



GURU NANAK INSTITUTE OF TECHNOLOGY

DEPARTMENT OF COMPUTER SCIENCE ENGINEERING

PROGRAM EDUCATIONAL OBJECTIVES

PEO 1: Graduates shall have the ability to apply knowledge across the Branches and in emerging areas of CE/ME/EEE/ECE/CSE/IT for higher studies, research, employability and handle the realistic problems.

PEO 2: Graduates shall have good communication skills, to possess ethical conduct, sense of responsibility to serve the society, and protect the environment.

PEO 3: Graduates shall have strong foundation in academic excellence, soft skills, managerial skills, leadership qualities and understand the need for lifelong learning for a successful professional career.

PROGRAM SPECIFIC OBJECTIVES

PSO1: Professional Skills: The ability to understand, analyze and develop computer programs in the areas related to algorithms, system software, multimedia, web design, big data analytics, and networking for efficient design of computer-based systems of varying complexity.

PSO2: Problem-Solving Skills: The ability to apply standard practices and strategies in software project development using open-ended programming environments to deliver a quality product for business success.

PSO3: Successful Career and Entrepreneurship: The ability to employ modern computer languages, environments, and platforms in creating innovative career paths to be an entrepreneur, and a zest for higher studies



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PROGRAMME OUTCOMES:

Engineering Graduates will be able to:

1. **Engineering Knowledge:** Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
2. **Problem analysis:** Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics natural science, and engineering sciences.
3. **Design / development of solutions:** Design solutions for complex engineering problems and design system components or process that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, society and environmental consideration.
4. **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.
5. **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.
6. **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.
7. **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.
8. **Ethics:** Apply ethics principles and commit to professional ethics and responsibilities and norms of the engineering practice.
9. **Individual and team work:** Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
10. **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.
11. **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 an team, to manage projects and in multidisciplinary environments.
12. **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.



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COURSE OUTCOMES

PROGRAMME: B.TECH	DEGREE: UG	A.Y: 2019-20	SEMESTER: I&II
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S.No	Year / Sem	Course Name	Course Outcomes (Student will be able to understand)
1	I-I	Mathematics-I	CO1: Write the matrix representation of a set of linear equations and to analyse the solution of the system of equations
			CO2: Reduce the quadratic form to canonical form using orthogonal transformations. Analyse the nature of sequence and series
			CO3: Solve the applications on the mean value theorems. Evaluate the improper integrals using Beta and Gamma functions.
			CO4: Find the extreme values of functions of two variables with/ without constraints
2	I-I	Chemistry	CO1 The knowledge of atomic, molecular and electronic changes, band theory related to conductivity
			CO2: The required principles and concepts of electrochemistry, corrosion and in understanding the problem of water and its treatments.
			CO3 The required skills to get clear concepts on basic spectroscopy and application to medical and other fields.
			CO4: The knowledge of configurational and conformational analysis of molecules and reaction mechanisms.
3	I-I	English	CO1: Use English Language effectively in spoken and written forms.
			CO2: Comprehend the given texts and respond appropriately.
			CO3: Communicate confidently in various contexts and different cultures.
			CO4: Acquire basic proficiency in English including reading and listening comprehension, writing and speaking skills.
4	I-I	Basic Electrical Engineering	CO1: Students will be able to analyze the basic concepts like ohms law, KCL, KVL, for different electrical networks and apply them to other networks reduction techniques.
			CO2: Students will be able to distinguish between AC and DC, demonstrate terminology used in AC Circuits, and



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			able to know the advantages and applications of AC Circuits.
			CO3: Students will be able to explain in detail about Transformers.
			CO4: Students will be able to distinguish between different types of DC/AC machines
			CO5: Students will be obtaining knowledge of various electrical installations.
5	I-II	Mathematics-II	CO1: Identify whether the given differential equation of first order is exact or not.
			CO2: Solve higher differential equation and apply the concept of differential equation to real world problems.
			CO3: Evaluate the multiple integrals and apply the concept to find areas, volumes, centre of mass and Gravity for cubes, sphere and rectangular parallelepiped
			CO4: Evaluate the line, surface and volume integrals and converting them from one to another.
6	I-I	Applied Physics	CO1: The student would be able to learn the fundamental concepts on Quantum behaviour of matter in its micro state.
			CO2: The knowledge of fundamentals of Semiconductor physics, Optoelectronics, Lasers and fibre optics enable the students to apply to various systems like communications, solar cell, photo cells and so on.
			CO3: Design, characterization and study of properties of material help the students to prepare new materials for various engineering applications.
			CO4: The course also helps the students to be exposed to the phenomena of electromagnetism and also to have exposure on magnetic materials and dielectric materials.
7	I-II	Programming For Problem Solving	CO1: Demonstrate the basic knowledge of computer hardware and software.
			CO2: Ability to write algorithms and draw flow charts for solving problems.
			CO3: Ability to code a given logic in C programming language.
			CO4: Implementing different searching and sorting techniques for problem solving.
8	I-II	Engineering Graphics	CO1: Preparing working drawings to communicate the ideas and information.
			CO2: Read, understand and interpret engineering drawings.
9	II-I	Analog and	CO1: Know the characteristics of various components.



