine unknown currents in the electrical circuits. (L5)
		CO2	Find the Eigen values and Eigen vectors of a matrix and apply Cayley- Hamilton theorem to find the inverse of a matrix. (L3)
		CO3	Reduce quadratic form to canonical form and examine the nature of quadratic form. (L4)
		CO4	Interpret the meaning and evaluate gradient of a scalar valued, curl and divergence of vector valued functions. (L5)
		CO5	Apply line integrals, surface integrals, volume integrals and their relations using Green's theorem, Stoke's theorem, Gauss Divergence theorems in various engineering applications. (L3)
C122	Green Chemistry	CO1	To develop knowledge about water and its treatment for industrial and potable purpose. (L3)
		CO2	Utilize the theory of construction and discharge reactions of various types of batteries are used in commercial society. (L3)
		CO3	Explain the importance of working principle, fabrication of electrodes and other components, advantages, disadvantages and environmental aspects of

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			fuel cells. (L4)
		CO4	Classify the corrosion mechanism of metals and factors influenced by rate and extent of corrosion and categorize the reasons for corrosion control methods. (L4)
		CO5	Apply green chemistry technology processes the knowledge for solving existing challenges faced in various engineering and societal areas. (L5)
C123	English	CO1	Develop moral values and inner peace(L3), Demonstrate the use of LSRW skills, Vocabulary and basic grammar concepts. (L3)
		CO2	Identify the impact of different social backgrounds (L3), recognize the poet's insights. (L4) Demonstrate the use of LSRW skills, Vocabulary and basic grammar concepts. (L3)
		CO3	Analyse socio-cultural context(L4), Establish effective interpersonal and communication skills(L3), Demonstrate the use of LSRW skills, Vocabulary and basic grammar concepts(L3)
		CO4	Focus on value of education(L4), Relate to the poet's nostalgia(L4), Demonstrate the use of LSRW skills, Vocabulary and basic grammar concepts (L3)
		CO5	Determine the central idea of the text(L3), Identify one's resilience(L3), Demonstrate the use of LSRW skills, Vocabulary and basic grammar concepts (L3)
C124	Digital Logic Design	CO1	Represent different number systems & binary codes and perform conversions & binary arithmetic. (L2)
		CO2	Apply different simplification methods for minimizing Boolean functions. (L3)
		CO3	Model various combinational circuits using gates and PLD's. (L3)
		CO4	Outline the concept of latches and flip-flops. Construct sequential logic circuits like counters and registers using flip-flops. (L3)
		CO5	Categorize Mealy & Moore models and Design Synchronous Sequential machines. (L3)
C125	Python Programming	CO1	Understand the historical development, necessity, applications, and basic concepts of python programming. (L2)
		CO2	Identify and implement appropriate control structures to solve a particular programming problem. (L3)
		CO3	Examine various data structures and apply to solve real world problems. (L3)
		CO4	Build simple functions and packages used in python for

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		solving real world problems. (L3)
	CO5	Outline Object Oriented concepts in python and illustrate Exception handling. (L2)

Laboratory Courses

Course Code	Course Title	Experiment No	CO. No.	Course Outcomes
C126	Communication Skills Lab	1, 2	CO1	Identify and pronounce the sounds of English; choose the accurate stress in connected speech for proper intonation. (L3)
		3, 4	CO2	Apply the main theme and ideas of the audio/video to take notes and summarize. (L3)
		5, 6, 7	CO3	Develop speaking skills by taking part in Just A Minute (JAM) – Picture Prompts-Narratives-Role Play. (L3)
		8, 9	CO4	Practice discussions and debates. (L3)
		10	CO5	Demonstrate Presentation Skills. (L3)
C127	Python Programming Lab	1, 2	CO1	Understand core programming basics and various Operators of Python. (L2)
		3, 4	CO2	Implement programs using conditional statements and loops and strings. (L3)
		5, 6	CO3	Develop functions and strings to perform simple tasks. (L3)
		7, 8, 9	CO4	Make use of various data structures like lists, tuples, sets and dictionaries. (L3)
		10, 11	CO5	Implement Python programs with files, Classes and objects. (L3)
C128	Web Technologies Fundamentals Labs	1, 2	CO1	Build HTML-based web pages using standard HTML elements.
		3, 4	CO2	Apply CSS (inline, internal, external) for layout and responsive design.
		5, 6	CO3	Use JavaScript for interactivity, DOM manipulation, and validation.
		7, 8, 9	CO4	Use arrays, objects, and OOP concepts in JavaScript to render dynamic content.
		10, 11	CO5	Create XML documents and DTD for validation.

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(With effect from 2022-23 admitted batch)

B. TECH Computer Science and Engineering (Artificial Intelligence and Machine Learning)
(Common with CSE and IT)

II Year - I Semester

Course code	Category	Course Title	Hours per week		Internal Marks	External Marks	Total Marks	Credits
			L	P				
AI2101	ES	Discrete Mathematical Structures	4	0	30	70	100	3
AI2102	PC	Computer Organization and Architecture	4	0	30	70	100	3
AI2103	BS	Probability, Statistics and Queuing theory	4	0	30	70	100	3
AI2104	PC	Operating Systems	4	0	30	70	100	3
AI2105	PC	Object Oriented Programming Through Java	4	0	30	70	100	3
AI2106	PC	Computer Organization & Architecture Lab	0	3	30	70	100	1.5
AI2107	PC	Object Oriented Programming Through Java Lab	0	3	50	50	100	1.5
AI2108	PC	Operating Systems Lab	0	3	50	50	100	1.5
AI2109	SC	Intellectual Property Rights (Internal)	1	2	100	0	100	2
AI2110	MC	Environmental Science	0	0	-	100	100	0
Total credits								21.5

II Year - II Semester

Course code	Category	Course Title	Hours per week		Internal Marks	External Marks	Total Marks	Credits
			L	P				
AI2201	ES	Microprocessors	4	0	30	70	100	3
AI2202	PC	Design and Analysis of Algorithms	4	0	30	70	100	3
AI2203	PC	Database Management Systems	4	0	30	70	100	3
AI2204	PC	Formal Languages & Automata Theory	4	0	30	70	100	3
AI2205	HSS	Managerial Economics	4	0	30	70	100	3
AI2206	PC	Algorithms Lab through C++	0	3	50	50	100	1.5
AI2207	PC	Database Management Systems Lab	0	3	50	50	100	1.5
AI2208	SC	Web Technologies	1	2	50	50	100	2
AI2209	MC	Professional Ethics & Universal Human Values	0	0	0	100	100	0
AI2210	MC	NCC/NSS	0	2	-	-	-	0
Total credits								20
Internship-I								

3rd Semester
Theory Courses

Course Code	Course Title	Course Outcomes	
C211	Discrete Mathematical Structures	CO1	Rewrite mathematical arguments using logical connectives and quantifiers and verify the validity of logical flow of arguments using propositional, predicate logic and describes the fundamental properties of the Number Theory
		CO2	Ability to solve problems using mathematical induction, recursion, permutations and combinations.
		CO3	Construct generating functions, recurrence relations and the solve recurrence relations, identify and give examples of various types of relations and describe various properties of the relations.
		CO4	Determine isomorphism of graphs and spanning tree of a given graph using BFS/DFS algorithms. Also determine minimal spanning tree of a given graph.
		CO5	Students will be able to use the concepts of Boolean Algebra for the analysis and design of various combinational and sequential Finite State Machines.
C212	Computer Organization & Architecture	CO1	Demonstrate design of a major components of a basic computer such as register transfer microoperations, registers, instruction codes, timing and control unit and arithmetic logic shift unit.
		CO2	Differentiate micro-programmed from hard-wired control unit and analyze the design of microprogrammed control unit
		CO3	Evaluate central processing units (CPUs), including register organization, instruction formats, and addressing modes, and understand 8085 microprocessor along with parallel processing
		CO4	Interpreting different ways of communication with I/O devices and standard I/O interfaces
		CO5	Understand memory hierarchy and the basics of memory systems for efficient data storage and retrieval in computer systems.
C213	Probability, Statistics and Queuing theory	CO1	Define and explain basic concepts in probability theory and how to translate real-world problems into probability models
		CO2	Solve standard problems that include random variables, discrete and continuous probability distributions
		CO3	Compute and interpret the results of Correlation Analysis, Multivariate Regression, Chi-Square test for Independence

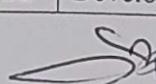
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			and Goodness of Fit
		CO4	Perform Test of Hypothesis and construct a confidence interval to estimate population parameters
		CO5	Explain basic concepts in Markov processes, M/M/1 and M/M/C queueing systems.
C214	Operating Systems	CO1	Summarize the Types, Structures, Services and System calls of Operating Systems and Operating System Design and Implementation.
		CO2	Outline various Process Concepts, Operations, IPC and Threads and make use of CPU Scheduling algorithms.
		CO3	Summarize various Process synchronization concepts and Deadlocks Identify the causes and effects of deadlocks in Operating system.
		CO4	Outline Memory Management concepts and Apply various Page Replacement Algorithms to manage the memory efficiently.
		CO5	Make use of File System Interface, File System Implementation and Mass Storage Structure and Examine Linux and Microsoft Windows Operating Systems.
C215	Object Oriented Programming Through Java	CO1	Explain the basic concepts of java programming constructs including Program Structure, Tokens, Control Statements and their representation.
		CO2	Demonstrate the use of classes and objects, Inheritance, Interfaces and also their behavior and implementation in solving specific problems.
		CO3	Develop java applications by using event based graphical user interfaces and I/O programming.
		CO4	Illustrate the concept of multi-threading and exception handling.
		CO5	Make use of Java Database Connectivity (JDBC) to build connection with database.

Laboratory/Skill Oriented Subjects

Course Code	Course Title	Experiment No	Course Outcomes
C216	Computer Organization &	Module 1: 1, 2	CO1 Simulate the logic gates, decoder, and multiplexer using VHDL programming.
		Module 1:	CO2 Develop the VHDL programming for D, S-R flip


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	Architecture Lab	3, 4		flops, and up-down counter.
		Module 1: 5, 6, 7	CO3	Design 4-bit shift register, ALU, and 4-bit binary adder and subtractor using VHDL programming.
		Module 2: 1	CO4	Formulate the assembly language programs for arithmetic operations using 8086 microprocessor.
		Module 2: 2	CO5	Implement assembly language programs for string operations using the 8086 microprocessor.
C217	Object Oriented Programming Through Java Lab	1	CO1	Identify classes, objects, members of a class and the relationship among them needed for a specific problem using basic java programming language constructs.
		2	CO2	Explain the usage of strings in Java by developing suitable applications.
		3,4,5,6,8	CO3	Solve real world problems using OOPs concepts.
		7,9	CO4	Build Java applications by handling exceptions.
		10,11,12	CO5	Develop concurrent applications by applying Multithreading and AWT concepts in the design of GUI based applications.
C218	Operating Systems Lab	Linux-1,2,3,4	CO1	Experiment with different Linux commands and develop shell programs for basic control statements.
		OS-1	CO2	Develop programs for various CPU Scheduling Algorithms.
		OS-2,4	CO3	Build programs for Memory Management Techniques and Page Replacement Algorithms.
		OS-3,5	CO4	Construct programs for various disk scheduling algorithms, Deadlock detection and Avoidance Techniques.
		Linux-5,6,7,8	CO5	Develop programs related to multiprogramming and multitasking capabilities of Linux and using system calls for process management, inter process communication.

Skill Oriented Courses

Course Code	Course Title	Course Outcomes	
C219(A)	Intellectual Property Rights	CO1	Outline the concept of Intellectual property rights, IPR tool kit and its importance in the global scenario and drive themselves towards the path of entrepreneurship through their creative innovations.
		CO2	Explain and gain knowledge on patents, patent registration process and recent developments in patent system.

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		CO3	Demonstrate and understand about copyright and trademark protection, the registration process and legal remedies available in case of infringement.
		CO4	Understand the principles of trade secrets and their maintenance, industrial design registration and remedies for infringement.
		CO5	Gain knowledge about the concept of IP commercialization, licensing, technology transfer and emerging areas in IP.

Mandatory Courses

Course Code	Course Title	Course Outcomes	
C219(B)	Environmental Science	CO1	Understand the importance of Ecosystem and Biodiversity for maintaining ecological balance.
		CO2	Identify the characteristics of various natural resources and can implement the conservation practices.
		CO3	Analyze the sources of pollutants and their effects on atmosphere.
		CO4	Understand the elements of sustainable development, energy and environmental management.
		CO5	Gain knowledge on environmental protection acts, solid waste management, new generation waste like e-waste, Plastic waste.

4th Semester Theory Courses

Course Code	Course Title	Course Outcomes	
C221	Microprocessors	CO1	Outline the architecture and instruction set of 8085 and 8086 microprocessors.
		CO2	Describe interfacing of different semiconductor memories and I/O devices with 8086 microprocessor.
		CO3	Implement parallel i/o interface, serial i/o interface, and timer interface with 8086 microprocessor.
		CO4	Develop applications using keyboard/display interface, interrupt controller interface and data converters with 8086 microprocessor.
		CO5	Outline the architecture and instruction set of 8051 microcontroller.
C222	Design and Analysis of Algorithms	CO1	Analyze the time and space complexities of algorithms using asymptotic notations.
		CO2	Apply divide and conquer and greedy paradigm to solve real time applications.

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		CO3	Make use of Dynamic programming paradigm to solve real world applications.
		CO4	Utilize Backtracking techniques, Branch and Bound to analyze engineering applications.
		CO5	Classify NP-Hard and NP-Complete problems to solve real world applications.
C223	Database Management Systems	CO1	Outline the architecture of DBMS and provide the knowledge on levels of abstraction.
		CO2	Construct the E-R model to represent databases, Model the database by Creating, maintaining and manipulating a relational database using SQL and convert ER to relational model using the concepts of Logical database design.
		CO3	Experiment with Relational Algebra, Basic SQL, nested queries, triggers, Embedded SQL, JDBC on real world problems and work with several operators like join, set, and aggregate.
		CO4	Relate and plan the concept of data planning and database design using normalization.
		CO5	Make use of the ACID properties in transaction management with Concurrency Control, Recoverability and Crash Recovery mechanisms.
C224	Formal Languages & Automata Theory	CO1	Compare different types of grammars and machines, distinguishing their definitions and classifications, to construct grammars and analyze finite state machines (FSMs) for optimization and real-world applications.
		CO2	Utilize algebraic laws to examine regular expressions and their correlation with finite automata, showcasing comprehension of their characteristics, such as pumping lemma, closure properties, decision properties, and equivalence, pertaining to regular languages.
		CO3	Inspect Context-Free Grammars (CFGs) and Parse Trees, apply them in various applications, identify and resolve ambiguity in grammars and languages, understand normal forms, and evaluate properties such as pumping lemma, closure, and decision for CFLs.
		CO4	Examine the relationship between PDAs and CFGs, demonstrate language recognition, establish equivalence, convert between representations, and assess Deterministic Pushdown Automata (DPDAs).
		CO5	Analyze Turing Machine concepts, including design and language acceptability, and explore undecidability, encompassing recursively enumerable problems and the Post Correspondence Problem.
C225	Managerial	CO1	Utilize the knowledge of demand for their products and

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	Economics		can assess various utility stages.
		CO2	Analyze Production function & economies of scale and can identify the cost of the product.
		CO3	Identify the nature of competitive market situations.
		CO4	Utilize the knowledge of various pricing strategies.
		CO5	Identify various stages of Business cycles.

Laboratory/Skill Oriented Subjects

Course Code	Course Title	Experiment No	Course Outcomes	
C226	Algorithms Lab through C++	1,2,3	CO1	Demonstrate the object-oriented concepts such as class, inheritance, Exception and Multithreading.
		4,5	CO2	Analyze the performance of merge sort and quick sort algorithms using divide and conquer technique.
		6	CO3	Apply dynamic programming and greedy methods to solve the Knapsack problem and evaluate their performance in optimization scenarios.
		7,8,9,10	CO4	Construct and apply graph algorithms to solve optimization problems, including shortest paths, spanning trees, all-pairs shortest paths, and the Travelling Salesperson problem.
		11,12	CO5	Develop and implement solutions using backtracking and dynamic programming to analyze and solve the subset sum problem and evaluate all Hamiltonian cycles in a connected undirected graph.
C227	Database Management Systems Lab	a, b	CO1	Define schemas and Apply DDL commands to Create the Database.
		c, d, e, f	CO2	Make use of SQL to write queries for performing data manipulation operations, Creating Views and Triggers.
		g	CO3	Design a Database by applying Normalization rules
		h, i	CO4	Develop Interfaces with Embedded SQL by using Host Languages.
		j, k	CO5	Apply tools to Build forms and Generate reports in SQL.

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Skill Courses

Course Code	Course Title	Course Outcomes	
C228	Web Technologies	CO1	Design and develop static web pages using HTML, demonstrating the ability to create interactive, well-structured web forms, and utilize essential form elements.
		CO2	Implement and apply inline, internal, and external CSS for styling static web pages, achieving a responsive and visually appealing user interface.
		CO3	Utilize JavaScript to enhance the functionality of web pages by adding client-side validation for user inputs in registration forms, ensuring data integrity.
		CO4	Demonstrate proficiency in building dynamic registration forms with JavaScript validation, ensuring correct format validation for fields such as name, password, email, and phone number.
		CO5	Evaluate the performance and usability of web pages by integrating interactive features such as form validation, pop-up alerts, and customized error messages in a dynamic registration form.

Mandatory Courses

Course Code	Course Title	Course Outcomes	
C229	Professional Ethics & Universal Human Values	CO1	Apply the moral template to inculcate the core human values for transformation into an ethical human being.
		CO2	Learn about the ethical responsibilities of the engineers and their professional roles.
		CO3	Acquire knowledge about engineering ethics, code of conduct for the development of professionalism in solving moral as well as ethical dilemmas.
		CO4	Evaluate the responsibility and accountability of a professional engineer towards design, operation, safety, by adopting risk benefit analysis and create awareness about IPR.
		CO5	Develop knowledge about global issues, have awareness on computer and environmental ethics, ethical problems in research.

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SCHEME AND SYLLABI
(With effect from 2022-23 admitted batch)

B. TECH Computer Science and Engineering (Artificial Intelligence and Machine Learning)

III Year - I Semester

Course code	Category	Course Title	Hours per week		Internal Marks	External Marks	Total Marks	Credits
			L	P				
AI3101	PC	Data Warehousing and Data Mining	4	0	30	70	100	3
AI3102	PC	Artificial Intelligence	4	0	30	70	100	3
AI3103	PC	Machine Learning Techniques	4	0	30	70	100	3
AI3104	PE	Professional Elective-I	4	0	30	70	100	3
AI3105	OE	Open Elective-I	4	0	30	70	100	3
AI3106	PC	Data Warehousing and Data Mining Lab	0	3	50	50	100	1.5
AI3107	PC	Machine Learning Techniques Lab	0	3	50	50	100	1.5
AI3108	SC	Skill Development Course-I: (Continuous Integration and Continuous Delivery using DevOps)	1	3	50	50	100	2
AI3109	INT	Internship-I	0	0	50	50	100	2
Summer Internship 2 Months (Mandatory) after 2 nd year (to be evaluated during III year I Semester)								
Total credits								22

III Year - II Semester

Course code	Category	Course Title	Hours per week		Internal Marks	External Marks	Total Marks	Credits
			L	P				
AI3201	PC	Computer Networks	4	0	30	70	100	3
AI3202	PC	Deep Learning Techniques	4	0	30	70	100	3
AI3203	PC	Big Data and Hadoop	4	0	30	70	100	3
AI3204	PE	Professional Elective-II	4	0	30	70	100	3
AI3205	OE	Open Elective-II	1	3	30	70	100	3
AI3206	PC	Computer Networks Lab						1.5
AI3207	PC	Deep Learning Lab	0	3	50	50	100	1.5
AI3208	PC	Big Data and Hadoop Lab	0	3	50	50	100	1.5
AI3209	SC	Skill Development Course-II: MEAN Stack Technologies	1	3	50	50	100	2
Total credits								21.5
Internship-II								

5th Semester
Theory Courses

Course Code	Course Title	Course Outcomes	
C311	Data Warehousing and Data Mining	CO1	Understand and explain the fundamentals of data mining, including its importance, kinds of data and patterns, enabling technologies, applications, and major issues.
		CO2	Analyze data objects, attribute types, statistical descriptions, similarity and dissimilarity measures, and visualization techniques to gain insights from datasets.
		CO3	Apply data preprocessing techniques such as data cleaning, integration, reduction, transformation, discretization, and concept hierarchy generation to improve data quality.
		CO4	Evaluate and implement data warehouse and OLAP concepts including data cube modeling, OLAP operations, data generalization, and usage for analytical processing.
		CO5	Design and implement data mining models for frequent pattern mining, classification, prediction, and clustering using appropriate algorithms and evaluation techniques.
C312	Artificial Intelligence	CO1	Explain fundamental artificial intelligence problem-solving techniques, including uninformed and heuristic search strategies to solve AI problems.
		CO2	Apply knowledge representation techniques using propositional and first-order predicate logic through logical inference, resolution, unification, rule-based reasoning, and logic programming to solve AI problems.
		CO3	Make use of reasoning techniques under uncertainty and structured knowledge representation methods, including non-monotonic reasoning, semantic networks, frames, conceptual dependency, and scripts to solve complex AI reasoning problems.
		CO4	Outline different steps in Natural Language Processing and plan by using techniques like goal stack, non-linear, hierarchical, and reactive planning concepts to evaluate intelligent systems.
		CO5	Relate expert system concepts by linking appropriate architectures, knowledge representation methods, and development techniques to design, evaluate, and validate expert systems for real-world applications.
C313	Machine Learning	CO1	Explain the fundamentals of AI, Machine Learning, and Deep Learning and the challenges of machine learning.

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	Techniques	CO2	Build an end-to-end machine learning project from problem formulation to model deployment.
		CO3	Apply supervised learning algorithms for regression and classification problems.
		CO4	Make use of dimensionality reduction techniques such as PCA and Kernel PCA to handle high-dimensional data.
		CO5	Develop ensemble and deep learning models using Random Forests and Neural Networks with TensorFlow/Keras.
C314	Compiler Design	CO1	Illustrate the introduction to compiler, Finite automata and development of lexical analyzers.
		CO2	Summarize the different parsing techniques and its application.
		CO3	Explain the semantic analysis and intermediate representation.
		CO4	Interpret the different machine dependent and independent code optimization techniques.
		CO5	Illustrate the code generation technique, storage organization and error handling schemes.
C315	Python for Data Science	CO1	Explain the roles of data science, stages of a data science project, applications in various fields, and key data security considerations.
		CO2	Make use of Python programming, including its data types, structures, and functions, to manipulate and analyze datasets effectively.
		CO3	Examine and process large datasets using NumPy and Pandas for tasks like indexing, slicing, aggregation, and statistical analysis.
		CO4	Develop and visualize data-driven insights using plotting libraries like matplotlib, seaborn, and other visualization tools, and produce meaningful reports or dashboards.
		CO5	Analyze data quality and perform preprocessing steps such as cleaning, transforming, merging, and reshaping datasets to prepare them for analysis.

Laboratory Courses

Course Code	Course Title	Experiment No	Course Outcomes
C316	Data Warehousing and Data Mining Lab	1	CO1 Understand and explain the features, interfaces, dataset formats, and basic data exploration capabilities of machine learning tools such as WEKA.

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		2,3	CO2	Apply data visualization, preprocessing, and association rule mining techniques using WEKA to prepare and explore datasets.
		4,5	CO3	Analyze and interpret classification techniques by implementing decision tree, Naïve Bayes, and k-NN algorithms and comparing their performance.
		6,7	CO4	Evaluate clustering and knowledge flow models by applying k-means and workflow-based machine learning techniques to derive insights from data.
		8,9, 10, 11,12	CO5	Design and develop complete machine learning solutions using Python, including dimensionality reduction, encoding, classification, association mining, and clustering.
C317	Machine Learning Techniques Lab	1,2	CO1	Apply exploratory data analysis (EDA) techniques and categorical encoding methods to preprocess and prepare datasets for machine learning tasks.
		3,4	CO2	Implement and evaluate classical supervised learning algorithms, including Decision Trees and k-Nearest Neighbors, for classification problems.
		5,6,7	CO3	Apply dimensionality reduction techniques (PCA) and solve real-world regression and classification problems using Linear and Logistic Regression.
		8,9	CO4	Design and implement advanced classifiers, including Support Vector Machines and stochastic gradient descent (SGD) models, and visualize their decision boundaries.
		10, 11,12	CO5	Analyze and improve model performance using ensemble methods (Random Forests, Gradient Boosting) and clustering algorithms (EM, k-Means), including evaluation of bias, variance, and model optimization techniques.
C318	Continuous Integration and Continuous Delivery using DevOps	1,2	CO1	Apply Git and GitHub commands to manage source code effectively, including repository creation, branching, merging, and version control operations for web applications.
		3,4	CO2	Configure and implement Continuous Integration (CI) using Jenkins, including installation, environment setup, job configuration, and automated build execution.
		5,6	CO3	Design and execute CI/CD pipelines using Jenkins pipeline scripts to automate build, test, and post-build actions for web applications.
		7	CO4	Build and deploy web applications using build automation tools (Maven) and deploy them to application servers such as Apache Tomcat, ensuring

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			automated and repeatable deployments.
		8,9,10,11	CO5 Develop, containerize, and orchestrate applications using Docker and Kubernetes, and automate the deployment and execution of containerized applications using Kubernetes clusters.

Summer Internship

Course Code	Course Title	Course Outcomes	
C319	Internship	CO1	Skill Development: Learning and improving skills such as Writing, verbal communication, research, technology, teamwork and leadership.
		CO2	Real World Applications: Understand the workplace, operating procedures, company profile and its products in addition to the existing class room knowledge.
		CO3	Career Awareness: To provide the opportunity to learn about the career positions and occupations along with the qualities and training required.
		CO4	Professional Ethics: Demonstrate professional values and ethical standards.
		CO5	Personal Development: To develop the self - confidence, assertiveness and basic work habits.

6th Semester Theory Courses

Course Code	Course Title	Course Outcomes	
C321	Computer Networks	CO1	Understand OSI and TCP/IP models.
		CO2	Analyse MAC layer protocols and LAN technologies.
		CO3	Design applications using internet protocols.
		CO4	Analyse and apply routing and congestion control algorithms.
		CO5	Imagine how internet works.
C322	Deep Learning Techniques	CO1	Describe the principles of biological and artificial neurons, and explain the structure and function of various neural network architectures.
		CO2	Implement and train multilayer perceptrons, CNNs, RNNs, autoencoders, and GANs using Keras for practical tasks like classification, forecasting, and generation.
		CO3	Examine and diagnose issues in deep neural networks such as vanishing/exploding gradients, overfitting, and

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			ineffective training, and propose appropriate solutions.
		CO4	Make use of deep learning models, optimizers, and architectures (e.g., YOLO, LSTMs) to select the best approach for a given problem.
		CO5	Develop advanced deep learning systems for computer vision, time series prediction, generative modelling, and reinforcement learning tasks.
C323	Big Data and Hadoop	CO1	Explain big data concepts, platforms, challenges of conventional systems, and big data analytics processes.
		CO2	Describe the Hadoop ecosystem, including HDFS architecture and the working of MapReduce.
		CO3	Develop MapReduce programs using Hadoop APIs and process large datasets using Pig Latin scripts.
		CO4	Apply HiveQL for data definition, manipulation, optimization, and advanced querying using partitioning and bucketing.
		CO5	Analyze big data using Apache Spark, implementing RDD and DataFrame operations for efficient, in-memory processing.
C324	Modern Cryptography and Network Security	CO1	Summarize the fundamentals of cybercrime and cybersecurity and relate cryptographic services and mechanisms, and mathematical foundations to address cyber threats.
		CO2	Relate and apply symmetric key cryptographic techniques by using the mathematical foundations and evaluating asymmetric encryption algorithms to address cyber threats.
		CO3	Relate and apply asymmetric key cryptographic techniques by using the mathematical foundations and evaluating asymmetric encryption algorithms to address cyber threats.
		CO4	Illustrate data integrity and authentication mechanisms by using message authentication, cryptographic hash functions, digital signature schemes, and key management techniques to ensure secure and trustworthy information systems.
		CO5	Extend system security mechanisms to implement security protocols at the application, transport, and network layers— including PGP, S/MIME, SSL/TLS, and IPSec to design secure systems.
C325	AI Chatbots	CO1	Understand and explain the role of chatbots in business, financial services, and insurance, including benefits, customer-centric approaches, data sources, and privacy regulations such as GDPR.
		CO2	Analyze chatbot development approaches and

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			conversational components such as intents, entities, utterances, dialog flows, channels, and human takeover mechanisms.
		CO3	Apply business considerations and success metrics to design chatbot solutions and compare chatbots with traditional applications for specific use cases.
		CO4	Implement and evaluate chatbot architectures using NLP, NLU, and NLG concepts with popular open-source and commercial frameworks.
		CO5	Design and deploy end-to-end chatbot solutions using platforms such as Microsoft Bot Framework, RASA, and Google Dialogflow with enterprise and third-party integrations.
C326	Software Engineering	CO1	Explain the fundamentals of software engineering, software processes, and core principles of software development.
		CO2	Explain the concept of Agility and discuss the cost of change in traditional and agile software development environments.
		CO3	Apply requirements engineering techniques to elicit, analyze, and model software requirements, and develop appropriate software design and architectural models using design concepts, architectural styles, and component-level design principles for software and web applications.
		CO4	Assess software quality, identify testing requirements, and select appropriate testing strategies and tools for different types of software applications, including web and mobile systems.
		CO5	Design and implement effective software testing plans, including automated testing frameworks, to ensure robust, reliable, and maintainable software systems.
C327	Internet of Things	CO1	Describe the concepts, architecture, technologies, and communication models underlying the Internet of Things (IoT) and M2M systems.
		CO2	Implement IoT connectivity solutions using web and messaging protocols (HTTP, REST, SOAP, WebSockets) and integrate sensors, actuators, and gateways for real-world applications.
		CO3	Explain IoT data acquisition, storage, processing, and analytics workflows, including cloud-based IoT platforms and services.
		CO4	Make use of IoT system designs for performance, scalability, and interoperability across applications such as smart homes, smart cities, agriculture, and connected

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			vehicles.
		CO5	Design, prototype, and develop IoT applications using embedded devices, APIs, and cloud services, implementing end-to-end solutions from data collection to visualization and control.

Laboratory Courses

Course Code	Course Title	Experiment No	Course Outcomes	
C328	Computer Networks Lab	1	CO1	Study the Network devices, physical layer, data link layer and network layer algorithms.
		2,3,4,5,6,7,8,9,10,11,12	CO2	Implement the various computer networks algorithms in any programming language.
		13	CO3	Implement the packet capture, captured traffic and perform analysis using Wireshark.
		14,15	CO4	Study and detect the operating system using Nmap.
		16	CO5	Find the number of packets dropped in various scenarios using NS2/NS3 Simulator.
C329	Deep Learning Techniques Lab	1,2	CO1	Apply multilayer perceptron models for classification tasks such as MNIST digit recognition and movie review sentiment analysis.
		3,4	CO2	Design neural network models for multiclass classification and regression problems, including news classification (Reuters) and Boston housing price prediction.
		5,6	CO3	Build convolutional neural networks (CNNs) for image classification tasks, including MNIST digits and simple images like dogs and cats.
		7,11	CO4	Utilize pre-trained networks (e.g., VGG16) and implement autoencoders for transfer learning and dimensionality reduction.
		8,9,10,12	CO5	Implement and train recurrent neural networks (RNNs), LSTMs, and GRUs for time series analysis and create LSTM models from scratch.
C3310	Big Data and Hadoop Lab	1	CO1	Make use of Hadoop Distributed File System (HDFS) file management operations such as adding, retrieving, and deleting files and directories using Hadoop commands to manipulate data.
		2,3,4	CO2	Develop and execute Hadoop MapReduce programs to solve data processing problems including word count, weather data mining, and enterprise salary

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				analysis.
		5,6	CO3	Write and execute Pig Latin scripts to perform data analysis operations such as word count, sorting, grouping, joining, and filtering.
		7,8,9	CO4	Create, manage, and query Hive databases and tables, load data using Sqoop, and perform filtering and join operations using HiveQL.
		10,11,12	CO5	Apply PySpark and Spark ML libraries to perform RDD and DataFrame transformations and build a machine learning model on large-scale datasets.
C3311	Mean Stack Technologies (Skill Development Course-II)	1	CO1	Build a basic web server using Node.js and work with Node Package Manager (NPM).
		2,3	CO2	Build a web server using Express.js.
		4,5,6,7,18,19	CO3	Develop JavaScript applications using typescript and work with document database using MongoDB.
		8,9,10,11,12,13,14	CO4	Utilize Angular JS to design dynamic and responsive web pages.
		15,16,17	CO5	Develop Angular Applications using Custom Validators, Server Communication and Routing.



JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY KAKINADA
KAKINADA – 533 003, Andhra Pradesh, India

DEPARTMENT OF CSE - ARTIFICIAL INTELLIGENCE & MACHINE LEARNING

IV B. Tech –I Semester (Tentative)						
S.No	Course Code	Course Title	Hours per week			Credits
			L	T	P	C
1	PE	Professional Elective-III 1.Reinforcement Learning 2.Soft Computing 3. Cryptography and Network Security 4. Block Chain Technologies 5. Speech Processing	3	0	0	3
2	PE	Professional Elective-IV 1. Robotic Process Automation 2. Cloud Computing 3. Big Data Analytics 4. NOSQL Databases 5. Video Analytics	3	0	0	3
3	PE	Professional Elective-V 1. Social Network Analysis 2. Recommender Systems 3. AI Chatbots 4. Object Oriented Analysis and Design 5. Semantic Web	3	0	0	3
4	Open Elective /Job Oriented	Open Elective-III Open Electives offered by other departments/API and Microservices (Job Oriented Course)	3	0	0	3
5	Open Elective /Job Oriented	Open Elective-IV Open Electives offered by other departments/Secure Coding Techniques (Job Oriented Course)	3	0	0	3
6	HS	Universal Human Values 2: Understanding Harmony	3	0	0	3
7	SO	1.Machine Learning with Go (Infosys Spring Board) OR 2.MEAN Stack Technologies-Module II- Angular JS and MongoDB	0	0	4	2
8	PR	Industrial/Research Internship 2 months (Mandatory) after third year (to be evaluated during VII semester	0	0	0	3
Total credits						23
9	Minor	Reinforcement Learning	4	0	0	4
Minor courses through SWAYAM			0	0	0	2



JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY KAKINADA
KAKINADA – 533 003, Andhra Pradesh, India

DEPARTMENT OF CSE - ARTIFICIAL INTELLIGENCE & MACHINE LEARNING

IV B. Tech –II Semester						
S.No	Course Code	Course Title	Hours per week			Credits
			L	T	P	
1	Project	Major Project Work, Seminar, Internship	-	-	-	12
Total credits						12

SUGGESTED COURSES MINOR ENGINEERING IN B.TECH.CSE- AI

Eligibility for Minor in CSE-AI: -

Note:

1. TWO, NPTEL courses of EIGHT week duration covering a total of 4 credits (offered by CSE Department only), Student can register at any time after the completion of II B.Tech. I Sem.

