



GEMS POLYTECHNIC COLLEGE

(Approved by AICTE, Govt. of India, F. No Northern/2015/1-2474317051)

NH-2, Jogiya more, Ratanpura, Aurangabad, Bihar– 824121

Department of Computer Science & Engineering

Course Outcome statement semester wise

Semester -1

Course Name	Basic Engineering Mathematics - T2400101	Course Year	2024-2025	Semester	1
CO 101.1	Solve the systems of equations of matrices & Vector algebra				
CO 101.2	Solve the simple problems on functions, limits, continuity function and derivatives.				
CO 101.3	Solve the problems & applications on differential calculus.				
CO 101.4	Use the concept of Coordinate geometry to solve the problems.				
CO 101.5	Use the concepts of probability and solve the problems.				

Course Name	Applied Physics- 2400102B	Course Year	2024-2025	Semester	1
CO 102.1	Estimate the errors in measurements of physical quantity with precision.				
CO 102.2	Apply the concept of waves for various engineering applications involving wave dynamics.				
CO 102.3	Apply the concepts of electromagnetics in engineering applications.				
CO 102.4	Use semiconductor devices for various electronics related applications.				
CO 102.5	Apply the basic concepts of modern physics for solving engineering problems.				

Course Name	: Fundamentals of Electrical and Electronic Engg. 2420103	Course Year	2024-2025	Semester	1
CO 103.1	Apply basic concepts of electricity to determine various electric parameters in a given electrical system.				
CO 103.2	Apply the fundamental laws and concepts of DC and AC circuits to a given electrical system.				
CO 103.3	Apply the principles of magnetism and electromagnetism to a given equipment.				
CO 103.4	Test the functionality of a given basic electronic component.				
CO 103.5	Use Boolean expressions and number systems to realize the basic logic circuits.				

Course Name	Fundamental of IT System - 2418104	Course Year	2024-2025	Semester	1
CO 104.1	Appraise computer systems and its applications for various educational, business, and industrial domain.				
CO 104.2	Design simple digital logic circuit function using basic universal logic gates				
CO 104.3	Configure different Operating Systems.				
CO 104.4	Create a physical network according to the given topology and troubleshoot it.				
CO 104.5	Classify the types of cyber-attack				

Course Name	Electrical and Electronics Workshop - 2420105	Course Year	2024-2025	Semester	1
CO 105.1	Use measuring devices and hand tools effectively.				
CO 105.2	Undertake wood working operations economically and safely.				
CO 105.3	Perform various joining operations using welding, brazing and soldering methods.				
CO 105.4	Identify basic electrical and electronics components.				
CO 105.5	Use firefighting equipment and other safety related accessories.				

Course Name	ICT Tools - 2418107(P2418107/S2418107)	Course Year	2024-2025	Semester	1
CO 106.1	Prepare business document using word processing tool.				
CO 106.2	Manipulate data and represent it graphically using spreadsheet.				
CO 106.3	Prepare professional slide-based presentations.				
CO 106.4	Work effectively with Internet and basic web services				

Course Name	Indian Constitution - 2400007(T2400007)	Course Year	2024-2025	Semester	1
CO 107.1	Enumerate salient features and characteristics of the constitution of India.				
CO 107.2	Follow fundamental rights and duties as responsible citizen and engineer of the country.				
CO 107.3	Analyze major constitutional amendments in the constitution.				

Course Name	Open Educational Resources (OER) - : 2400009(T2400009)	Course Year	2024-2025	Semester	1
CO 108.1	Use Open Educational Resources (OER) after their evaluation				
CO 108.2	Use copyright material appropriately.				
CO 108.3	Implement suitable Creative Common License.				

Semester - 2

Course Name	Programming with C - 2418101	Course Year	2024-2025	Semester	2
CO 109.1	Develop flowchart and algorithm to solve problems logically.				
CO 109.2	Write simple 'C' programs using arithmetic expressions.				
CO 109.3	Develop 'C' programs using control structure.				
CO 109.4	Develop 'C' programs using arrays and structures.				
CO 109.5	Develop/Use functions in C programs for modular programming approach.				
CO 109.6	Develop 'C' programs using pointers.				

Course Name	Web Technology - 2418102	Course Year	2024-2025	Semester	2
CO 110.1	Create and link web pages using block level and text level formatting tags				
CO 110.2	Organize the content using table and frames.				
CO 110.3	Apply presentation schemes on content using CSS.				
CO 110.4	Create interactive web pages using basic JavaScript.				
CO 110.5	Use objects and events in JavaScript				

Course Name	Applied Chemistry- B - 2400103B	Course Year	2024-2025	Semester	2
CO 111.1	Solve various engineering problems applying the basic concepts of atomic structure, chemical bonding, and solutions.				
CO 111.2	Use relevant water treatment techniques to solve domestic and industrial problems.				
CO 111.3	Solve emerging problems using concept of engineering materials and properties.				
CO 111.4	Analyze the behavior of given materials under different temperature and pressure conditions.				
CO 111.5	Solve the engineering problems using the concept of electrochemistry and corrosion.				

