

Course Outcomes (COs)

On completion of these courses, the students will be able to:

B.E. (Computer) 1st Year

Course Code - Name	Course Outcomes
2110002- COMMUNICATION SKILLS	CO1: Aware of the elements of functional English in order to make them authentic users of language in any given academic and/or professional situation. CO2: Proficient in making academic presentations. CO3: Exposed to the real-time career oriented environment. CO4: Develop felicity of expression and familiarity with technology enabled communication. CO5: Exposed to the corporate etiquette and rhetoric.
2110003- COMPUTER PROGRAMMING AND UTILIZATION	CO1: Recognize the changes in hardware and software technologies with respect to the evolution of computers and describe the function of system software (operating Systems) and application softwares. CO2: Illustrate the flowchart and inscribe an algorithm for a given problem describe C programs using operators. CO3: Develop conditional and iterative statements to write C programs. CO4: Exercise user defined functions to solve real time problems. CO5: Inscribe C programs that use Pointers to access arrays, strings and functions. CO6: Exercise user defined data types including structures and unions to solve problems.
2110005- ELEMENT OF ELECTRICAL ENGINEERING	CO1: Identify the basic elements of the electrical engineering. CO2: To write the programs for controlling electrical elements. CO3: The significance of electrical engineering for software fields.
2110006- ELEMENTS OF MECHANICAL ENGINEERING	CO1: Identify the basic elements of the mechanical engineering. CO2: To write the programs for controlling mechanical elements. CO3: The significance of mechanical engineering for software fields.
2110007- ENVIRONMENTAL STUDIES	CO1: Understand the importance of environment. CO2: Identify the environmental problems and issues on local, regional and global scale. CO3: Identify problems due to human interactions with the environment. CO4: Get encouragement to contribute solutions for the existing environmental issues. CO5: Understand the enforcement of environmental acts in our constitution.
2110014- CALCULUS	CO1: Determine the convergence of infinite series. CO2: Calculate the derivatives of functions of several variables.

	<p>CO3: Graphing and optimization of the functions.</p> <p>CO4: Compute the basic multiple integrals.</p>
2110015-VCLA	<p>CO1: Calculate the limits and derivatives.</p> <p>CO2:Determine convergence of sequence and series.</p>
2110011-PHYSICS	<p>CO1: Analyze and understand the basics of electricity and how these basic ideas are used to enhance our current prosperity.</p> <p>CO2: Understand the differences between classical and quantum mechanics and learn about semiconductor technology.</p> <p>CO3: Analyze and learn about how materials behave at low temperature, causes for their behavior and applications.</p> <p>CO4: Analyze and understand various types of lasers and optical fibers and their applications.</p> <p>CO5: Understand the fabrication of nonmaterial, carbon nanotubes and their applications in various fields.</p>
2110012- *WORKSHOP	<p>CO1: Model and design various basic prototypes in the carpentry trade such as Lap joint, Lap Tee joint, Dove tail joint, Mortise & Tenon joint, Cross-Lap joint.</p> <p>CO2: Design and model various basic prototypes in the trade of Welding such as Lap joint, Lap Tee joint, Edge joint, Butt joint and Corner joint.</p> <p>CO3: Make various basic prototypes in the trade of Tin smithy such as plain Cylindrical pipe, Cylindrical pipe one end inclined, Cylindrical pipe both ends</p>
2110013- ENGINEERING GRAPHICS	<p>CO1: Representing various conics and curves.</p> <p>CO2: Perform dimensioning to a given drawing.</p> <p>CO3: Construction of Plain and Diagonal scales.</p> <p>CO4: Orthographic projections of Lines, Planes, and Solids.</p> <p>CO5: Construction of Isometric Scale, Isometric Projections and Views.</p> <p>CO6: Sectioning of various Solids and their representation.</p> <p>CO7: Understand Development of surfaces and their representation.</p> <p>CO8: Conversion of Pictorial views to Orthographic Projections.</p>