S.No.	Subject Title	Credits
1	Introduction to Artificial Intelligence and Machine Learning	4
2	Machine Learning	4
3	Deep Learning	4
4	Reinforcement Learning	4
5	MOOCS Courses ** 1. Introduction to Soft Computing(NPTEL) (https://nptel.ac.in/courses/106105173) 2. Digital Speech Processing (NPTEL) (https://nptel.ac.in/courses/117105145) 3. Cloud Computing (NPTEL) (https://nptel.ac.in/courses/106105167) 4. Practical Machine Learning with Tensorflow (NPTEL) (https://nptel.ac.in/courses/106106213)	4
Total		20

**Choose 02 MOOCS courses @ 2credits each from SWAYAM/NPTEL

7th Semester
Theory Courses

Course Code	Course Title	Course Outcomes	
C411	Cryptography and Network Security	CO1	Relate various types of security attacks with security services, mechanisms and make use of the mathematics in cryptography.
		CO2	Make use of the mathematics in symmetric cryptography and extend this mathematical concept to formulate modern symmetric key cipher techniques such as DES, AES, etc.
		CO3	Make use of the mathematics in asymmetric cryptography and extend these mathematical concepts to formulate asymmetric key cipher techniques.
		CO4	Relate symmetric and asymmetric cryptography concepts to achieve Data Integrity, Digital Signature Schemes & Key Management.
		CO5	Select network security protocols to use in application, transport, and network layers of Open System Interconnection (OSI) model.
C412	Big Data Analytics	CO1	Illustrate big data challenges in different domains including social media, transportation, finance and medicine.

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		CO2	Use various techniques for mining data stream.
		CO3	Design and develop Hadoop.
		CO4	Identify the characteristics of datasets and compare the trivial data and big data for various applications.
		CO5	Explore the various search methods and visualization techniques.
C413	Object Oriented Analysis and Design	CO1	Illustrate the nature of complex system and its solutions.
		CO2	Make use of basic UML constructs and develop class and object.
		CO3	Apply Advanced Structural Modeling Concepts for designing real time applications.
		CO4	Identify interaction and use cases, model the use case, interaction and activity diagram.
		CO5	Analyze the techniques of State Chart Diagrams and Implementation Diagrams to model behavioural aspects and Runtime environment of Software Systems.
C414	API and Micro services	CO1	Demonstrate an understanding of the Spring Framework, IoC container, and Java-based configuration, and apply AutoScanning for component discovery.
		CO2	Develop Spring Boot applications with annotations, Autowiring, and AOP advices, following best practices.
		CO3	Analyze Spring Data JPA with Spring Boot for handling pagination, sorting, queries, transactions, and custom repository implementation.
		CO4	Distinguish between SOAP-based and RESTful web services, and construct RESTful web services adhering to industry standards.
		CO5	Analyze annotations for parameter injection, handle exceptions and data validation, contrast REST endpoint versioning strategies, and categorize methods for configuring CORS securely in Spring RESTful services.
C415	Data Communications	CO1	Outline the functions of various layers of OSI/TCP reference model and functions of various Data communication Networks.
		CO2	Understand about the various data link layer protocols.
		CO3	Explain the network layer protocols and demonstrate the mechanism of routing the data in network layer
		CO4	Explain the significance of transport layer and know the various Flow control and congestion control mechanisms.
		CO5	Understand the functions of various Application layer Protocols.
		CO1	Need, basic guide lives. Content and processes for value education.

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C416	Universal Human Values 2	CO2	Understand harmony in human being; harmony in oneself.
		CO3	Understand harmony in family and society; harmony in human relationship.
		CO4	Understand of harmony in nature and existence; whole existence as coexistence.
		CO5	Implications of harmony in nature and existence; holistic understanding of harmony on professional ethics.

Laboratory/Skill Oriented Subjects

Course Code	Course Title	Experiment No	Course Outcomes	
C417	Mean Stack Technologies- Module II- Angular JS and MongoDB	1,2,3,6	CO1	Build a component-based application using Angular components and enhance their functionality using directives.
		4,7,8	CO2	Utilize data binding for developing Angular forms and bind them with model data.
		5	CO3	Apply Angular built-in or custom pipes to format the rendered data.
		9,10	CO4	Develop a single page application by using synchronous or asynchronous Angular routing.
		11,12	CO5	Make use of MongoDB queries to perform CRUD operations on document database.

Internship

Course Code	Course Title	Course Outcomes	
C418	Industrial / Research Internship	CO1	Skill Development: Learning and improving skills such as Writing, verbal communication, research, technology, teamwork and leadership.
		CO2	Real World Applications: Understand the workplace, operating procedures, company profile and its products in addition to the existing class room-knowledge.
		CO3	Career Awareness: To provide the opportunity to learn about the career positions and occupations along with the qualities and training required.
		CO4	Professional Ethics: Demonstrate professional values and ethical standards.
		CO5	Personal Development: To develop the self - confidence, assertiveness and basic work habits.

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8th Semester
Theory Courses

Course Code	Course Title	Course Outcomes	
C421	Project	CO1	Demonstrate the technical knowledge to identify problems in the field of Computer Science and 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.

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GAYATRI VIDYA PARISHAD COLLEGE OF ENGINEERING FOR WOMEN

(Autonomous)

(Approved by AICTE, New Delhi and Permanently Affiliated to Andhra University, Visakhapatnam)
Madhurawada :: Visakhapatnam – 530 048

COURSE STRUCTURE

(Applicable for the Academic Year 2024-25 onwards)

DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

B.Tech Electrical and Electronics Engineering

SCHEME AND SYLLABI

(With effect from 2024-25 admitted batch)

I Year - I Semester									
Course Code	Category	Course Title	Hours per Week		Internal Marks	External Marks	Total Marks	Credits	
			L	P					
24BM11RC01	BS	Calculus and Differential Equations	3	0	30	70	100	3	
24BP11RC01	BS	Engineering Physics	3	0	30	70	100	3	
24BC11RC01	BS	Green Chemistry	3	0	30	70	100	3	
24EC11RC03	ES	Basic Electronics Engineering	3	0	30	70	100	3	
24EE11RC01	ES	Fundamentals of Electrical Engineering	3	0	30	70	100	3	
24BP11RC02	BS	Engineering Physics Lab	0	3	50	50	100	1.5	
24BC11RC02	BS	Green Chemistry Lab	0	3	50	50	100	1.5	
24CT11RC05	ES	IT Essentials Lab	0	3	50	50	100	1.5	
Total Credits									19.5

I Year - II Semester									
Course Code	Category	Course Title	Hours per Week		Internal Marks	External Marks	Total Marks	Credits	
			L	P					
24BM11RC02	BS	Linear Algebra and Vector Calculus	3	0	30	70	100	3	
24HE11RC01	HSS	English	3	0	30	70	100	3	
24CT11RC02	ES	Problem Solving Using C	3	0	30	70	100	3	
24EE11RC03	ES	Electrical Circuits – 1	3	0	30	70	100	3	
24EE11RC04	ES	Thermal & Hydro Prime Movers	3	0	30	70	100	3	
24HE11RC02	HSS	Communication Skills Lab	0	3	50	50	100	1.5	
24CT11RC04	ES	Problem Solving Using C Lab	0	3	50	50	100	1.5	
24EE11RC05	ES	Electrical Engineering Workshop	0	3	50	50	100	1.5	
Total Credits									19.5



GAYATRI VIDYA PARISHAD COLLEGE OF ENGINEERING FOR WOMEN (Autonomous)

Madhurawada: Visakhapatnam – 530048

(Approved by AICTE, New Delhi and Affiliated to Andhra University, Visakhapatnam)

(Accredited by NBA for B. Tech-CSE, ECE, IT and EEE)

Accredited by NAAC with A Grade from 2022-2023 to 2027-2028

Course Outcomes

1st Semester

Theory Courses

Course Code	Course Title	Course Outcomes	
C111	Calculus and Differential Equations	CO 1	Examine the functional dependency and utilize Taylor's theorem to expand the function of two variables.
		CO 2	Determine extrema of multivariable functions.
		CO 3	Utilize double and triple integrals to evaluate areas of plane curves and the volumes of solids.
		CO 4	Solve the first order differential equations and higher order differential equations with constant coefficients, apply the techniques to solve problems related to various engineering fields.
		CO 5	Find the Laplace Transforms of various functions and apply it to solve ordinary differential Equations with initial conditions.
C112	Engineering Physics	CO 1	Apply the principles of interference, diffraction, and polarization in wave optics, and utilize optical instruments for practical applications.
		CO 2	Familiarize the basic concepts of Thermodynamics relevant to engineering applications.
		CO 3	Outline the knowledge of basic principles of Electromagnetism and EM Waves.
		CO 4	Describe the basic principles of lasers, optical fibres and their use in technological applications
		CO 5	Understand the basic principles of Quantum mechanics, Quantum computing.
C113	Green Chemistry	CO 1	To develop knowledge about water and its treatment for industrial and potable purpose.
		CO 2	Utilize the theory of construction and discharge reactions of various types of batteries are used in commercial society



		CO 3	Explain the importance of working principle, fabrication of electrodes and other components, advantages, disadvantages and environmental aspects of fuel cells.
		CO 4	Classify the corrosion mechanism of metals and factors influenced by rate and extent of corrosion and categorize the reasons for corrosion control methods
		CO 5	Apply green chemistry technology processes the knowledge for solving existing challenges faced in various engineering and societal areas.
C114	Basic Electronics Engineering	CO 1	Brief evolution and impact of electronics
		CO 2	Comprehend the characteristics of semiconductors, devices, and their applications
		CO 3	Analyze the transistor operation with different biasing techniques.
		CO 4	Understand the characteristics of FET
		CO 5	Outline the basic concepts and applications of op-amps.
C115	Fundamentals of Electrical Engineering	CO 1	Summarize the basic concepts in electric circuits
		CO 2	Apply the fundamental laws in Electrical Engineering.
		CO 3	Summarize the operation of various measuring instruments.
		CO 4	Summarize the concepts of various magnetic and dielectric materials.
		CO 5	Design the wiring schemes for house hold appliances using appropriate wiring components

Laboratory Courses

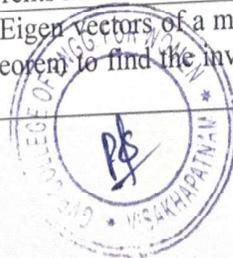
Course Code	Course Title	Experiment No	CO. No.	Course Outcomes
C116	Engineering Physics lab	1,2,4	CO 1	Interpret the physical parameters based on optical phenomena.
		5	CO 2	Verify the behaviour of double refraction in birefringent material like quartz.
		3,6	CO 3	Demonstrate the concepts of diffraction through



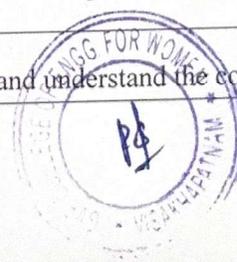
				experiments
		10,11	CO 4	Calibrate instruments like low range voltmeters and ammeters.
		13,14,15	CO 5	Design temperature sensors based on diodes and thermistors.
C117	Green Chemistry Lab	1,2	CO 1	Make use of experimental skills for quantitatively with accuracy analysis in acid-base titrations using suitable indicators
		3,7,9,10,11	CO 2	Apply the principals of redox titrations Chromium (VI) by Mohr's Salt Solution in different samples.
		4	CO 3	Utilize with complex metric titrations to determine hardness of water and estimate the amount of impurities present in the samples.
		5,8	CO 4	Perform experiments with instrument novel materials to be used as zeolite for removal of hardness of water to acquire skills of different methods of chemical analysis.
		6	CO 5	Develop the skills of green synthesis through the preparation of a polymer/ drug.
C118	IT Essentials Lab	1,2,3	CO 1	Identify the peripherals of a computer
		4,5	CO 2	Demonstrate the installation process of operating systems like MS Windows, LINUX.
		6,7	CO 3	Make use of Office suite that comprises with various applications to create documents, and captivating presentations
		8,9,10	CO 4	Make use of Office suite that comprises with various applications to organize & analyse data
		11,12	CO 5	Categorize various UNIX/LINUX Commands to work on a modern operating system and Make use of LaTeX tool to prepare research articles

**2nd Semester
Theory Courses**

Course Code	Course Title	Course Outcomes	
C121	Linear Algebra Vector Calculus	CO 1	Test for consistency and solve linear system of equations, also determine unknown currents in the electrical circuits.
		CO 2	Find the Eigen values and Eigen vectors of a matrix and apply Cayley- Hamilton theorem to find the inverse of a matrix.



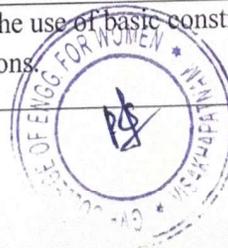
		CO 3	Reduce quadratic form to canonical form and examine the nature of quadratic form.
		CO 4	Interpret the meaning and evaluate gradient of a scalar valued, curl and divergence of vector valued functions
		CO 5	Apply line integrals, surface integrals, volume integrals and their relations using Green's theorem, Stoke's theorem, Gauss Divergence theorems in various engineering applications.
C122	English	CO 1	Develop moral values and inner peace, Demonstrate the use of LSRW skills, Vocabulary and basic grammar concepts
		CO 2	Identify the impact of different social backgrounds, recognize the poet's insights. Demonstrate the use of LSRW skills, Vocabulary and basic grammar concepts.
		CO 3	Analyse socio-cultural context, Establish effective interpersonal and communication skills, Demonstrate the use of LSRW skills, Vocabulary and basic grammar concepts
		CO 4	Focus on value of education, Relate to the poet's nostalgia, Demonstrate the use of LSRW skills, Vocabulary and basic grammar concepts
		CO 5	Determine the central idea of the text, Identify one's resilience, Demonstrate the use of LSRW skills, Vocabulary and basic grammar concepts
C123	Problem Solvin Using C	CO 1	Explain the basic constructs of C through the use of simple applications
		CO 2	Demonstrate the utilization of arrays and strings in the development of C programs.
		CO 3	Utilize functions and pointers to construct various applications in C.
		CO 4	Apply concepts of structures and unions to build and implement C applications.
		CO 5	Develop applications using sequential and random-access file processing techniques
C124	Electrical Circuits – 1	CO 1	Analyse the electrical networks using mesh and nodal analysis techniques.
		CO 2	Analyse Electrical circuits with AC excitation
		CO 3	Summarize the applications of network theorems.
		CO 4	Summarize the concept of resonance and understand bandwidth, Q factor, and locus diagrams
		CO 5	Analyze magnetic circuits and understand the concepts of



			graph theory
C125	Thermal & Hydro Prime Movers	CO 1	Classify internal combustion engines & boilers and assess the performance
		CO 2	Analyse the various Vapour Power Cycles.
		CO 3	Analyze the different methods for improving the efficiency of gas turbines.
		CO 4	Determine the forces acting on the stationary & moving vanes and summarize the operation of pumps
		CO 5	Summarize the working of various types of hydraulic turbines.

Laboratory Courses

Course Code	Course Title	Experiment No	CO. No.	Course Outcomes
C126	Communication Skills Lab	1,2	CO 1	Identify and pronounce the sounds of English; choose the accurate stress in connected speech for proper intonation.
		3,4	CO 2	Apply the main theme and ideas of the audio/video to take notes and summarize.
		5,6, 7,8	CO 3	Develop speaking skills by taking part in Just A Minute (JAM) – Picture Prompts-Narratives-Role Play.
		9,10	CO 4	Practice discussions and debates
		11,12	CO 5	Demonstrate Presentation Skills
C127	Electrical Engineering Workshop	1,2, 3	CO 1	Identify, select, and troubleshoots the house wiring components
		10,11	CO 2	Troubleshoot electrical appliances such as tube light, fan and domestic pump.
		4,9	CO 3	Develop house wiring schemes using protective equipment like MCB and ELCBs
		5,6	CO 4	Design Go-down wiring /Tunnel wiring and hospital wiring schemes.
		7,8, 12,13	CO 5	Measure the Basic Electrical Parameters using suitable instruments
C128	Problem Solving	1,2, 3	CO 1	Outline the use of basic constructs of C for simple applications.



	Using C Lab	4	CO 2	Develop C programs for simple applications using Arrays and Strings.
		5,6, 7	CO 3	Illustrate concepts such as functions, recursion, and pointers with suitable examples.
		8	CO 4	Build C programs involving Structures and Unions
		9	CO 5	Develop applications using sequential and random-access file processing

**B.Tech & B.Tech+M.Tech
II Year - I Semester**

Course code	Category	Course Title	Hours per week		Internal Marks	External Marks	Total Marks	Credits
			L	P				
EE2101	BS	Operations Research	4	0	30	70	100	3
EE2102	PC	Network Theory	4	0	30	70	100	3
EE2103	PC	Electronic Circuits	4	0	30	70	100	3
EE2104	PC	Electrical Machines - I	4	0	30	70	100	3
EE2105	HSS	Managerial Economics	4	0	30	70	100	3
EE2106	PC	Electrical Networks Lab	0	3	50	50	100	1.5
EE2107	PC	Electrical Machines – I lab	0	3	50	50	100	1.5
EE2108	PC	Electronic Circuits Lab	0	3	50	50	100	1.5
EE2109	SC	Matlab & Interfacing	1	2	50	50	100	2
EE2110	MC	Professional Ethics & Universal Human values	0	0	-	100	100	0
EE2111	MC	NCC/NSS	0	2	-	-	-	0
Total credits								21.5

**B.Tech & B.Tech+M.Tech
II Year - II Semester**

Course code	Category	Course Title	Hours per week		Internal Marks	External Marks	Total Marks	Credits
			L	P				
EE2201	ES	Signals & Systems	4	0	30	70	100	3
EE2202	BS/PC	Electrical Measurements	4	0	30	70	100	3
EE2203	PC	Electrical Machines – II	4	0	30	70	100	3
EE2204	PC	EMF Theory	4	0	30	70	100	3
EE2205	PC	Electrical Engineering Materials	4	0	30	70	100	3
EE2206	PC	Electrical Machines – II Lab	0	3	50	50	100	1.5
EE2207	PC	Electrical Measurements lab	0	3	50	50	100	1.5
EE2208	SC	Electrical CAD	1	2	50	50	100	2
EE2209	MC	Environmental Science	0	0	-	100	100	0
Total credits								20
Internship I								

3rd Semester
Theory Courses

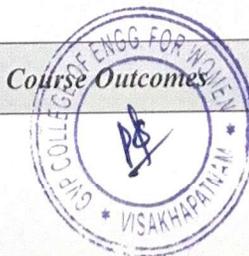
Course Code	Course Title	Course Outcomes	
C211	Operations Research	CO1	Develop a mathematical model (Linear Programming Problem) and solve LPP using Graphical method, Simplex method.
		CO2	Solve LPP using artificial variable techniques like Big-M method, Two phase method.
		CO3	Determine basic feasible solution for transportation problems and optimal solution for assignment problems.
		CO4	Construct a project network and evaluating them using PERT and CPM.
		CO5	Understand the concepts of inventory management, decision theory problems through the application of game theory.
C212	Network Theory	CO1	Analyse the electrical networks using mesh and nodal analysis techniques.
		CO2	Summarize the applications of network theorems.
		CO3	Analyse the transient behaviour of electrical networks for DC excitations
		CO4	Analyse Electrical circuits with AC excitation.
		CO5	Summarize the concept of resonance and understand bandwidth, Q factor, and analysis of circuits using Laplace transformation
C213	Electronic Circuits	CO1	Compare single stage amplifier and multistage amplifier by observing various parameters and their frequency response
		CO2	Compare different types of feedback amplifiers
		CO3	Make use of baurkhasan criterion to design different types



			of oscillators
		CO4	Apply load line concept to examine different types of power amplifiers and analyze different tuned amplifiers
		CO5	Outline basic operation of Op-Amp and describe Op-Amp based circuits
C214	Electrical Machine-I	CO1	Summarize the concepts of electro-mechanical energy conversion principles.
		CO2	Summarize the construction, principle of operation and analyze the characteristics and performance of DC generators.
		CO3	Outline the principle of operation of DC motor and analyze the performance of DC motor.
		CO4	Analyze the performance of transformers and autotransformers.
		CO5	Summarize the three phase transformer connections and phase conversion methods.
C215	Managerial Economics	CO1	Utilize the knowledge of demand for their products and can assess various utility stages
		CO2	Analyze Production function & economies of scale and can identify the cost of the product.
		CO3	Identify the nature of competitive market situations.
		CO4	Utilize the knowledge of various pricing strategies.
		CO5	Identify various stages of Business cycles.
C219	Matlab & Interfacing (Skill Course)	CO1	Simulate the electrical circuits using MATLAB/Simulink software and verify the laws and principles of electrical circuits.
		CO2	Simulate the two port networks using MATLAB/Simulink software and verify the two port network parameters.
		CO3	Simulate the Half-wave/Full-wave Rectifier circuits, observe the waveforms and determine the average value, RMS value, form factor and ripple factor using MATLAB/Simulink
		CO4	Study initial conditions and External Characteristics of DC Shunt motor using MATLAB/Simulink
		CO5	Study Speed Control of DC Shunt motor using MATLAB/Simulink.

Laboratory Courses

Course Code	Course Title	Expe rime	Course Outcomes

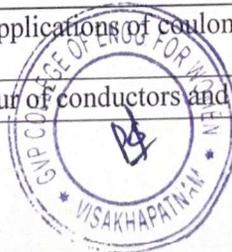


		<i>nt No</i>		
216	Electrical Networks Lab	1,2,3 ,4	CO1	Analyze the different Network Theorems
		5,6	CO2	Apply Maximum Power Transfer and Reciprocity theorems to optimize circuit performance.
		7	CO3	Determine the different two port network parameters
		8	CO4	Evaluate the behavior of Series and Parallel resonance circuits.
		9,10	CO5	Measure the powers in three phase circuits .
217	Electrical Machines – I Lab	2,3,4 ,7,8	CO1	Determine and predetermine the performance of DC machines and transformer.
		1,6	CO2	Identify different conditions required to be satisfied for self – excited DC Generators.
		5	CO3	Start and speed control of the different DC machines.
		9	CO4	Examine the load sharing between two parallel connected transformers.
		10	CO5	Analyze phase conversion in Scott connected transformers.
218	Electronic Circuits Lab	4	CO1	Design and analyze various amplifiers (single & Multistage amplifier)
		2,3	CO2	Design and analyze various oscillators(RC phase shift oscillator and Colpitt's oscillator)
		1,8	CO3	Design and analyze feedback amplifiers (voltage series and current series feedback amplifiers)
		12	CO4	Design various linear and non linear applications(Adder,subtractor & Comparator) using IC741 op-amp
		5,6,7 ,9,10 ,11	CO5	Become expert with software skills (Multisim, OrCAD Pspice and Capture) for the analysis and design of circuits



Theory Courses

Course Code	Course Title	Course Outcomes	
C221	Signals & Systems	CO 1	Understand the classification, representation of signals and perform various mathematical operations on signals
		CO 2	Classify the systems based on their properties, representation of LTI system in both continuous and discrete time domain
		CO 3	Make use of fourier concepts and Z-transform to analyse continuous and discrete time signals
		CO 4	Compute the response of LTI systems using convolution and describing the systems by using differential & difference equations
		CO 5	Explain the process of sampling, effects of undersampling and reconstruction of signals
C222	Electrical Measurements	CO 1	Summarize the principle of operation and working of different types of instruments for measurement of Electrical Quantities
		CO 2	Choose right type of instrument for measurement of power and power factor
		CO 3	Select right type for measurement of R, L,C.
		CO 4	Summarize the principle of operation and working of magnetic measurements.
		CO 5	Demonstrate the working of Potentiometers and Instrument Transformers
C223	Electrical Machines - II	CO 1	Explain the operation and performance of three phase induction motor.
		CO 2	Analyze the torque-speed relation, performance of induction motor and induction generator.
		CO 3	Explain the working principle and summarize the starting methods of single phase induction motors.
		CO 4	Analyze the performance of synchronous generator
		CO 5	Understand the operation, performance and summarize the starting methods of synchronous motors.
C224	EMF Theory	CO 1	Summarize the applications of coulomb's and Gauss's Law for electric fields
		CO	Analyse behaviour of conductors and dielectrics in electric



		2	fields, apply boundary conditions to calculate capacitance.
		CO 3	Outline the basic principles and laws of magnetostatics
		CO 4	Apply the principles of magnetostatics to determine self and mutual inductance.
		CO 5	Summarize the Maxwell's Equations for static and Time varying fields.
C225	Electrical Engineering Materials	CO 1	Analyse the various dielectric materials and their properties, applications
		CO 2	Classify the magnetic materials and understand their properties
		CO 3	Summarize the special purpose magnetic materials and semi-conductor materials
		CO 4	Explain the materials used in electrical engineering and their effects.
		CO 5	Summarize the special purpose materials and their applications.
C228	Electrical CAD(Skill Course)	CO 1	Understand the associated features of ECAD using standard-based drafting and drawing skills.
		CO 2	To Acquire the knowledge of creating projects in Electrical CAD
		CO 3	Acquire the knowledge of drawing reports and bill of materials in electrical circuits.
		CO 4	To develop the electrical machines wiring with protection using Electrical CAD
		CO 5	To familiarize with standard 2D and 3D drawing, modifying, dimension and view commands.

Laboratory Courses

Course Code	Course Title	Experiment No	Course Outcomes
C226	Electrical Machine - II Lab	1,2	CO1 Determine and predetermine the performance of three phase Induction motor
		3,4	CO2 Predetermine the regulation of three-phase alternator by various methods.
		8	CO3 Start and speed control of the three phase Induction motor.
		9,6,5	CO4 Analyze the performance of three phase synchronous



				machine.
		7,10	CO5	Assess and improve the performance of single phase induction motor.
C227	Electrical Measurements Lab	2,3,4	CO1	Measurement of resistance, inductance and capacitance using different bridges
		1,5	CO2	Calibration of dynamometer wattmeter and LPF power factor meter using indirect and direct loading.
		8,9	CO3	Test for calibration of voltmeter and ammeter using DC Potentiometer and dielectric oil
		6	CO4	Measurement of three phase reactive power using single wattmeter
		7,10	CO5	Calibration of single phase energy meter and strain gauge

**B.Tech & B.Tech+M.Tech
III Year - I Semester**

Course code	Category	Course Title	Hours per week		Internal Marks	External Marks	Total Marks	Credits
			L	P				
EE3101	PC	Pulse & Digital Circuits	4	0	30	70	100	3
EE3102	PC	Power Electronics	4	0	30	70	100	3
EE3103	PC	Power Systems – I	4	0	30	70	100	3
EE3104	PE	Professional Elective I	4	0	30	70	100	3
EE3105	OE	Open Elective I	4	0	30	70	100	3
EE3106	PC	PDC Lab	0	3	50	50	100	1.5
EE3107	PC	Power Electronics Lab	0	3	50	50	100	1.5
EE3108	SC	PLCs	1	2	50	50	100	2
EE3109	INT	Internship I			50	50	100	2
Total Credits								22

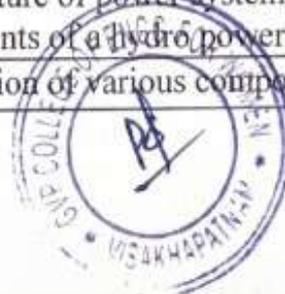
**B.Tech & B.Tech+M.Tech
III Year - II Semester**

Course code	Category	Course Title	Hours per week		Internal Marks	External Marks	Total Marks	Credits
			L	P				
EE3201	PC	Power System Analysis & Stability	4	0	30	70	100	3
EE3202	PC	Power Systems – II	4	0	30	70	100	3
EE3203	PC	Control Systems	4	0	30	70	100	3
EE3204	PE	Professional Elective II	4	0	30	70	100	3
EE3205	OE	Open Elective II	4	0	30	70	100	3
EE3206	PC	Microprocessors & Microcontrollers Lab	0	3	50	50	100	1.5
EE3207	PC	Control Systems Lab	0	3	50	50	100	1.5
EE3208	PC	Power Systems Simulation Lab	0	3	50	50	100	1.5
EE3209	SC	Soft Skills	1	2	50	50	100	2
Total Credits								21.5
Internship II								

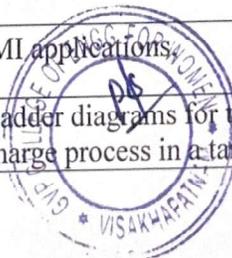
5th Semester

Theory Courses

Course Code	Course Title	Course Outcomes	
C311	Pulse & Digital Circuits	CO 1	Explain the response of linear wave shaping circuits to various non sinusoidal inputs.
		CO 2	Extend the applications of diodes and transistors to non-linear waveshaping case.
		CO 3	Build Collector and Emitter Coupled Bistable Multivibrators
		CO 4	Analyze and design astable and monostable multivibrator circuits with BJTs.
		CO 5	Illustrate the operation of different time base generators and logic gates.
C312	Power Electronics	CO 1	Describe the working and characteristics of basic power electronic devices
		CO 2	Apply different gate triggering and protection methods for thyristors
		CO 3	Analyze single-phase and three-phase controlled rectifier circuits
		CO 4	Analyze the working of DC-DC choppers and cyclo-converters
		CO 5	Summarize the operation of inverters and PWM techniques
C313	Power Systems - I	CO 1	Describe the structure of power system and functions of different components of a hydro power plant.
		CO	Outline the operation of various components in a Thermal



		2	power station.
		CO 3	Discuss the working principle of nuclear power reactors and Diesel power plants.
		CO 4	Summarize the operation of Gas and MHD power plants.
		CO 5	Analyse the significance of various factors of economic aspects of power generation. and apply the suitable tariff method for various consumers.
C314	Utilization of Electrical Energy	CO 1	Describe the principles and applications of electric heating and welding methods.
		CO 2	Apply the basic concepts of illumination, light sources, and lighting methods.
		CO 3	Analyze the working of refrigeration & air-conditioning systems and their electrical circuits.
		CO 4	Outline the electrolytic processes and summarize their applications such as electroplating and galvanizing.
		CO 5	Describe electrical safety measures, wiring methods, earthing, and the basic structure of power systems.
C315	Artificial Intelligence and Machine Learning	CO 1	Outline the key concepts of neural networks, including perceptron and backpropagation.
		CO 2	Explain different machine learning methods and their applications in real-world contexts.
		CO 3	Discuss the features and applications of various classification and regression algorithms.
		CO 4	Outline the architecture and layers of convolutional neural networks.
		CO 5	Describe the principles and applications of advanced AI models, DNN and GAN.
C318	SKILL:PLCs	CO 1	Explain the PLC Hardware and Software used in PLC.
		CO 2	Construct the Ladder diagrams for Logic Gates and latching of motors in PLC.
		CO 3	Describe the usage and applications of Timers and Counters, Arithmetic Instructions, Comparator.
		CO 4	Develop the HMI applications.
		CO 5	Construct the Ladder diagrams for traffic signals/water filling and discharge process in a tank.



