

## Department of Information Technology

### Course Outcomes

SE – 2015 Course			
Semester – I			
Course Code	Course Name	Course Outcomes	
214441	Discrete Structures	CO1	Formulate problems precisely and solve the problems
		CO2	Apply formal proof techniques, and explain their reasoning clearly
		CO3	Use set, relation and function to formulate a problem and solve it
		CO4	Use graph theory and trees to formulate the problems and solve them
		CO5	Use mathematical propositions and proof techniques to check the truthfulness of a real life situation.
		CO6	Use of algebraic structures in real life applications
214442	Computer Organization & Architecture	CO1	Solve problems based on Computer Arithmetic.
		CO2	Ability to understand the organization of Computer and machine instructions and programs.
		CO3	Obtain Knowledge about micro –programming of a Processor.
		CO4	Understand concepts related to memory and IO organization.
		CO5	Acquire knowledge about Instruction Level Parallelism
		CO6	Acquire knowledge about Parallel Organization of multi-processors & multi core systems
214443	Digital Electronics and Logic Design	CO1	Spectacle an awareness and apply knowledge of number systems, codes, Boolean algebra and use necessary A.C, D.C Loading characteristics as well as functioning while designing with logic gates.
		CO2	Use logic function representation for simplification

			with K-Maps and analyze as well as design Combinational logic circuits using SSI & MSI chips.
		CO3	Analyze Sequential circuits like Flip-Flops (Truth Table, Excitation table), their conversion & design the applications.
		CO4	Identify the Digital Circuits, Input/Outputs to replace by FPGA
		CO5	Use VHDL programming technique with different modeling styles for any digital circuits.
<b>214444</b>	<b>Fundamentals of Data Structures</b>	CO1	Apply appropriate constructs of C language, coding standards for application development.
		CO2	Use dynamic memory allocation concepts and file handling in various application developments.
		CO3	Perform basic analysis of algorithms with respect to time and space complexity
		CO4	Select appropriate searching and/or sorting techniques in the application development
		CO5	Select and use appropriate data structures for problem solving and programming
		CO6	Use algorithmic foundations for solving problems and programming
<b>214445</b>	<b>Problem Solving and Object Oriented programming</b>	CO1	Develop algorithms for solving problems by using modular programming concepts
		CO2	Abstract data and entities from the problem domain, build object models and design software solutions using object-oriented principles and strategies
		CO3	Discover, explore and apply tools and best practices in object-oriented programming.
		CO4	Develop programs that appropriately utilize key object-oriented concepts
		CO5	Design and implement an object oriented solution to solve a real life problem.
		CO6	Identify relationship among objects using inheritance and polymorphism

214446	<b>Digital Laboratory</b>	CO1	Spectacle an awareness and apply knowledge and concepts and methods of digital system design techniques as hands-on experiments with the use of necessary A.C, D.C Loading characteristics.
		CO2	Use logic function representation for simplification with K-Maps and analyze as well as design Combinational logic circuits using SSI & MSI chips.
		CO3	Analyze Sequential circuits like Flip-Flops (Truth Table, Excitation table) & design the applications like Asynchronous and Synchronous Counters.
		CO4	Design Sequential Logic circuits: Sequence generators, MOD counters with registers/Counters using synchronous /asynchronous counters.
		CO5	Understand the need of skills, techniques and learn state-of-the-art engineering tools through hands-on experimentation on the Xilinx tools for design as well as the basics of VHDL.
		CO6	Understand and implement the design Steps, main programming technique with different modeling styles for any digital circuits with VHDL Programming.
214447	<b>Programming Laboratory</b>	CO1	Apply appropriate constructs of C language, coding standards for application development.
		CO2	Use dynamic memory allocation concepts and file handling in various application developments.
		CO3	Perform basic analysis of algorithms with respect to time and space complexity
		CO4	Select appropriate searching and/or sorting techniques in the application development
		CO5	Select and use appropriate data structures for problem solving and programming
		CO6	Use algorithmic foundations for solving problems and programming
214448	<b>Object Oriented programming Lab.</b>	CO1	Develop and implement algorithms for solving simple problems using modular programming concept.