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		Digital Electronics	CO2: Understand the utilization of components. CO3: Design and analyze small signal amplifier circuits. CO4: Learn Postulates of Boolean algebra and to minimize combinational functions CO5: Design and analyze combinational and sequential circuits CO6: Know about the logic families and realization of logic gates.
10	II-I	Data Structures	CO1: Ability to select the data structures that efficiently model the information in a problem. CO2: Ability to assess efficiency trade-offs among different data structure implementations or combinations. CO3: Implement and know the application of algorithms for sorting and pattern matching. CO4: Design programs using a variety of data structures, including hash tables, binary and general tree structures, search trees, tries, heaps, graphs, and AVL-trees.
11	II-I	Computer Oriented Statistical Methods	CO1: Apply the concepts of probability and distributions to some case studies CO2: Correlate the material of one unit to the material in other units CO3: Resolve the potential misconceptions and hazards in each topic of study.
12	II-I	Object Oriented Programming Through C++	CO1: Able to develop programs with reusability CO2: Develop programs for file handling CO3: Handle exceptions in programming CO4: Develop applications for a range of problems using object-oriented programming techniques
13	II-I	Computer Organization And Architecture	CO1: Understand the basics of instructions sets and their impact on processor design. CO2: Demonstrate an understanding of the design of the functional units of a digital computer system. CO3: Evaluate cost performance and design trade-offs in designing and constructing a computerprocessor including memory. CO4: Design a pipeline for consistent execution of instructions with minimum hazards CO5: Recognize and manipulate representations of numbers stored in digital computers
14	II-II	Discrete Mathematics	CO1: Ability to understand and construct precise mathematical proofs CO2: Ability to use logic and set theory to formulate precise statements CO3: Ability to analyze and solve counting problems on finite and discrete structures CO4: Ability to describe and manipulate sequences



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			CO5: Ability to apply graph theory in solving computing problems
15	II-II	Database Management Systems Database Management Systems	CO1: Gain knowledge of fundamentals of DBMS, database design and normal forms
			CO2. Master the basics of SQL for retrieval and management of data
			CO3: Be acquainted with the basics of transaction processing and concurrency control.
			CO4: Familiarity with database storage structures and access techniques
16	II-II	Operating Systems	CO1: Gain knowledge of fundamentals of DBMS, database design and normal forms
			CO1: Will be able to control access to a computer and the files that may be shared
			CO2: Demonstrate the knowledge of the components of computer and their respective roles in computing
			CO3: Ability to recognize and resolve user problems with standard operating environments.
17	II-II	Business Economics And Financial Analysis	CO4: Gain practical knowledge of how programming languages, operating systems, and architectures interact and how to use each effectively.
			The students will understand the various Forms of Business and the impact of economic variables on the Business. The Demand, Supply, Production, Cost, Market Structure, Pricing aspects are learnt. The Students can study the firm's financial position by analyzing the Financial Statements of a Company
18	II-II	Java Programming	CO1:Able to solve real world problems using OOP techniques
			CO2:. Able to understand the use of abstract classes.
			CO3: Able to solve problems using java collection framework and I/o classes
			CO4: Able to develop multithreaded applications with synchronization.
			CO5:Able to develop applets for web applications
			CO6: Able to design GUI based applications
19	II-II	Constitution Of India	CO1: Understand the meaning and importance of Constitution
			CO2: Explain about making of Indian Constitution - contribution of Constituent assembly on it
			CO3: Describe the Salient (Outstanding) features of Indian Constitution.
			CO4: Describe the importance of Preamble of the Indian Constitution and its significance
20		Design And	CO1: Ability to analyze the performance of algorithms.