C319	INTERSHIP	CO 1	Skill Development: Learning and improving skills such as writing, verbal communication, research, technology, teamwork and leadership
		CO 2	Real World Applications: Understand the workplace, operating procedures, company profile and its products in addition to the existing class room knowledge
		CO 3	Career Awareness: To provide the opportunity to learn about the career positions and occupations along with the qualities and training required
		CO 4	Professional Ethics: Demonstrate professional values and ethical standards
		CO 5	Personal Development: To develop the self - confidence, assertiveness and basic work habits

Laboratory Courses

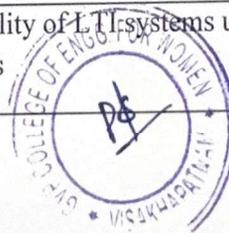
Course Code	Course Title	Experiment No	Course Outcomes	
C316	PDC lab	1,2	CO1	Analyze the behaviour of various linear waveshaping circuits
		3,4	CO2	Design various non-linear waveshaping circuits
			CO3	Design astable and monostable multivibrator circuits with BJTs.
		5,6	CO4	Build Collector and Emitter Coupled Bistable Multivibrators
		7,8		Develop time base generators and sweep circuits
9,10	CO5			
C317	Power Electronics Lab	1,2	CO1	Analyze the V-I characteristics of SCR and determine latching and holding currents.
		3,4,5	CO2	Design and test firing circuits for SCR and evaluate the performance of half-wave phase-controlled rectifiers.
			CO3	Analyze the operation of single-phase controlled and half-controlled bridge rectifiers with R and RL loads.
		6,11	CO4	Examine the performance of AC voltage controllers, inverters, and forced commutation circuits
		8		Analyze and verify the operation of DC choppers and single-phase cyclo-converters.
7,9,10	CO5			



6th Semester

Theory Courses

Course Code	Course Title	Course Outcomes	
C321	Power System Analysis & Stability	CO 1	Develop the impedance Diagram in (PU) and Construct the Ybus matrix for a power system by singular transformation and direct inspection method
		CO 2	Summarize the load flow solutions for power system using various types of power flow methods
		CO 3	Develop the Zbus matrix and the fault current for 3 phase short circuit conditions for a power system
		CO 4	Analyze the unsymmetrical faults using sequence components in power system
		CO 5	Analyze the steady state, transient and dynamic stability concepts of a power system
C322	Power Systems – II	CO 1	Describe the System Voltage effects and Compute the transmission line parameters for various types of transmission line configurations
		CO 2	Classify transmission lines and Analyse the performance of short, Medium and Long transmission lines
		CO 3	Evaluate the sag and tension of a transmission line for various configurations and Outline the effects of corona.
		CO 4	Select a suitable insulators for a particular operating voltage and develop the methods to improve string efficiency.
		CO 5	Determine the capacitance of a given cable and apply the best methods for equal stress distribution in insulation.
C323	Control Systems	CO 1	Develop mathematical models for physical systems
		CO 2	Analyze linear control systems to derive transfer functions using block diagrams and signal flow graphs
		CO 3	Evaluate transient and steady-state behavior of control systems
		CO 4	Examine the stability of LTI systems using Routh's stability criterion and the Root locus method
		CO 5	Analyze the stability of LTI systems using frequency response methods



C324	Electric Drives and Traction	CO 1	Outline the basic components, classification, working, and applications of electric drive systems for different load conditions
		CO 2	Explain the speed control techniques of DC motor drives
		CO 3	Explain the speed control techniques of AC motor drives
		CO 4	Describe the fundamentals of electric traction systems and traction motors.
		CO 5	Analyze the traction performance and control methods of traction motors.
C325	Data Science	CO 1	Explain the fundamentals of Data Science, facets of data, big data ecosystem, and the complete data science process.
		CO 2	Apply machine learning techniques using Python tools for feature engineering, model selection, validation, and prediction in real-world applications.
		CO 3	Analyze big data handling techniques using Hadoop and NoSQL databases and apply them to practical case studies
		CO 4	Use graph databases and text analytics tools to solve data science problems involving structured and unstructured data.
		CO 5	Design data visualizations and develop prototype applications to present analytical results for engineering problem-solving scenarios.
C329	Soft Skills	CO 1	Apply verbal and non-verbal communication to real life situations.
		CO 2	Utilize goal-setting and time management strategies to improve productivity.
		CO 3	Develop leadership and team management skills for effective collaboration.
		CO 4	Take part in group discussions.
		CO 5	Construct effective resumes and prepare for interviews to successfully navigate in job market

Laboratory Courses

Course Code	Course Title	Experiment No	Course Outcomes
C326	Microprocessors & Microcon	1,2,3,4,5,6,7	CO1 Develop basic assembly language programs based on arithmetic, logical, shift and string operations using MASM32 assembler.
		8,9	CO2 Carry out execution of string operations with the 8086-

	trollers Lab			microprocessor using the MASM32 assembler.
		10	CO3	Build basic assembly language programs based on arithmetic operations using 8086 microprocessors.
		11	CO4	Interfacing I/O Devices with 8086 microprocessors.
		12	CO5	Implementing basic assembly language programs of 8051 microcontroller using KEIL simulator.
C327	Control Systems Lab	2,6,7,8	CO1	Analyze the performance and working of Magnetic amplifier, D.C and A.C. servo motors and synchros
		3,4	CO2	Design P,PI,PD,PID controllers and lag-lead compensators
		1	CO3	Analyze the performance of a second order control systems
		5	CO4	Evaluate temperature control of an oven using PID controller
		9,10	CO5	Test the controllability, observability and judge the stability of control systems in frequency domain using MATLAB.
C328	Power Systems Simulatio n Lab	1,2,6	CO1	Analyze sequence impedances of alternators and transformers.
				Evaluate transmission line performance using ABCD parameters and line constants.
		3,4,7	CO2	
		5	CO3	Assess the performance of PV panels under different conditions.
		8,9,10,11	CO4	Apply computational methods for load flow, Y-bus formation, and economic dispatch.
		12	CO5	Analyze transient and steady-state stability of power systems.

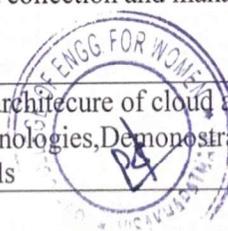
7th Semester

Theory Courses

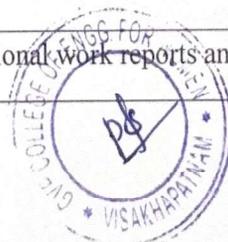
<i>Course Code</i>	<i>Course Title</i>	<i>Course Outcomes</i>	
C411	FACTS	CO 1	Summarize the concept of power flow control in transmission lines using FACTS controllers
		CO 2	Outline the differences between VSC and CSC
		CO 3	Apply the shunt compensation methods to improve the stability in the transmission lines



		CO 4	Outline the importance of series capacitive compensation
		CO 5	Explain the operating principle and list applications of UPFC and IPFC
C412	HEV	CO 1	Summarize the concept of Electric Vehicles (EV) and Hybrid Electric Vehicles (HEV).
		CO 2	Analyze the various drive train configurations of hybrid electric vehicles.
		CO 3	Choose an effective motor for EV and HEV application and summarize drive train concept of plug in electric vehicles
		CO 4	Analyze the power converters used in hybrid electric vehicles
		CO 5	Summarize concept of energy storage systems using battery and other storage systems
C413	PSOC	CO 1	Determine the optimal scheduling of Generators with and without losses
		CO 2	Outline the Hydrothermal scheduling and solve Unit commitment problems subjected to constraints.
		CO 3	Model the Isolated power system for single area load frequency control with and without controller
		CO 4	Understand the load frequency control for two area system with and without controllers
		CO 5	Understand the importance of Reactive power control and line power compensation.
C414	DS	CO 1	Acquire the Knowledge and expertise to become a proficient data scientist
		CO 2	Demonstrate an understanding of statistics and machine learning concepts that are vital for data science
		CO 3	Explain how data is collected, managed and stored for data science
		CO 4	Interpret the key concepts in data science, including their real-world applications and the toolkit used by data Scientists.
		CO 5	Illustrate data collection and management scripts using MongoDB.
C415	Cloud Computing with	CO 1	Analyze the architecture of cloud and Understand the cloud enabling technologies, Demonstrate Cloud service models



	AWS	CO 2	Choose the levels of virtualization and tools for resource provisioning.
		CO 3	Identify and apply deployment and management options of AWS cloud architecture
		CO 4	Analyze the principles of Security and Trust management to protect confidentiality of data in the Cloud.
		CO 5	Design architecture to de-couple infrastructure and reduce inter-dependencies
C416	UHV	CO 1	Classify course introduction, need, basic guidelines, content and process for value education
		CO 2	Demonstrate harmony in human being-harmony in myself
		CO 3	Explain harmony in the family and society ,harmony in human relationship
		CO 4	Summarize harmony in nature and existence -whole existence as coexistence
		CO 5	Assume the above holistic understanding of harmony in professional ethicks
C417	Machines Learning with Python Lab(Skill advanced course)	CO 1	Implement procedures for the machine learning algorithms
		CO 2	Design and Develop Python programs for various Learning algorithms
		CO 3	Apply appropriate data sets to the Machine Learning algorithms
		CO 4	Develop Machine Learning algorithms to solve real world problems
		CO 5	Implement procedures for the machine learning algorithms
C418	Industrial / Research Internship 2	CO 1	Participate in the projects in industries during his or her industrial training.
		CO 2	Describe use of advanced tools and techniques encountered during industrial training and visit.
		CO 3	Interact with industrial personnel and follow engineering practices and discipline prescribed in industry.
		CO 4	Develop awareness about general workplace behaviour and build interpersonal and team skills.
		CO 5	Prepare professional work reports and presentations.



8th Semester
Theory Courses

Course Code	Course Title	Course Outcomes	
421	Major Project	CO 1	Demonstrate the technical knowledge to identify problems in the field of Electrical & Electronics Engineering and its allied areas.
		CO 2	Analyze and formulate technical projects with a comprehensive and systematic approach.
		CO 3	Identify the modern tools to implement technical projects.
		CO 4	Design engineering solutions for solving complex engineering problems.
		CO 5	Develop effective communication skills, professional behaviour and team work.




 Head
 of Electrical & Electronic
 College of Engineering
 Madhurawade
 SAKHAPATNAM-5



JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY KAKINADA
KAKINADA–533003, Andhra Pradesh, India
DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

IV B.Tech – I Semester

Sl. No	Course Components	Subjects	L	T	P	Credits
1	PEC	Professional Elective – III	3	0	0	3
2	PEC	Professional Elective – IV	3	0	0	3
3	PEC	Professional Elective – V	3	0	0	3
4	OEC	Open Elective- III/Job Oriented Elective-III	3	0	0	3
5	OEC	Open Elective-IV /Job Oriented Elective-IV	3	0	0	3
6	HSMC	Universal Human Values-2: Understanding Harmony	3	0	0	3
7	SC	Skill Advanced Course Machine Learning with PythonLab	0	0	4	2
8	PROJ	Industrial / Research Internship 2 Months (Mandatory) after third year (to be evaluated during VII Semester)	0	0	3	3
Total Credits			23			
		Minors Course*	4	0	0	4
		Honors Course*	4	0	0	4

IVB.TechIISemester

Sl. No	Course Components	Subjects	L	T	P	Credits
1	Major Project	Project work, seminar and internship in industry (6 Months)	--	--	--	12
Total Credits			12			

HSMC: Humanities and Social Science
Including Management Courses
BSC : Basic Science Courses
ESC: Engineering Science Courses
PCC: Professional Core Courses

PEC : Professional Elective Courses
OEC : Open Elective Courses
PROJ : Internship, Seminar, Project Wok
MC : Mandatory Courses
SC : Skill Oriented Courses



GAYATRI VIDYA PARISHAD COLLEGE OF ENGINEERING FOR WOMEN

(Autonomous)

(Approved by AICTE, New Delhi and Permanently Affiliated to Andhra University, Visakhapatnam)
Madhurawada :: Visakhapatnam – 530 048

COURSE STRUCTURE

(Applicable for the Academic Year 2024-25 onwards)

DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

B.Tech Electrical and Electronics Engineering

SCHEME AND SYLLABI

(With effect from 2024-25 admitted batch)

I Year - I Semester								
Course Code	Category	Course Title	Hours per Week		Internal Marks	External Marks	Total Marks	Credits
			L	P				
24BM11RC01	BS	Calculus and Differential Equations	3	0	30	70	100	3
24BP11RC01	BS	Engineering Physics	3	0	30	70	100	3
24BC11RC01	BS	Green Chemistry	3	0	30	70	100	3
24EC11RC03	ES	Basic Electronics Engineering	3	0	30	70	100	3
24EE11RC01	ES	Fundamentals of Electrical Engineering	3	0	30	70	100	3
24BP11RC02	BS	Engineering Physics Lab	0	3	50	50	100	1.5
24BC11RC02	BS	Green Chemistry Lab	0	3	50	50	100	1.5
24CT11RC05	ES	IT Essentials Lab	0	3	50	50	100	1.5
Total Credits								19.5

I Year - II Semester								
Course Code	Category	Course Title	Hours per Week		Internal Marks	External Marks	Total Marks	Credits
			L	P				
24BM11RC02	BS	Linear Algebra and Vector Calculus	3	0	30	70	100	3
24HE11RC01	HSS	English	3	0	30	70	100	3
24CT11RC02	ES	Problem Solving Using C	3	0	30	70	100	3
24EE11RC03	ES	Electrical Circuits – 1	3	0	30	70	100	3
24EE11RC04	ES	Thermal & Hydro Prime Movers	3	0	30	70	100	3
24HE11RC02	HSS	Communication Skills Lab	0	3	50	50	100	1.5
24CT11RC04	ES	Problem Solving Using C Lab	0	3	50	50	100	1.5
24EE11RC05	ES	Electrical Engineering Workshop	0	3	50	50	100	1.5
Total Credits								19.5



GAYATRI VIDYA PARISHAD COLLEGE OF ENGINEERING FOR WOMEN (Autonomous)

Madhurawada: Visakhapatnam – 530048

(Approved by AICTE, New Delhi and Affiliated to Andhra University, Visakhapatnam)

(Accredited by NBA for B. Tech-CSE, ECE, IT and EEE)

Accredited by NAAC with A Grade from 2022-2023 to 2027-2028

Course Outcomes

1st Semester

Theory Courses

Course Code	Course Title	Course Outcomes	
C111	Calculus and Differential Equations	CO 1	Examine the functional dependency and utilize Taylor's theorem to expand the function of two variables.
		CO 2	Determine extrema of multivariable functions.
		CO 3	Utilize double and triple integrals to evaluate areas of plane curves and the volumes of solids.
		CO 4	Solve the first order differential equations and higher order differential equations with constant coefficients, apply the techniques to solve problems related to various engineering fields.
		CO 5	Find the Laplace Transforms of various functions and apply it to solve ordinary differential Equations with initial conditions.
C112	Engineering Physics	CO 1	Apply the principles of interference, diffraction, and polarization in wave optics, and utilize optical instruments for practical applications.
		CO 2	Familiarize the basic concepts of Thermodynamics relevant to engineering applications.
		CO 3	Outline the knowledge of basic principles of Electromagnetism and EM Waves.
		CO 4	Describe the basic principles of lasers, optical fibres and their use in technological applications
		CO 5	Understand the basic principles of Quantum mechanics, Quantum computing.
C113	Green Chemistry	CO 1	To develop knowledge about water and its treatment for industrial and potable purpose.
		CO 2	Utilize the theory of construction and discharge reactions of various types of batteries are used in commercial society



		CO 3	Explain the importance of working principle, fabrication of electrodes and other components, advantages, disadvantages and environmental aspects of fuel cells.
		CO 4	Classify the corrosion mechanism of metals and factors influenced by rate and extent of corrosion and categorize the reasons for corrosion control methods
		CO 5	Apply green chemistry technology processes the knowledge for solving existing challenges faced in various engineering and societal areas.
C114	Basic Electronics Engineering	CO 1	Brief evolution and impact of electronics
		CO 2	Comprehend the characteristics of semiconductors, devices, and their applications
		CO 3	Analyze the transistor operation with different biasing techniques.
		CO 4	Understand the characteristics of FET
		CO 5	Outline the basic concepts and applications of op-amps.
C115	Fundamentals of Electrical Engineering	CO 1	Summarize the basic concepts in electric circuits
		CO 2	Apply the fundamental laws in Electrical Engineering.
		CO 3	Summarize the operation of various measuring instruments.
		CO 4	Summarize the concepts of various magnetic and dielectric materials.
		CO 5	Design the wiring schemes for house hold appliances using appropriate wiring components

Laboratory Courses

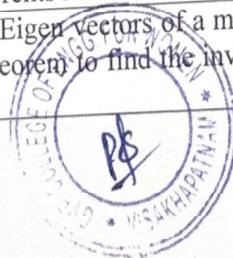
Course Code	Course Title	Experiment No	CO. No.	Course Outcomes
C116	Engineering Physics lab	1,2,4	CO 1	Interpret the physical parameters based on optical phenomena.
		5	CO 2	Verify the behaviour of double refraction in birefringent material like quartz.
		3,6	CO 3	Demonstrate the concepts of diffraction through



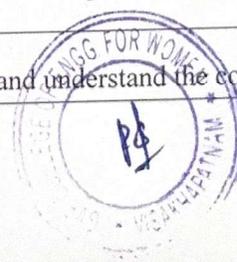
				experiments
		10,11	CO 4	Calibrate instruments like low range voltmeters and ammeters.
		13,14,15	CO 5	Design temperature sensors based on diodes and thermistors.
C117	Green Chemistry Lab	1,2	CO 1	Make use of experimental skills for quantitatively with accuracy analysis in acid-base titrations using suitable indicators
		3,7,9,10,11	CO 2	Apply the principals of redox titrations Chromium (VI) by Mohr's Salt Solution in different samples.
		4	CO 3	Utilize with complex metric titrations to determine hardness of water and estimate the amount of impurities present in the samples.
		5,8	CO 4	Perform experiments with instrument novel materials to be used as zeolite for removal of hardness of water to acquire skills of different methods of chemical analysis.
		6	CO 5	Develop the skills of green synthesis through the preparation of a polymer/ drug.
C118	IT Essentials Lab	1,2,3	CO 1	Identify the peripherals of a computer
		4,5	CO 2	Demonstrate the installation process of operating systems like MS Windows, LINUX.
		6,7	CO 3	Make use of Office suite that comprises with various applications to create documents, and captivating presentations
		8,9,10	CO 4	Make use of Office suite that comprises with various applications to organize & analyse data
		11,12	CO 5	Categorize various UNIX/LINUX Commands to work on a modern operating system and Make use of LaTeX tool to prepare research articles

**2nd Semester
Theory Courses**

Course Code	Course Title	Course Outcomes	
C121	Linear Algebra Vector Calculus	CO 1	Test for consistency and solve linear system of equations, also determine unknown currents in the electrical circuits.
		CO 2	Find the Eigen values and Eigen vectors of a matrix and apply Cayley- Hamilton theorem to find the inverse of a matrix.



		CO 3	Reduce quadratic form to canonical form and examine the nature of quadratic form.
		CO 4	Interpret the meaning and evaluate gradient of a scalar valued, curl and divergence of vector valued functions
		CO 5	Apply line integrals, surface integrals, volume integrals and their relations using Green's theorem, Stoke's theorem, Gauss Divergence theorems in various engineering applications.
C122	English	CO 1	Develop moral values and inner peace, Demonstrate the use of LSRW skills, Vocabulary and basic grammar concepts
		CO 2	Identify the impact of different social backgrounds, recognize the poet's insights. Demonstrate the use of LSRW skills, Vocabulary and basic grammar concepts.
		CO 3	Analyse socio-cultural context, Establish effective interpersonal and communication skills, Demonstrate the use of LSRW skills, Vocabulary and basic grammar concepts
		CO 4	Focus on value of education, Relate to the poet's nostalgia, Demonstrate the use of LSRW skills, Vocabulary and basic grammar concepts
		CO 5	Determine the central idea of the text, Identify one's resilience, Demonstrate the use of LSRW skills, Vocabulary and basic grammar concepts
C123	Problem Solvin Using C	CO 1	Explain the basic constructs of C through the use of simple applications
		CO 2	Demonstrate the utilization of arrays and strings in the development of C programs.
		CO 3	Utilize functions and pointers to construct various applications in C.
		CO 4	Apply concepts of structures and unions to build and implement C applications.
		CO 5	Develop applications using sequential and random-access file processing techniques
C124	Electrical Circuits – 1	CO 1	Analyse the electrical networks using mesh and nodal analysis techniques.
		CO 2	Analyse Electrical circuits with AC excitation
		CO 3	Summarize the applications of network theorems.
		CO 4	Summarize the concept of resonance and understand bandwidth, Q factor, and locus diagrams
		CO 5	Analyze magnetic circuits and understand the concepts of



			graph theory
C125	Thermal & Hydro Prime Movers	CO 1	Classify internal combustion engines & boilers and assess the performance
		CO 2	Analyse the various Vapour Power Cycles.
		CO 3	Analyze the different methods for improving the efficiency of gas turbines.
		CO 4	Determine the forces acting on the stationary & moving vanes and summarize the operation of pumps
		CO 5	Summarize the working of various types of hydraulic turbines.

Laboratory Courses

Course Code	Course Title	Experiment No	CO. No.	Course Outcomes
C126	Communication Skills Lab	1,2	CO 1	Identify and pronounce the sounds of English; choose the accurate stress in connected speech for proper intonation.
		3,4	CO 2	Apply the main theme and ideas of the audio/video to take notes and summarize.
		5,6, 7,8	CO 3	Develop speaking skills by taking part in Just A Minute (JAM) – Picture Prompts-Narratives-Role Play.
		9,10	CO 4	Practice discussions and debates
		11,12	CO 5	Demonstrate Presentation Skills
C127	Electrical Engineering Workshop	1,2, 3	CO 1	Identify, select, and troubleshoots the house wiring components
		10,11	CO 2	Troubleshoot electrical appliances such as tube light, fan and domestic pump.
		4,9	CO 3	Develop house wiring schemes using protective equipment like MCB and ELCBs
		5,6	CO 4	Design Go-down wiring /Tunnel wiring and hospital wiring schemes.
		7,8, 12,13	CO 5	Measure the Basic Electrical Parameters using suitable instruments
C128	Problem Solving	1,2, 3	CO 1	Outline the use of basic constructs of C for simple applications.



	Using C Lab	4	CO 2	Develop C programs for simple applications using Arrays and Strings.
		5,6, 7	CO 3	Illustrate concepts such as functions, recursion, and pointers with suitable examples.
		8	CO 4	Build C programs involving Structures and Unions
		9	CO 5	Develop applications using sequential and random-access file processing

**B.Tech & B.Tech+M.Tech
II Year - I Semester**

Course code	Category	Course Title	Hours per week		Internal Marks	External Marks	Total Marks	Credits
			L	P				
EE2101	BS	Operations Research	4	0	30	70	100	3
EE2102	PC	Network Theory	4	0	30	70	100	3
EE2103	PC	Electronic Circuits	4	0	30	70	100	3
EE2104	PC	Electrical Machines - I	4	0	30	70	100	3
EE2105	HSS	Managerial Economics	4	0	30	70	100	3
EE2106	PC	Electrical Networks Lab	0	3	50	50	100	1.5
EE2107	PC	Electrical Machines – I lab	0	3	50	50	100	1.5
EE2108	PC	Electronic Circuits Lab	0	3	50	50	100	1.5
EE2109	SC	Matlab & Interfacing	1	2	50	50	100	2
EE2110	MC	Professional Ethics & Universal Human values	0	0	-	100	100	0
EE2111	MC	NCC/NSS	0	2	-	-	-	0
Total credits								21.5

**B.Tech & B.Tech+M.Tech
II Year - II Semester**

Course code	Category	Course Title	Hours per week		Internal Marks	External Marks	Total Marks	Credits
			L	P				
EE2201	ES	Signals & Systems	4	0	30	70	100	3
EE2202	BS/PC	Electrical Measurements	4	0	30	70	100	3
EE2203	PC	Electrical Machines – II	4	0	30	70	100	3
EE2204	PC	EMF Theory	4	0	30	70	100	3
EE2205	PC	Electrical Engineering Materials	4	0	30	70	100	3
EE2206	PC	Electrical Machines – II Lab	0	3	50	50	100	1.5
EE2207	PC	Electrical Measurements lab	0	3	50	50	100	1.5
EE2208	SC	Electrical CAD	1	2	50	50	100	2
EE2209	MC	Environmental Science	0	0	-	100	100	0
Total credits								20
Internship I								

3rd Semester
Theory Courses

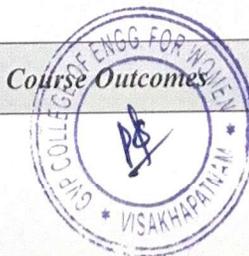
Course Code	Course Title	Course Outcomes	
C211	Operations Research	CO1	Develop a mathematical model (Linear Programming Problem) and solve LPP using Graphical method, Simplex method.
		CO2	Solve LPP using artificial variable techniques like Big-M method, Two phase method.
		CO3	Determine basic feasible solution for transportation problems and optimal solution for assignment problems.
		CO4	Construct a project network and evaluating them using PERT and CPM.
		CO5	Understand the concepts of inventory management, decision theory problems through the application of game theory.
C212	Network Theory	CO1	Analyse the electrical networks using mesh and nodal analysis techniques.
		CO2	Summarize the applications of network theorems.
		CO3	Analyse the transient behaviour of electrical networks for DC excitations
		CO4	Analyse Electrical circuits with AC excitation.
		CO5	Summarize the concept of resonance and understand bandwidth, Q factor, and analysis of circuits using Laplace transformation
C213	Electronic Circuits	CO1	Compare single stage amplifier and multistage amplifier by observing various parameters and their frequency response
		CO2	Compare different types of feedback amplifiers
		CO3	Make use of baurkhasan criterion to design different types



			of oscillators
		CO4	Apply load line concept to examine different types of power amplifiers and analyze different tuned amplifiers
		CO5	Outline basic operation of Op-Amp and describe Op-Amp based circuits
C214	Electrical Machine-I	CO1	Summarize the concepts of electro-mechanical energy conversion principles.
		CO2	Summarize the construction, principle of operation and analyze the characteristics and performance of DC generators.
		CO3	Outline the principle of operation of DC motor and analyze the performance of DC motor.
		CO4	Analyze the performance of transformers and autotransformers.
		CO5	Summarize the three phase transformer connections and phase conversion methods.
C215	Managerial Economics	CO1	Utilize the knowledge of demand for their products and can assess various utility stages
		CO2	Analyze Production function & economies of scale and can identify the cost of the product.
		CO3	Identify the nature of competitive market situations.
		CO4	Utilize the knowledge of various pricing strategies.
		CO5	Identify various stages of Business cycles.
C219	Matlab & Interfacing (Skill Course)	CO1	Simulate the electrical circuits using MATLAB/Simulink software and verify the laws and principles of electrical circuits.
		CO2	Simulate the two port networks using MATLAB/Simulink software and verify the two port network parameters.
		CO3	Simulate the Half-wave/Full-wave Rectifier circuits, observe the waveforms and determine the average value, RMS value, form factor and ripple factor using MATLAB/Simulink
		CO4	Study initial conditions and External Characteristics of DC Shunt motor using MATLAB/Simulink
		CO5	Study Speed Control of DC Shunt motor using MATLAB/Simulink.

Laboratory Courses

Course Code	Course Title	Expe rime	Course Outcomes



		<i>nt No</i>		
216	Electrical Networks Lab	1,2,3 ,4	CO1	Analyze the different Network Theorems
		5,6	CO2	Apply Maximum Power Transfer and Reciprocity theorems to optimize circuit performance.
		7	CO3	Determine the different two port network parameters
		8	CO4	Evaluate the behavior of Series and Parallel resonance circuits.
		9,10	CO5	Measure the powers in three phase circuits .
217	Electrical Machines – I Lab	2,3,4 ,7,8	CO1	Determine and predetermine the performance of DC machines and transformer.
		1,6	CO2	Identify different conditions required to be satisfied for self – excited DC Generators.
		5	CO3	Start and speed control of the different DC machines.
		9	CO4	Examine the load sharing between two parallel connected transformers.
		10	CO5	Analyze phase conversion in Scott connected transformers.
218	Electronic Circuits Lab	4	CO1	Design and analyze various amplifiers (single & Multistage amplifier)
		2,3	CO2	Design and analyze various oscillators(RC phase shift oscillator and Colpitt's oscillator)
		1,8	CO3	Design and analyze feedback amplifiers (voltage series and current series feedback amplifiers)
		12	CO4	Design various linear and non linear applications(Adder,subtractor & Comparator) using IC741 op-amp
		5,6,7 ,9,10 ,11	CO5	Become expert with software skills (Multisim, OrCAD Pspice and Capture) for the analysis and design of circuits



Theory Courses

Course Code	Course Title	Course Outcomes	
C221	Signals & Systems	CO 1	Understand the classification, representation of signals and perform various mathematical operations on signals
		CO 2	Classify the systems based on their properties, representation of LTI system in both continuous and discrete time domain
		CO 3	Make use of fourier concepts and Z-transform to analyse continuous and discrete time signals
		CO 4	Compute the response of LTI systems using convolution and describing the systems by using differential & difference equations
		CO 5	Explain the process of sampling, effects of undersampling and reconstruction of signals
C222	Electrical Measurements	CO 1	Summarize the principle of operation and working of different types of instruments for measurement of Electrical Quantities
		CO 2	Choose right type of instrument for measurement of power and power factor
		CO 3	Select right type for measurement of R, L,C.
		CO 4	Summarize the principle of operation and working of magnetic measurements.
		CO 5	Demonstrate the working of Potentiometers and Instrument Transformers
C223	Electrical Machines - II	CO 1	Explain the operation and performance of three phase induction motor.
		CO 2	Analyze the torque-speed relation, performance of induction motor and induction generator.
		CO 3	Explain the working principle and summarize the starting methods of single phase induction motors.
		CO 4	Analyze the performance of synchronous generator
		CO 5	Understand the operation, performance and summarize the starting methods of synchronous motors.
C224	EMF Theory	CO 1	Summarize the applications of coulomb's and Gauss's Law for electric fields
		CO	Analyse behaviour of conductors and dielectrics in electric



		2	fields, apply boundary conditions to calculate capacitance.
		CO 3	Outline the basic principles and laws of magnetostatics
		CO 4	Apply the principles of magnetostatics to determine self and mutual inductance.
		CO 5	Summarize the Maxwell's Equations for static and Time varying fields.
C225	Electrical Engineering Materials	CO 1	Analyse the various dielectric materials and their properties, applications
		CO 2	Classify the magnetic materials and understand their properties
		CO 3	Summarize the special purpose magnetic materials and semi-conductor materials
		CO 4	Explain the materials used in electrical engineering and their effects.
		CO 5	Summarize the special purpose materials and their applications.
C228	Electrical CAD(Skill Course)	CO 1	Understand the associated features of ECAD using standard-based drafting and drawing skills.
		CO 2	To Acquire the knowledge of creating projects in Electrical CAD
		CO 3	Acquire the knowledge of drawing reports and bill of materials in electrical circuits.
		CO 4	To develop the electrical machines wiring with protection using Electrical CAD
		CO 5	To familiarize with standard 2D and 3D drawing, modifying, dimension and view commands.

Laboratory Courses

Course Code	Course Title	Experiment No	Course Outcomes
C226	Electrical Machine - II Lab	1,2	CO1 Determine and predetermine the performance of three phase Induction motor
		3,4	CO2 Predetermine the regulation of three-phase alternator by various methods.
		8	CO3 Start and speed control of the three phase Induction motor.
		9,6,5	CO4 Analyze the performance of three phase synchronous



				machine.
		7,10	CO5	Assess and improve the performance of single phase induction motor.
C227	Electrical Measurements Lab	2,3,4	CO1	Measurement of resistance, inductance and capacitance using different bridges
		1,5	CO2	Calibration of dynamometer wattmeter and LPF power factor meter using indirect and direct loading.
		8,9	CO3	Test for calibration of voltmeter and ammeter using DC Potentiometer and dielectric oil
		6	CO4	Measurement of three phase reactive power using single wattmeter
		7,10	CO5	Calibration of single phase energy meter and strain gauge

**B.Tech & B.Tech+M.Tech
III Year - I Semester**

Course code	Category	Course Title	Hours per week		Internal Marks	External Marks	Total Marks	Credits
			L	P				
EE3101	PC	Pulse & Digital Circuits	4	0	30	70	100	3
EE3102	PC	Power Electronics	4	0	30	70	100	3
EE3103	PC	Power Systems – I	4	0	30	70	100	3
EE3104	PE	Professional Elective I	4	0	30	70	100	3
EE3105	OE	Open Elective I	4	0	30	70	100	3
EE3106	PC	PDC Lab	0	3	50	50	100	1.5
EE3107	PC	Power Electronics Lab	0	3	50	50	100	1.5
EE3108	SC	PLCs	1	2	50	50	100	2
EE3109	INT	Internship I			50	50	100	2
Total Credits								22

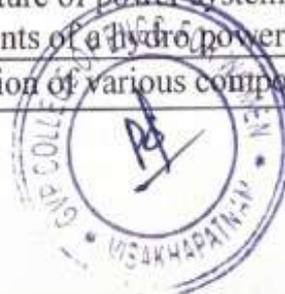
**B.Tech & B.Tech+M.Tech
III Year - II Semester**

Course code	Category	Course Title	Hours per week		Internal Marks	External Marks	Total Marks	Credits
			L	P				
EE3201	PC	Power System Analysis & Stability	4	0	30	70	100	3
EE3202	PC	Power Systems – II	4	0	30	70	100	3
EE3203	PC	Control Systems	4	0	30	70	100	3
EE3204	PE	Professional Elective II	4	0	30	70	100	3
EE3205	OE	Open Elective II	4	0	30	70	100	3
EE3206	PC	Microprocessors & Microcontrollers Lab	0	3	50	50	100	1.5
EE3207	PC	Control Systems Lab	0	3	50	50	100	1.5
EE3208	PC	Power Systems Simulation Lab	0	3	50	50	100	1.5
EE3209	SC	Soft Skills	1	2	50	50	100	2
Total Credits								21.5
Internship II								

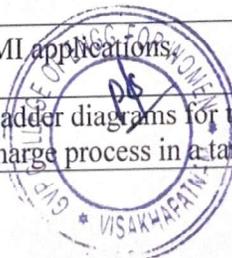
5th Semester

Theory Courses

Course Code	Course Title	Course Outcomes	
C311	Pulse & Digital Circuits	CO 1	Explain the response of linear wave shaping circuits to various non sinusoidal inputs.
		CO 2	Extend the applications of diodes and transistors to non-linear waveshaping case.
		CO 3	Build Collector and Emitter Coupled Bistable Multivibrators
		CO 4	Analyze and design astable and monostable multivibrator circuits with BJTs.
		CO 5	Illustrate the operation of different time base generators and logic gates.
C312	Power Electronics	CO 1	Describe the working and characteristics of basic power electronic devices
		CO 2	Apply different gate triggering and protection methods for thyristors
		CO 3	Analyze single-phase and three-phase controlled rectifier circuits
		CO 4	Analyze the working of DC-DC choppers and cyclo-converters
		CO 5	Summarize the operation of inverters and PWM techniques
C313	Power Systems - I	CO 1	Describe the structure of power system and functions of different components of a hydro power plant.
		CO	Outline the operation of various components in a Thermal



		2	power station.
		CO 3	Discuss the working principle of nuclear power reactors and Diesel power plants.
		CO 4	Summarize the operation of Gas and MHD power plants.
		CO 5	Analyse the significance of various factors of economic aspects of power generation. and apply the suitable tariff method for various consumers.
C314	Utilization of Electrical Energy	CO 1	Describe the principles and applications of electric heating and welding methods.
		CO. 2	Apply the basic concepts of illumination, light sources, and lighting methods.
		CO 3	Analyze the working of refrigeration & air-conditioning systems and their electrical circuits.
		CO 4	Outline the electrolytic processes and summarize their applications such as electroplating and galvanizing.
		CO 5	Describe electrical safety measures, wiring methods, earthing, and the basic structure of power systems.
C315	Artificial Intelligence and Machine Learning	CO 1	Outline the key concepts of neural networks, including perceptron and backpropagation.
		CO 2	Explain different machine learning methods and their applications in real-world contexts.
		CO 3	Discuss the features and applications of various classification and regression algorithms.
		CO 4	Outline the architecture and layers of convolutional neural networks.
		CO 5	Describe the principles and applications of advanced AI models, DNN and GAN.
C318	SKILL:PLCs	CO 1	Explain the PLC Hardware and Software used in PLC.
		CO 2	Construct the Ladder diagrams for Logic Gates and latching of motors in PLC.
		CO 3	Describe the usage and applications of Timers and Counters, Arithmetic Instructions, Comparator.
		CO 4	Develop the HMI applications.
		CO 5	Construct the Ladder diagrams for traffic signals/water filling and discharge process in a tank.