Course Name	Communication Skills (English) - 2400104	Course Year	2024-2025	Semester	2
CO 112.1	Communicate contextually in different situations.				
CO 112.2	Use Verbal Communication Effectively				
CO 112.3	Deploy Non-Verbal Communication Contextually.				
CO 112.4	Write various texts using vocabulary and correct grammar.				
CO 112.5	Draft effective business correspondence with brevity and clarity.				

Course Name	Applied Mathematics- B - 2400105B	Course Year	2024-2025	Semester	2
CO 113.1	Demonstrate the ability to solve engineering-related problems based on applications of integration.				
CO 113.2	Use the concept of number theory in problem-solving for cryptography and data compression.				
CO 113.3	Perform computation for reaching solutions to nonlinear equations of branch-specific problems.				
CO 113.4	Use linear algebra to solve branch-specific problems.				
CO 113.5	Apply Linear programming for optimization problems.				

Course Name	Professional Ethics - 2400107	Course Year	2024-2025	Semester	2
CO 114.1	Demonstrate good values and ethics in the day to day activities and at workplace.				
CO 114.2	Identify a set of values and ethics related to fair professional practice.				

Course Name	Essence of Indian Knowledge System and Tradition - : 2400108	Course Year	2024-2025	Semester	2
CO 115.1	Identify the rich heritage and legacy residing in our Indian Knowledge systems.				
CO 115.2	Correlate the technological & philosophical concepts of IKS with engineering domain specific problems and local problems for finding out possible solutions.				

Semester - III

Course Name	: Data Structures and Algorithm - : 2418301	Course Year	2024-2025	Semester	3
CO 201.1	Analyze the efficiency of algorithm				
CO 201.2	Implement operations on linear data structures				
CO 201.3	Implement operations on non-linear data structures				
CO 201.4	Apply different searching, sorting and hashing techniques to solve				
CO 201.5	Design efficient algorithms to solve the real-world problems.				

Course Name	Operating System - : 2418302	Course Year	2024-2025	Semester	3
CO 202.1	Enumerate the types and functions of operating systems.				
CO 202.2	Explain the process and inter process communication.				
CO 202.3	Analyze issues related to CPU scheduling and deadlocks.				
CO 202.4	Illustrate the concept of Memory management and virtual memory.				
CO 202.5	Illustrate the concept of File management.				

Course Name	Discrete Structure - 2418303	Course Year	2024-2025	Semester	3
CO 203.1	Demonstrate proficiency in recognizing and applying various logic and proof techniques for engineering applications.				
CO 203.2	Apply the concepts of set theory, relations and their application in modeling computer science engineering-based problems.				
CO 203.3	Apply combinatorial principles to solve branch specific problems.				
CO 203.4	Use graph theoretic principles to solve computer science engineering related problems.				
CO 203.5	Solve computer science engineering-based problems using the basics of fuzzy set theory.				

Course Name	Digital Electronics and Microprocessor - : 2418304	Course Year	2024-2025	Semester	3
CO 204.1	Minimize the Boolean expressions and implement it using logic gates.				
CO 204.2	Test simple combinational and sequential circuits.				
CO 204.3	Use data converters and memory in digital electronic systems.				
CO 204.4	Develop simple assembly language programs for various operations using instruction set of 8085 microprocessors.				
CO 204.5	Interface the memory and I/O devices to 8085 microprocessors.				

Course Name	Python Programming - 2418305	Course Year	2024-2025	Semester	3
CO 205.1	Use various data types and operators in formation of expressions.				
CO 205.2	Write and execute programs using control statements.				
CO 205.3	Perform relevant operations on Sequence data types				
CO 205.4	Create functions in modules				
CO 205.5	Use numpy in writing python programs				
CO 205.6	Handle data files and exceptions.				

Course Name	Summer Internship -I - 2418306	Course Year	2024-2025	Semester	3
CO 206.1	Comprehend the practices of identified industry or world of work related to diploma engineering programme of study.				
CO 206.2	Map real equipment, processes, product, management, operations etc. to the course of study through various glimpses of input, process and output in different type of industries.				
CO 206.3	Identify the probable enterprises /startups for futuristic planning and self-growth.				
CO 206.4	Identify the probable job function and job position in their relevant programme of study.				