		CO2	Abstract data and entities from the problem domain, build object models and design software solutions using object-oriented principles and strategies.
		CO3	Discover, explore and apply tools and best practices in object-oriented programming.
		CO4	Develop programs that appropriately utilize key object-oriented concepts
		CO5	Create a data base using files
		CO6	Develop problem-solving and programming skills using OOP concept
214449	Communication Skills	CO1	Provides an ability to understand, analyze and interpret the essentiality of grammar and its proper usage.
		CO2	Build the students' vocabulary by means of communication via web, direct Communication and indirect communication.
		CO3	Improves Students' Pronunciation skills and understanding between various phonetic sounds during communication.
		CO4	Understanding the various rules and means of written communication.
		CO5	Effective communication with active listening, facing problems while communication and how to overcome it.
		CO6	Improve students overall linguistic & communicative competence in English
<b>SE – 2015 Course</b>			
<b>Semester – II</b>			
<b>Course Code</b>	<b>Course Name</b>	<b>Course Outcomes</b>	
207003	Engineering Mathematics -III	CO1	Solve higher order linear differential equation using appropriate techniques for modeling and analyzing electrical circuits.
		CO2	Solve problems related to Fourier transform, Z-Transform and applications to Signal and Image

			processing.
		CO3	Apply statistical methods like correlation, regression analysis and probability theory for analysis and prediction of a given data as applied to machine intelligence.
		CO4	Perform vector differentiation and integration to analyze the vector fields and apply to compute line, surface and volume integrals.
		CO5	Analyze conformal mappings, transformations and perform contour integration of complex functions required in Image processing, Digital filters and Computer graphics.
214450	<b>Computer Graphics</b>	CO1	Apply mathematics and logic to develop Computer programs for elementary graphic Operations
		CO2	Develop scientific and strategic approach to solve complex problems in the domain of Computer Graphics
		CO3	Develop the competency to understand the concepts related to Computer Vision and Virtual reality
		CO4	Apply the logic to develop animation and gaming programs
		CO5	Explain and employ techniques of geometrical transforms to produce, position and manipulate objects in 2 dimensional and 3-dimensional space respectively.
		CO6	Apply the concepts of rendering, shading, animation, curves and fractals using computer graphics tools in design, development and testing of 2D, 3D modeling applications.
214451	<b>Processor Architecture and Interfacing</b>	CO1	Learn architectural details of 80386 microprocessor
		CO2	Understand memory management and multitasking of 80386 microprocessor
		CO3	Understand architecture and memory organization of 8051 microcontroller
		CO4	Explain timers and interrupts of 8051 microcontroller and its interfacing with I/O devices

214452	<b>Data Structures &amp; Files</b>	CO1	Perform basic analysis of algorithms with respect to time and space complexity.
		CO2	Analyze algorithms and to determine algorithm correctness and time efficiency class.
		CO3	Understand different advanced abstract data type (ADT) and data structures and their implementations.
		CO4	Understand different algorithm design techniques (brute -force, divide and conquer, greedy, etc.) and their implementation
		CO5	Apply and implement learned algorithm design techniques and data structures to solve problems.
		CO6	Design different hashing functions and use files organizations.
214453	<b>Foundation of comm.&amp; Comp Network</b>	CO1	Understand data/signal transmission over communication media.
		CO2	Recognize usage of various modulation techniques in communication.
		CO3	Analyze various spread spectrum and multiplexing techniques.
		CO4	Use concepts of Data Communication to solve various related problems.
		CO5	Understand error correction and detection techniques.
		CO6	Acquaint with transmission media and their standards.
214454	<b>Processor Interfacing Laboratory</b>	CO1	Learn and apply concepts related to assembly language programming
		CO2	Write and execute assembly language program to perform array addition, code conversion, block transfer, sorting and string operations
		CO3	Learn and apply interfacing of real world input and output devices to 8051 microcontroller
214453	<b>Data Structure and Files Laboratory</b>	CO1	Apply and implement algorithm to illustrate use of linear data structures such as stack, queue
		CO2	Apply and implement algorithms to create/represent and traverse non-linear data structures such as trees,