C319	INTERSHIP	CO 1	Skill Development: Learning and improving skills such as writing, verbal communication, research, technology, teamwork and leadership
		CO 2	Real World Applications: Understand the workplace, operating procedures, company profile and its products in addition to the existing class room knowledge
		CO 3	Career Awareness: To provide the opportunity to learn about the career positions and occupations along with the qualities and training required
		CO 4	Professional Ethics: Demonstrate professional values and ethical standards
		CO 5	Personal Development: To develop the self - confidence, assertiveness and basic work habits

Laboratory Courses

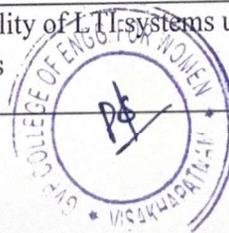
Course Code	Course Title	Experiment No	Course Outcomes	
C316	PDC lab	1,2	CO1	Analyze the behaviour of various linear waveshaping circuits
		3,4	CO2	Design various non-linear waveshaping circuits
			CO3	Design astable and monostable multivibrator circuits with BJTs.
		5,6	CO4	Build Collector and Emitter Coupled Bistable Multivibrators
		7,8		Develop time base generators and sweep circuits
9,10	CO5			
C317	Power Electronics Lab	1,2	CO1	Analyze the V-I characteristics of SCR and determine latching and holding currents.
		3,4,5	CO2	Design and test firing circuits for SCR and evaluate the performance of half-wave phase-controlled rectifiers.
			CO3	Analyze the operation of single-phase controlled and half-controlled bridge rectifiers with R and RL loads.
		6,11	CO4	Examine the performance of AC voltage controllers, inverters, and forced commutation circuits
		8		Analyze and verify the operation of DC choppers and single-phase cyclo-converters.
7,9,10	CO5			



6th Semester

Theory Courses

Course Code	Course Title	Course Outcomes	
C321	Power System Analysis & Stability	CO 1	Develop the impedance Diagram in (PU) and Construct the Ybus matrix for a power system by singular transformation and direct inspection method
		CO 2	Summarize the load flow solutions for power system using various types of power flow methods
		CO 3	Develop the Zbus matrix and the fault current for 3 phase short circuit conditions for a power system
		CO 4	Analyze the unsymmetrical faults using sequence components in power system
		CO 5	Analyze the steady state, transient and dynamic stability concepts of a power system
C322	Power Systems – II	CO 1	Describe the System Voltage effects and Compute the transmission line parameters for various types of transmission line configurations
		CO 2	Classify transmission lines and Analyse the performance of short, Medium and Long transmission lines
		CO 3	Evaluate the sag and tension of a transmission line for various configurations and Outline the effects of corona.
		CO 4	Select a suitable insulators for a particular operating voltage and develop the methods to improve string efficiency.
		CO 5	Determine the capacitance of a given cable and apply the best methods for equal stress distribution in insulation.
C323	Control Systems	CO 1	Develop mathematical models for physical systems
		CO 2	Analyze linear control systems to derive transfer functions using block diagrams and signal flow graphs
		CO 3	Evaluate transient and steady-state behavior of control systems
		CO 4	Examine the stability of LTI systems using Routh's stability criterion and the Root locus method
		CO 5	Analyze the stability of LTI systems using frequency response methods



C324	Electric Drives and Traction	CO 1	Outline the basic components, classification, working, and applications of electric drive systems for different load conditions
		CO 2	Explain the speed control techniques of DC motor drives
		CO 3	Explain the speed control techniques of AC motor drives
		CO 4	Describe the fundamentals of electric traction systems and traction motors.
		CO 5	Analyze the traction performance and control methods of traction motors.
C325	Data Science	CO 1	Explain the fundamentals of Data Science, facets of data, big data ecosystem, and the complete data science process.
		CO 2	Apply machine learning techniques using Python tools for feature engineering, model selection, validation, and prediction in real-world applications.
		CO 3	Analyze big data handling techniques using Hadoop and NoSQL databases and apply them to practical case studies
		CO 4	Use graph databases and text analytics tools to solve data science problems involving structured and unstructured data.
		CO 5	Design data visualizations and develop prototype applications to present analytical results for engineering problem-solving scenarios.
C329	Soft Skills	CO 1	Apply verbal and non-verbal communication to real life situations.
		CO 2	Utilize goal-setting and time management strategies to improve productivity.
		CO 3	Develop leadership and team management skills for effective collaboration.
		CO 4	Take part in group discussions.
		CO 5	Construct effective resumes and prepare for interviews to successfully navigate in job market

Laboratory Courses

Course Code	Course Title	Experiment No	Course Outcomes
C326	Microprocessors & Microcon	1,2,3,4,5,6,7	CO1 Develop basic assembly language programs based on arithmetic, logical, shift and string operations using MASM32 assembler.
		8,9	CO2 Carry out execution of string operations with the 8086-

	trollers Lab			microprocessor using the MASM32 assembler.
		10	CO3	Build basic assembly language programs based on arithmetic operations using 8086 microprocessors.
		11	CO4	Interfacing I/O Devices with 8086 microprocessors.
		12	CO5	Implementing basic assembly language programs of 8051 microcontroller using KEIL simulator.
C327	Control Systems Lab	2,6,7,8	CO1	Analyze the performance and working of Magnetic amplifier, D.C and A.C. servo motors and synchros
		3,4	CO2	Design P,PI,PD,PID controllers and lag-lead compensators
		1	CO3	Analyze the performance of a second order control systems
		5	CO4	Evaluate temperature control of an oven using PID controller
		9,10	CO5	Test the controllability, observability and judge the stability of control systems in frequency domain using MATLAB.
C328	Power Systems Simulation Lab	1,2,6	CO1	Analyze sequence impedances of alternators and transformers.
				Evaluate transmission line performance using ABCD parameters and line constants.
		3,4,7	CO2	
		5	CO3	Assess the performance of PV panels under different conditions.
		8,9,10,11	CO4	Apply computational methods for load flow, Y-bus formation, and economic dispatch.
		12	CO5	Analyze transient and steady-state stability of power systems.



JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY KAKINADA
KAKINADA–533003, Andhra Pradesh, India
DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

IV B.Tech – I Semester

Sl. No	Course Components	Subjects	L	T	P	Credits
1	PEC	Professional Elective – III	3	0	0	3
2	PEC	Professional Elective – IV	3	0	0	3
3	PEC	Professional Elective – V	3	0	0	3
4	OEC	Open Elective- III/Job Oriented Elective-III	3	0	0	3
5	OEC	Open Elective-IV /Job Oriented Elective-IV	3	0	0	3
6	HSMC	Universal Human Values-2: Understanding Harmony	3	0	0	3
7	SC	Skill Advanced Course Machine Learning with PythonLab	0	0	4	2
8	PROJ	Industrial / Research Internship 2 Months (Mandatory) after third year (to be evaluated during VII Semester)	0	0	3	3
Total Credits			23			
		Minors Course*	4	0	0	4
		Honors Course*	4	0	0	4

IVB.TechIISemester

Sl. No	Course Components	Subjects	L	T	P	Credits
1	Major Project	Project work, seminar and internship in industry (6 Months)	--	--	--	12
Total Credits			12			

HSMC: Humanities and Social Science
Including Management Courses
BSC : Basic Science Courses
ESC: Engineering Science Courses
PCC: Professional Core Courses

PEC : Professional Elective Courses
OEC : Open Elective Courses
PROJ : Internship, Seminar, Project Wok
MC : Mandatory Courses
SC : Skill Oriented Courses

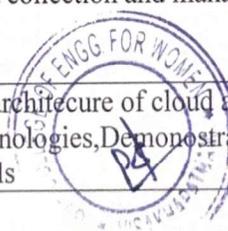
7th Semester

Theory Courses

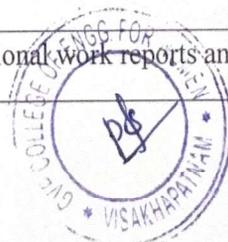
<i>Course Code</i>	<i>Course Title</i>	<i>Course Outcomes</i>	
C411	FACTS	CO 1	Summarize the concept of power flow control in transmission lines using FACTS controllers
		CO 2	Outline the differences between VSC and CSC
		CO 3	Apply the shunt compensation methods to improve the stability in the transmission lines



		CO 4	Outline the importance of series capacitive compensation
		CO 5	Explain the operating principle and list applications of UPFC and IPFC
C412	HEV	CO 1	Summarize the concept of Electric Vehicles (EV) and Hybrid Electric Vehicles (HEV).
		CO 2	Analyze the various drive train configurations of hybrid electric vehicles.
		CO 3	Choose an effective motor for EV and HEV application and summarize drive train concept of plug in electric vehicles
		CO 4	Analyze the power converters used in hybrid electric vehicles
		CO 5	Summarize concept of energy storage systems using battery and other storage systems
C413	PSOC	CO 1	Determine the optimal scheduling of Generators with and without losses
		CO 2	Outline the Hydrothermal scheduling and solve Unit commitment problems subjected to constraints.
		CO 3	Model the Isolated power system for single area load frequency control with and without controller
		CO 4	Understand the load frequency control for two area system with and without controllers
		CO 5	Understand the importance of Reactive power control and line power compensation.
C414	DS	CO 1	Acquire the Knowledge and expertise to become a proficient data scientist
		CO 2	Demonstrate an understanding of statistics and machine learning concepts that are vital for data science
		CO 3	Explain how data is collected, managed and stored for data science
		CO 4	Interpret the key concepts in data science, including their real-world applications and the toolkit used by data Scientists.
		CO 5	Illustrate data collection and management scripts using MongoDB.
C415	Cloud Computing with	CO 1	Analyze the architecture of cloud and Understand the cloud enabling technologies, Demonstrate Cloud service models



	AWS	CO 2	Choose the levels of virtualization and tools for resource provisioning.
		CO 3	Identify and apply deployment and management options of AWS cloud architecture
		CO 4	Analyze the principles of Security and Trust management to protect confidentiality of data in the Cloud.
		CO 5	Design architecture to de-couple infrastructure and reduce inter-dependencies
C416	UHV	CO 1	Classify course introduction, need, basic guidelines, content and process for value education
		CO 2	Demonstrate harmony in human being-harmony in myself
		CO 3	Explain harmony in the family and society ,harmony in human relationship
		CO 4	Summarize harmony in nature and existence -whole existence as coexistence
		CO 5	Assume the above holistic understanding of harmony in professional ethicks
C417	Machines Learning with Python Lab(Skill advanced course)	CO 1	Implement procedures for the machine learning algorithms
		CO 2	Design and Develop Python programs for various Learning algorithms
		CO 3	Apply appropriate data sets to the Machine Learning algorithms
		CO 4	Develop Machine Learning algorithms to solve real world problems
		CO 5	Implement procedures for the machine learning algorithms
C418	Industrial / Research Internship 2	CO 1	Participate in the projects in industries during his or her industrial training.
		CO 2	Describe use of advanced tools and techniques encountered during industrial training and visit.
		CO 3	Interact with industrial personnel and follow engineering practices and discipline prescribed in industry.
		CO 4	Develop awareness about general workplace behaviour and build interpersonal and team skills.
		CO 5	Prepare professional work reports and presentations.



8th Semester
Theory Courses

Course Code	Course Title	Course Outcomes	
421	Major Project	CO 1	Demonstrate the technical knowledge to identify problems in the field of Electrical & Electronics Engineering and its allied areas.
		CO 2	Analyze and formulate technical projects with a comprehensive and systematic approach.
		CO 3	Identify the modern tools to implement technical projects.
		CO 4	Design engineering solutions for solving complex engineering problems.
		CO 5	Develop effective communication skills, professional behaviour and team work.



RVS
Head
of Electrical & Electronic
College of Engineering
Madhurawade
SAKHAPATNAM-5



GAYATRI VIDYA PARISHAD COLLEGE OF ENGINEERING FOR WOMEN

(Autonomous)

(Approved by AICTE, New Delhi and Permanently Affiliated to Andhra University, Visakhapatnam)

Madhurawada :: Visakhapatnam – 530 048

COURSE STRUCTURE

(Applicable for the Academic Year 2024-25 onwards)

DEPARTMENT OF INFORMATION TECHNOLOGY

B.Tech. Information Technology

SCHEME AND SYLLABI

(With effect from 2024-25 admitted batch)

I Year - I Semester								
Course Code	Category	Course Title	Hours per Week		Internal Marks	External Marks	Total Marks	Credits
			L	P				
24BM11RC01	BS	Calculus and Differential Equations	3	0	30	70	100	3
24BC11RC01	BS	Green Chemistry	3	0	30	70	100	3
24HE11RC01	HSS	English	3	0	30	70	100	3
24CT11RC01	ES	Fundamentals of Computers	3	0	30	70	100	3
24CT11RC02	ES	Problem Solving using C	3	0	30	70	100	3
24HE11RC02	HSS	Communication Skills Lab	0	3	50	50	100	1.5
24CT11RC03	ES	Computer Engineering Workshop	0	3	50	50	100	1.5
24CT11RC04	ES	Problem Solving using C Lab	0	3	50	50	100	1.5
Total Credits								19.5
I Year - II Semester								
Course Code	Category	Course Title	Hours per Week		Internal Marks	External Marks	Total Marks	Credits
			L	P				
24BM11RC02	BS	Linear Algebra and Vector Calculus	3	0	30	70	100	3
24BP11RC01	BS	Engineering Physics	3	0	30	70	100	3
24EC11RC05	ES	Digital Logic Design	3	0	30	70	100	3
24EC11RC04	ES	Elements of Electronics Engineering	3	0	30	70	100	3
24CT11RC06	ES	Python Programming	3	0	30	70	100	3
24BP11RC02	BS	Engineering Physics Lab	0	3	50	50	100	1.5
24CT11RC07	ES	Python Programming Lab	0	3	50	50	100	1.5
24CT11RC08	ES	Web Technologies Fundamentals Lab	0	3	50	50	100	1.5
Total Credits								19.5



GAYATRI VIDYA PARISHAD COLLEGE OF ENGINEERING FOR WOMEN (AUTONOMOUS)

Madhurawada, Visakhapatnam - 530 048

(Approved by AICTE, New Delhi and Permanently Affiliated to Andhra University, Visakhapatnam)

Accredited by NAAC with 'A' from 2022 to 2027

CSE, ECE and IT Courses Accredited by NBA (2019-2022) and Re-Accredited by NBA (2022-2025)

EEE Course Accredited by NBA (2023-2026)

Ph : 0891-2739144, 2526638 Email : gvpcew@gmail.com Website : www.gvpcew.ac.in

Department of Information Technology (24-25 AY)

Course Outcomes

1st Semester

Theory Courses

Course Code	Course Title	Course Outcomes	
C111 24BM11 RC01	Calculus and Differential Equations	CO1	Examine the functional dependency and estimate function of two variables using Taylor's theorem. L4
		CO2	Determine extrema of multivariable functions. (L5)
		CO3	Utilize double and triple integrals to evaluate areas of plane curves and the volumes of solids. (L5)
		CO4	Solve the first order differential equations and higher order differential equations with constant coefficients, apply the techniques to solve problems related to various engineering fields. (L3)
		CO5	Find the Laplace Transforms of various functions and apply it to solve ordinary differential Equations with initial conditions. (L3)
C112	Green Chemistry	CO1	To develop the knowledge about water and its treatment for industrial and potable purpose
		CO2	Utilize the theory of construction and discharge reactions of various types of batteries are used in commercial society
		CO3	Explain the importance of working principle, fabrication of electrodes and other components, advantages, disadvantages and environmental aspects of fuel cells
		CO4	Classify the corrosion mechanism of metals and factors influenced by rate and extent of corrosion and categorize the reasons for corrosion control methods
		CO5	Apply green chemistry technology processes the knowledge for solving existing challenges faced in various engineering and societal areas
	English	CO1	Develop moral values and inner peace(L3), Demonstrate the use of



C113			LSRW skills, Vocabulary and basic grammar concepts.(L3)
		CO2	Identify the impact of different social backgrounds (L3), recognize the poet's insights. (L4), Demonstrate the use of LSRW skills, Vocabulary and basic grammar concepts.(L3)
		CO3	Illustrate Verbal & Non-verbal communication through the One-Act play; practice Time Management skills; demonstrate the use of LSRW skills, Vocabulary and basic grammar concepts.
		CO4	Analyze the contributions of eminent personalities for societal development; demonstrate the use of LSRW skills, Vocabulary and basic grammar concepts.
		CO5	Interpret the Political implications of language use and cultural revival; demonstrate the use of LSRW skills, Vocabulary and basic grammar concepts.
C114	Fundamentals of Computers	CO1	Identify different I/O devices and their usage.
		CO2	Compare different computer memory with their efficiency.
		CO3	Relate different computer software's and programming languages for solving problems.
		CO4	Summarize the use of operating system, database system, and computer network in the field of computing in engineering.
		CO5	Infer the methods and applications of artificial intelligence (AI), machine learning (ML) and data science.
C115	Problem Solving Using C	CO1	Explain about basics of computer, importance of various data types and identify decision statements and loops for various problems.
		CO2	Understand the concepts of arrays and strings to familiarize matrices and string handling functions.
		CO3	Utilize functions and pointers with different scopes, types of returns and pointer expressions to solve math problems.
		CO4	Identify the importance of structures and unions and their applications in suitable fields.
		CO5	Apply the concepts of file handling and command line arguments.



Laboratory Courses

Course Code	Course Title	Experiment No	CO. No.	Course Outcomes
C116	Communication skills Lab	1,2	CO1	Identify and pronounce the sounds of English; choose the accurate stress in connected speech for proper intonation (L3)
		3,4	CO2	Apply the main theme and ideas of the audio/video to take notes and summarize (L3)
		5,6,7	CO3	Develop speaking skills by taking part in Just A Minute (JAM) – Narratives-Role Play (L3)
		8,9	CO4	Practice discussions and debates(L3)
		10	CO5	Demonstrate Presentation Skills(L3)
C117	Computer Engineering Workshop Lab	1,2	CO1	Identify the peripherals of a computer.
		3,4	CO2	Demonstrate the installation process of operating systems like MS Windows, LINUX.
		5	CO3	Make use of MS-Office suite that comprises of various applications to create documents, organizes & analyses data and captivating presentations.
		6,7	CO4	Categorize various UNIX/LINUX Commands to work on a modern operating system
		8	CO5	Experiment with GIT Commands and make use of LaTeX to prepare research articles.
C118	Problem Solving Using using C lab	1,2	CO1	Understand the C-Programs on basic concepts like variables, datatypes
		3,4	CO2	Experiment with Selection, Decision control statements, Loop control statements Using C.
		5,6,7,8	CO3	Develop the C-Programs on the Arrays, Strings Concepts
		9,10,11, 12,13	CO4	Make use of Structures, Pointers, Dynamic Memory Allocation in C
		14,15,16	CO5	Develop the programs on the Functions, Files concepts using C




Head of Department
 Dept. of Information Technology
 GVP College of Engineering for Women
 Madhurawada, Visakhapatnam-18

2nd Semester

Theory Courses

Course Code	Course Title	Course Outcomes	
C121	Linear Algebra and Vector Calculus	CO1	Test for the consistency and solve linear system of equations, also determine unknown currents in the electrical circuits. (L5)
		CO2	Find the Eigen values and Eigen vectors of a matrix, and apply Cayley- Hamilton theorem to find the inverse of a matrix. (L3)
		CO3	Reduce quadratic form to canonical form and examine the nature of quadratic form. (L4)
		CO4	Interpret the meaning and evaluate gradient, curl and divergence. (L5)
		CO5	Apply line integrals, surface integrals, volume integrals and their relations using Green's theorem, Stoke's theorem, Gauss Divergence theorems in various engineering applications. (L3)
C122	Engineering Physics	CO1	Apply the principles of interference, diffraction, and polarization in wave optics, and utilize optical instruments for practical applications
		CO2	Familiarize the basic concepts of Thermodynamics relevant to engineering applications.
		CO3	Introduce the knowledge of basic principles of Electromagnetism and EM Waves.
		CO4	Learn basic principles of lasers, optical fibres and their use in technological applications.
		CO5	Understand the intuitive ideas of the Quantum physics and apply them to different quantum mechanical systems to realize the free electron theory and band theory of solids. Understand the processing methods of materials in Nano phase.
C123	Elements of Electronics Engineering	CO1	Comprehend the characteristics of semiconductors, devices, and their applications.
		CO2	Understand the working of rectifiers with filters.
		CO3	Analyze the transistor operation with different biasing techniques.
		CO4	Analyze the working of low power transistor amplifier designs.
		CO5	Understand the characteristics of FET.
C124	Python Programming	CO1	Understand the historical development, necessity, applications, and basic concepts of python programming.(L2)



		CO2	Identify and implement appropriate control structures to solve a particular programming problem.(L3)
		CO3	Examine various data structures and apply to solve real world problems.. (L3)
		CO4	Build simple functions and packages used in python for solving real world problems. (L3)
		CO5	Outline Object Oriented concepts in python and illustrate Exception handling.(L2)
C125	Digital Logic Design	CO1	Interpret the significance of number systems, conversions, binary codes and understand Boolean algebra theorems.
		CO2	Make use of different simplification methods for minimizing Boolean functions.
		CO3	Build simple combinational digital circuits using logic gates.
		CO4	Develop Asynchronous and Synchronous Sequential digital circuits using the logic functions.
		CO5	Construct combinational circuits using PLD's and understand the basics of VHDL.

Laboratory Courses

Course Code	Course Title	Experiment No	CO. No.	Course Outcomes
C126	Engineering Physics Lab	1 & 6	CO1	Operate travelling microscope to study the thin film interference.
		2,4,5 &15	CO2	Determine wavelengths of light from discharge lamps and laser source by operating spectrometer, prism and diffraction grating.
		3	CO3	Study the variation of magnetic field with Stewart Gee apparatus and calculate the Planck's constant using LED.
		7 & 8	CO4	Calibrate a DC moving coil voltmeter and ammeter
		12	CO5	Estimate the vibrational frequency due to tuning fork.
C127	Python Programming Lab	1,2	CO1	Understand core programming basics and various Operators of Python.
		3,4,	CO2	Implement programs using conditional statements and loops



		5,6	CO3	Develop functions and strings to perform simple tasks.
		7,8,9	CO4	Make Use of Various Data Structures like lists,tuples,sets,dictionaries
		10,11	CO5	Implement Python Programs with files,classes and objects
C128	Web Technologies Fundamentals Lab	1,2	CO1	Build HTML-based web pages using standard HTML elements .
		3,4,	CO2	Apply CSS (inline, internal, external) for layout and responsive design .
		5,6	CO3	Use JavaScript for interactivity, DOM manipulation, and validation .
		7,8,9	CO4	Use arrays, objects, and OOP concepts in JavaScript to render dynamic content .
		10,11	CO5	Create XML documents and DTD for validation .



(With effect from 2022-23 AB)

B.Tech

INFORMATION TECHNOLOGY

**(Common with B.Tech(CSE), B.Tech + M.Tech(CSE), B.Tech(AI), B.Tech(AI&ML),
B.Tech(AI&DS), B.Tech(E&CE))**

II Year - I Semester

Course code	Category	Course Title	Hours per week		Internal Marks	External Marks	Total Marks	Credits
			L	P				
IT2101	ES	Discrete Mathematical Structures	4	0	30	70	100	3
IT2102	PC	Computer Organization and Architecture	4	0	30	70	100	3
IT2103	BS	Probability Statistics and Queuing Theory	4	0	30	70	100	3
IT2104	PC	Operating Systems	4	0	30	70	100	3
IT2105	PC	Object Oriented Programming Through Java	4	0	30	70	100	3
IT2106	PC	Computer Organization & Architecture Lab	0	3	30	70	100	1.5
IT2107	PC	Object Oriented Programming Through Java Lab	0	3	50	50	100	1.5
IT2108	PC	Operating Systems Lab	0	3	50	50	100	1.5
IT2109	SC	Intellectual Property Rights (Internal)	1	2	100	0	100	2
IT2110	MC	Environmental Science	0	0	-	100	100	0
Total credits								21.5



(With effect from 2022-23 AB)

B.Tech

INFORMATION TECHNOLOGY

**(Common with B.Tech(CSE), B.Tech + M.Tech(CSE), B.Tech(AI), B.Tech(AI&ML),
B.Tech(AI&DS), B.Tech(E&CE))**

II Year - II Semester

Course code	Category	Course Title	Hours per week		Internal Marks	External Marks	Total Marks	Credits
			L	P				
IT2201	ES	Microprocessors	4	0	30	70	100	3
IT2202	PC	Design and Analysis of Algorithms	4	0	30	70	100	3
IT2203	PC	Database Management Systems	4	0	30	70	100	3
IT2204	PC	Formal Languages & Automata Theory	4	0	30	70	100	3
IT2205	HSS	Managerial Economics	4	0	30	70	100	3
IT2206	PC	Algorithms Lab through C++.	0	3	50	50	100	1.5
IT2207	PC	Database Management Systems Lab	0	3	50	50	100	1.5
IT2208	SC	Web Technologies	1	2	50	50	100	2
IT2209	MC	Professional Ethics & Universal Human Values	0	0	0	100	100	0
IT2210	MC	NCC/NSS	0	2	-	-	-	0
Total credits								20
Internship-I								

3rd Semester
Theory Courses

Course Code	Course Title	Course Outcomes	
C211	Discrete Mathematical Structures	CO1	Rewrite mathematical arguments using logical connectives and quantifiers and verify the validity of logical flow of arguments using propositional, predicate logic and describes the fundamental properties of the Number Theory
		CO2	Ability to solve problems using mathematical induction, recursion, permutations and combinations.
		CO3	Construct generating functions, recurrence relations and the solve recurrence relations, identify and give examples of various types of relations and describe various properties of the relations.
		CO4	Determine isomorphism of graphs and spanning tree of a given graph using BFS/DFS algorithms. Also determine minimal spanning tree of a given graph.
		CO5	Students will be able to use the concepts of Boolean Algebra for the analysis and design of various combinational and sequential Finite State Machines.
C212	Computer Organization & Architecture	CO1	Demonstrate design of a major components of a basic computer such as register transfer microoperations, registers, instruction codes, timing and control unit and arithmetic logic shift unit.
		CO2	Differentiate micro-programmed from hard-wired control unit and analyze the design of microprogrammed control unit
		CO3	Evaluate central processing units (CPUs), including register organization, instruction formats, and addressing modes, and understand 8085 microprocessor along with



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			parallel processing
		CO4	Interpreting different ways of communication with I/O devices and standard I/O interfaces
		CO5	Understand memory hierarchy and the basics of memory systems for efficient data storage and retrieval in computer systems.
C213	Probability, Statistics and Queuing theory	CO1	Define and explain basic concepts in probability theory and how to translate real-world problems into probability models
		CO2	Solve standard problems that include random variables, discrete and continuous probability distributions
		CO3	Compute and interpret the results of Correlation Analysis, Multivariate Regression, Chi-Square test for Independence and Goodness of Fit
		CO4	Perform Test of Hypothesis and construct a confidence interval to estimate population parameters
		CO5	Explain basic concepts in Markov processes, M/M/1 and M/M/C queuing systems.
C214	Operating Systems	CO1	Summarize the Types, Structures, Services and System calls of Operating Systems and Operating System Design and Implementation.
		CO2	Outline various Process Concepts, Operations, IPC and Threads and make use of CPU Scheduling algorithms.
		CO3	Summarize various Process synchronization concepts and Deadlocks Identify the causes and effects of deadlocks in Operating system.
		CO4	Outline Memory Management concepts and Apply various Page Replacement Algorithms to manage the memory efficiently.
		CO5	Make use of File System Interface, File System Implementation and Mass Storage Structure and Examine Linux and Microsoft Windows Operating Systems.
C215	Object Oriented Programming Through Java	CO1	Explain the basic concepts of java programming constructs including Program Structure, Tokens, Control Statements and their representation.
		CO2	Demonstrate the use of classes and objects, Inheritance, Interfaces and also their behavior and implementation in solving specific problems.
		CO3	Develop java applications by using event based graphical user interfaces and I/O programming



		CO4	Illustrate the concept of multi-threading and exception handling
		CO5	Make use of Java Database Connectivity (JDBC) to build connection with database

Skill Oriented

Laboratory Subjects

Course Code	Course Title	Experiment No	Course Outcomes	
C216	Computer Organization & Architecture Lab	Module 1:1,2	CO1	Simulate the logic gates, decoder, and multiplexer using VHDL programming.
		Module1: 3,4	CO2	Develop the VHDL programming for D,S-R flip flops, and up-down counter.
		Module1: 5,6,7	CO3	Design 4-bit shift register, ALU, and 4-bit binary adder and subtractor using VHDL programming.
		Module2: 1	CO4	Formulate the assembly language programs for arithmetic operations using 8086 microprocessor
		Module2: 2	CO5	Implement assembly language programs for string operations using the 8086 microprocessor.
C217	Object Oriented Programming Through Java Lab	1	CO1	Identify classes, objects, members of a class and the relationship among them needed for a specific problem using basic java programming language constructs.
		2	CO2	Explain the usage of strings in Java by developing suitable applications.
		3,4,5,6,8	CO3	Solve real world problems using OOPs concepts.
		7,9	CO4	Build Java applications by handling exceptions.
		10,11,12	CO5	Develop concurrent applications by applying Multithreading and AWT concepts in the design of GUI based applications.
C218	Operating Systems Lab	Linux-1,2,3,4	CO1	Experiment with different Linux commands and develop shell programs for basic control statements.
		OS-1	CO2	Develop programs for various CPU Scheduling Algorithms
		OS-2,4	CO3	Build programs for Memory Management Techniques and Page Replacement Algorithms.
		OS-3,5	CO4	Construct programs for various disk scheduling algorithms, Deadlock detection and Avoidance Techniques.
		Linux-	CO5	Develop programs related to multiprogramming and



		5,6,7,8		multitasking capabilities of Linux and using system calls for process management, inter process communication
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Skill Oriented Courses

Course Code	Course Title	Course Outcomes	
C2109	Intellectual Property Rights	CO1	Outline the concept of Intellectual property rights, IPR tool kit and its importance in the global scenario and drive themselves towards the path of entrepreneurship through their creative innovations.
		CO2	Explain and gain knowledge on patents, patent registration process and recent developments in patent system.
		CO3	Demonstrate and understand about copyright and trademark protection, the registration process and legal remedies available in case of infringement
		CO4	Understand the principles of trade secrets and their maintenance, industrial design registration and remedies for infringement.
		CO5	Gain knowledge about the concept of IP commercialization, licensing, technology transfer and emerging areas in IP

Mandatory Courses

Course Code	Course Title	Course Outcomes	
-	Environmental Science	CO1	Understand the importance of Ecosystem and Biodiversity for maintaining ecological balance.
		CO2	Identify the characteristics of various natural resources and can implement the conservation practices.
		CO3	Analyze the sources of pollutants and their effects on atmosphere.
		CO4	Understand the elements of sustainable development, energy and environmental management
		CO5	Gain knowledge on environmental protection acts, solid waste management, new generation waste like e-waste, Plastic waste.



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4th Semester
Theory Courses

Course Code	Course Title	Course Outcomes	
C221	Microprocessors	CO1	Outline the architecture and instruction set of 8085 and 8086 microprocessors
		CO2	Describe interfacing of different semiconductor memories and I/O devices with 8086 microprocessor
		CO3	Implement parallel i/o interface , serial i/o interface , and timer interface with 8086 microprocessor
		CO4	Develop applications using keyboard/display interface, interrupt controller interface and data converters with 8086 microprocessor
		CO5	Outline the architecture and instruction set of 8051 microcontroller
C222	Design and Analysis of Algorithms	CO1	Analyze the time and space complexities of algorithms using asymptotic notations.
		CO2	Apply divide and conquer and greedy paradigm to solve real time applications.
		CO3	Make use of Dynamic programming paradigm to solve real world applications.
		CO4	Utilize Backtracking techniques, Branch and Bound to analyze engineering applications.
		CO5	Classify NP-Hard and NP-Complete problems to solve real world applications.
C223	Database Management Systems	CO1	Outline the architecture of DBMS and provide the knowledge on levels of abstraction
		CO2	Construct the E-R model to represent databases, Model the database by Creating, maintaining and manipulating a relational database using SQL and convert ER to relational model using the concepts of Logical database design.
		CO3	Experiment with Relational Algebra, Basic SQL, nested queries, triggers, Embedded SQL, JDBC on real world problems and work with several operators like join, set, and aggregate.
		CO4	Relate and Plan the concept of data planning and database design using normalization
		CO5	Make use of the ACID properties in transaction



			management with Concurrency Control, Recoverability and Crash Recovery mechanisms.
C224	Formal Languages & Automata Theory	CO1	Compare different types of grammars and machines, distinguishing their definitions and classifications, to construct grammars and analyze finite state machines (FSMs) for optimization and realworld applications
		CO2	Utilize algebraic laws to examine regular expressions and their correlation with finite automata, showcasing comprehension of their characteristics, such as pumping lemma, closure properties, decision properties, and equivalence, pertaining to regular languages.
		CO3	Inspect Context-Free Grammars (CFGs) and Parse Trees, apply them in various applications, identify and resolve ambiguity in grammars and languages, understand normal forms, and evaluate properties such as pumping lemma, closure, and decision for CFLs
		CO4	Examine the relationship between PDAs and CFGs, demonstrate language recognition, establish equivalence, convert between representations, and assess Deterministic Pushdown Automata (DPDAs).
		CO5	Analyze Turing Machine concepts, including design and language acceptability, and explore undecidability, encompassing recursively enumerable problems and the Post Correspondence Problem.
C225	Managerial Economics	CO1	Utilize the knowledge of demand for their products and can assess various utility stages
		CO2	Analyze Production function & economies of scale and can identify the cost of the product.
		CO3	Identify the nature of competitive market situations.
		CO4	Utilize the knowledge of various pricing strategies.
		CO5	Identify various stages of Business cycles.