B.E. (Computer) 3rd Semester

2130002- ADVANCE ENGINEERING MATHS	CO1: Provide the Knowledge of solving linear differential equations with constant coefficients. CO2: Analyze general periodic functions in the form of an infinite convergent series of sine and cosines . CO3: Apply the numerical methods for transitioning a mathematical model of a problem to an programmable algorithm obtaining solution numerically or graphically. CO4: Afford Mathematical devices through which solutions of numerous boundary value problems of engineering can be obtained.
2130004- ENGINEERING ECONOMICS AND MANAGEMENT	CO1: To impart knowledge, with respect to concepts, principles and practical applications of Economics, which govern the functioning of a firm / organization under different market conditions. CO2: To help the students to understand the fundamental concepts and principles of management; the basic roles, skills, functions of management, various organizational structures and basic knowledge of marketing.
2130702- DATA STRUCTURES	CO1: Differentiate primitive and non primitive structures. CO2: Design and apply appropriate data structures for solving computing problems. CO3: Apply sorting and searching algorithms to the small and large data sets.
2130703- DATABASE MANAGEMENT SYSTEMS	CO1: Evaluate business information problem and find the requirements of a problem in terms of data. CO2: Understand the uses the database schema and need for normalization. CO3: Design the database schema with the use of appropriate data types for storage of data in database. CO4: Use different types of physical implementation of database. CO5: Use database for concurrent use. CO6: Backup data from database.
2131004- DIGITAL ELECTRONIS	CO1: After learning the course the students should be able to explain about digital number systems and logic circuits. CO2: The student should be able to solve logic function minimization. CO3: The students should be able to differentiate between combinational and sequential circuits such as decoders, encoders, multiplexers, demultiplexers, flip-flops, counters, registers. CO4: They should be able to design using FSM. In the laboratory, they should be able to verify the functions of various digital integrated circuits. CO5: The students should be able state the specifications of logic families. CO6: They should be able to start writing HDL codes for various digital circuits. CO7: The student should be able to compare the design using digital circuits and PLDs.

<p>2130005- DESIGN ENGINEERING I</p>	<p>CO1: To expose students to the basic process and framework of Design Thinking. CO2: Study about relevant tools & techniques for Creativity & Innovation.</p>
<p>3CE01- SOFTWARE</p>	<p>CO1: Use knowledge of HTML and CSS code and an HTML editor to create personal and/or business websites following current professional and/or industry standards. CO2: Use critical thinking skills to design and create websites. CO3: Use a stand-alone FTP program to upload files to a web server. CO4: Be prepared to pursue future courses in website development and design.</p>
<p>3CE02- SEMINAR</p>	<p>CO1: To expose students to the 'real' working environment and get acquainted with the organization structure, business operations and administrative functions. CO2: To set the stage for future recruitment by potential employers. CO3: Student can summarize multiple points of view in order to draw conclusions. CO4: Demonstrate active verbal and non-verbal skills. CO5: Better understand the role that effective presentations have in public/professional contexts and gain experience in formal/ informal presentation. CO6: Develop audience-centered presentations meeting concrete professional objectives and integrating ethical and legal visual aids.</p>
<p>3CE04- GATE CLASSES</p>	<p>CO1: Improve the analytical, quantitative as well as qualitative aspects of the subjects. CO2: Understand and develop the basic concepts of each subject including important definitions, equations, derivations, theorems, laws in every subject. CO3: Provide fundamental knowledge in all the domains of Computer Engineering CO4: Improve the ability to recall, comprehension, application, analyze and synthesize through problem solving</p>