Course Name	Sports, Yoga and Meditation - 2400008(P2400008/S2400008)	Course Year	2024-2025	Semester	3
CO 207.1	Select appropriate physical activities to maintain healthy lifestyle.				
CO 207.2	Apply basic principles and practices of Yoga and meditation for overall growth & development.				
CO 207.3	Use fitness and wellness techniques for optimal health and wellbeing				
CO 207.4	Apply ancient Indian ayurvedic methods and techniques, exercises, yoga and meditation for fitness and wellness.				

Course Name	Principles of Management - 2400111	Course Year	2024-2025	Semester	3
CO 208.1	Design strategic plan for various types of organizations.				
CO 208.2	Take decisions to handle world of work situations.				
CO 208.3	Formulate organizational hierarchy for different situations.				
CO 208.4	Identify various leadership styles.				

Semester- 4

Course Name	Java Programming - 2418401	Course Year	2024-2025	Semester	4
CO 209.1	Implement Control structure in Java using concept of Class and Object				
CO 209.2	Develop programs using Constructor and String Class				
CO 209.3	Apply concept of inheritance for code reusability.				
CO 209.4	Implement Exception Handling and multithreading				
CO 209.5	Develop programs for handling I/O and file streams.				

Course Name	Theory of computation - 2418402	Course Year	2024-2025	Semester	4
CO 210.1	Establish Relationship between grammar and language in the context of Theory of Computation.				
CO 210.2	Apply finite automata, regular expressions, and regular grammar to recognize and generate regular languages.				
CO 210.3	Analyze context-free languages and pushdown automata to determine their equivalence with context- free grammars.				
CO 210.4	Evaluate Turing machines to solve problems considering their capabilities and limitations.				
CO 210.5	Apply Rice's theorem to demonstrate undecidable problems about languages.				
CO 210.6	Transforming one problem into another problem using reduction algorithm.				

Course Name	Database Management System - 2418403	Course Year	2024-2025	Semester	4
CO 211.1	Illustrate the fundamental concepts of Database, Database System and Database Management System.				
CO 211.2	Use the concepts of E-R Modeling, Keys and constraints to design a database				
CO 211.3	Normalize/De-normalize the database to optimize its performance				
CO 211.4	Use Structured Query Language (SQL) for database manipulation				
CO 211.5	Create and use schema objects such as View, Index, Synonyms and Sequence to optimize database performance.				

Course Name	Computer Organization and Architecture - 2418404	Course Year	2024-2025	Semester	4
CO 212.1	Elaborate the basic architecture of Central processing Unit (CPU)				
CO 212.2	Analyze the operations of Arithmetical and Logical Unit (ALU) by applying various arithmetic operation principles.				
CO 212.3	Analyze communication paradigm of I/O devices and standard I/O interfaces				
CO 212.4	Analyze the performance of various classes of Memories				
CO 212.5	Calculate the performance of CPU in Pipelined based architecture.				

Course Name	Computer Troubleshooting & Maintenance - 2418405	Course Year	2024-2025	Semester	4
CO 213.1	Troubleshoot the computer system.				
CO 213.2	Troubleshoot peripheral devices.				
CO 213.3	Troubleshoot operating system, security threats and driver-related problems.				
CO 213.4	Troubleshoot network and internet connectivity.				
CO 213.5	Recover data and optimize system performance.				

Course Name	Environmental Education and Sustainable Development - : 2400006	Course Year	2024-2025	Semester	4
CO 214.1	Explain the importance of ecosystem for the protection of environment				
CO 214.2	Use relevant air & water pollution control methods to solve pollution related issues				
CO 214.3	Recognize relevant energy sources required for domestic & industrial application				
CO 214.4	Analyze the issues of climate change and its impact on sustainability				
CO 214.5	Apply engineering solutions/methods/legislations to reduce the activities that are harming the environment.				

Course Name	Employability Skills Development - 2400408	Course Year	2024-2025	Semester	4
CO 215.1	Build resume and showcase portfolio for placement activity.				
CO 215.2	Face interviews and participate effectively in Group Discussions.				
CO 215.3	Apply engineering tools in work situations and societal processes.				

Course Name	Community/ Society Development (Non-Exam Course) - 2400110	Course Year	2024-2025	Semester	4
CO 216.1	Identify the issues and problems faced by local communities/societies that can be addressed through community development schemes for sustainable development.				
CO 216.2	Prepare an action plan for an identified issue under community development scheme for a selected area.				