Laboratory Subjects

Course Code	Course Title	Experiment No	Course Outcomes	
C226	Algorithms Lab through C++.	1,2,3	CO1	Demonstrate the object-oriented concepts such as class, inheritance, Exception and Multithreading.
		4,5	CO2	Analyze the performance of merge sort and quick sort algorithms using divide and conquer technique.
		6	CO3	Apply dynamic programming and greedy methods to solve the Knapsack problem and evaluate their performance in



		7,8,9,10	CO4	optimization scenarios. Construct and apply graph algorithms to solve optimization problems, including shortest paths, spanning trees, all-pairs shortest paths, and the Travelling Salesperson problem.
		11,12	CO5	Develop and implement solutions using backtracking and dynamic programming to analyze and solve the subset sum problem and evaluate all Hamiltonian cycles in a connected undirected graph.
C227	Database Management Systems Lab	a, b	CO1	Define schemas and Apply DDL commands to Create the Database
		c, d, e, f	CO2	Make use of SQL to write queries for performing data manipulation operations, Creating Views and Triggers
		G	CO3	Design a Database by applying Normalization rules
		h, i	CO4	Develop Interfaces with Embedded SQL by using Host Languages
		j, k	CO5	Apply tools to Build forms and Generate reports in SQL

Skill Oriented Courses

Course Code	Course Title	Course Outcomes	
C228	Web Technologies	CO1	Design and develop static web pages using HTML, demonstrating the ability to create interactive, well-structured web forms, and utilize essential form elements.
		CO2	Implement and apply inline, internal, and external CSS for styling static web pages, achieving a responsive and visually appealing user interface.
		CO3	Utilize JavaScript to enhance the functionality of web pages by adding client-side validation for user inputs in registration forms, ensuring data integrity.
		CO4	Demonstrate proficiency in building dynamic registration forms with JavaScript validation, ensuring correct format validation for fields such as name, password, email, and phone number.
		CO5	Evaluate the performance and usability of web pages by integrating interactive features such as form validation, pop-up alerts, and customized error messages in a dynamic registration form.

Manadatory Courses

Course Code	Course Title	Course Outcomes	
-	Professional Ethics & Universal	CO1	Apply the moral template to inculcate the core human values for transformation into an ethical human being
		CO2	Learn about the ethical responsibilities of the engineers and



	Human Values		their professional roles
		CO3	Acquire knowledge about engineering ethics, code of conduct for the development of professionalism in solving moral as well as ethical dilemmas
		CO4	Evaluate the responsibility and accountability of a professional engineer towards design, operation, safety, by adopting risk benefit analysis and create awareness about IPR
		CO5	Develop knowledge about global issues, have awareness on computer and environmental ethics, ethical problems in research



(With effect from 2022-23 AB)

B.Tech

INFORMATION TECHNOLOGY

III Year - I Semester

Course code	Category	Course Title	Hours per week		Internal Marks	External Marks	Total Marks	Credits	
			L	P					
IT3101	PC	Data Communications & Computer Networks	4	0	30	70	100	3	
IT3102	PC	Artificial Intelligence	4	0	30	70	100	3	
IT3103	PC	Object Oriented Software Engineering	4	0	30	70	100	3	
IT3104	PE	Professional Elective - I	4	0	30	70	100	3	
IT3105	OE	Open Elective - I	4	0	30	70	100	3	
IT3106	PC	Data Communications & Computer Networks Lab	0	3	50	50	100	1.5	
IT3107	PC	Object Oriented Software Engineering Lab	0	3	50	50	100	1.5	
IT3108	SC	Soft Skills	1	2	50	50	100	2	
IT3109	INT	Internship - I	0	0	50	50	100	2	
Summer Internship 2 Months (Mandatory) after 2nd year (to be evaluated during III Year I Semester)									
Total Credits									22



(With effect from 2022-23 AB)

B.Tech

INFORMATION TECHNOLOGY

III Year – II Semester

Course code	Category	Course Title	Hours per week		Internal Marks	External Marks	Total Marks	Credits
			L	P				
IT3201	PC	Internet of Things	4	0	30	70	100	3
IT3202	PC	Data warehouse & Data Mining	4	0	30	70	100	3
IT3203	PC	Cryptography & Network Security	4	0	30	70	100	3
IT3204	PE	Professional Elective - II	4	0	30	70	100	3
IT3205	OE	Open Elective - II	4	0	30	70	100	3
IT3206	PC	Internet of Things Lab	0	3	50	50	100	1.5
IT3207	PC	Data warehouse & Data Mining Lab	0	3	50	50	100	1.5
IT3208	PC	Cryptography & Network Security Lab	0	3	50	50	100	1.5
IT3209	SC	Python Programming	1	2	50	50	100	2
Industrial / Research Internship 2 months								
Total Credits								21.5

5th Semester

Theory Courses

Course Code	Course Title	Course Outcomes	
C311	Data Communications & Computer Networks	CO1	Understand the concepts of Data Communications and Network reference models (OSI and TCP/IP reference models).
		CO2	Understand the Data Communications interface and Signal Encoding Techniques.
		CO3	Interpret Data link layer Framing Techniques like FDM ,TDM and MAC Sublayer.
		CO4	Make use of the Network Layer routing algorithms ,Internet protocols to perform better network communication.
		CO5	Analyze the Transport layer protocols- TCP,UDP protocol working mechanism in Client – Server Data communication and Application layer protocols- SNMP.
C312	Artificial Intelligence	CO1	Characterize AI problems in state-space search and identify production system categories.
		CO2	Understand & evaluate heuristic search strategies and apply them appropriately.
		CO3	Represent domain knowledge using predicate logic and apply inference techniques.
		CO4	Apply reasoning methods (statistical, fuzzy, non-monotonic) to handle uncertainty.
		CO5	Understand concepts of NLP, planning, and expert



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			systems.
C313	Object Oriented Software Engineering	CO1	Relate the techniques of Machine Learning with the Statistical Learning Concepts.
		CO2	Demonstrate Various Classification and Regression techniques
		CO3	Analyze various Ensembling Learning Methods
		CO4	Illustrate the Clustering Techniques and Dimensionality Reduction Models in Machine Learning..
		CO5	Understand the basics of Software Engineering, its process models and the idea of Requirements Engineering
C314	Compiler Design	CO1	Demonstrate compiler phases, the role of lexical and syntax analyzer and Develop a lexical analyzer for a programming language using regular expressions, finite automata and LEX generator.
		CO2	Compare the pros and cons of top-down and bottom-up parsing techniques and assess their constraints, while evaluating the efficiency of syntax analysis parsing
		CO3	Analyze the different syntax-directed translation techniques and their effectiveness in generating intermediate code for a programming language.
		CO4	Apply efficient code optimization techniques to intermediate code.
		CO5	Build a code generator for a programming language and understand issues related to register allocation and assignment.
C315	Mobile Cellular Communication (MCC)	CO1	Outline and analyze the concepts of cellular systems and the effect of co-channel Interference reduction.
		CO2	Illustrate different types of antennas used at cell site and mobile stations.
		CO3	Outline various frequency management, channel assignment algorithms in cellular systems and illustrate various propagation effects in cellular environment.
		CO4	Compare various types of handoff techniques and summarize the concepts of dropped calls.
		CO5	Understand the principle and features of 5G technology



			in cellular systems
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Laboratory Courses

Course Code	Course Title	Experiment No	Course Outcomes	
C316	Data Communications & Computer Networks Lab	1,2,8	CO1	Understand the Packet tracer Software, Network Cables and Network Configuration Commands.
		3,9,12	CO2	Make use of Data link Elementary protocols for Error Detection and Correction.
		4,7,10,11,15	CO3	Apply High-Level Data Link Control protocols.
		5,13,14	CO4	Experiment Transport layer protocols in Client –Server communication.
		6,16	CO5	Apply the Network Simulators for Congestion Control Algorithms.
C317	Object Oriented Software Engineering	1,2	CO1	Understand the Requirements & Prepare Documentation.
		3	CO2	Make use of various design diagrams for the gathered requirements.
		4,5	CO3	Construct the UML Diagrams.
		7,8,9	CO4	Analyse the quality in object-oriented software engineering.
		6	CO5	Understand the testing problems and test whether all the requirements specified have been achieved or not.

Skill Oriented Courses

Course Code	Course Title	Course Outcomes	
C318	Soft Skills	CO1	Apply verbal and non-verbal communication to real life situations.
		CO2	Utilize goal-setting and time management strategies to improve productivity
		CO3	Develop leadership and team management skills for effective collaboration
		CO4	Take part in group discussions.
		CO5	Construct effective resumes and prepare for interviews to successfully navigate in job market.

Summer Internship

Course Code	Course Title	Course Outcomes	
C319	Internship	CO1	Skill Development: Learning and improving skills such as Writing, verbal communication, research, technology, teamwork and leadership
		CO2	Real World Applications: Understand the workplace,



			operating procedures, company profile and its products in addition to the existing class room knowledge
		CO3	Career Awareness: To provide the opportunity to learn about the career positions and occupations along with the qualities and training required
		CO4	Professional Ethics: Demonstrate professional values and ethical standards
		CO5	Personal Development: To develop the self - confidence, assertiveness and basic work habits

6th Semester

Theory Courses

Course Code	Course Title	Course Outcomes	
C321	IOT	CO1	Understand the core concepts, architecture, and communication technologies of IoT and M2M systems.
		CO2	Outline the various web communication protocols and their usage for connecting IoT devices.
		CO3	Illustrate the processes of IoT data acquisition, storage, and analysis using cloud computing platforms
		CO4	Summarize the steps for prototyping sensors and actuators using embedded platforms like Arduino and Raspberry Pi and connecting them to cloud services.
		CO5	Illustrate the Design of real time IoT based applications
C322	Data Warehousing & Data Mining) (Professional Elective-1)	CO1	Understand the fundamental concepts of data mining and data warehousing, including data types, patterns, techniques, applications, and challenges.
		CO2	Perform data preprocessing tasks such as data cleaning, integration, reduction, transformation, and visualization to prepare quality data for mining applications..
		CO3	Apply OLAP operations and multidimensional data modeling concepts using data cubes for effective data warehouse design and analysis.
		CO4	Implement frequent pattern mining, association rule mining, and classification techniques (e.g., Decision Trees, Naïve Bayes, k-NN, Backpropagation) and



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ms in

			evaluate model performance.
		CO5	Analyze datasets using various clustering techniques (partitioning, hierarchical, density-based, grid-based) and assess clustering results based on evaluation metrics.
C323	Cryptography & Network Security	CO1	Classify various Security attacks ,Services, Mechanisms and Mathematics of Cryptography
		CO2	Relate Mathematics of Symmetric Key Cryptography and Apply the Symmetric key Cryptography like DES, AES.
		CO3	Relate Mathematics of Asymmetric Key Cryptography and Apply the Asymmetric key cryptography.
		CO4	Make use of Data Integrity, Digital Signature Schemes & Key Management for verifying the authenticity of digital messages
		CO5	Select protocols like PGP,S/MIME in Application layer and SSL,TLS in Transport layer to Secure the Network during data transmission and Select Internet protocol security (IPsec) at the Network Layer to provide security for Internet Protocol
C324	Machine Learning	CO1	Understand different types of ML, applications of ML in different domains, VC dimension and PAC learning for concept learning and supervisory model selection
		CO2	Create Bayesian discriminant functions for decision regions with maximum likelihood estimation of parameters considering bias-variance tradeoff and Apply methods for missing value imputation, parameter estimation and dimensionality reduction on Multi-variate datasets
		CO3	Apply various Clustering approaches like Expectation Maximization, K-Means, Hierarchical to form clusters
		CO4	Solve classification and regression problems with Non Parametric methods,Decision Trees and Assess Classification Algorithms
		CO5	Utilize linear discriminants and SVMs to solve real time classification problems and analyze the performance of classification algorithms
C325	IRS	CO1	Summarize information retrieval systems and the



			various data structures and algorithms used in it
		CO2	Outline the various techniques of representing, storing and retrieving documents using Inverted Files and Signature Files.
		CO3	Build PAT Trees and PATRICA Tress and Summarize the various algorithms on PAT Trees
		CO4	Apply stemming algorithms and Analyze their performance
		CO5	Construct various applications like Thesaurus and Search Engines and Apply different information retrieval techniques.

Laboratory Subjects

Course Code	Course Title	Experiment No	Course Outcomes	
C326	IOT LAB	ALL	CO1	Demonstrate the ability to set up and configure basic IoT hardware using Python on Raspberry Pi.
		ALL	CO2	Apply Python programming to interface sensors and actuators for real-world data acquisition and control
		3,9,10	CO3	Utilize Pulse Width Modulation (PWM) techniques for controlling devices such as servo and stepper motors.
		7	CO4	Integrate cloud services with IoT systems to enable data storage and remote monitoring.
		Cycle2	CO5	Develop a mini-project by combining hardware and software components to design an end-to-end IoT application.
C327	Cryptography & Network Security Lab	Exp1,2	CO1	Understand and apply foundational encryption concepts, including XOR operations and bitwise manipulation in C programming.
		Exp 3	CO2	Implement cryptographic algorithms, such as Ceaser Cipher, Substitution Cipher, and Hill Cipher, using Java programming.
		Exp 4,5,6	CO3	Implement the DES ,RijnDael,Blowfish algorithm in Java, showcasing understanding and application of public-key cryptography.
		Exp 8,10	CO4	Implement the Rivest-Shamir-Adleman (RSA) ,SHA algorithm in Java, showcasing understanding and application of public-key cryptography.
		Exp 9	CO5	Implement secure communication mechanisms, including the Diffie-Hellman Key Exchange in HTML and JavaScript, emphasizing the principles of secure key exchange.



Skill Oriented Courses

<i>Course Code</i>	<i>Course Title</i>	<i>Course Outcomes</i>	
C329	Python Programming Lab	1,2,3	Implement searching, sorting and handle text and files using Python data structures such as lists and dictionaries
		4,6	Calculate statistical measures using Python such as measures of central tendency, correlation
		5,7,8,9	Use Python data related libraries such as Numpy and Pandas and create data visualizations
		10,11,12	Implement basic machine learning tasks pre-processing data, compressing data, clustering,PCA
		13,14	Develop Programs to Implement classification and cross-validation



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IV B. Tech –I Semester						
S.No	Course Code	Course Title	Hours per week			Credits
			L	T	P	
1	PE	Professional Elective-III 1.Cloud Computing 2. Artificial Neural Networks 3. Internet of Things (IoT) 4.Cyber Security & Forensics	3	0	0	3
2	PE	Professional Elective-IV 1. Deep Learning Techniques 2. Social Networks Analysis 3. Advanced Databases 4.MOOCs-NPTEL/SWAYAM	3	0	0	3
3	PE	Professional Elective-V 1.Block-Chain Technologies 2.M-Commerce 3.Ethical Hacking 4.MOOCs-NPTEL/SWAYAM	3	0	0	3
4	Open Elective /Job Oriented	Open Elective-III Open Electives offered by other departments	2	0	2	3
5	Open Elective /Job Oriented	Open Elective-IV Open Electives offered by other departments	2	0	2	3
6	HS	Universal Human Values 2: Understanding Harmony	3	0	0	3
7	SO	PYTHON: Deep Learning OR Secure Coding Techniques OR APSSDC offered Courses	0	0	4	2
8	PR	Industrial/Research Internship 2 months (Mandatory) after third year (to be evaluated during VII semester)	0	0	0	3
Total credits						23
11	Minor	Software Engineering ^S / any other from PART-B (For Minor)	3	0	2	3+1
12	Honors	Any course from the Pool, as per the opted track	4	0	0	4
Minor course through SWAYAM			-	-	-	2

^S- Integrated Course



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DEPARTMENT OF INFORMATION TECHNOLOGY

IV B. Tech –II Semester						
S.No	Course Code	Course Title	Hours per week			Credits
			L	T	P	C
1	Project	Major Project Work, Seminar Internship	-	-	-	12
Total credits						12

Note:

1. **For integrated courses:** Theory and laboratory exams will be conducted separately, and the student concern will get credits if successfully completes both theory and laboratory. Only external exam will be conducted for Laboratory component. Credit based weightage shall be considered while awarding the grade.
2. **For MOOC courses:** Based on the students interest, student can register and complete a 12 week course one year in advance, by prior information to the concern.

7th Semester
Theory Courses

Course Code	Course Title	Course Outcomes	
C411	Cloud Computing	CO1	Make use of the System models, Clustering and Virtualization for distributed and parallel systems, Scalable computing over the Internet.
		CO2	Identify the features of Virtual machines and Virtualization of clusters and data centers, Virtualization of CPU, Memory and I/O devices.
		CO3	Extend the Cloud Platform Architecture Cloud computing through Delivery models and Services. The services offered by Google App Engine, AWS and MS-Azure.
		CO4	Apply Cloud Resource Management and scheduling , Scheduling algorithms for computing cloud
		CO5	Analyze Storage Systems in Cloud Computing like DFS, GFS.
	Cyber Security & Forensics	CO1	Explain the Cyber Crime Fundamentals
		CO2	Describe the types of attacks on networks
		CO3	Analyze various tools available for Cyber Crime Investigation
		CO4	Explain the various Forensics and Investigation fundamentals and tools



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C412	Deep Learning Techniques	CO5	Analyze the legal perspectives of Cyber Crime
		CO1	Demonstrate the fundamental concepts learning techniques of Artificial Intelligence, Machine Learning and Deep Learning.
		CO2	Summarize the Deep learning concepts for training and improving the deep networks
		CO3	Make use of Keras, TensorFlow, Theano and CNTK to perform binary and multiclass classifications.
		CO4	Classify the Concepts of CNN and RNN
		CO5	Interpret the concepts to Develop Interactive Applications of Deep Learning.
C413	Block Chain Technologies	CO1	Enumerate the basic concepts, technology and Crypto currency used for blockchain
		CO2	Understand hashing, differentiate private/public blockchains and able to describe the primitives of the distributed computing and cryptography related to block chain.
		CO3	Illustrate the concepts of Bit coin and their usage.
		CO4	Illustrate about advanced blockchain concepts like Ethereum, IOTA, consensus, private blockchains like Hyperledger, diverse cryptocurrencies, and adoption strategies.
		CO5	Understand blockchain challenges, business models, regulations, and versatile applications in E-Governance, land registration, and healthcare systems.
	Ethical Hacking	CO1	Explain the Concepts related to hacking, ports and protocols, Pen testing and Virtualization
		CO2	Determine the applicable footprinting techniques and scanning methods
		CO3	Explain the process of system hacking and Explain the concepts Trojans, backdoors, worms and Virus and its Counter Measures
		CO4	Demonstrate System Understanding of the concepts of Sniffing, Social Engineering and its attacks
		CO5	Determine the applicable methods of Cryptography, Steganography and Vulnerability Assessment
C414	EMI	CO1	Understand the different characteristics of electronic measuring instruments
		CO2	Understand the different types of Signal generators and its



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			applications.
		CO3	Understand the design and functioning of Oscilloscopes.
		CO4	Utilize AC bridges for measurement of inductance and capacitance and understand the operation of Q-meter and counters.
		CO5	Outline the working principle of transducers to the measure the different physical parameters.
C415	Digital Logic Design	CO1	Represent different number systems, perform binary arithmetic, Apply Boolean theorems to minimize logic functions and Realize any logic gates with NAND and NOR gates.
		CO2	Manipulate Boolean expressions using Karnaugh Maps in both SOP and POS forms. Model combinational logic circuits using gates.
		CO3	Model combinational logic circuits using PLD's
		CO4	Outline the concept of latches and flip-flops. Construct sequential logic circuits like counters and registers using flip-flops.
		CO5	Model Finite State Machines using Mealy and Moore
	Data Communication s	CO1	Outline the functions of various layers of OSI/TCP reference model ,the Categories and functions of various Data communication Networks
		CO2	Understand and explain various datalink layer protocols.
		CO3	Explain the network layer protocols& Demonstrate the mechanism of routing the data in networklayer
		CO4	Explain significance of transport layer and know the various Flow control and Congestion control Mechanisms
		CO5	Understand the Functioning of various Application layerProtocols.
C416	Universal Human Values	CO1	Classify Course Introduction, Need, Basic guidelines, Content and Process for Value Education



		CO2	Demonstrate harmony in human being harmony in my
		CO3	Explain harmony in the family and society, harmony in human relationship
		CO4	Summarize harmony in nature and existence-whole existence as co existence
		CO5	Assume the above holistic understanding of harmony in professional ethics.

Skill Oriented Courses

Course Code	Course Title	Experiment No	Course Outcomes	
C417	Deep Learning	1,2,4,8	CO1	Apply the concepts of ANN to Build a convolutional neural network and Recurrent Neural Networks for Classification, Image Recognition, Prediction applications.
		3,5,7,11, 12	CO2	Make use of Optimization and hyper parameter tuning concepts in developing Deep Learning applications.
		6	CO3	Develop Object Detection applications by utilizing advanced Deep learning architectures.
		9	CO4	Build advanced Deep Learning applications by using autoencoders.
		10	CO5	Construct advanced Deep Learning applications by using Generative Adversal Networks..

Summer Internship

Course Code	Course Title	Course Outcomes	
C418	Industrial/ Research Internship	CO1	Skill Development: Learning and improving skills such as Writing, verbal communication, research, technology, teamwork and leadership
		CO2	Real World Applications: Understand the workplace, operating procedures, company profile and its products in addition to the existing class room knowledge
		CO3	Career Awareness: To provide the opportunity to learn about the career positions and occupations along with the qualities and training required



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		CO4	Professional Ethics: Demonstrate professional values and ethical standards
		CO5	Personal Development: To develop the self - confidence, assertiveness and basic work habits

8th Semester

Course Code	Course Title	Course Outcomes	
C421	Project	CO1	Demonstrate the technical knowledge to identify problems in the field of Computer Science and 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.




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GVP COLLEGE OF ENGINEERING FOR WOMEN

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DEPARTMENT OF ELECTRONICS AND COMMUNICATION
ENGINEERING

M.Tech -VLSI DESIGN & EMBEDDED SYSTEMS

Course Structure and Scheme of Valuation w.e.f. 2024-25 admitted batch

I SEMESTER

Code	Name of the subject	Periods/week		Max. Marks		Total	Credits
		Theory	Lab	Ext.	Int.		
24EC21RC01	Analog and Digital CMOS VLSI Design	3	-	70	30	100	3
24EC21RC02	Embedded Systems Design	3	-	70	30	100	3
24EC21PE01	Elective-I	3	-	70	30	100	3
24EC21PE02	Elective-II	3	-	70	30	100	3
24HM21AC01	Research Methodology & IPR	2	-	70	30	100	2
24HM21AC02	Organizational Behavior (Audit Course)	3	-	-	100	100	0
24EC21RC03	Analog and Digital CMOS VLSI Design Lab	-	3	50	50	100	1.5
24EC21RC04	Embedded system Design Lab	-	3	50	50	100	1.5
Total		17	6	450	350	800	17

Elective-I: Application Specific Integrated Circuit (ASIC)/ Advanced Operating Systems/ Parallel Processing

Elective II: CPLD and FPGA Architectures & Applications / Electronic Design Automation Tools/ Digital System Design

II SEMESTER

Code	Name of the subject	Periods/week		Max. Marks		Total	Credits
		Theory	Lab	Ext.	Int.		
24EC21RC05	RTL Design & Verification using System Verilog	3	-	70	30	100	3
24EC21RC06	Internet of Things and its Applications	3	-	70	30	100	3
24EC21PE03	Elective-III	3	-	70	30	100	3
24EC21PE04	Elective-IV	3	-	70	30	100	3
24HM21AC03	Entrepreneurship (Audit course)	3	-	-	100	100	0
24EC21RC07	RTL Design & Verification using System Verilog Lab	-	3	50	50	100	1.5
24EC21RC08	Internet of Things and its Applications Lab	-	3	50	50	100	1.5
24EC21PR01	Mini Project with Seminar	-	4	-	100	100	2
Total		15	10	380	420	800	17

Elective III: Low Power VLSI Design/ System on Chip Design/ Digital Signal and Image Processing

Elective IV: Communication Buses and Interfaces / Design for Testability/ DSP Processors and Architectures



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Department of Electronics and Communication Engineering Course Outcomes for the courses in the AY 2024-25

M.Tech (VLSI Design & Embedded System) Autonomous Structure- COURSE OUTCOMES (w.e.f 2024 batch)

1stSemester

Course Code	Course Title	Course Outcomes	
C111	Analog and Digital CMOS VLSI Design	CO1	Understand the concepts of MOS Devices and Modeling
		CO2	Analyze the CMOS sub circuits
		CO3	Illustrate the concepts of MOS Design and compare the characteristics of a Psuedo-nMOS and CMOS Inverter.
		CO4	Design and analysis of Combinational Circuits using NMOS logic, CMOS logic and Transmission gate logic.
		CO5	Design and analysis of Sequential Circuits using nMOS logic, CMOS logic and Transmission gate logic.
C112	Embedded Systems Design	CO1	Analyze the quality principles and tools in embedded system during product development process and Design interface circuit with processor and memory devices.
		CO2	Understand the architectural and programming concepts of ARM controllers.
		CO3	Compare and select ARM processor core based SoC with several features/peripherals based on requirements of embedded applications.
		CO4	Develop software programs to control embedded system using C
		CO5	Develop software programs to control embedded system using Python Languages.
C113	Application Specific Integrated Circuit (ASIC)- PE1	CO1	Architect ASIC library design
		CO2	Develop programmable ASIC logic cells
		CO3	Design I/O cells and interconnects
		CO4	Identify new developments in SOC and low power design.
		CO5	Design cell design
	Advanced Operating Systems- PE1	CO1	Understand the objectives of computer system architecture, instruction execution, I/O functions, memory hierarchy, and operating system.
		CO2	Apply basic commands, I/O redirection, filters, editors, and shell operations in a Unix/Linux environment.
		CO3	Understand the concept of system calls, process management, and inter-process communication techniques like pipes, semaphores, and sockets.
		CO4	Outline the goals, design issues, and communication models in distributed systems.
		CO5	Apply synchronization techniques and Deadlock





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			management strategies in distributed systems.
	Parallel Processing- PE1	CO1	Outline the concepts of parallel processing and pipelining systems.
		CO2	Classify pipelining processors and illustrate advanced pipelining techniques.
		CO3	Build various architectures for VLIW processors.
		CO4	Make use of latency hiding techniques for implementing multithreaded processors
		CO5	Analyze parallel programming techniques and operating systems for multiprocessors customizing applications.
C114	CPLD and FPGA Architectures & Applications- PE2	CO1	Understand the features and architectures of industrial CPLDs with different families.
		CO2	Understand the features and architectures of industrial FPGAs with different families.
		CO3	Know the programming techniques used in FPGA design methodology.
		CO4	Design and implement complex real time digital circuits.
		CO5	Analyze the behavior of Integrated digital applications
	Electronic Design Automation Tools- PE2	CO1	Design software system models in a suitable system-level modeling language
		CO2	Make use of functional models into hardware and software components
		CO3	Construct models Using effective optimization techniques
		CO4	Compare the complexity and efficiency of various algorithms at high level and low level
		CO5	Analyze the behaviour of Mixed signal Digital Applications
	Digital System Design- PE2	CO1	Apply CAMP algorithm for minimization of switching functions
		CO2	Make use of IISc and Compact algorithms in the development of minimized PLAS
		CO3	Develop Programmable Logic Devices using ASM charts
		CO4	Analyze various techniques for fault diagnosis in combinational circuits
		CO5	Analyze various techniques for fault diagnosis in sequential circuits
C115	Research Methodology & IPR	CO1	Understand the nature, sources, and formulation of research problems and research methodologies.
		CO2	Apply effective literature review techniques while following research ethics and plagiarism guidelines.
		CO3	Prepare research reports, papers, and proposals using effective technical writing skills.
		CO4	Understand the fundamentals and processes of Intellectual Property Rights and patenting systems.
		CO5	Analyze patent rights, technology transfer, and recent developments in IPR across various domains.





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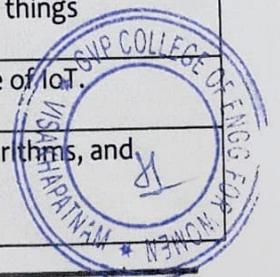
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Laboratory Courses

Course Code	Course Title	Experiment No	CO. No.	Course Outcomes
C116	Analog and Digital CMOS VLSI Design Lab	1-5	CO1	Develop different Analog Applications
		1-5	CO2	Analyze the functional behaviour of analog circuits and determine performance metrics
		6-12	CO3	Develop different digital Applications
		6-12	CO4	Analyze the functional behaviour of digital circuits and determine performance metrics
		6	CO5	Construct layout and GDSII implementation of digital circuits
C117	Embedded system Design Lab	1-5	CO1	Develop and execute Assembly Language Programs for arithmetic and bit manipulation on ARM Cortex M3.
		7,8,9,10,12	CO2	Interface and control hardware components like motors and DACs using Embedded C on an ARM Cortex M3 evaluation board.
		6	CO3	Utilize UART for serial communication and message display in Embedded C on ARM Cortex M3.
		11	CO4	Implement external interrupts to control LEDs and other outputs using Embedded C.
		13	CO5	Interface with sensors and read data using SPI ADC ICs on an ARM Cortex M3 evaluation board.

2nd Semester

Course Code	Course Title	Course Outcomes	
C121	RTL Design & Verification using System Verilog	CO1	Understand the importance of System Verilog
		CO2	Develop conditional constructs based digital applications using System Verilog
		CO3	Develop object oriented Programming(OOP) based digital applications
		CO4	Develop digital Applications using System Verilog
		CO5	Analyze functional coverage using System Verilog
C122	Internet of Things and its Applications	CO1	Articulate the main concepts, key technologies, strengths, and limitations of cloud computing and the possible applications for state-of-the-art Internet of things
		CO2	Identify the architecture and infrastructure of IoT.
		CO3	Choose the appropriate technologies, algorithms, and approaches for the related issues.





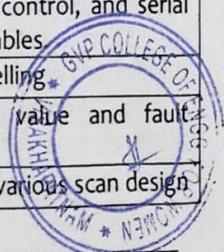
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		C04	Identify problems, and explain, analyze, and evaluate various IoT solutions	
		C05	Explain the core issues of IoT such as security, privacy, and interoperability	
C123	Low Power VLSI Design- PE3	C01	Illustrate the necessity of low power VLSI, Sources of power dissipation techniques and importance of Short-Channel effects	
		C02	Explain the concepts of Low-Power Design Approaches	
		C03	Analyze Low-Voltage Low-Power Adder Circuits	
		C04	Apply Low Power Design concept to Different Multiplier circuits	
		C05	Classify and Compare Low-Voltage Low-Power Memories	
	System on Chip Design- PE3	C01	Illustrate System on Chip design architecture, Memory and Addressing	
		C02	Compare different processor architectures like VLIW and Superscalar	
		C03	Build SOC Memory system design, Types of cache and Memory interaction	
		C04	Analyze interconnect architectures and Reconfiguration technologies	
		C05	Examine different SOC design application case studies	
	Digital Signal and Image Processing- PE3	C01	Analyze discrete-time signals and systems in various domains (i.e Time, Z and Fourier)	
		C02	Design the digital filters (both IIR and FIR) from the given specifications	
		C03	Analyze the quantization effects in digital filters and understand the basics of image sampling, quantization and image transforms.	
		C04	Understand the concepts of image enhancement, image restoration and image segmentation.	
		C05	Know the various methods involved in image compression and fundamentals in color image processing.	
	C124	Communication Buses and Interfaces- PE4	C01	Compare serial buses like RS232, RS485, I2C, and SPI in terms of data rates, features, limitations, and applications.
			C02	Understand CAN architecture, including ISO 11898 standards, data transmission, frame formats, and application layers.
			C03	Outline PCIe revisions, configuration space, bus enumeration, hardware/software implementation, protocols, and applications.
			C04	Understand USB transfer types, enumeration states, descriptor types, and device drivers.
			C05	Learn about SFPDP configurations, flow control, and serial data transmission over fiber and copper cables
Design for Testability- PE4		C01	Outline the testing process and fault modelling	
		C02	Analyze different algorithms for true value and fault simulation	
		C03	Test circuits for SCOAP measures and list various scan design	





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			methods	
		CO4	Analyze BIST process and types of BISTs	
		CO5	Analyze fault coverage using ATPG techniques	
		DSP Processors and Architectures- PE4	CO1	Understand DSP fundamentals and analyze computational accuracy and error sources in DSP implementations.
			CO2	Outline the basic architecture, computational blocks, memory, and external interfacing features of programmable DSP devices.
	CO3		Learn about the TMS320C54XX DSP's architecture, memory, instructions, peripherals, interrupts, and pipeline operation.	
	CO4		Examine the Analog Devices DSP family, including ALU/MAC blocks, ADSP 2100, ADSP-2181, and Blackfin processor architecture.	
	CO5		Analyze memory space organization, external bus interfacing, I/O methods, and DMA in programmable DSP devices.	
	C127	Mini Project with Seminar	CO1	Learn new concepts and apply them to the solution of engineering problems
			CO2	Demonstrate the skills for performing literature survey, identify gaps, analyze the technical content
CO3			Formulate and conduct experiments and utilize modern tools for developing working models / process / system	
CO4			Clearly communicate their ideas in writing and prepare a well-documented report	
CO5			Create informative PPTs and clearly communicate their ideas orally demonstrating technical knowledge	

Laboratory Courses

Course Code	Course Title	Experiment No	CO. No.	Course Outcomes
C125	RTL Design & Verification using System Verilog Lab	1	CO1	Implementation of FSMs using System Verilog
		2	CO2	Transform Verilog RTL code to System verilog
		1-7	CO3	Design and Verify combinational digital applications using System Verilog
		9	CO4	Develop FIFO using conditional constructs
		8,10	CO5	Analyze the functional coverage for digital applications
C126	Internet of Things and its Applications Lab	1-7	CO1	Understand Arduino, Node MCU, Raspberry Pi, and cloud services like Thingspeak and Blynk
		2,3,4	CO2	Interface with ESP8266/Raspberry Pi to control LED blinking, switching, and intensity using PWM.
		5,6	CO3	Transmit LED and ultrasonic sensor data to cloud services via ESP8266/Raspberry Pi.