B.E. (Computer) 4th Semester

2140705- OBJECT ORIENTED PROGRAMMING WITH C++	CO1: Describe the important concepts of object oriented programming like object and class, Encapsulation, inheritance and polymorphism. CO2: Write the skeleton of C++ program. CO3: Write the simple C++ programs using the variables, operators, control structures, functions and I/O objects cin and cout. CO4: Write the simple object oriented programs in C++ using objects and classes. CO5: Use features of C++ like type conversion, inheritance, polymorphism, I/O streams and files to develop programs for real life problems. CO6: Use advance features like templates and exception to make programs supporting reusability and sophistication. CO7: Use standard template library for faster development. CO8: Develop the applications using object oriented programming with C.
2140706- NUMERICAL AND STATISTICAL METHODS FOR COMPUTER ENGINEERING	CO1: Solve system of linear equations. CO2: Understand various methods of modeling. CO3: Apply Mathematical Modeling and for Engineering Problem Solving. CO4: Solve Mathematical Equations by various methods. CO5: Find Best Curve fitting for given data. CO6: Apply Numerical Integration. CO7: Solve Differential Equations. CO8: Understand Statistical Methods for Data Analysis and sampling techniques. CO9: Write programs for various numerical and statistical methods.
2140707- COMPUTER ORGANIZATION	CO1: To apply knowledge of the processor's internal registers and operations by use of a PC based microprocessor simulator. CO2: To write assembly language programs and download the machine code that will provide solutions real-world control problems. CO3: To eliminate or remove stall by altering order of instructions. CO4: To write programs using the capabilities of the stack, the program counter, the status register and show how these are used to execute a machine code program.
2140709- COMPUTER NETWORKS	CO1: Analyze the requirements for a given organizational structure and select the most appropriate networking architecture and technologies. CO2: Specify and identify deficiencies in existing protocols, and then go onto formulate new and better Protocols. CO3: Analyze, specify and design the topological and routing strategies for an IP based networking infrastructure. CO4: Have a working knowledge of datagram and internet socket programming.

<p>2140002 - Design Engineering I B</p>	<p>CO: To validate the learning from previous semester of the understanding Design Thinking, by translating the concepts into exercises. Here branch specific topics need to be selected by students and refine their learning for Design Thinking phases.</p>
<p>2140702- OPERATING SYSTEM</p>	<p>CO1: Analyzing the working of an operating system and its components. CO2: Defining and analyzing the synchronization process. CO3: Identifying the working methodology of multithreaded applications. CO4: Determining the reasons of deadlocks, and their remedial measures in an operating system. CO5: Learning the management of different type of memories and I/O devices in the computer system. CO6: Comparing and analyzing different file systems being used in different operating systems, different security issues and shell programming in UNIX.</p>
<p>4CE01- SOFTWARE</p>	<p>CO1: Create PHP scripts that use object-oriented PHP. CO2: Implement business logic within the database. CO3: Use stored procedures and triggers, are secure, portable and scalable. CO4: Create and deploy a portable web-based system. CO5: Be prepared to pursue future courses in website development and design.</p>
<p>4CE02- SEMINAR</p>	<p>CO1: To expose students to the 'real' working environment and get acquainted with the organization structure, business operations and administrative functions. CO2: To set the stage for future recruitment by potential employers. CO3: Student can summarize multiple points of view in order to draw conclusions. CO4: Demonstrate active verbal and non-verbal skills. CO5: Better understand the role that effective presentations have in public/professional contexts and gain experience in formal/ informal presentation.</p>
<p>4CE04- GATE CLASSES</p>	<p>CO1: Improve the analytical, quantitative as well as qualitative aspects of the subjects. CO2: Understand and develop the basic concepts of each subject including important definitions, equations, derivations, theorems, laws in every subject. CO3: Provide fundamental knowledge in all the domains of Computer Engineering. CO4: Improve the ability to recall, comprehension, application, analyze and synthesize through problem solving.</p>

B.E. (Computer) 5th Semester

2150002- CYBER SECURITY	CO: student should understand cyber-attack, types of cybercrimes, cyber laws and also how to protect them self and ultimately society from such attacks.
2150003- DISASTER MANAGEMENT	CO1: Understand disasters, disaster preparedness and mitigation measures. CO2: Understand role of IT, remote sensing, GIS and GPS in risk reduction. CO3: Understand disaster management acts and guidelines along with role of various stack holders during disasters.
2150703- ANALYSIS AND DESIGN OF ALGORITHMS	CO1: Analyze the asymptotic performance of algorithms. CO2: Derive and solve recurrences describing the performance of divide-and-conquer algorithms. CO3: Find optimal solution by applying various methods. CO4: Apply pattern matching algorithms to find particular pattern. CO5: Differentiate polynomial and nonpolynomial problems. CO6: Explain the major graph algorithms and their analyses. Employ graphs to model engineering problems, when appropriate.
2150704- OBJECT ORIENTED PROGRAMMING USING JAVA	CO1: Understand object oriented programming concepts and implement in java. CO2: Comprehend building blocks of OOPs language, inheritance, package and interfaces. CO3: Identify exception handling methods. CO4: Implement multithreading in object oriented programs. CO5: Prepare UML diagrams for software system.
2150707- MICROPROCESSOR AND INTERFACING	CO1: List and specify the various features of microprocessor, memory and I/O devices including concepts of system bus. CO2: Identify the various elements of 8085 microprocessor architecture, its bus organization including control signals. CO3: List the pin functions of the 8085 microprocessor. CO4: Describe the 8085 processor addressing modes, instruction classification and function of each instruction and write the assembly language programs using 8085 instructions. CO5: Explain the concepts of memory and I/O interfacing with 8085 processor with Programmable devices. CO6: List and describe the features of advance microprocessor.
2150708- SYSTEM PROGRAMMING	CO1: To understand the execution process of HLL programs. CO2: To understand the working of scanners and parser. CO3: To understand the basic design of various system software. CO4: To implement various system software.
2150001 - Design Engineering - II A	CO: To validate the learning from the understanding Design Thinking course, by translating the concepts into exercises. In this module, students will work upon community based projects to validate their learning of Design Thinking process.