			graphs etc
		CO3	Apply and implement algorithms to create and manipulate database using different file organizations
		CO4	Learn and apply the concept of hashing in database creation and manipulation
<b>214454</b>	<b>Computer Graphics Laboratory</b>	CO1	Apply and implement line drawing and circle drawing algorithms to draw specific shape given in the problem
		CO2	Apply and implement polygon filling algorithm for a given polygon
		CO3	Apply and implement 2-D and 3-D transformation algorithms for given input shape
		CO4	Apply and implement polygon clipping algorithm for given input polygon
		CO5	Apply and implement fractal generation algorithm for a given input
		CO6	Apply and implement animation concepts for generating simple animation without using any animation tool

## Department of Information Technology

### Course Outcomes

TE – 2015 Course			
Semester –I			
Course Code	Course Name	Course Outcomes	
314441	Theory of Computation	CO1	To construct finite state machines to solve problems in computing.
		CO2	To write mathematical expressions for the formal languages
		CO3	To apply well defined rules for syntax verification.
		CO4	To construct and analyze Push Down, Post and Turing Machine for formal languages.
		CO5	To express the understanding of the decidability and decidability problems.
		CO6	To express the understanding of computational complexity.
314442	Database Management	CO1	To define basic functions of DBMS & RDBMS.
		CO2	To analyze database models & entity relationship models.
		CO3	To design and implement a database schema for a given problem-domain.
		CO4	To populate and query a database using SQL DML/DDI commands.
		CO5	Do Programming in PL/SQL including stored procedures, stored functions, cursors and packages.
		CO6	To appreciate the impact of analytics and big data on the information industry and the external ecosystem for analytical and data services.
314443	Software Engineering & Project Management	CO1	To identify unique features of various software application domains and classify software applications.
		CO2	To choose and apply appropriate lifecycle model of software development.



		CO3	To describe principles of agile development, discuss the SCRUM process and distinguish model from other process models.
		CO4	To analyze software requirements by applying various modeling techniques.
		CO5	To list and classify CASE tools and discuss recent trends and research in software engineering.
		CO6	To understand IT project management through life cycle of the project and future trends in IT Project Management.
314444	Operating System	CO1	Fundamental understanding of the role of Operating Systems.
		CO2	To understand the concept of a process and thread.
		CO3	To apply the cons of process/thread scheduling.
		CO4	To apply the concept of process synchronization, mutual exclusion and the deadlock.
		CO5	To realize the concept of I/O management and File system.
		CO6	To understand the various memory management techniques.
314445	Human Computer Interaction	CO1	To explain importance of HCI study and principles of user-centered design (UCD) approach.
		CO2	To develop understanding of human factors in HCI design.
		CO3	To develop understanding of models, paradigms and context of interactions.
		CO4	To develop understanding of design process.
		CO5	To evaluate usability of a user-interface design.
		CO6	To apply cognitive models for predicting human-computer-interactions.
303146	Software Laboratory-I	CO1	To install and configure database systems.
		CO2	To analyze database models & entity relationship models.
		CO3	To design and implement a database schema for a given