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		Part B-1,3	CO4	Develop IoT projects such as temperature/humidity loggers and automatic plant watering systems.
		7, Part B-2,4	CO5	Create remote control systems for street lights and motion detectors with email notifications.



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M.Tech -Computer Science and Engineering(Data Science)

Course Structure w.e.f. 2024-25

I SEMESTER

Code	Name of the subject	Periods/week		Max.Marks		Total	Credits
		Theory	Lab	Ext.	Int.		
24CS21RC01	Introduction to Data Science	3	-	70	30	100	3
24CS21RC02	Cloud Computing and Virtualization	3	-	70	30	100	3
24CS21PE01	Elective-I	3	-	70	30	100	3
24CS21PE02	Elective-II	3	-	70	30	100	3
24HM21RC01	Research Methodology &IPR	2	-	70	30	100	2
24HM21AC02	Organizational Behavior (Audit Course)	3	-	70	30	100	0
24CS21RC03	Data Science Applications with Python Lab		3	50	50	100	1.5
24CS21RC04	Cloud Computing and Big Data Analytics Lab		3	50	50	100	1.5
Total		18	6	520	280	800	17

Elective-I: Big Data Analytics, Computational Linear Algebra, Soft Computing, Computational Biology, Internet of Things

Elective II: Cyber Security for Data Science, Optimization Techniques for Data Science, Time Series Data Analysis, Natural Language Processing, Statistical Modeling

II SEMESTER

Code	Name of the subject	Periods/week		Max. Marks		Total	Credits
		Theory	Lab	Ext.	Int.		
24CS21RC05	Machine Learning	3	-	70	30	100	3
24CS21RC06	Data Visualization	3	-	70	30	100	3
24CS21PE03	Elective-III	3	-	70	30	100	3
24CS21PE04	Elective-IV	3	-	70	30	100	3
24HM21AC03	Entrepreneurship (Audit Course)	3	-	70	30	100	0
24CS21RC07	Machine Learning Lab	-	3	50	50	100	1.5
24CS21RC08	Data visualization using Tableau Lab	-	3	50	50	100	1.5
24CS21PR01	Mini Project With Seminar	-	4	-	100	100	2
Total		15	9	450	350	800	17

Elective III: Image and Video Analytics, Social Media Analytics, Deep Learning, Business Analytics, High Performance Computing

Elective IV: Geographic Information System, Block Chain Technology, Secure Software Design, Data Storage Technologies and Networks, Information Retrieval Systems



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 (Approved by AICTE, New Delhi and Affiliated to Andhra University)
 Accredited by NAAC with "A" grade from 2022 to 2027
 CSE, ECE and IT Courses Accredited by NBA (2019-2022) and Re-accredited by NBA
 (2022-2025)
 EEE Course Accredited by NBA (2023-2026)

DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

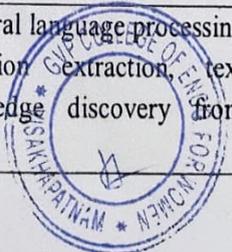
Course Outcomes for the courses in the AY 2024-25

M.Tech -Computer Science and Engineering(Data Science)

Course Structure w.e.f. 2024-25

I SEMESTER

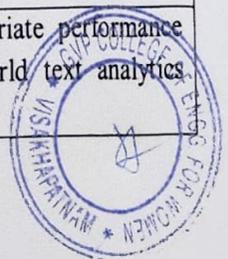
<i>Course Code</i>	<i>Course Title</i>		<i>Course Outcomes</i>
(24CS21RC01)	Introduction to Data Science	CO1	Classify the core fundamentals of data science, encompassing data cleaning and preprocessing techniques, exploratory data analysis, and ethical considerations involved in data-driven decision making.
		CO2	Demonstrate the application of data science techniques across domains such as healthcare, education, manufacturing, and cybersecurity by employing appropriate supervised, unsupervised, and reinforcement learning paradigms.
		CO3	Apply feature selection, feature generation, and classification techniques to build and evaluate predictive models for structured datasets.
		CO4	Implement and evaluate clustering algorithms to group unlabeled data and assess cluster quality using suitable evaluation measures.
		CO5	Apply text mining and natural language processing techniques for information extraction, text classification, and knowledge discovery from textual data.



(24CS21RC01)	Cloud Computing and Virtualization	CO1	Explain cloud computing concepts, service models, and deployment models..
		CO2	Describe virtualization techniques and their role in cloud infrastructure.
		CO3	Analyze cloud architectures, resource provisioning, and management strategies.
		CO4	Apply cloud platforms for deploying and managing applications.
		CO5	Evaluate cloud security, scalability, and performance challenges.

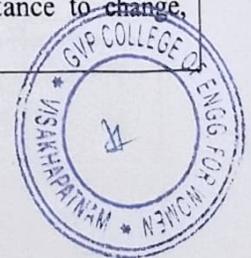
(24CS21P E01)	Big Data Analytics	CO1	Explain the fundamentals of Big Data, its characteristics, technologies, and industry applications.
		CO2	Implement Hadoop, MapReduce, and NoSQL data models to process and manage large-scale datasets.
		CO3	Apply HiveQL concepts to define, manipulate, and optimize data using Hive.
		CO4	Utilize Apache Spark operations using RDDs and DataFrame APIs for large-scale data processing.
		CO5	Analyze advanced Spark features including tuning, deployment, and stream processing techniques.

(24CS21 RC02)	Natural Language Processing	CO1	Explain fundamental concepts of natural language processing, linguistic levels, and NLP applications...
		CO2	Apply text preprocessing techniques such as tokenization, stemming, lemmatization, and stop-word removal.
		CO3	Analyze statistical and machine learning-based approaches for language modeling and text classification.
		CO4	Implement NLP techniques for tasks such as part-of-speech tagging, named entity recognition, and sentiment analysis.
		CO5	Evaluate NLP models using appropriate performance metrics and apply them to real-world text analytics problems.



(24HM2 IRC01)	Research Methodology & IPR	CO1	Define and formulate research problems, identify suitable research approaches, and apply appropriate methods for data collection, analysis, interpretation, and instrumentation.
		CO2	Perform effective literature surveys, critically analyse research articles, and adhere to research ethics and plagiarism policies
		CO3	Prepare technical reports, research papers, and research proposals, and present research work effectively for review and assessment
		CO4	Explain the concepts and types of Intellectual Property Rights (IPR) and describe national and international patenting processes, including PCT.
		CO5	Apply knowledge of patent rights, licensing, technology transfer, patent databases, and geographical indications in protecting innovations

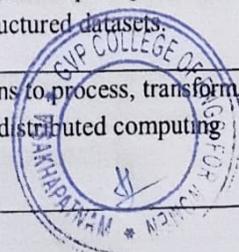
(24HM2 IAC02)	Organizational Behavior (Audit Course)	CO1	Understand the concept, nature, role, and interdisciplinary foundations of Organizational Behavior.
		CO2	Analyze major motivation theories and group dynamics, including group types, development, and cohesiveness .
		CO3	Analyze leadership concepts and leadership styles in comparison with management functions
		CO4	Understand and analyze the communication process, forms, directions, and organizational conflicts with appropriate management techniques
		CO5	Examine organizational change, resistance to change, and methods to overcome resistance



Laboratory Courses

Course Code	Course Title		Course Outcomes
(24CS21 RC03)	Data Science Applications with Python Lab	CO1	Implement efficient data science solutions using Python programming constructs and data structures for advanced feature engineering and data transformation.
		CO2	Demonstrate data science-oriented file handling techniques in Python to acquire, preprocess, and manage textual datasets.
		CO3	Utilize data science libraries such as Pandas to load, integrate, clean, and manipulate structured datasets for analysis.
		CO4	Apply exploratory data analysis and data visualization techniques using Python to identify patterns, trends, and insights in datasets.
		CO5	Develop a data science-based Natural Language Processing (NLP) case study to extract, analyze, and interpret information from unstructured text data.

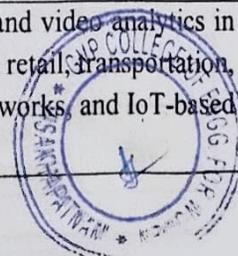
(24CS21 RC04)	Cloud Computing and Big Data Analytics Lab	CO1	Apply cloud computing concepts to create and manage virtual machines, storage accounts, and web applications on Microsoft Azure.
		CO2	Implement Azure platform services such as Function Apps, Azure AD, Key Vault, Traffic Manager, and API Management for secure and scalable applications.
		CO3	Apply containerization and orchestration techniques using Azure Container Registry, App Service, and Azure Kubernetes Service.
		CO4	Analyze big data processing using Hadoop MapReduce programs for large-scale, semi-structured datasets.
		CO5	Apply Hive and PySpark operations to process, transform, and analyze structured data using distributed computing frameworks.



2nd Semester

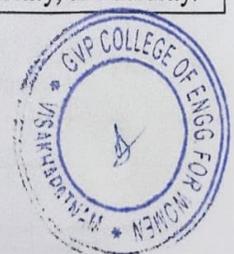
C121 (24CS21 RC05)	Machine Learning	CO1	Explain the concepts of intelligent machines, well-posed problems, data representation, types of data, forms of learning, and the relationship between machine learning and data mining.
		CO2	Apply supervised learning algorithms such as K-Nearest Neighbors, Linear Regression, and Logistic Regression to solve classification and regression problems.
		CO3	Analyze learning principles including bias, overfitting, generalization, computational learning theory, and the reasons why learning algorithms perform effectively.
		CO4	Apply Support Vector Machines and Neural Network models including Perceptron, Multilayer Perceptron, and Radial Basis Function networks for classification and regression tasks.
		CO5	Analyze decision tree learning techniques using ID3, C4.5, and CART algorithms, including impurity measures, pruning methods, and their operational characteristics.

C123 (24CS21 PE03)	Image and Video Analytics	CO1	Explain the principles of digital image representation, including visual perception, sampling and quantization, pixel relationships, mathematical tools, and image transforms such as DFT, DCT, DWT, and Hadamard transform.
		CO2	Apply spatial and frequency domain filtering techniques, including smoothing, blurring, sharpening, edge detection, histogram processing, and basic statistical image models.
		CO3	Analyze color models, image and video segmentation methods, denoising techniques, enhancement processes, and compression techniques used in image and video processing.
		CO4	Analyze object detection, recognition, classification, texture modeling, and object tracking techniques used in image and video data.
		CO5	Explain the applications of image and video analytics in domains such as industrial systems, retail, transportation, remote sensing, wireless sensor networks, and IoT-based video analytics architectures.



C124 (24CS21 PE04)	Secure Software Design	CO1	Explain and analyze secure software design principles, common software vulnerabilities, security programming practices, fundamental security design concepts, and security testing techniques.
		CO2	Apply enterprise application development concepts to design distributed N-tier architectures, select suitable technologies for presentation, business, and data tiers, and develop multi-tier enterprise software solutions.
		CO3	Apply enterprise systems administration techniques to implement and maintain directory-based server infrastructures, monitor server resources, and administer core network services in heterogeneous environments.
		CO4	Analyze enterprise network requirements and apply network management and troubleshooting techniques for networks running multiple enterprise services.
		CO5	Analyze and apply defensive programming techniques to handle insecure exceptions, prevent command and SQL injection attacks, and strengthen web and mobile applications against security threats.

C125 (24CS21 PE04)	Data Storage Technologies and Networks	CO1	Explain different storage media and technologies, including magnetic, optical, and semiconductor storage, along with read/write techniques, issues, and limitations.
		CO2	Explain different storage media and technologies, including magnetic, optical, and semiconductor storage, along with read/write techniques, issues, and limitations.
		CO3	Analyze large storage systems such as hard disks and network-attached storage with respect to scalability and networking considerations.
		CO4	Analyze storage architecture concepts including storage partitioning, system design, caching mechanisms, and legacy storage systems.
		CO5	Explain and analyze Storage Area Network components, storage clusters and grids, and storage quality of service aspects related to performance, reliability, and security.

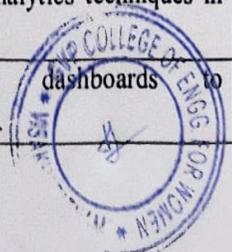


(24HM2 1AC03)	Entrepreneurship (Audit Course)	CO1	Understand the basic concepts, functions, principles, and levels of management
		CO2	Identify and classify various forms of business organizations in the private, public, and joint sectors
		CO3	Analyze production and operations management, human resource functions, marketing functions, and methods of raising finance
		CO4	Examine the role, characteristics, and challenges of entrepreneurship, including women entrepreneurship
		CO5	Analyze entrepreneurial development, project formulation stages, and procedures for starting small enterprises with government incentives

Laboratory Courses

<i>Course Code</i>	<i>Course Title</i>		<i>Course Outcomes</i>
(24CS21 RC07)	Machine Learning Lab	CO1	Apply machine learning algorithms for classification, regression, and clustering problems.
		CO2	Implement data preprocessing and feature engineering techniques for machine learning tasks.
		CO3	Analyze model performance using appropriate evaluation metrics
		CO4	Experiment with different machine learning models and parameter tuning techniques.
		CO5	Develop practical machine learning solutions using real-world datasets.

(24CS21 RC08)	Data Visualization using Tableau Lab	CO1	Apply Tableau tools to create basic and advanced visualizations.
		CO2	Perform data preparation and transformation within Tableau environment.
		CO3	Design interactive dashboards for effective data exploration.
		CO4	Analyze datasets using visual analytics techniques in Tableau.
		CO5	Develop professional-quality dashboards to communicate insights effectively.





GAYATRI VIDYA PARISHAD COLLEGE OF ENGINEERING FOR WOMEN
KORUPU, MEDAKURUVA, VISAKHAPATNAM - 530 048
(AFFILIATED TO ANJUMMA UNIVERSITY, VISAKHAPATNAM)
(ACCREDITED BY NATIONAL BOARD OF ACCREDITATION (NBA) FOR B.TECH CSE, ECE AND IT - VALID FROM 2019-22 AND 2022-25)
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(ACCREDITED BY NATIONAL ASSESSMENT AND ACCREDITATION COUNCIL (NAAC) WITH A GRADE - VALID FROM 2022-27)

DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

Date: 02-06-24

INTERNAL NOTE

This is to inform all the Faculty of CSE that Department Advisory Committee is revised. I thank all the previous members for their continuous support in making decisions for improvement of the Department. Following is the New Committee

DEPARTMENT ADVISORY COMMITTEE MEMBERS

1. Dr. PVS Lakshmi Jagadamba HoD, CSE ... In the chair
2. Dr. N.Sharmili, Associate Professor, CSE
3. Dr.V.Lakshamana Rao, Assistant Professor, CSE
4. Mrs. K. Suneetha, Assistant Professor, CSE
5. Mrs. V Gowtami Annapura, Assistant Professor, CSE

Copy to:

Principal
Vice Principal
Mr.S.Sumahasan
Dr. V.Lakshamana Rao




HoD-CSE
Head of Department
Dept. of Computer Science & Engineering
GVP College of Engineering for Women
Madhurawada, Visakhapatnam-48



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DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

Date: 02-06-24

DEPARTMENT ADVISORY COMMITTEE MEMBERS

1. Dr. PVS Lakshmi Jagadamba HoD, CSE
2. Dr. N.Sharmili, Associate Professor, CSE
3. Dr.V.Lakshamana Rao, Assistant Professor, CSE
4. Mrs. K. Suneetha, Assistant Professor, CSE
5. Mrs. V Gowtami Annapurna, Assistant Professor, CSE

... In the chair



Alakes
Head of Department
HOD, CSE
Dept. of Computer Science & Engineering
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DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

MINUTES OF THE MEETING OF THE DEPARTMENT ADVISORY COMMITTEE
HELD ON 26th JULY 2024 IN THE HOD'S CHAMBER

Members present:

1. Dr. PVS Lakshmi Jagadamba HoD, CSE ... In the chair
2. Dr. N.Sharmili, Associate Professor, CSE
3. Dr.V.Lakshman Rao, Assistant Professor, CSE
4. Mrs. K. Suneetha, Assistant Professor, CSE
5. Mrs. V Gowtami Annapurna, Assistant Professor, CSE

Agenda:

1. Elective subjects to offer for IV B. Tech CSE, Semester-I, AY: 2023-24
2. Planning of training and placement activities.
3. Planning of Academic and Co-Circular activities.
4. Any other issues with the permission of chair.

The members discussed and resolved the following:

1. The chairman welcomed all members and briefed about the compulsory courses, elective courses, and lab courses in R20 for IV BTech to consider in the odd semester 2024-25
2. From II, III years GVPCEW has been affiliated to ANDHRA UNIVERSITY, VISAKHAPATNAM. DAC members provided feedback on the contents of new curriculum in AU CSE. HoD then requested the DAC members to submit the detailed feedback report on the II,III CSE Courses
3. In JNTUK R20 Regulations (IV-I) DAC decided to take options to choose one from the following courses for IV CSE students.
 - Elective III for IV CSE: 1. Cloud Computing
2. Cyber Security Forensics
 - Elective IV for IV CSE: 1. Deep Learning Techniques
2. Computer Vision

Elective V for IV CSE: 1. Block Chain Technologies
2. Ethical Hacking

Open Elective III/Job Oriented Course for IV CSE: DAC members recommended to go for Job Oriented Course API Micro Services to all the students.

Open Elective IV: ECE Department will handle Open Elective IV. They recommended to choose one form the following courses for IV CSE students

- 1.Data Communications
- 2.Digital Logic Design

SKILL COURSES: 1.Mean Stack Technologies2
2.Python Deep Learning

HOD informed DAC members that Cloud Computing and Deep Learning Techniques are opted by the most of the Students as Elective III, Elective IV respectively. Hence it is decided to offer the above courses to all the students

Elective III for IV CSE: 1. Cloud Computing
Elective IV for IV CSE: 2. Deep Learning Techniques

4 As per JNTU R20 Regulations, DAC recommended the following courses as Open Electives

Open Elective III: AI tools and Techniques for IV ECE & IV EEE students

Open Elective IV: Block Chain Technologies for IV ECE students

5. In AU Regulations (III-I) DAC decided to offer Data Warehousing and Data Mining as Professional Elective-I to all students as it is necessary course to learn in III year.

Professional Elective-I for III CSE: 1.Data Warehousing and Data Mining

6. AU offers a Provision to obtain MINOR degree in ECE to the 2022 Admitted Batch only.In this regard student have to complete 2 of the 4 following courses as Open Electives.

Open Electives

1. Digital Logic Design(I-II Compulsory Subject)
2. Microprocessors (II-II Compulsory Subject)
3. Mobile Cellular Communication(III-I Open Elective)
4. GPS Principles And Its Applications(IV-I Open Elective)

DAC recommended to offer MCC as Open Elective I to III CSE students

Open Elective I for III CSE: Mobile Cellular Communications

7. As per JNTUK R20 regulation the project work must be submitted in IV-II semester. DAC members discussed and recommended the Project Coordinators to start the Project Batches Division and Guide Allocation

8. As per JNTUK R20 regulation, Internship which is done by the students at the end of III-II semester must be submitted in the IV-I semester. DAC recommended Internship Coordinator to monitor the Internship status.

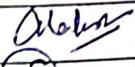
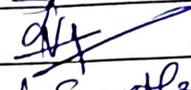
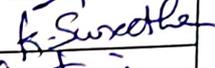
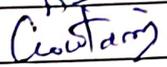
9. HOD requested DAC members to verify course files and lab files of the previous semester as part of Academic audit.

10. DAC members discussed about the academic and co-curricular activities to conduct in this semester. Keeping in view the Gap Analysis, the Academic plan for this session has been prepared to bridge the gap.

- (a) DAC recommended to conduct workshops/training for 3rd and 2nd year students on Problem solving skills and latest trends on topics such as Quantum Computing, and UI Development.
- (b) DAC recommended to conduct workshops/training for 3rd and 2nd year students on DEVOPS and Python courses to bridge the gap as they are not there in the curriculum of Andhra University
- (c) DAC recommended to conduct Faculty Development Programs on latest technologies like Agile Methodologies, DEVOPS, Microsoft Azure AI
- (d) DAC recommended to conduct student activities under COSCENGERS and CSI professional body chapters.
- (e) In this regard, DAC recommended course-coordinators to coordinate with subjects handling faculty to identify content beyond syllabus in their respective subjects for pertaining POs.

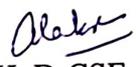
11. As GVP College of Engineering for Women has been granted Autonomous Status from the Academic Year 2024–25, the I B.Tech and I M.Tech Course Structure and Syllabus are to be approved by the Board of Studies. The HOD has requested DAC members to review and provide suggestions on the tentative course structure and syllabus, to be finalized in the BoS meeting scheduled on 03-08-2024 at the GVPCEW (A) premises.

Members Present:

S.No.	Name	Signature
1	Dr. PVS Lakshmi Jagadamba HoD, CSE	
2	Dr. N Sharmilli, Associate Professor, CSE	
3	Dr.V.Lakshman Rao, Assistant Professor, CSE	
4	Mrs. K. Suneetha, Assistant Professor, CSE	
5	Mrs. V.Gowtami, Assistant Professor, CSE	

Date: 26-07-2024




HoD-CSE
Head of Department
Dept. of Computer Science & Engineering
GVP College of Engineering for Women
Madhurawada, Visakhapatnam-48



GAYATRI VIDYA PARISHAD COLLEGE OF ENGINEERING FOR WOMEN

KOMMADI, MADHURAWADA, VISAKHAPATNAM - 530 048

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DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

MINUTES OF THE MEETING OF THE DEPARTMENT ADVISORY COMMITTEE

HELD ON 11th December 2024 IN THE HOD'S CHAMBER

Members present:

1. Dr. PVS Lakshmi Jagadamba HoD, CSE ... In the chair
2. Dr. N.Sharmili, Associate Professor, CSE
3. Dr. V.Lakshman Rao, Assistant Professor, CSE
4. Mrs. K. Suneetha, Assistant Professor, CSE
5. Mrs. V Gowtami Annapurna, Assistant Professor, CSE

Agenda:

1. Ensuing Electives of III B. Tech for Semester-II, AY: 2024-25
2. Planning of Academic and Co-Circular activities.
3. Any other issues with the permission of chair.

The members discussed and resolved the following:

1. The chairman welcomed all members and reviewed the minutes of previous DAC meeting, briefed about the compulsory courses, elective courses, and lab courses in AU-regulation to consider in the even semester 2024-25
2. In AU Regulations (III-II) DAC decided to take options to choose one from the following courses for III CSE students.

Professional Elective II for III CSE: 1. Cloud Computing
2. Software Project Management

Open Elective II for III CSE : 1.Data Science
2.Block Chain Technologies

3. As per AU Regulations, DAC recommended the following courses as Open electives/Minor in CSE for other branches.

Data Science for III ECE and III EEE Students.

4. As per orders given by AU and APSCHE, all students of 2nd and 3rd years have to do 6-week internship during summer vacation and will be evaluated in 2025-26 odd semester. In this regard, HOD sensitized all DAC members about the internship given in AU Regulations. HOD requested DAC members to submit recommendations on the internship project.

5. HOD requested DAC members to verify course files and lab files of the previous semester as part of Academic audit.

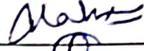
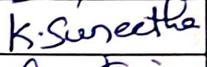
6. DAC members discussed about the academic and co-curricular activities to conduct in this semester. Keeping in view the Gap Analysis, the Academic plan for this session has been prepared to bridge the gap.

- (a) DAC recommended to conduct workshops/training for 3rd and 2nd year students on Problem solving skills and latest trends on topics such as Data Structures, Machine Learning Fundamentals Using Python. HOD informed that some of the activities such as UI Development, DEVOPS planned in the previous semester will be conducted in current semester.
- (b) HOD informed to conduct another Faculty Development Program also which is planned in previous semester will be conducted in the current semester.
- (c) DAC recommended to conduct student activities under COSCENGERS, CSI professional body chapters.
- (d) In this regard, DAC recommended course-coordinators to coordinate with subjects handling faculty to identify content beyond syllabus in their respective subjects for pertaining POs.

7. DAC has discussed the PO/PSO attainment levels for 20-24 Admitted Batch(R20 Regulation). Basing on the results of 2020-24 Batch, DAC has finalized the CO Attainment as 45% and PO target is increased to 68%. Since students performed well owing to the activities conducted by the department, all POs were attained.

8. The HOD has requested the DAC members to provide suggestions for the preparation of the II, III, and IV B.Tech and II M.Tech Course Structure and Syllabus for the 2024-25 batch onwards, as GVPCEW (A) is planning to conduct the Board of Studies (BoS) meeting in the month of February/March 2025.

Members Present:

S.No.	Name	Signature
1	Dr. PVS Lakshmi Jagadamba HoD, CSE	
2	Dr. N Sharmilli, Associate Professor, CSE	
3	Dr. V. Lakshman Rao, Assistant Professor, CSE	
4	Mrs. K. Suneetha, Assistant Professor, CSE	
5	Mrs. V. Gowtami, Assistant Professor, CSE	

Date: 11-12-2024




HoD-CSE

Head of Department
Dept. of Computer Science & Engineering
GVP College of Engineering for Women
Madhurawada, Visakhapatnam-48



GAYATRI VIDYA PARISHAD COLLEGE OF ENGINEERING FOR WOMEN

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EAPCET
Counselling
Code

GVPW

DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING (AI&ML)

Date: 29/07/2024

MINUTES OF THE MEETING

Members present:

1. Dr. Dwiti Krishna Bebarta, HoD, CSE(AI&ML) ... In the chair
2. Dr. K Purushottam Naidu, CSE(AI&ML)
3. Ms. D. Balasantoshimata, CSE (AI&ML)

Agenda:

1. Discussion on 4-1 course structure and detailed syllabus of R-20 regulation, JNTUK.
2. Elective subject to offer for IV-1 B. Tech CSE (AI&ML) students, R-20 regulation. AY: 2024-25
3. Planning of Academic and Co-Circular activities during AY: 2024-2025, odd semester.
4. Any other issues with the permission of chair

The members discussed and resolved the following:

1. The chairman welcomed all members of the DAC.
2. Members of the committee discussed about the course structure and syllabus content of 4-1 in detail proposed by the University.
3. The chairman has briefed about the compulsory courses, elective courses, and lab courses for IV-I B. Tech CSE (AI&ML) for the AY-2024-25.
4. DAC members decided three elective courses based on the merit from the pool of five listed courses mentioned in the JNTUK R-20 regulation. Later let students prefer any one choice which may benefit in their professional life.

Professional Elective-III

1. Reinforcement Learning
2. Soft Computing
3. Cryptography and Network Security
4. Block Chain Technologies
5. Speech Processing

The three courses proposed by the committee are given below:

1. Reinforcement Learning
2. Cryptography and Network Security
3. Speech Processing

Professional Elective-IV

1. Robotic Process Automation
2. Cloud Computing
3. Big Data Analytics
4. NOSQL Databases
5. Video Analytics

The three courses proposed by the committee are given below:

1. Cloud Computing
2. Big Data Analytics
3. Video Analytics

Professional Elective-V

1. Social Network Analysis
2. Recommender Systems
3. AI Chatbots
4. Object Oriented Analysis and Design
5. Semantic Web

The three courses proposed by the committee are given below:

1. Social Network Analysis
2. AI Chatbots
3. Object Oriented Analysis and Design

Open Elective-III

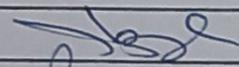
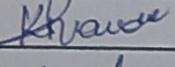
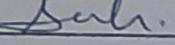
- Open Electives offered by other departments
1. Principles of Communications (ECE)
 2. Fundamentals of Electric Vehicle (EEE)
- API and Microservices (Job Oriented Course)

Open Elective-IV

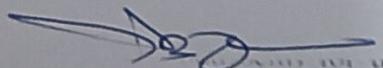
- Open Electives offered by other departments
- Options
1. Concepts of Smart Grid Technologies (EEE)
 2. Data Communications (ECE)
- Secure Coding Techniques (Job Oriented Course)

5. HoD requested DAC members to verify course files and lab related files of the previous semester as part of Academic audit.
6. HoD requested the members to plan the academic calendar (2024-2025 odd sem) for the Department about teaching-learning activities and inform the same to concern coordinator for preparation.

Members Present:

Sl. No.	Name of the Staff Member	Designation	Signature
1	Dr. Dwiti Krishna Bebart	Associate Professor & HoD	
2	Dr. K Purushotam Naidu	Assistant Professor	
3	Ms. D. Balasantoshimata	Assistant Professor	

Date: 29-07-2024


HoD-CSE (AI&ML)
Head of Department
Dept. of Computer Science & Engineering (AIML)
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GVPW

DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING (AI&ML)

Date: 19/08/2024

MINUTES OF THE MEETING

Members present:

1. Dr. Dwiti Krishna Bebarta, HoD, CSE(AI&ML) ... In the chair
2. Dr. K Purushottam Naidu, CSE(AI&ML)
3. Ms. D. Balasantoshimata, CSE (AI&ML)

Agenda:

1. Discussion on 3-1 course structure and detailed syllabus of R-22 regulation, Andhra University (AU).
2. Elective subjects to offer for III-I for B. Tech CSE (AI&ML) students AY: 2024-25
3. Any other issues with the permission of chair

The members discussed and resolved the following:

1. The chairman welcomed all members of the DAC.
2. The chairman has briefed about the compulsory courses, elective courses, and lab courses for III-I, B. Tech CSE (AI&ML) for the AY-2024-25 (R-22 regulations, AU)
3. DAC members decided three elective courses based on the merit from the pool of listed professional and open elective courses mentioned in the AU, R-22 regulation. Later let students prefer their choice which may benefit in their professional life.

Professional Elective-I:

The three courses proposed by the committee are given below:

1. Software Project Management
2. Compiler Design
3. Cloud Computing

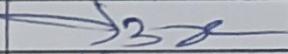
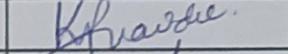
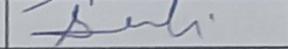
Open Elective-I

The three courses proposed by the committee are given below:

1. Python Programming
2. Python for Data Science
3. NoSQL Database

4. DAC members discussed about the academic and co-curricular activities to conduct in this semester. Keeping in view the Gap Analysis, the Academic plan for this session has been prepared to bridge the curriculum gap.
- (a) DAC recommended for conducting workshops/training activities for the students on problem solving skills and latest trends on Machine Learning, Block Chain, and PySpark, etc.
 - (b) DAC recommended course-coordinators to coordinate with subjects handling faculty to identify content beyond syllabus for pertaining POs.

Members Present:

Sl. No.	Name of the Staff Member	Designation	Signature
1	Dr. Dwiti Krishna Bebartta	Associate Professor & HoD	
2	Dr. K Purushotam Naidu	Assistant Professor	
3	Ms. D. Balasantoshimata	Assistant Professor	

Date: 19-08-2024


HoD-CSE (AI&ML)
Head of Department
Dept. of Computer Science & Engineering (AIML)
GVP College of Engineering for Women
Madhurawada, Visakhapatnam-48



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EAPCET
Counselling
Code

GVPW

DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING (AI&ML)

Date: 10/09/2024

MINUTES OF THE MEETING

Members present:

1. Dr. Dwiti Krishna Bebarta, HoD, CSE(AI&ML) ... In the chair
2. Dr. K Purushottam Naidu, CSE(AI&ML)
3. Ms. D. Balasantoshimata, CSE (AI&ML)

Agenda:

1. Discussion on 2-1 course structure and detailed syllabus of R-22 regulation, Andhra University (AU).
2. Any other issues with the permission of chair

The members discussed and resolved the following:

1. The chairman welcomed all members of the DAC.
2. The chairman has briefed about the compulsory theory courses, lab courses, and skill course for II-I, B. Tech CSE (AI&ML) for the AY-2024-25 (R-22 regulations, AU)
3. DAC members discussed about the academic and co-curricular activities to conduct in this semester. Keeping in view the Gap Analysis, the Academic plan for this session has been prepared to bridge the curriculum gap.
 - (a) DAC recommended for conducting workshops/training activities for the students on problem solving skills and latest trends on CSE (AI&ML).
 - (b) DAC recommended course-coordinators to coordinate with subjects handling faculty to identify content beyond syllabus for pertaining POs.

Members Present:

Sl. No.	Name of the Staff Member	Designation	Signature
1	Dr. Dwiti Krishna Bebarta	Associate Professor & HoD	
2	Dr. K Purushottam Naidu	Assistant Professor	
3	Ms. D. Balasantoshimata	Assistant Professor	

Date: 10-09-2024

Head of Department (AI&ML)
Dept. of Computer Science & Engineering (AI&ML)
GVP College of Engineering for Women
Madhurawada, Visakhapatnam-48



GAYATRI VIDYA PARISHAD COLLEGE OF ENGINEERING FOR WOMEN

Kommadi, Madhurawada, Visakhapatnam 530 048

(Approved by AICTE, New Delhi, Affiliated to Andhra University, Visakhapatnam)

(Accredited by National Board of Accreditation [NBA] for B.Tech CSE, ECE and IT - valid from 2019-22 and 2022-25)

(Accredited by National Assessment and Accreditation Council [NAAC] with A Grade - valid from 2022-2027)

Phone: +91-891-2739144, 2739124, 2719125, 2719127 Email id: gvpcew@gmail.com, info@gvpcew.ac.in

EAPCET
Counselling
Code

GVPW

DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING (AI&ML)

Date: 07/01/2025

MINUTES OF THE MEETING

Members present:

1. Dr. Dwiti Krishna Bebarta, HoD, CSE(AI&ML) ... In the chair
2. Dr. K Purushottam Naidu, CSE(AI&ML)
3. Ms. D. Balasantoshimata, CSE (AI&ML)

Agenda:

1. Discussion on 3-2 course structure and detailed syllabus of R-22 regulation, Andhra University (AU).
2. Elective subjects to offer for III-II for B. Tech CSE (AI&ML) students, R-22 regulation. AY: 2024-25
3. Any other issues with the permission of chair

The members discussed and resolved the following:

1. The chairman welcomed all members of the DAC.
2. The chairman has briefed about the compulsory courses, elective courses, and lab courses for IV-II, III-II, and II-II of B. Tech CSE (AI&ML) for the AY-2023-24 (R-20 and R-22 regulations).
3. DAC members have decided three elective courses based on the merit from the pool of listed in the AU R-22 regulation. Later let students prefer their choice which may be benefited in their professional life.