SEMSTER - 5

Course Name	Data Communication and Computer Network - 2418501	Course Year	2024-2025	Semester	5
CO 301.1	Choose the appropriate transmission media type based on the needs.				
CO 301.2	Explain the function of Data link layer protocols.				
CO 301.3	Create subnet for given IP				
CO 301.4	Explain the function of Transport layer protocols				
CO 301.5	Create FTP and HTTP server				

Course Name	Software Engineering - 2418502	Course Year	2024-2025	Semester	5
CO 302.1	Choose suitable Software process model for software development.				
CO 302.2	Prepare software requirement specifications (SRS) for a given problem.				
CO 302.3	Construct data designs using different software models.				
CO 302.4	Evaluate size and cost of software product.				
CO 302.5	Plan software testing for quality assurance				
CO 302.6	Prepare plan to schedule and track the progress of a given project using project management techniques				

Course Name	Programme Electives* -Data Science: Data Warehousing and Data Mining / Advanced JAVA Programming - 2418503	Course Year	2024-2025	Semester	5
CO 303.1	Apply statistical methods and forecasting techniques for data analysis.				
CO 303.2	Explain the architecture and benefits of data warehousing.				
CO 303.3	Prepare / Pre-process data for data mining.				
CO 303.4	Use classification techniques for predicting class label attributes.				
CO 303.5	Use clustering techniques to identify groups of similar objects in datasets.				

Course Name	Open Electives**/ - 3D Printing & Design - 2400504	Course Year	2024-2025	Semester	5
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Course Name	Entrepreneurship Development & Start-ups - 2400505	Course Year	2024-2025	Semester	5
CO 305.1	Demonstrate traits of a successful intrapreneur/ entrepreneur/ start-up co-founder.				
CO 305.2	Innovate products and services using creativity and innovation techniques.				
CO 305.3	Manage critical resources from support institutions.				
CO 305.4	Prepare sustainable small business plans.				

Course Name	Summer Internship- II - 2418506	Course Year	2024-2025	Semester	5
CO 306.1	Develop the comprehensive view of industry 4.0 elements and 21st century skills requirements in the relevant diploma engineering programme through Summer Internship-II.				
CO 306.2	Outline the importance of industrial training and Internship for gaining direct practical skills on their relevant domain area of industrial equipment, automation, machinery, processes, product, management, operations, software development etc.				
CO 306.3	Use the knowledge and skills gained during industrial training or world of work.				

Course Name	Minor Project - 2418507	Course Year	2024-2025	Semester	5
CO 307.1	Identify a real-world problem in the form of a project to be developed.				
CO 307.2	Perform literature survey related to the identified area/problem.				
CO 307.3	Identify preliminary resource requirements (Equipment, Tools, Software, Manpower, Services)				
CO 307.4	Prepare project synopsis for the identified problem/project title within stipulated time period.				

SEMESTER - 6

Course Name	Cloud Computing - 2418601	Course Year	2024-2025	Semester	6
CO 308.1	Maintain various Cloud based service.				
CO 308.2	Implement virtualization in cloud.				
CO 308.3	Maintain storage in cloud.				
CO 308.4	Configure and manage cloud-based networks.				
CO 308.5	Implement security measures for cloud resources.				

Course Name	Computer Network with Linux and Windows - 2418602	Course Year	2024-2025	Semester	6
CO 309.1	Share Files/Devices on LAN.				
CO 309.2	Select the appropriate type of wireless/wire-bound media for network connectivity.				
CO 309.3	Create subnets using the given IPv4 address.				
CO 309.4	Manage network interfaces and network services on Linux systems.				
CO 309.5	Manage network interfaces and network services on Windows systems.				

Course Name 310	Programme Electives* - (Introduction to Machine Learning/ Mobile Application Development) - 2418603	Course Year	2024-2025	Semester	6
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Course Name	Open Electives**/ COE (3D Printing & Design) - 2400604	Course Year	2024-2025	Semester	6
CO 311.1	Select newer 3D Printing material for various applications.				
CO 311.2	Use solid based 3D Printing processes to develop products.				
CO 311.3	Use liquid-based 3D Printing processes to develop products.				
CO 311.4	Use powder-based 3D Printing processes to develop products.				
CO 311.5	Apply post processing techniques and quality checks on 3D printed components.				

Course Name	Major Project - 2418605	Course Year	2024-2025	Semester	6
CO 312.1	Integrate the knowledge (K), skills (S), attitudes (A) developed, in a new task or problem identified in the form of project work.				
CO 312.2	Develop higher level of cognitive, psychomotor and affective domain skills relevant to the course/programme.				
CO 312.3	Solve the industrial/real world problems/tasks by Integrating the generic skills/soft skills/employable skills with relevant technical skills.				
CO 312.4	Develop the capabilities and skills of innovativeness, creativity, resourcefulness, time management, problem solving abilities, interpersonal skills, pro-activeness, cost effectiveness, environment consideration and sustainability.				
CO 312.5	Prepare the project report.				