<p style="text-align: center;">5CE01- SOFTWARE</p>	<p>CO1: Create PHP scripts that use object-oriented PHP.</p> <p>CO2: Implement business logic within the database.</p> <p>CO3: Use stored procedures and triggers, are secure, portable and scalable.</p> <p>CO4: Create and deploy a portable web-based system.</p> <p>CO5: Be prepared to pursue future courses in website development and design.</p> <p>CO4: Be prepared to pursue future courses in website development and design.</p>
<p style="text-align: center;">5CE02- SEMINAR</p>	<p>CO1: To expose students to the 'real' working environment and get acquainted with the organization structure, business operations and administrative functions.</p> <p>CO2: To set the stage for future recruitment by potential employers.</p> <p>CO3: Student can summarize multiple points of view in order to draw conclusions.</p> <p>CO4: Demonstrate active verbal and non-verbal skills.</p> <p>CO5: Better understand the role that effective presentations have in public/professional contexts and gain experience in formal/ informal presentation.</p>
<p style="text-align: center;">5CE04- GATE CLASSES</p>	<p>CO1: Improve the analytical, quantitative as well as qualitative aspects of the subjects.</p> <p>CO2: Understand and develop the basic concepts of each subject including important definitions, equations, derivations, theorems, laws in every subject.</p> <p>CO3: Provide fundamental knowledge in all the domains of Computer Engineering .</p> <p>CO4: Improve the ability to recall, comprehension, application, analyze and synthesize through problem solving.</p>

B.E. (Computer) 6th Semester

<p>2160001- Design Engineering – II B</p>	<p>CO: To validate the learning from the understanding Design Thinking course by translating the concepts into exercises. In this module, student will continue their work from 5thsemester on Community based project and complete the Design Thinking cycle with emphasis on product development, detail design, prototyping and validation of the solutions in real environment.</p>
<p>2160703- Computer Graphics</p>	<p>CO1: Students will have an appreciation of the history and evolution of computer graphics, both hardware and software. Assessed by written homework assignment.</p> <p>CO2: Students will have an understanding of 2D graphics and algorithms including: line drawing, polygon filling, clipping, and transformations. They will be able to implement these. Assessed by tests and programming assignments.</p> <p>CO3: Students will understand the concepts of and techniques used in 3D computer graphics, including viewing transformations, hierarchical modeling, color, lighting and texture mapping. Students will be exposed to current computer graphics research areas. Assessed by tests, homework and programming assignments.</p> <p>CO4: Students will be able to use a current graphics API (OpenGL). Assessed by programming assignments.</p> <p>CO5: Students will be introduced to algorithms and techniques fundamental to 3D computer graphics and will understand the relationship between the 2D and 3D versions of such algorithms. Students will be able to reason about and apply these algorithms and techniques in new situations. Assessed by tests and programming assignments.</p>
<p>2160702- INFORMATION SECURITY</p>	<p>CO1: How you select appropriate techniques to tackle and solve problems in the discipline of information security management.</p> <p>CO2: Why security and its management are important for any modern organization.</p> <p>CO3: How an information security management system should be planned, Documented, implemented and improved, according to the BSI standard on information security management.</p>
<p>2160701- SOFTWARE ENGINEERING</p>	<p>CO1: The ability to analyze, design, verify, validate, implement, apply, and maintain software systems.</p> <p>CO2: The ability to appropriately apply discrete mathematics, probability and statistics and relevant topics in computer science and supporting disciplines to complex software systems.</p> <p>CO3: The ability to work in one or more significant application domains</p> <p>CO4: The ability to manage the development of software systems.</p>