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	III- I	Analysis Of Algorithms	CO2: Ability to choose appropriate algorithm design techniques for solving problems.
			CO3: Ability to understand how the choice of data structures and the algorithm design methods impact the performance of programs.
21	III- I	Data Communication And Computer Networks	CO1: Students should be understand and explore the basics of Computer Networks and Various Protocols. He/She will be in a position to understand the World Wide Web concepts.
			CO2: Students will be in a position to administrate a network and flow of information further he/she can understand easily the concepts of network security, Mobile and ad hoc networks
23	III- I	Fundamentals Of Management	CO1: The students understand the significance of Management in their Profession.
			CO2: The various Management Functions like Planning, Organizing, Staffing, Leading, Motivation and Control aspects are learnt in this course.
			CO3: The students can explore the Management Practices in their domain area.
24	III-I	Software Engineering	CO1: Ability to identify the minimum requirements for the development of application.
			CO2: Ability to develop, maintain, efficient, reliable and cost effective software solutions
			CO3: Ability to critically thinking and evaluate assumptions and arguments.
25	III-1	Disaster Management	CO1: Perceive knowledge of disaster management
			CO2: Omit the risk and loss of property
			CO3: Omit the loss of lives during disaster
			CO4: Plan in all disaster related measures
26	III-II	Compiler Design	CO 1: Ability to design, develop, and implement a compiler for any language
			CO 2: Able to use lex and yacc tools for developing a scanner and a parser
			CO 3: Able to design algorithms to perform code optimization in order to improve the performance of a program in terms of space and time complexity
			CO 4: Ability to design algorithms to generate machine code
27	III-II	Web Technologies	CO 1: gain knowledge of client side scripting, validation of forms and AJAX programming
			CO 2: have understanding of server side scripting with PHP language
			CO3: have understanding of what is XML and how to parse and use XML Data with Java



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			CO4: To introduce Server side programming with Java Servlets and JSP
28	III-II	Cryptography And Network Security	CO1. Student will be able to understand basic cryptographic algorithms, message and web authentication and security issues.
			CO2: Ability to identify information system requirements for both of them such as client and server
			CO3: Ability to understand the current legal issues towards information security
29	III-II	Intellectual Property Rights	CO1: Analyze international intellectual property rights system, the main forms of intellectual property rights and the relevant.
			CO2: Demonstrate context of sustainable development.
			CO3: Estimate three dimensions of sustainable development: Environmental, Economic and social.
30	III-II	Design Patterns	CO1: Create software designs that are scalable and easily maintainable
			CO2: Understand the best use of Object Oriented concepts for creating truly OOP programs
			CO3: Use creational design patterns in software design for class instantiation
			CO4: Use structural design patterns for better class and object composition
			CO5: Use behavioral patterns for better organization and communication between the objects
			CO6: Use refactoring to compose the methods for proper code packaging
			CO7: Use refactoring to better organize the class responsibilities of current code
31	IV-1	Data Mining	CO1: Ability to perform the preprocessing of data and apply mining techniques on it.
			CO2: Ability to identify the association rules, classification and clusters in large data sets.
			CO3: Ability to solve real world problems in business and scientific information using data mining
			CO4: Ability to classify web pages, extracting knowledge from the web
32	IV-1	Principles Of Programming Languages	CO1: Ability to express syntax and semantics in formal notation.
			CO2: Ability to apply suitable programming paradigm for the application.
			CO3: Ability to compare the features of various programming languages.



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			CO4: Able to understand the programming paradigms of modern programming languages.
			CO5: Able to understand the concepts of ADT and OOP.
			CO6: Ability to program in different language paradigms and evaluate their relative benefits.
33	IV-1	Python Programming	CO1: Examine Python syntax and semantics and be fluent in the use of Python flow control and functions.
			CO2: Demonstrate proficiency in handling Strings and File Systems.
			CO3: Create, run and manipulate Python Programs using core data structures like Lists, Dictionaries and use Regular Expressions
			CO4: Interpret the concepts of Object-Oriented Programming as used in Python.
			CO5: Implement exemplary applications related to Network Programming, Web Services and Databases in Python.
34	IV-1	Distributed Systems Distributed Systems	CO1: Able to comprehend and design a new distributed system with the desired features.
			CO2: Able to start literature survey leading to further research in any subarea.
			CO3: Able to develop new distributed applications
35	IV-1	Cloud Computing	CO1: This course provides an insight into cloud computing
			CO2: Topics covered include- distributed system models, different cloud service models, service-oriented architectures, cloud programming and software environments, resource management.
36	IV-II	Entrepreneur Resource Planning Entrepreneur Resource Planning	CO1: Identify the important business functions provided by typical business software such as enterprise resource planning and customer relationship management.
			CO2: Describe basic concepts of erp systems for manufacturing or service companies
			CO3: Analyze the technical aspect of telecommunication systems, internet and their roles in business environment
37	IV-II	Modern Software Engineering	CO1: Apply the basic concepts of software engineering
			CO2: Identify the significance of process models.
			CO3: Applying the Agile Methodology
38	IV-II	Computer Forensics	CO1: Students will understand the usage of computers in forensic, and how to use various forensic tools for a wide variety of investigations.
			CO2: It gives an opportunity to students to continue their zeal in research in computer forensics