Professional Elective-II

The following three courses are proposed by the committee are given below:

1. Modern Cryptography and Network Security
2. Cloud Computing
3. Software Engineering
4. Game Development

Open Elective-II

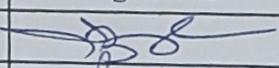
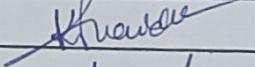
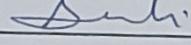
The following three courses are proposed by the committee are given below:

1. AI Chatbot
2. Mobile Computing
3. Internet of Things
4. Renewable Energy Source

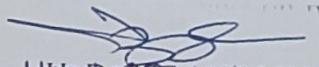
4. DAC members discussed about the academic and co-curricular activities to conduct in this semester. Keeping in view the Gap Analysis, the Academic plan for this session has been prepared to bridge the curriculum gap.

- (a) DAC recommended to conduct workshops/training for 3rd year students on problem solving skills and latest trends in computer science.
- (b) DAC recommended course-coordinators to coordinate with subjects handling faculty to identify content beyond syllabus for pertaining POs.

Members Present:

Sl. No.	Name of the Staff Member	Designation	Signature
1	Dr. Dwiti Krishna Bebartta	Professor & HoD	
2	Dr. K Purushotam Naidu	Associate Professor	
3	Ms. D. Balasantoshimata	Assistant Professor	

Date: 07-01-2025


Head of Department
Dept. of Computer Science & Engineering (AIML)
GVP College of Engineering for Women
Madhurawada, Visakhapatnam-48



GAYATRI VIDYA PARISHAD COLLEGE OF ENGINEERING FOR WOMEN

Kommadi, Madhurawada, Visakhapatnam 530 048

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EAPCET
Counselling
Code

GVPW

DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING (AI&ML)

Date: 17/02/2025

MINUTES OF THE MEETING

Members present:

1. Dr. Dwiti Krishna Bebarta, HoD, CSE(AI&ML) ... In the chair
2. Dr. K Purushottam Naidu, CSE(AI&ML)
3. Ms. D. Balasantoshimata, CSE (AI&ML)

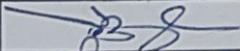
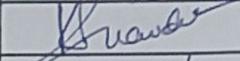
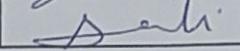
Agenda:

1. Discussion on 2-2 course structure and detailed syllabus of R-22 regulation, Andhra University (AU).
2. Any other issues with the permission of chair

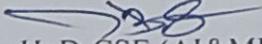
The members discussed and resolved the following:

1. The chairman welcomed all members of the DAC.
2. The chairman has briefed about the compulsory courses, skill course, and lab courses for II-II of B. Tech CSE (AI&ML) for the AY-2024-25 (R-22 regulations).
3. DAC members have decided three elective courses based on the merit from the pool of listed in the AU R-22 regulation. Later let students prefer their choice which may be benefited in their professional life.
4. DAC members discussed about the academic and co-curricular activities to conduct in this semester. Keeping in view the Gap Analysis, the Academic plan for this session has been prepared to bridge the curriculum gap.
 - (a) DAC recommended for conducting workshops/training for 2nd year students on problem solving skills and latest trends in computer science.
 - (b) DAC recommended course-coordinators to coordinate with subjects handling faculty to identify content beyond syllabus for pertaining POs.
5. The chairman has briefed about the Major Project Work, Seminar, Internship which is mentioned in IV-I B. Tech CSE (AI&ML) students under JNTUK syllabus.
6. The chairman has instructed the coordinator for planning internal reviews to monitor the progress of the project work. Also informed the all project batches must work on research articles and try to publish their work in reputed journals.

Members Present:

Sl. No.	Name of the Staff Member	Designation	Signature
1	Dr. Dwiti Krishna Bebart	Professor & HoD	
2	Dr. K Purushotam Naidu	Associate Professor	
3	Ms. D. Balasantoshimata	Assistant Professor	

Date: 17-02-2025


HoD-CSE (AI&ML)
Head of Department
Dept. of Computer Science & Engineering (AIML)
GVP College of Engineering for Women
Madhurawada, Visakhapatnam-48

MINUTES OF THE MEETING OF THE DEPARTMENT ADVISORY COMMITTEE HELD

ON 28th JUNE 2024 IN THE HOD'S CHAMBER

DAC Members:

1. Dr. P.M.K. Prasad, Associate Professor, HoD, ECE ... In the chair
2. Dr. L. Ganesh, Associate Professor, ECE
3. Dr. B. Vijaya Lakshmi, Associate Professor, ECE
4. Dr. D.V.A.N Ravi Kumar, Associate Professor, ECE
5. Ms. B.V.S. Renuka Devi, Assistant Professor, ECE
6. Ms. Ch. Sirisha, Assistant Professor, ECE

Agenda:

1. Discussion on ensuing subjects and electives of II, III, and IV B.Tech, Semester-I for AY 2024-25.
2. Planning of academic and co-curricular activities for the forthcoming semester.
3. Progress review of NBA and NAAC-related documentation and activities.
4. Discussion on the First-Year Autonomous course structure and courses.
5. Any other issues with the permission of the Chair.

The members discussed and resolved the following:

1. The meeting commenced with a warm welcome by **Dr. P.M.K. Prasad**, who chaired the session. He briefed the members about the agenda items and emphasized the importance of timely preparation for the forthcoming **Academic Year 2024-25**.
2. He outlined the course structure for **II Year (AU syllabus), III Year (AU syllabus), and IV Year (R-20 JNTUK syllabus)** for Semester-I, detailing the inclusion of **core subjects, professional and open electives, skill-oriented courses-OOPs through JAVA, and laboratory components**.
3. With the introduction of the new III-I AU syllabus, the Chairperson requested the DAC members to ensure that the Course Outcomes are finalized in alignment with AU guidelines and framed as per the requirements of NBA.



4. The committee discussed the **need for equipment and consumables** for various labs and skill courses in the upcoming semester.

In the III year AU syllabus, Digital communication and Internet of Things labs were available. The committee discussed on the need of any additional instruments and software tools.

5. Based on faculty specialization and experience, the following members were nominated as **Lab In-charges** for the laboratories which were introduced in III year AU syllabus.

Digital Communication Lab: Ms. N Roopavathi

Internet of Things Lab: Ms. Ch. Sirisha

It is finalized that lab in charges should look into the syllabus and obtain quotations from authorized suppliers and initiate procurement procedures in consultation with the HoD.

6. Detailed discussions were held to finalize options for **Professional and Open Electives for III and IV Year** students.

It was unanimously decided to collect **student preferences** before finalizing the electives for offering.

The elective options are as follows:

III ECE

- **Open Elective-I:**
 1. Artificial Intelligence and Machine Learning
- **Professional Elective-I:**
 1. Electronic Measurements and Instrumentation
 2. Computer Networks

IV ECE

- **Professional Elective-III:**
 1. Digital Image Processing
- **Professional Elective-IV:**
 1. Satellite Communications
- **Professional Elective-V:**
 1. Radar Engineering
 2. Internet of Things
- **Open Elective-III:**
 1. Data Science
 2. AI Tools & Techniques
- **Open Elective-IV:**
 1. Blockchain Technologies
 2. Cloud Computing using AWS



7. The DAC reviewed academic and co-curricular activities conducted during the previous semester. It was resolved to organize guest lectures, workshops, and seminars on industry-relevant topics, and to promote participation in professional bodies such as IETE, IEEE, and the student association ECLAT-A.

Members also proposed conducting hands-on technical sessions in emerging domains such as AI, VLSI, IoT, and embedded systems.

8. The Chairman instructed the DAC members to verify course files and lab records of the previous semester as part of the internal academic audit process.

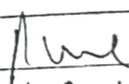
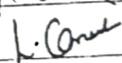
9. The Chairman highlighted the progress of framing the Autonomous course structure for the First-Year (2024 batch) for both B.Tech and M. Tech courses.

He encouraged the committee to ensure that the syllabus is outcome-based and aligned with AICTE and industry guidelines.

10. Since there were no further points for discussion, the meeting concluded with a note of appreciation from the Chair.

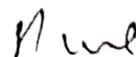
The HoD thanked all members for their active participation, valuable inputs, and commitment towards continuous improvement of academic standards in the department.

Members Present:

S.No.	Name	Signature
1	Dr. P.M.K. Prasad, Associate Professor, ECE	
2	Dr. L. Ganesh, Associate Professor, ECE	
2	Dr. B. Vijaya Lakshmi, Associate Professor, ECE	
4	Dr. D.V.A. N Ravi Kumar, Associate Professor, ECE	
5	Ms. B.V.S. Renuka Devi, Assistant Professor, ECE	
6	Ms. Ch. Sirisha, Assistant Professor, ECE	

Date: 28.06.2024




HoD-ECE

HEAD
DEPARTMENT OF
ELECTRONICS AND COMMUNICATION ENGINEERING
G V P COLLEGE OF ENGINEERING FOR WOMEN
MADHURAWADA, VISAKHAPATNAM - 530 015



Gayatri Vidya Parishad College of Engineering for Women

Madhurawada :: Visakhapatnam - 530 048

(Affiliated to Andhra University, Approved by AICTE, New Delhi, accredited by NBA)

DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

MINUTES OF THE MEETING OF THE DEPARTMENT ADVISORY COMMITTEE HELD
ON 22nd NOVEMBER 2024 IN THE HOD'S CHAMBER

DAC Members:

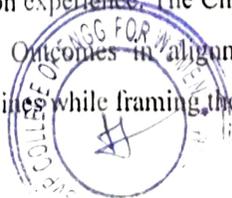
1. Dr. P.M.K. Prasad, Associate Professor, HoD. ECE ... In the chair
2. Dr. L. Ganesh, Associate Professor, ECE
3. Dr. B. Vijaya Lakshmi, Associate Professor, ECE
4. Dr. D.A.V.N Ravi Kumar, Associate Professor, ECE
5. Ms. B.V.S. Renuka Devi, Assistant Professor, ECE
6. Ms. Ch. Sirisha, Assistant Professor, ECE

Agenda:

1. Ensuing subjects and electives of II, III, and IV B.Tech, Semester-II, AY 2024-25.
2. Preparation for NAAC AQAR report submission.
3. Preparation of **II, III, and IV Year course structure and syllabus for the Autonomous batch.**
4. Any other issues with the permission of the Chair.

The members discussed and resolved the following:

1. The Chairman, **Dr. P.M.K. Prasad**, welcomed all the members and briefed them on the subjects, electives, skill-oriented courses, and laboratory components pertaining to **II Year (AU syllabus), III Year (AU syllabus), and IV Year (JNTUK R-20 syllabus)** for Semester-II, AY 2024-25. He emphasized maintaining consistency between theoretical and practical components and aligning the electives with industry requirements.
2. The syllabus for **III-II (AU curriculum)** was reviewed. Members discussed improvements in lab experiments, introduction of soft skills as skill course and course content delivery to strengthen students' conceptual understanding and hands-on experience. The Chairperson requested the DAC members to review and finalize the Course Outcomes in alignment with the AU-specified outcomes and to adhere to the prescribed guidelines while framing them.



3. Based on faculty specialization and experience, the following members were nominated as **Lab In-charges** for the laboratories which were introduced in III year AU syllabus.

Antenna Simulation lab: Mr. N Maheswara Rao

Digital Signal Processing Lab: Dr. D V A N Ravi Kumar

Microwave Engineering Lab: Ms. L Sarika

4. The committee deliberated on the selection of electives for **III Year ECE** and decided to collect student preferences before finalizing one subject under each elective category.

Proposed Elective Options – III Year ECE

- **Professional Elective–II:**

1. VLSI Design
2. Cellular Mobile Communication

- **Open Elective–II:**

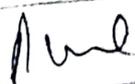
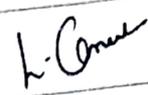
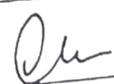
1. Data Science

The HoD emphasized offering electives that align with current technological trends and ensure adequate faculty expertise for course delivery.

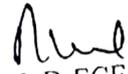
5. It was decided to assign **Ms. M. Mani Kumari** and **Ms. B.V.R. Gowri** as **Project Coordinators** for **IV-II (R20) 2021 batch** students to monitor project progress, internal reviews, and documentation.
6. The Chairman informed members about the **NAAC Annual Quality Assurance Report (AQAR)** submission deadline and instructed faculty to ensure timely updates and completion of all required departmental files and supporting documents.
7. The committee discussed the ongoing work related to the **framing of II, III & IV year B.Tech and II year M. Tech course structure and syllabus** for the **Autonomous Regulation** applicable to upcoming batches. The Chairman advised members to align the syllabus with **AICTE guidelines** and **Andhra University curriculum** by incorporating **emerging technologies, interdisciplinary courses, and skill-oriented components**.
8. There being no further points for discussion, the meeting concluded with a vote of thanks to the Chair. The Chairman appreciated the active participation and contributions of all members.



Members Present:

S.No.	Name	Signature
1	Dr. P.M.K. Prasad, Associate Professor, ECE	
2	Dr. L. Ganesh, Associate Professor, ECE	
2	Dr. B.Vijaya Lakshmi, Associate Professor, ECE	
4	Dr. D.V.A .N Ravi Kumar, Associate Professor, ECE	
5	Ms. B.V.S. Renuka Devi, Assistant Professor, ECE	
6	Ms. Ch. Sirisha, Assistant Professor, ECE	

Date: 22.11.2024


HoD-ECE

HEAD
DEPARTMENT OF
ELECTRONICS AND COMMUNICATION ENGINEERING
G V P COLLEGE OF ENGINEERING FOR WOMEN
MADHURAWADA, VISAKHAPATNAM - 530 048





Gayatri Vidya Parishad College of Engineering for Women

Madhurawada :: Visakhapatnam – 530 048

(Affiliated to Andhra University, Approved by AICTE, New Delhi, accredited by NBA)

DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

MINUTES OF THE MEETING OF THE DEPARTMENT ADVISORY COMMITTEE HELD
ON 17th JANUARY 2025 IN THE HOD'S CHAMBER

DAC Members:

1. Dr. P.M.K. Prasad, Professor, HoD, ECE ... In the chair
2. Dr. L. Ganesh, Associate Professor, ECE
3. Dr. B. Vijaya Lakshmi, Associate Professor, ECE
4. Dr. D.A.V.N Ravi Kumar, Associate Professor, ECE
5. Ms. B.V.S. Renuka Devi, Assistant Professor, ECE
6. Ms. Ch. Sirisha, Assistant Professor, ECE

Agenda

1. Discussion on the existing syllabus and course structure for II, III, and IV year B.Tech & II year M.Tech.
2. Streamlining and defining subjects into specific domains/streams.
3. Formation of research groups for each stream.
4. Allocation of subjects to respective research teams for syllabus preparation.
5. Ensuring alignment of the revised syllabus with Andhra University norms.
6. Any other matters with the permission of the Chair.

The following items were discussed and the committee resolved to forward the same to the Board of Studies for consideration and necessary action.

1. Review of Existing Course Structure

- o The committee reviewed the current course structure of II, III, and IV year programs.
- o It was decided to revise and update the syllabus to reflect the latest industry trends and AU guidelines.

2. Definition of Streams

- o The subjects were categorized into specific streams, such as:
 - Core Engineering Stream
 - Interdisciplinary/Research Stream
 - Open Electives and Professional Electives



Each stream will focus on specialized areas to strengthen students' technical knowledge and research orientation.

3. Responsibility of Research Groups

- It was decided to assign to the existing Research Groups, the responsibility of preparing and revising the syllabus for subjects under their respective streams, in line with AU norms and industry needs.
- Research groups will draft the syllabus in alignment with Andhra University guidelines, credit structures, and outcome-based education (OBE) framework.
- Cross-verification with latest Regulation approved by the academic council of GVPCEW(A) was recommended.

4. Timeline for Submission

- All research groups are required to submit their proposed syllabus drafts by [15.02.2025] for departmental review before forwarding to the Board of Studies.

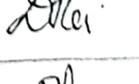
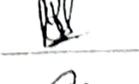
5. Other Discussions

- Suggestions for incorporating skill-based and value-added courses were noted.
- The committee emphasized integrating modern tools, laboratory components and industry-aligned mini projects.

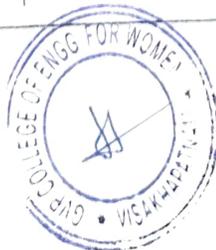
Conclusion

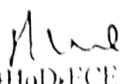
The HoD thanked all the members for their active participation. The meeting concluded with the decision to reconvene after the initial draft of the revised syllabus is prepared for further review and approval.

Members Present:

S.No.	Name	Signature
1	Dr. P.M.K. Prasad, Professor, ECE	
2	Dr. L. Ganesh, Associate Professor, ECE	
2	Dr. B. Vijaya Lakshmi, Associate Professor, ECE	
4	Dr. D.V.A .N Ravi Kumar, Associate Professor, ECE	
5	Ms. B.V.S. Renuka Devi, Assistant Professor, ECE	
6	Ms. Ch. Sirisha, Assistant Professor, ECE	

Date: 17.01.2025




HoD ECE
DEPARTMENT OF
ELECTRONICS AND COMMUNICATION ENGINEERING
GVP COLLEGE OF ENGINEERING FOR WOMEN
MADHURAWADA, VISA KHAPATNAM - 530 043



GAYATRI VIDYA PARISHAD COLLEGE OF ENGINEERING FOR WOMEN (AUTONOMOUS)

Madhurawada, Visakhapatnam - 530 048

(Approved by AICTE, New Delhi and Permanently Affiliated to Andhra University, Visakhapatnam)

Accredited by NAAC with 'A' from 2022 to 2027

CSE, ECE and IT Courses Accredited by NBA (2019-2022) and Re-Accredited by NBA (2022-2025)

EEE Course Accredited by NBA (2023-2026)

Ph : 0891-2739144, 2526639 Email : gvpcew@gmail.com Website : www.gvpcew.ac.in

Department of Electronics and Communication Engineering

Subject Name: Digital Logic Design Lab

Subject Code: 24EC11RC07

Year and Sem: I B. Tech- II Semester

Department: ECE

Academic Year: 2024-2025

Regulation: R 24

COs, CO-PO Mapping

At the end of the course student will be able to

Course Code	Course Title	Experiment No	Course Outcomes	
	Digital Logic Design Lab	1,2,3,4	CO1	Verify the functional behavior of different logic gates and realize the Boolean expressions using these gates.
		5,6,7,8	CO2	Build combinational circuits to implement different logic functions
		9	CO3	Verify the functional behavior of different Flipflops.
		10,11,12	CO4	Construct sequential circuits like counters and registers using flip-flops.
		1 to 12	CO5	Make use of Digital ICs for verification and design of Digital circuits.

Mapping of Course Outcomes (COs) with Program Outcomes (POs)

Course Outcomes		Program Outcomes (POs)													
		PO1	PO2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO1	PSO2
	CO1	3	2	2	2	2	-	-	-	-	-	-	1	2	2
	CO2	3	2	2	2	2	-	-	-	-	-	-	1	2	2
	CO3	3	2	2	2	2	-	-	-	-	-	-	1	3	2
	CO4	3	2	2	3	2	-	-	-	-	-	-	1	2	2
	CO5	3	2	2	3	2	-	-	-	-	-	-	2	2	2
Average		3	2	2	3	2	-	-	-	-	-	-		3	2

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

If there is no correlation, put "-"



- PO1. Engineering knowledge:** Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
- PO2. Problem analysis:** Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
- PO3. Design/development of solutions:** Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.
- PO4. Conduct investigations of complex problems:** Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.
- PO5. Modern tool usage:** Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.
- PO6. The engineer and society:** Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.
- PO7. Environment and sustainability:** Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.
- PO8. Ethics:** Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
- PO9. Individual and team work:** Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
- PO10. Communication:** Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.
- PO11. Project management and finance:** Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.
- PO12. Life-long learning:** Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.
- PSO-1.** Develop real-time applications by applying software engineering principles and implementing with Develop emerging technologies in the field of Computer Science
- PSO-2.** Apply the knowledge of data analytics, soft computing, information security and other domains in computer science for developing software systems



Signature(s) of the faculty:




Head of the Department



**GAYATRI VIDYA PARISHAD COLLEGE OF ENGINEERING FOR WOMEN
(Autonomous)**

(Approved by AICTE, New Delhi and Permanently Affiliated to Andhra University,
Visakhapatnam) Madhurawada :: Visakhapatnam – 530 048

Department of Computer Science and Engineering

Class: I B.Tech. – I Sem.

Branch(es): CSE, CSE (AI&ML), IT

Lab Name: Computer Engineering Workshop-

Lab Code: 24CT11RC03

Academic Year: 2024-2025

Course Outcomes:

Course Outcomes	At the end of the course students are able to:	Bloom's Level
CO1	Identify the peripherals of a computer.	L3
CO2	Demonstrate the installation process of operating systems like MS Windows, LINUX.	L3
CO3	Make use of MS-Office suite that comprises of various applications to create documents, organizes & analyses data and captivating presentations.	L3
CO4	Categorize various UNIX/LINUX Commands to work on a modern operating system	L3
CO5	Experiment with GIT Commands and make use of LaTeX to prepare research articles.	L3

CO-PO & PSO Mapping:

Course outcomes	Programme Outcomes												PSOs	
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	3	2	2	1	2	-	-	-	-	-	1	2	2	3
CO2	3	2	3	2	3	-	-	-	-	-	1	2	3	3
CO3	2	2	3	2	3	-	-	-	2	2	1	2	3	2
CO4	3	2	2	2	3	-	-	-	1	1	1	2	3	3
CO5	3	2	3	2	3	-	-	-	2	2	2	3	3	3

Mapping Scale: 1 – Low, 2 – Moderate, 3 – Strong; “-” indicates no direct mapping

CO-PO & PSO Mapping Justifications:





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Department of Computer Science and Engineering

CO1: Identify the peripherals of a computer.

- **PO1 (Engineering Knowledge) – 3:** Requires strong understanding of fundamental hardware components.
- **PO2 (Problem Analysis) – 2:** Students analyze the role and functionality of each device.
- **PO3 (Design/Development of Solutions) – 2:** Knowledge of peripherals aids in assembling/maintaining computer systems.
- **PO4 (Investigation of Complex Problems) – 1:** Preliminary investigation while disassembling and assembling components.
- **PO5 (Modern Tool Usage) – 2:** Involves studying modern input/output and hardware devices.
- **PO11 (Project Management) – 1:** Minor planning during hardware assembly tasks.
- **PO12 (Lifelong Learning) – 2:** Rapid hardware advancements necessitate continuous learning.
- **PSO1 – 2:** Foundational for building real-time computing systems.
- **PSO2 – 1:** Peripheral identification marginally supports computational domains.

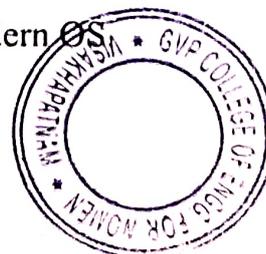
CO2: Demonstrate installation of operating systems like MS Windows, Linux.

- **PO1 – 3:** Requires strong foundational knowledge of computer architecture and OS concepts.
- **PO2 – 2:** Students troubleshoot installation issues and interpret errors.
- **PO3 – 3:** Installing OS directly contributes to creating functional computing systems.
- **PO4 – 2:** Involves exploring installation modes, disk partitions, and dual-boot concepts.
- **PO5 – 3:** Utilizes modern OS installation tools and utilities.
- **PO11 – 1:** Minor project management when configuring OS settings.
- **PO12 – 2:** OS platforms evolve rapidly; learners must adapt continuously.
- **PSO1 – 3:** Strong link with system-level configuration for real-time applications.
- **PSO2 – 2:** Supports system-level understanding essential for secure and efficient software development.

CO3: Make use of MS-Office tools for documents, spreadsheets, and presentations.

- **PO1 – 2:** Requires basic engineering knowledge to organize and analyze information.
- **PO2 – 2:** Students analyze data and apply spreadsheet functions.
- **PO3 – 3:** Creating documents, spreadsheets, and PPTs contributes to solution development.
- **PO4 – 2:** Application of formulas, charts, and formatting requires investigative effort.
- **PO5 – 3:** Strong focus on modern digital tools like Word, Excel, PPT, and SaaS tools.
- **PO9 – 2:** Documentation and presentations promote effective teamwork.
- **PO10 – 2:** Strong relevance to communication of technical information.
- **PO11 – 1:** Basic planning for preparing structured documents and presentations.
- **PO12 – 2:** Continuous learning due to evolving office technologies.
- **PSO1 – 3:** Documents and data analysis support software development documentation.
- **PSO2 – 2:** Excel and analytical tools support data-related computations.

CO4: Categorize UNIX/LINUX commands to work on a modern OS





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Department of Computer Science and Engineering

Class: I B.Tech. – I Sem.

Branch(es): CSE, CSE (AI&ML), IT

Subject Name: Fundamentals of Computers-

Subject Code: 24CT11RC01

Academic Year: 2024-2025

Course Outcomes:

Course Outcomes	At the end of the course students are able to:	Bloom's Level
CO1	Identify different I/O devices and their usage.	L3
CO2	Compare different computer memory with their efficiency.	L2
CO3	Relate different computer software's and programming languages for solving problems.	L1
CO4	Summarize the use of operating system, database system, and computer network in the field of computing in engineering.	L2
CO5	Infer the methods and applications of artificial intelligence (AI), machine learning (ML) and data science.	L2

CO-PO & PSO Mapping:

Course outcomes	Programme Outcomes												PSOs	
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	3	2	2	1	2	-	-	-	-	-	1	2	2	3
CO2	3	2	2	1	2	-	-	-	-	-	1	2	2	3
CO3	3	2	3	2	2	-	-	-	1	1	1	2	3	3
CO4	3	2	2	2	2	-	-	-	1	1	1	2	3	3
CO5	3	2	2	2	3	-	-	-	1	1	1	3	3	3

Mapping Scale: 1 – Low, 2 – Moderate, 3 – Strong; “-” indicates no direct mapping

CO-PO & PSO Mapping Justifications:





Department of Computer Science and Engineering

CO1: Identify different I/O devices and their usage.

- **PO1 (Engineering Knowledge) – 3:** Requires fundamental understanding of hardware components and device principles.
- **PO2 (Problem Analysis) – 2:** Students compare and interpret functional differences among devices.
- **PO3 (Design/Development of Solutions) – 2:** Understanding devices contributes to selecting appropriate solutions in engineering setups.
- **PO4 (Investigation of Complex Problems) – 1:** Basic investigation of device behaviour while selecting peripherals.
- **PO5 (Modern Tool Usage) – 2:** Exposure to various modern I/O devices and their practical relevance.
- **PO11 (Project Management & Finance) – 1:** Basic planning when selecting hardware for computer systems.
- **PO12 (Lifelong Learning) – 2:** Rapidly changing I/O technologies promote continuous learning.
- **PSO1 – 2:** Basic knowledge of system components supports later development of real-time applications.
- **PSO2 – 1:** Limited relevance to software analytics, but foundational.

CO2: Compare different computer memory with their efficiency.

- **PO1 – 3:** Requires strong understanding of computer memory hierarchy and architecture.
- **PO2 – 2:** Students analyze speed, cost, and performance of memory types.
- **PO3 – 2:** Memory selection influences solution design in computing systems.
- **PO4 – 1:** Basic investigation into memory efficiency and comparison.
- **PO5 – 2:** Understanding memory contributes to selecting tools/systems efficiently.
- **PO11 – 1:** Minor project planning relevance for memory allocation decisions.
- **PO12 – 2:** Memory technologies evolve quickly, requiring continuous learning.
- **PSO1 – 2:** Understanding memory systems is essential for real-time application performance.
- **PSO2 – 1:** Limited yet foundational relevance to data-intensive systems.

CO3: Relate software and programming languages for solving problems.

- **PO1 – 3:** Deep understanding of software categories and programming paradigms is essential.
- **PO2 – 2:** Students analyze language features and their suitability for tasks.
- **PO3 – 3:** Directly aligned with designing solutions using appropriate languages.
- **PO4 – 2:** Basic investigation into development life cycles and language structures.
- **PO5 – 2:** Involves modern tools and language environments.
- **PO9 (Team Work) – 1:** Software development often involves teamwork.
- **PO10 (Communication) – 1:** Communicating program logic, flowcharts, and pseudocode.
- **PO11 – 1:** Minor planning involvement in program development.
- **PO12 – 2:** Continuous evolution of programming languages encourages lifelong learning.
- **PSO1 – 3:** Strong relevance: foundation for real-time software development.
- **PSO2 – 2:** Supports later study of analytics, soft computing, and smart systems.

CO4: Summarize OS, DBMS, and Networks usage in engineering.

CO-PO MAPPING



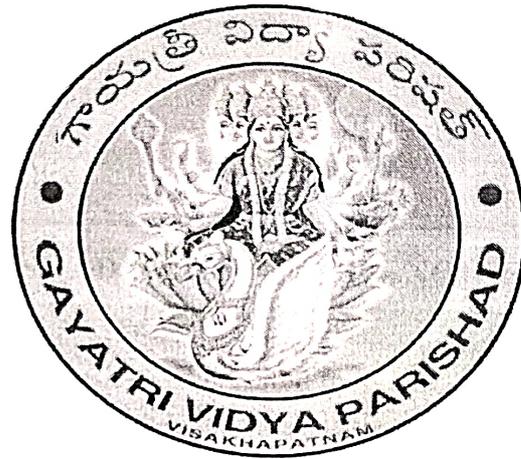
DIGITAL LOGIC DESIGN LAB

**GAYATRI VIDYA PARISHAD COLLEGE OF ENGINEERING FOR WOMEN
(Autonomous)**

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(Accredited by NBA & Accredited by NAAC with A Grade)

Madhurawada :: Visakhapatnam – 530048



DIGITAL LOGIC DESIGN LAB MANUAL

Department of Electronics and Communication Engineering

nnn

Dept. of ECE, GVPCEW

DIGITAL LOGIC DESIGN LAB

VISION & MISSION

Vision of the Institute

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

Mission of the Institute

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

Vision of the Department

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

Mission of the Department

- 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



DIGITAL LOGIC DESIGN LAB

DIGITAL LOGIC DESIGN LAB

List of Experiments:

1. Verification of Logic Gates
2. Verification of Demorgan's Laws
3. Realization of Gates by using universal building blocks
4. Realization of SOP and POS
5. Half Adder & Full adder
6. Implementation of a function by using Decoders
7. Implementation of a function by using Multiplexers.
8. 3-bit Parity Generator
9. Verification of Flip - flops
10. Mod-8 Synchronous counter
11. Johnson Counter
12. 4 - bit Shift-register



DIGITAL LOGIC DESIGN LAB

COs, POs, PSOs & CO-PO-PSO Mapping

Course Outcomes

<i>NBA Subject Code</i>	<i>Course Outcomes</i>	
	CO1	Verify the functional behavior of different logic gates and realize the Boolean expressions using these gates.
	CO2	Build combinational circuits to implement different logic functions.
	CO3	Verify the functional behavior of different Flip-flops.
	CO4	Construct sequential circuits like counters and registers using flip-flops.
	CO5	Make use of Digital ICs for verification and design of Digital circuits.

Program Specific Outcomes

1. To acquire knowledge required for designing electronics and communication systems.
2. To design, simulate and implement essential modules in the areas of Electronic circuits, VLSI, Embedded systems, Communication and Signal processing.

Programme Outcomes

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

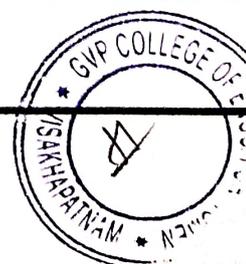
PO2: Identify, formulate and analyze complex electronics and communication engineering problems using the principles of mathematics and engineering sciences to reach substantiated conclusions.

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.

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

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

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

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

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

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

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

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

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



DIGITAL LOGIC DESIGN LAB

LABORATORY RULES

1. Remove your footwear before you enter the lab (if simulation lab).
2. Keep the lab premises clean.
3. Always maintain silence in the lab premises. Be considerate to other lab users.
4. If you leave the lab, do not leave your personal belongings unattended.
5. Don't damage, remove, or disconnect any labels, parts, cables or equipment.
6. Lab users must sign in and out of the lab in the login register (for regular labs) or in remedial lab register (for extra labs).
7. No food or drink in any form is allowed in the labs.
8. Do not use cell phones in laboratory premises.
9. Lab users should maintain professional and courteous communication.
10. Please operate the equipment with respect and care.
11. Activities in the lab(s) that are considered by the lab incharge to be abusive to the software, hardware, and/or personnel may result in expulsion from the lab(s) and denial of future use of the lab(s).
12. The lab assistants are here to help when they can and to maintain the labs' operation. However, the lab assistants are not here to do your work for you.
13. Any failure to follow these lab rules may result in the loss of your lab privileges.