<p>2160704- THEORY OF COMPUTATION</p>	<p>CO1:Have a good knowledge of formal computation and its relationship to languages. CO2: Be able to classify languages into their types. CO3: Be able to understand formal reasoning about languages.</p>
<p>2160704- EMBEDED AND VLSI DESIGN</p>	<p>CO1: Will learn various peripheral components. CO2: Use AVR Programming to interface various peripherals. CO3: Able to visualize the design of an embedded system to unified modeling language. CO4: Able to analyze and document various development cycle for the embedded system.</p>
<p>2160705- WEB APPLICATION DEVELOPMENT</p>	<p>CO1: Installing and configuring a web server.. CO2: Writing dynamic web pages, accessing data bases and using web services CO3: Applying security concepts to web servers. CO4: Designing and implementing web applications.</p>
<p>2160707 - ADVANCE JAVA TECHNOLOGY</p>	<p>CO1: Design/Develop Program. CO2: Develop appropriate data model and database scheme. CO3: Create and test prototypes. CO4: Develop Structure. CO5: Identify major subsystems and interfaces. CO6: Validate design scheme and models. CO7: Implement Program. CO8: Write code. CO9: Perform unit testing. CO10: Integrate subsystems. CO11: Test and Validate Program. CO12: Develop test procedures.</p>
<p>2160710 – DISTRIBUTED OPERATING SYSTEM</p>	<p>CO1: List the principles of distributed systems and describe the problems and challenges associated with these principles. CO2: Understand Distributed Computing techniques, Synchronous and Processes. CO3: Apply Shared Data access and Files concepts. CO4: Design a distributed system that fulfills requirements with regards to key distributed systems properties. CO5: Understand Distributed File Systems and Distributed Shared Memory. CO6: Apply Distributed web-based system. CO7: Understand the importance of security in distributed systems.</p>

2160711 – NET TECHNOLOGY	CO1: Use .net framework architecture, various tools, and Validation techniques, use of different templates available in Visual Studio, Implementation and testing strategies in real time applications. CO2: Use advanced concepts related to Web Services, WCF, and WPF in project development.
6CE01- SOFTWARE	CO1: Create Android applications. CO2: Implement Android applications with different layouts. CO3: Create Android apps using different views. CO4: Create Android apps which uses SQLite database.
6CE02- SEMINAR	CO1: To expose students to the 'real' working environment and get acquainted with the organization structure, business operations and administrative functions. CO2: To set the stage for future recruitment by potential employers. CO3: Student can summarize multiple points of view in order to draw conclusions. CO4: Demonstrate active verbal and non-verbal skills. CO5: Better understand the role that effective presentations have in public/professional contexts and gain experience in formal/ informal presentation.
6CE04- GATE CLASSES	CO1: Improve the analytical, quantitative as well as qualitative aspects of the subjects. CO2: Understand and develop the basic concepts of each subject including important definitions, equations, derivations, theorems, laws in every subject. CO3: Provide fundamental knowledge in all the domains of Computer Engineering. CO4: Improve the ability to recall, comprehension, application, analyze and synthesize through problem solving.

B.E. (Computer) 7th Semester

2170701- COMPILER DESIGN	CO1: Learn how a compiler works. CO2: Know about the powerful compiler generation tools, which are useful to the other non-compiler applications. CO3: Learn how to write programs that execute faster. CO4: Gain teamwork experience working on a large, complex software project. CO5: Realize that computing science theory can be used as the basis for real applications.
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<p style="text-align: center;">2170710- WIRELESS COMMUNICATION AND MOBILE PROGRAMMING</p>	<p>CO1: Describe the basic concepts and principles in mobile computing. CO2: Understand the concept of Wireless LANs, PAN, Mobile Networks, and Sensor Networks. CO3: Explain the structure and components for Mobile IP and Mobility Management. CO4: Understand positioning techniques and location-based services and applications. CO5: Describe the important issues and concerns on security and privacy.</p>
<p style="text-align: center;">2170712- IMAGE PROCESSING</p>	<p>CO1: Understand the basic image enhancement techniques in spatial & frequency domains. CO2: Understand the various kind of noise present in the image and how to restore the noisy image. CO3: Understand the basic multi-resolution techniques and segmentation methods. CO4: To apply these concepts for image handling in various fields.</p>
<p style="text-align: center;">2170713- SERVICE ORIENTED COMPUTING</p>	<p>CO1: To understand the principles of service oriented architecture. CO2: To understand and describe the standards & technologies of modern web services implementations. CO3: To properly use market-leading development tools to create and consume web services. CO4: To analyze and select the appropriate framework components in the creation of web service solutions. CO5: To apply object-oriented programming principles to the creation of web service solutions. CO6: To identify the requirements of a medium-difficulty programming task, and create software that meets the requirements.</p>
<p style="text-align: center;">2170714- DISTRIBUTED DBMS</p>	<p>CO1: Understand what Distributed DBMS is. CO2: Understand various architectures of DDBMS. CO3: Apply various fragmentation techniques given a problem. CO4: Understand and calculate the cost of enforcing semantic integrity control. CO5: Understand the steps of query processing. CO6: How optimization techniques are applies to Distributed Database. CO7: Learn and understand various Query Optimization Algorithms. CO8: Understand Transaction Management & Compare various approaches to concurrency control in Distributed database. CO9: Understand various algorithms and techniques for deadlock and recovery in Distributed database.</p>
<p style="text-align: center;">2170715- DATA MINING AND BUSINESS INTELIGENCE</p>	<p>CO1: Students will be able to use mining tool. CO2: Students are able to perform various data warehouse related exercise.</p>

B.E. (Computer) 8th Semester

2180703- ARTIFICIAL INTELLIGENCE	CO1: Understand various search methods. CO2: Use various knowledge representation methods. CO3: Understand various Game Playing techniques. CO4: Use Prolog Programming language using predicate logic
2180709- IOT AND APPLICATIONS	CO1: Understand the vision of IoT from a global context. CO2: Understand the application of IoT. CO3: Determine the Market perspective of IoT. CO4: Use of Devices, Gateways and Data Management in IoT. CO5: Building state of the art architecture in IoT. CO6: Application of IoT in Industrial and Commercial Building Automation and Real World Design Constraints.
2180711- PYTHON PROGRAMMING	CO1: To develop proficiency in creating based applications using the Python Programming Language. CO2: To be able to understand the various data structures available in Python programming language and apply them in solving computational problems. CO3: To be able to draw various kinds of plots using PyLab. CO4: To be able to do text filtering with regular expressions in Python. CO5: To be able to create socket applications in Python. CO6: To be able to create GUI applications in Python.
2180712- CLOUD INFRASTRUCTURE AND SERVICES	CO1: To explain the core concepts of the cloud computing paradigm: how and why this paradigm shift came about, the characteristics, advantages and challenges brought about by the various models and services in cloud computing. CO2: To apply the fundamental concepts in datacenters to understand the tradeoffs in power, efficiency and cost by Load balancing approach. CO3: To discuss system virtualization and outline its role in enabling the cloud computing system model. CO4: To illustrate the fundamental concepts of cloud storage and demonstrate their use in storage systems such as Amazon S3 and HDFS. CO5: To analyze various cloud programming models and apply them to solve problems on the cloud. CO6: To understand various management and other distinguish services of AWS.
2180713- WEB DATA MANAGEMENT	CO1: To understand the overall vision of the Semantic Web. CO2: To analyze the current technology stack (URIs, XML, RDF/S, OWL). CO3: To understand how one could use these technologies for building something useful. CO4: To define and test ontology. CO5: To define schema mappings. CO6: To install and use tools for semantic data management.

<p>2180714- iOS PROGRAMMING</p>	<p>CO1: Design iphone and ipad application. CO2: Develop iphone and ipad application. CO3: Upload ios application on app store.</p>
<p>2180715- ANDROID PROGRAMMING</p>	<p>CO1: This course teaches final-year Computer Science students how to develop Android apps. CO2: To be able to understand the process of developing software for the mobile. CO3: To be able to create mobile applications on the Android Platform. CO4: To be able to create mobile applications involving data storage in SQLite database.</p>