DIGITAL LOGIC DESIGN LAB

LAB SCHEDULE

S.No.	EXPERIMENT	No. of Weeks
Cycle-1		
1	Verification of Logic Gates	1
2	Verification of Demorgan's Laws	1
3	Realization of Gates by using universal building blocks	1
4	Realization of SOP and POS	1
5	Half Adder & Full adder	1
6	Implementation of a function by using Decoders	1
	Internal Exam – I	1
Cycle-2		
7	Implementation of a function by using Multiplexers.	1
8	3-bit Parity Generator	1
9	Verification of Flip - flops	1
10	Mod-8 Synchronous counter	1
11	Johnson Counter	1
12	4 - bit Shift-register	1
	Internal Exam – II	1



DIGITAL LOGIC DESIGN LAB

Equipment Required:

1. Digital Logic Trainer Kit
2. Breadboard
3. Integrated Circuits(ICs)
4. Multimeters
5. Patch Cords



DIGITAL LOGIC DESIGN LAB

Table of Contents

1. Experiments

Cycle-1 Experiments

1.1 Verification of Logic Gates	1
1.2. Verification of Demorgan's Laws	9
1.3. Realization of Gates by using universal building blocks	13
1.4 Realization of SOP and POS	17
1.5. Half Adder & Full adder	21
1.6. Implementation of a function by using Decoders	24

Cycle-2 Experiments

1.7. Implementation of a function by using Multiplexers	29
1.8. 3-bit Parity Generator	33
1.9. Verification of Flip - flops	36
1.10. Mod-8 Synchronous counter	40
1.11. Johnson Counter	43
1.12. 4 - bit Shift-register	46



EXPERIMENT-1 VERIFICATION OF LOGIC GATES

1. **AIM:** To study about basic logic gates and verify their truth tables.
2. **APPARATUS REQUIRED:**

SL No.	COMPONENT	SPECIFICATION	QTY
1	AND GATE	IC 7408	1
2	OR GATE	IC 7432	1
3	NOT GATE	IC 7404	1
4	NAND GATE	IC7400	1
5	NOR GATE	IC 7402	1
6	EX-OR GATE	IC 7486	1
7	IC TRAINER KIT		1
8	Patch chords		1

3. **THEORY:**

Circuit that takes the logical decision and the process are called logic gates. Each gate has one or more input and only one output. OR, AND and NOT are basic gates. NAND, NOR and X-OR are known as universal gates. Basic gates form these gates.

AND GATE:

The AND gate performs a logical multiplication commonly known as AND function. The output is high when both the inputs are high. The output is low level when any one of the inputs is low.

OR GATE:

The OR gate performs a logical addition commonly known as OR function. The output is high when any one of the inputs is high. The output is low level when both the inputs are low.

NOT GATE:

The NOT gate is called an inverter. The output is high when the input is low. The output is low when the input is high.

NAND GATE:

The NAND gate is a contraction of AND-NOT. The output is high when both inputs are low and any one of the input is low. The output is low level when both inputs are high.

NOR GATE:

The NOR gate is a contraction of OR-NOT. The output is high when both inputs are low. The output is low when one or both inputs are high.

X-OR GATE:

The output is high when any one of the inputs is high. The output is low when both the inputs are low and both the inputs are high.

X-NOR GATE:

The XNOR (exclusive-NOR) gate is a combination XOR gate followed by an inverter.

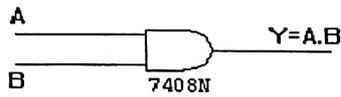
DIGITAL LOGIC DESIGN LAB

Its output is "true" if the inputs are the same, and "false" if the inputs are different.

4. DIAGRAMS:

AND GATE:

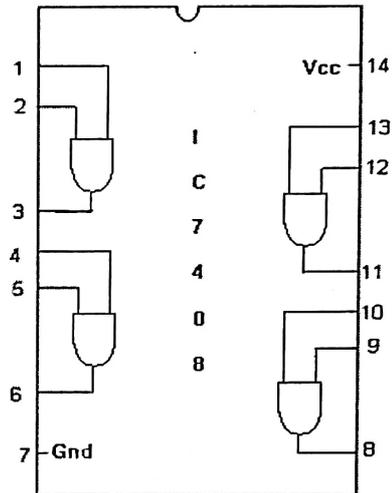
SYMBOL



TRUTH TABLE

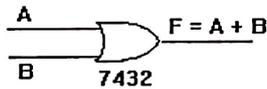
A	B	A.B
0	0	0
0	1	0
1	0	0
1	1	1

PIN DIAGRAM



OR GATE:

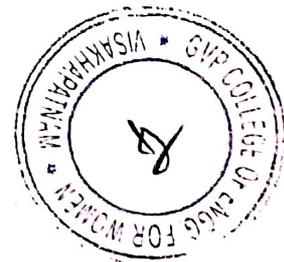
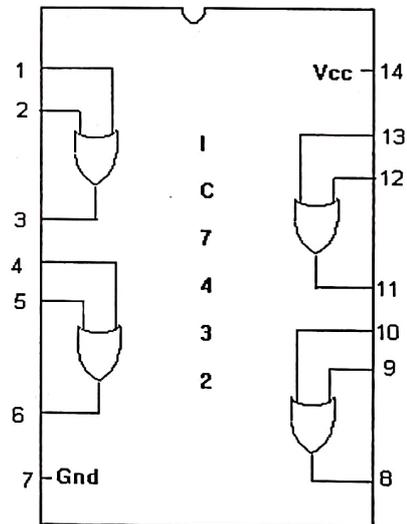
SYMBOL :



TRUTH TABLE

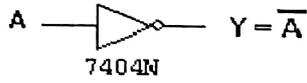
A	B	A+B
0	0	0
0	1	1
1	0	1
1	1	1

PIN DIAGRAM :



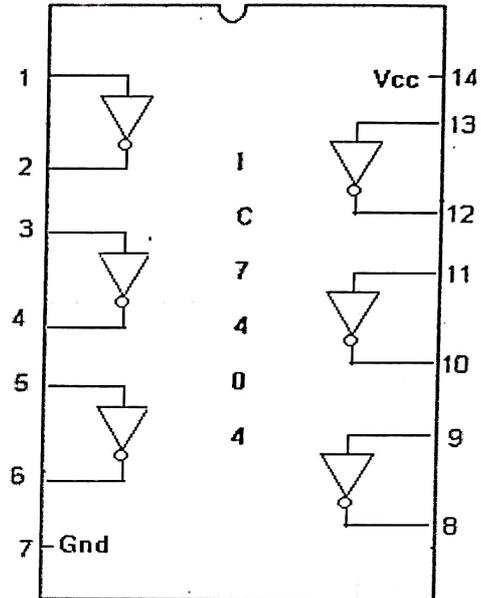
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NOT GATE:

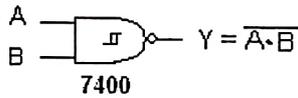


TRUTH TABLE :

A	\overline{A}
0	1
1	0

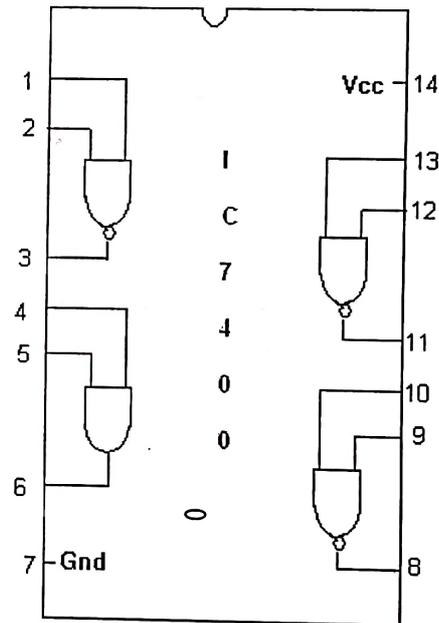


NAND GATE:



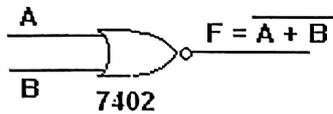
TRUTH TABLE

A	B	$\overline{A \cdot B}$
0	0	1
0	1	1
1	0	1
1	1	0



NOR GATE:

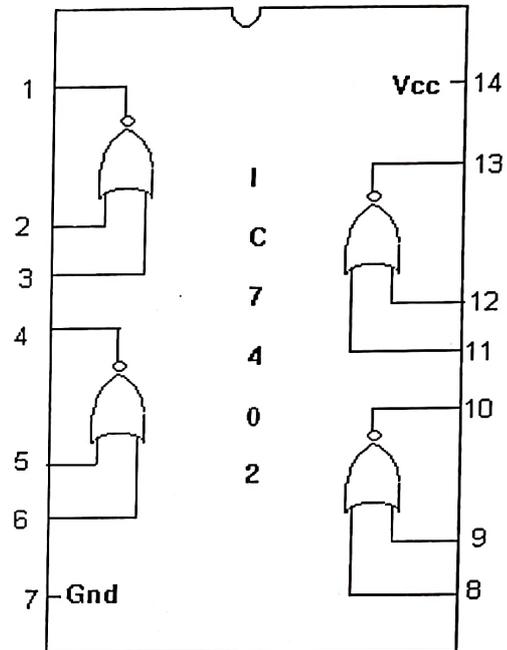
SYMBOL :



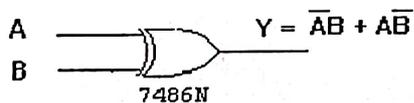
TRUTH TABLE

A	B	$\overline{A+B}$
0	0	1
0	1	1
1	0	1
1	1	0

PIN DIAGRAM :

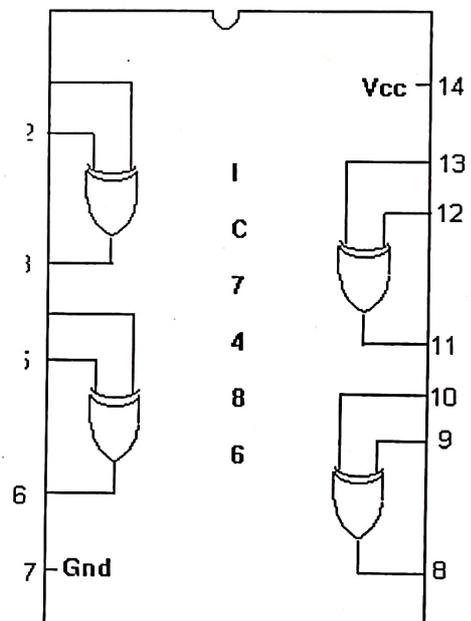


EX-OR GATE:

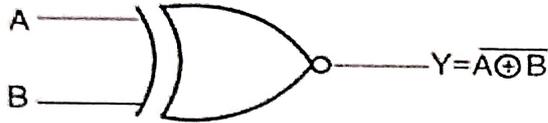


TRUTH TABLE :

A	B	$\overline{A}B + A\overline{B}$
0	0	0
0	1	1
1	0	1
1	1	0

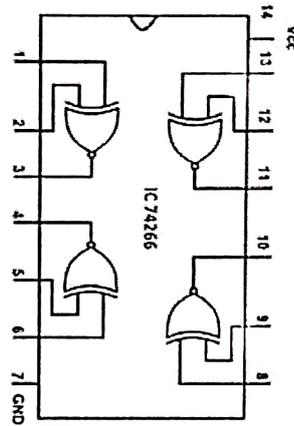


EX-NOR GATE:



A	B	Y
0	0	1
0	1	0
1	0	0
1	1	1

$$Y = \overline{(A \oplus B)} = (A.B + \overline{A}.\overline{B})$$



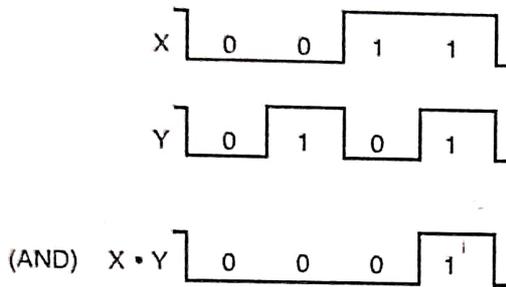
5. PROCEDURE:

1. Connections should be done as per the circuit diagram mentioned above.
2. Connect the 7th pin of IC to ground terminal and 14th pin of IC to power supply.
3. Connect the positive terminal of multimeter to the output to the IC and its negative terminal to the ground.
4. Switch on the power supply.
5. Provide the inputs and note the outputs after providing each input.
6. Repeat the same procedure for all the gates.

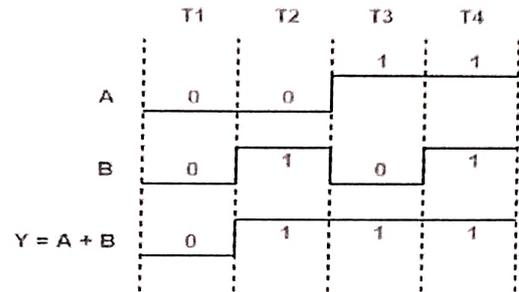


6. MODEL WAVEFORMS:

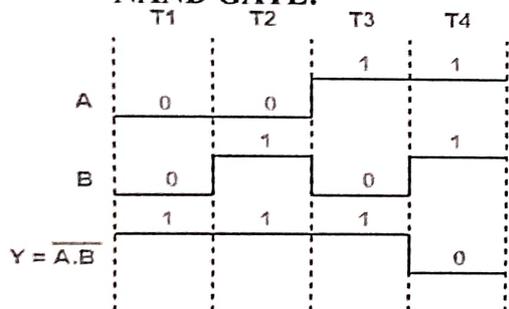
AND GATE:



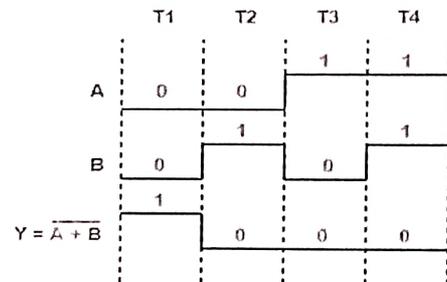
OR GATE:



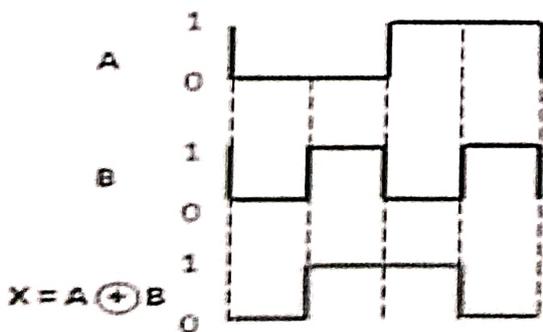
NAND GATE:



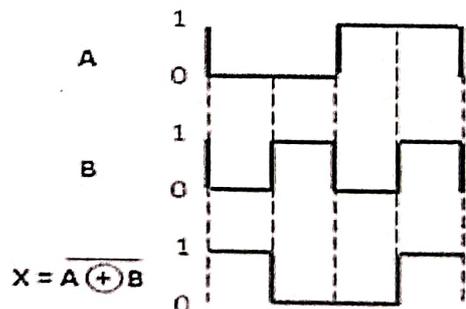
NOR GATE:



EX-OR GATE:



EX-NOR GATE:



7. VERIFICATION TABLE:

AND GATE

A	B	OUT

OR GATE

A	B	OUT

NAND GATE

A	B	OUT

NOR GATE

A	B	OUT

EX-OR GATE

A	B	OUT

EX-NOR GATE

A	B	OUT



DIGITAL LOGIC DESIGN LAB

NOT GATE

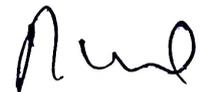
A	OUT

8. ANALYSIS:

9. PRECAUTIONS:

- a. Connections must be carefully done on the breadboard.
- b. Identify the pins of the IC properly!
- c. Take care while removing and inserting the IC's on the breadboard.
- d. If doing manually, be cautious of the current passing through the breadboard and OFF the current supply while making connections.

10. RESULT: Therefore, all the truth tables of logic gates have been verified.



HEAD
DEPARTMENT OF
ELECTRONICS AND COMMUNICATION ENGINEERING
G V P COLLEGE OF ENGINEERING FOR WOMEN
MADHURAWADA, VISAKHAPATNAM - 530 012



Signals & Systems

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Courses

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This course

Courses > Academic Year 2025-26 > Electronics & Communication Engineering > Second year > Section-I > 25_26_24EC11_55

Course Settings Participants Grades Reports More

COURSE CODE : 24EC11RC11

COURSE OUTCOMES - SYLLABUS - TEXTBOOKS

Course Outcomes: At the end of the Course, the student shall be able to

- CO1: Understand basic Signals and Systems including their properties and classifications.
- CO2: Apply Fourier Series and Fourier Transform to analyze Continuous and Discrete Time signals.
- CO3: Explain the techniques of convolution and correlation for signal processing.
- CO4: Apply Laplace Transform for analysing and characterizing Linear Time-Invariant (LTI) systems.
- CO5: Identify appropriate sampling rate to support signal reconstruction, and Make Use of Z-Transforms for discrete system analysis.

SYLLABUS PDF

Text Books:

1. Alan V. Oppenheim, Alan S. Willsky and S. Hamid Nawab, Signals and Systems, PHI, 2ndEdn, 1996.
2. B. P. Lathi, Signal Processing and Linear Systems, Berkeley Cambridge Press, 1998.
3. A. Anand Kumar, Signals and Systems, PHI, Third Edition, 2013.

Reference Books:

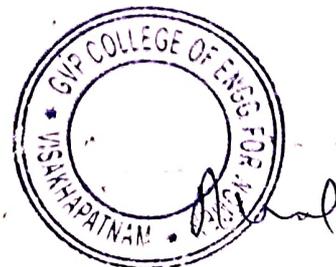
1. K. Raja Rajeswari and B. V. Rao, Signals and Systems, Prentice Hall India Learning Private Limited, Second edition, 2013.
2. P. Ramesh Babu and R. Ananda Natarajan, Signals and Systems, Scitech, Chennai, 3rdEdn, 2009.

Web References:

1. <https://youtube.com/playlist?list=PLyaSpOzTE6MRKIXQ1m2v13nd7ZUqKEN8&si=Np16Dmx6e2GgChXr>

PREVIOUS QP'S (JAN 2024 & 2025) PDF

PREVIOUS QP'S (JAN 2022 & 2023) PDF



11

11

UNIT-1

UNIT-1 SYLLABUS:

Introduction to signals and systems: Basic signals, elementary signals in continuous and discrete domain, classification of signals, useful signal operations, discrete signal models, discrete signal operations, classification of systems, basic system properties, unit impulse response of a system, system response to external input, system stability.

 PART-1 NOTES PDF

 PART-2 NOTES PDF

UNIT-2

UNIT-2 SYLLABUS:

Frequency analysis of continuous and Discrete time signals: Fourier Series Representation of continuous time Periodic Signals, convergence of the Fourier Series, exponential Fourier series, power density spectrum of periodic signals, Discrete time Fourier series(DTFS), power density spectrum of discrete periodic signals, Representation of aperiodic signals, Fourier Transform, transform of some useful functions, Fourier Transform for periodic signals, theorems and properties of Fourier transforms. Discrete time Fourier transform (DTFT), Convergence of DTFT, DTFT theorems and properties.

 PART-1 NOTES PDF

 PART-2 NOTES PDF

 PART-3 NOTES PDF



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UNIT-3

UNIT-3 SYLLABUS:

Convolution: Concept of convolution, Properties of convolution, Convolution theorems, Graphical procedure to perform convolution,

Correlation of signals: Concept of correlation-signal comparison, Cross correlation and its properties, Autocorrelation and its properties, relation between convolution and correlation.

 NOTES PDF

UNIT-4

UNIT-4 SYLLABUS

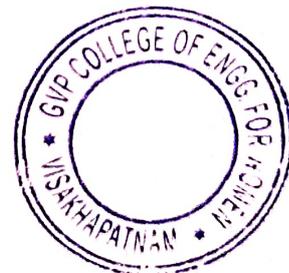
Laplace Transform: Introduction, The Laplace Transform, the region of convergence for Laplace Transforms, Properties of Laplace Transforms, the initial and final value theorems, commonly used Laplace Transform pairs, The Inverse Laplace Transform, Analysis and characterization of LTI systems using the Laplace Transforms.

 NOTES PDF

UNIT-5

UNIT-5 SYLLABUS

Sampling Theorem and Z-transform: sampling theorem, reconstruction of a signal from its samples using interpolation, The effect of Under sampling, aliasing, unilateral and bilateral Z-Transforms, Properties of Z-Transform, relationship of the Fourier transform to the Z-transform, Inverse Z-Transform Methods, the initial and final value theorems, some common Z-transform pairs, causality and stability, Analysis and characterization of LTI systems using the Z-Transforms.



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📁 > Courses > Computer Science Engineering(CSE) > Academic Year:2024-25 > Second Year > Section-2 > 24_25_21_CSE2_PSQT

⚠️ This course is hidden and cannot be accessed by students. [Click here to update settings](#)



Your progress

COURSE OUTCOMES

At the end of the course students able to

- Define and explain basic concepts in probability theory and how to translate real-world problems into probability models.
- Solve standard problems that include random variables, discrete and continuous probability distributions.
- Compute and interpret the results of Correlation analysis, Multivariate regression, Chi-Square test for independence and Goodness of Fit.
- Perform the testing of Hypothesis and construct a confidence interval to estimate population parameters.
- Explain the basic concepts of Markov processes, M/M/1 and M/M/C queueing systems.

SYLLABUS

PROBABILITY STATISTICS AND QUEUEING THEORY SYLLABUS

Handouts



- Probability Handout
- Discrete and Continuous Random variables Handout
- Probability Distributions Handout

Testing of Hypothesis

- chi-square test
- Testing of Hypothesis

QUEUEING THEORY

- INTRODUCTION
- Problems on Queueing Theory

OLD PAPERS

- 2022-2023
- OLD PAPER-2
- 2020-2021
- OLD PAPERS
- OLD PAPERS1
- 2023-2024 paper

Assignment

- Assignment-II



Topic 3

 UNIT3Notes by Dr.NS

 UNIT3P2 NOTES

UNIT4

 UNIT4

 Byzantine generals problemfinal

UNIT5

 UNIT5

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📁 > Courses > Electronics and Communication Engineering(ECE) > Academic Year:2024-25 > Fourth Year > 4_1_ECE_SC

⚠️ This course is hidden and cannot be accessed by students. [Click here to update settings](#)



Your progress

R20 IV-I SATELLITE COMMUNICATIONS

R20 IV-I ECE SATELLITE COMMUNICATIONS SYLLABUS

Outcomes:

At the end of this course the student can able to:

1. Understand the concepts, applications and subsystems of Satellite communications. 2. Derive the expression for G/T ratio and to solve some analytical problems on satellite link design.
3. Understand the various types of multiple access techniques and architecture of earth station design.
4. Understand the concepts of GPS and its architecture.

SC MID-I QUESTION BANK

TEXT BOOKS:

1. Satellite Communications - Timothy Pratt, Charles Bostian and Jeremy Allnutt, WSE, Wiley Publications, 2ndEdition, 2003.
2. Satellite Communications Engineering - Wilbur L. Pritchard, Robert A Nelson and Henri G. Suyderhoud, 2ndEdition, Pearson Publications, 2003.
3. Digital satellite communication by TRI T HATMH



REFERENCES:

1. Satellite Communications : Design Principles – M. Richharia, BS Publications, 2nd Edition, 2003.
2. Satellite Communication - D.C Agarwal, Khanna Publications, 5th Ed.
3. Fundamentals of Satellite Communications – K.N. Raja Rao, PHI, 2004
4. Satellite Communications – Dennis Roddy, McGraw Hill, 2nd Edition, 1996.

 SC MID-II ASSIGNMENT

 SC MID-II QUESTION BANK

 R20 SC JNTUK PREVIOUS PAPERS

UNIT I INTRODUCTION, ORBITAL MECHANICS AND LAUNCHERS

 SC UNIT-I LECTURE NOTES

UNIT II SATELLITE SUB SYSTEMS

 SC UNIT-II LECTURE NOTES

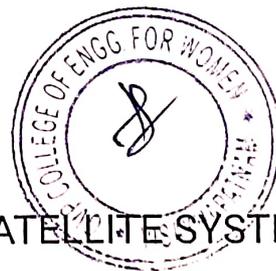
UNIT III SATELLITE LINK DESIGN

 SC UNIT-III LECTURE NOTES

UNIT IV MULTIPLE ACCESS, EARTH STATION TECHNOLOGY

 SC UNIT-IV LECTURE NOTES

UNIT V LOW EARTH ORBIT AND GEO-STATIONARY SATELLITE SYSTEMS,
SATELLITE NAVIGATION & THE GLOBAL POSITIONING SYSTEM





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📁 > Courses > Electronics and Communication Engineering(ECE) > Academic Year:2024-25 > Third Year
> Section-I > 3_1_ECE1_AIML

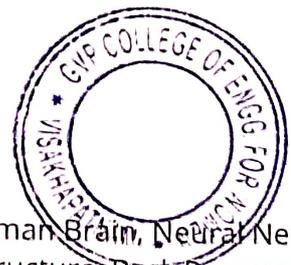
⚠️ This course is hidden and cannot be accessed by students. [Click here to update settings](#)

×

Your progress

CO1	Outline the key concepts of neural networks, including perceptron and backpropagation. (L2)
CO2	Explain different machine learning methods and their applications in real-world contexts. (L2)
CO3	Discuss the features and applications of various classification and regression algorithms. (L2)
CO4	Outline the architecture and layers of convolutional neural networks. (L2)
CO5	Describe the principles and applications of advanced AI models, DNN and GAN. (L2)

UNIT-1



Unit I: Introduction to Artificial Intelligence: Biological Motivation for a Human Brain, Neural Network Representation, ANN Architecture, Perceptron, Multi-Layer Perceptron Structure, Back Propagation.

UNIT-1

Handwritten signature



UNIT-2

Unit II: Machine Learning: Introduction to Machine Learning, Different Types of Machine Learning Methods, Supervised, Semi Supervised, Unsupervised and Reinforcement Learning.

 UNIT-2



UNIT-3

Unit III: Classification and Regression Algorithms: Difference Between Classification and Regression, Classification Algorithms, KNN, SVM Algorithms and its Applications, Regression Algorithm, Linear Regression, Decision Tree Regression and Random Forest Regression.

 UNIT-3



UNIT-4

Unit IV: Convolution Neural Networks: Introduction to Convolution Neural Networks, Basic Principle, Architecture, Types of CNN Layers, Pooling Layers, Convolution Layers and Fully Connected Layers, Applications of CNN.

 UNIT-4



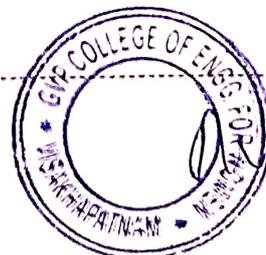
UNIT-5

Unit V: Advanced Topics in Artificial Intelligence and Machine Learning: DNN Model, Significance, Overview of DNN Technique and its Applications, Generative Models, Working Principle of GAN and its Applications.

 UNIT-5



 Navigation





📁 > Courses > Computer Science Engineering(CSE) > Academic Year:2024-25 > Fourth Year > Section-I
> 4_1_CSE_BCT

Your progress 

 Announcements

 BCT_SYLLABUS

 TB-Blockchain Blue print for Economy by Melanie Swan

 CO PO mapping of BCT

 JNTUQPAPER_BLOCK-CHAIN-TECHNOLOGIES-JAN-2024

 model paper related to syllabus

UNIT1

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 UNIT1Notes by Dr.NS

Topic 2

 UNIT2Notes

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opic 3

 UNIT3Notes by Dr.NS

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Department of Computer Science Engineering



Dr. P.V.S.L. Jagadamba
M.Tech., Ph.D
Professor & HOD
Contact : 0848483016
[Profile](#)

List of Faculty

Courses Offered

B.Tech(CSE) - Intake: 240

B.Tech(Cyber Security) - Intake: 60

M.Tech(Data Science) - Intake: 12

Clubs/Professional Bodies

CSI - Computer Society of India

[CSI Activities 2019-2020](#)

[CSI Activities 2020-2021](#)

[CSI Activities 2021-2022](#)

COSCENGRS - Computer Science Engineers

Department at a glance

Research

Department Vision

To evolve into a Centre of learning that imparts quality education in Computer Science and Engineering to produce highly competent professionals.

Department Mission

- Impart computing and technical skills with an emphasis on professional competency and human values.
- Enrich the learning aptitude to face the dynamic environment of the Computer Industry.
- Enhance the analytical and problem-solving capability through contests and technical seminars.

Program Educational Objectives

After successful completion of the program, the graduates will be able to:

- PEO-1: Apply both fundamental and advanced knowledge to analyse, design and develop innovative computing products.
- PEO-2: Design and develop interdisciplinary and innovative software systems for real-world problems.
- PEO-3: Inculcate soft skills, ethical conduct and an ability to engage in lifelong learning to serve the societal and environmental needs.

Program Specific Outcomes

Engineering Graduates will be able to:

- PSO-1: Develop real-time applications by applying software engineering principles and implementing with emerging technologies in the field of Computer Science and Engineering.
- PSO-2: Apply the knowledge of data analytics, soft computing, information security and other domains in Computer Science and Engineering for developing software systems.

Department of CSE(Artificial intelligence & Machine learning)



Dr. Dwiti Krishna Bebartha
M.Tech., Ph.D
Professor & HOD
Contact : 9381343654
[Profile](#)

List of Faculty

Courses Offered

B.Tech(AI & ML) - Intake: 180

Clubs/Professional Bodies

CSI - Computer Society of India

[CSI Activities 2019-2020](#)

[CSI Activities 2020-2021](#)

[CSI Activities 2021-2022](#)

Department at a glance

Research

[Online Certification Courses completed by the Faculty till sep 2021](#)

[Publications](#)

[Patents from CSE](#)

[Faculty Development Programs](#)

[List of Conferences](#)

Department Vision

Empower students in the areas of Artificial Intelligence and Machine Learning with interdisciplinary design skills and a highly professional mindset to enable them to effectively address technological and societal challenges.

Department Mission

- ❖ Foster a dynamic learning environment that empowers students through hands-on, interdisciplinary education.
- ❖ Collaborate with industry and academia to enhance professional readiness and innovation.
- ❖ Promote active engagement in co-curricular activities to develop leadership and social responsibility.

Program Educational Objectives

After successful completion of the program, the graduates will be able to:

- ❖ PEO-1: Equip graduates with fundamental knowledge in applied mathematics, sciences, and engineering skills for effective professional practice or advanced studies.
- ❖ PEO-2: Enable graduates to compete globally with innovative design skills in their respective fields.
- ❖ PEO-3: Foster continuous improvement in professional skills, social awareness, ethical conduct, and communication abilities

Program Specific Outcomes

Engineering Graduates will be able to:

- ❖ PSO-1: Deliver innovative solutions to real-world challenges using computer programming and emerging techniques.
- ❖ PSO-2: Analyze and implement AI and ML models for complex, multidisciplinary problems, optimizing performance and outcomes.



Dr P. Murali Krishna Prasad

M.Tech., Ph.D
Professor & HOD
Contact: 9849962648
[Profile](#)

[List of Faculty](#)

Courses Offered

B.Tech - ECE Intake: 120

M.Tech - VLSI Intake: 12

Clubs/Professional Bodies

ECLAT-A

[Student Activity](#)

[Department at a glance](#)

Research

[Online Certification Courses](#)

[Publications](#)

[Conference Publications and Book Chapters](#)

Department Vision

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

After successful completion of the program, the graduates will be able to:

- PEO-1: Analyze and apply the knowledge of Mathematics, Science, and Engineering concepts for solving Electronics and Communication Engineering problems.
- PEO-2: Solve complex problems in Electronics and Communication Engineering and its allied areas to attain optimum solutions.
- PEO-3: Excel in chosen career by exhibiting life skills and professional ethics in multidisciplinary fields through continuous learning and research.

Program Specific Outcomes

Engineering Graduates will be able to:

- 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.

Department of Electrical & Electronics Engineering

Solar Charging Station in EEE Department



Dr. R.V.S Lakshmi Kumari
B.Tech., M.Tech., Ph.D
Professor & HOD
Contact : 7093413324
[Profile](#)

List of Faculty

Courses Offered

B.Tech - Intake: 60

Clubs/Professional Bodies

TESLA - *Technolosky Electrical Scientella*

Department at a glance

Research

[Journal Publications from EEE](#)

[Conference Publications from EEE](#)

[Patents from EEE](#)

[Book Chapters from EEE](#)

[Faculty Development Programs](#)

[Innovative Methodologies](#)

Department Vision

To develop into a centre of learning that empowers students with contemporary knowledge in Electrical & Electronics Engineering for their overall growth.

Department Mission

- Impart skills both in traditional and modern areas of Electrical & Electronics Engineering
- Provide exposure to latest developments in the field through Seminars, Industrial visits, Workshops and Paper presentations.
- Prepare the young minds to apply professional engineering practices by considering environmental and societal needs.

Program Educational Objectives

After successful completion of the program, the graduates will be able to:

- PEO-1: Applying fundamentals of Mathematics, Science, Electrical and Electronics Engineering and soft skills in their Professional Engineering Practice.
- PEO-2: Exhibit critical thinking, problem solving skills and design systems for real world problems.
- PEO-3: Establish leading positions in society by adopting professional ethics and life long learning.

Program Specific Outcomes

Engineering Graduates will be able to:

- PSO-1: Design and analyze systems that efficiently generate, transmit, distribute and utilize electrical power.
- PSO-2: Demonstrate the proficiency in the use of hardware and software tools for solving the complex engineering problems in renewable energy and other emerging areas.

Department of Information Technology



Dr. M. Bhanu Sridhar
B.E.,M.Tech.,Ph.D
Professor & HOD
Contact : 9490458740
[Profile](#)

List of Faculty

Courses Offered

B.Tech(IT) - Intake: 60

Clubs/Professional Bodies

CSI - Computer Society of India

SPIKE - Students Fanapoly of Information Knowledge Enhancement

Department at a glance

Research

[Publications](#)

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[Faculty Development Programs](#)

[Patents](#)

Department Vision

The Department of IT strives to produce competent professionals who are technically sound and ethically strong for the IT industry.

Department Mission

- Provide quality training that prepares Students to be technically competent for the Industrial and Societal needs.
- Facilitate an environment that promotes continuous learning to face the challenges in the IT sector.
- Provide opportunities for learning, leadership and communication skills.

Program Educational Objectives

After successful completion of the program, the graduates will be able to:

- PEO-1: Apply, analyze and solve complex engineering problems using emerging IT technologies with the help of fundamental knowledge in mathematics, science, and engineering.
- PEO-2: Comprehend, Analyse, Design and Create innovative computing products and solutions for real-life problems.
- PEO-3: Inculcate the necessary skills to engage in lifelong learning.

Program Specific Outcomes

Engineering Graduates will be able to:

- PSO-1: Develop software applications by analyzing, designing and implementing with cutting edge technology to address the needs of IT industry.
- PSO-2: Apply the knowledge of Data Science, machine learning, image processing and allied areas to obtain optimized solutions for real time problems.