			problem-domain
		CO4	To understand the relational and document type database systems.
		CO5	To populate and query a database using SQL DML/DDL commands.
		CO6	To populate and query a database using MongoDB commands.
303147	<b>Software Laboratory-II</b>	CO1	To understand the basics of Linux commands and program the shell of Linux.
		CO2	To develop various system programs for the functioning of operating system.
		CO3	To implement basic building blocks like processes, threads under the Linux.
		CO4	To develop various system programs for the functioning of OS concepts in user space like concurrency control and file handling in Linux.
		CO5	To design and implement Linux Kernel Source Code.
		CO6	To develop the system program for the functioning of OS concepts in kernel space like embedding the system call in any Linux kernel.
303148	<b>Software Laboratory-III</b>	CO1	To identify the needs of users through requirement gathering.
		CO2	To apply the concepts of Software Engineering process models for project development.
		CO3	To apply the concepts of HCI for user-friendly project development.
		CO4	To deploy website on live web server and access through URL.
		CO5	To understand, explore and apply various web technologies.
		CO6	To develop team building for efficient project development.
<b>Semester – II</b>			
<b>Course</b>	<b>Course Name</b>	<b>Course Outcomes</b>	

Code			
314450	<b>Computer Network Technology</b>	CO1	To know Responsibilities, services offered and protocol used at each layer of network.
		CO2	To understand protocol used at different layers of network.
		CO3	To know the difference between different types of network.
		CO4	To know the different wireless technologies and IEEE standards.
		CO5	To use and apply the standards and protocols learned, for application development.
		CO6	To understand and explore recent trends in network domain.
314451	<b>System Programming</b>	CO1	To learn independently modern software development tools and creates novel solutions for language Processing applications
		CO2	To design and implement assemblers and macro processors
		CO3	To use tool LEX for generation of Lexical Analyzer.
		CO4	To use YACC tool for generation of syntax analyzer.
		CO5	To generate output for all the phases of compiler
		CO6	To apply code optimization in the compilation process.
314452	<b>Design and Analysis of Algorithms</b>	CO1	To calculate computational complexity using asymptotic notations for various algorithms.
		CO2	To apply Divide & Conquer as well as Greedy approach to design algorithms.
		CO3	To practice principle of optimality.
		CO4	To illustrate different problems using Backtracking.
		CO5	To compare different methods of Branch and Bound strategy.
		CO6	To explore the concept of P, NP, NP-complete, NP-Hard and parallel algorithms.
314453	<b>Cloud Computing</b>	CO1	To understand the need of Cloud based solutions.

		CO2	To understand Security Mechanisms and issues in various Cloud Applications To explore effective techniques to program Cloud Systems.
		CO3	To understand current challenges and trade-offs in Cloud Computing.
		CO4	To find challenges in cloud computing and delve into it to effective solutions.
		CO5	To understand emerging trends in cloud computing.
<b>314454</b>	<b>Data Science &amp; Big Data Analytics</b>	CO1	To understand Big Data primitives.
		CO2	To learn and apply different mathematical models for Big Data.
		CO3	To demonstrate their Big Data learning skills by developing industry or research applications.
		CO4	To analyze each learning model come from a different algorithmic approach and it will perform differently under different datasets.
		CO5	To understand needs challenges and techniques for big data visualization.
		CO6	To learn different programming platforms for big data analytics.
<b>314458</b>	<b>Project Based Seminar</b>	CO1	To Gather, organize, summarize and interpret technical literature with the purpose of formulating a project proposal.
		CO2	To write a technical report summarizing state-of-the-art on an identified topic
		CO3	Present the study using graphics and multimedia presentations.
		CO4	Define intended future work based on the technical review.
		CO5	To explore and enhance the use of various presentation tools and techniques.
		CO6	To understand scientific approach for literature survey and paper writing.

<b>314455</b>	<b>Software Laboratory IV</b>	CO1	To implement small size network and its use of various networking commands.
		CO2	To understand and use various networking and simulations tools.
		CO3	To configure various client/server environments to use application layer protocols.
		CO4	To understand the protocol design at various layers.
		CO5	To explore use of protocols in various wired and wireless applications.
		CO6	To develop applications on emerging trends.
<b>314456</b>	<b>Software Laboratory -V</b>	CO1	To design and implement two pass assembler for hypothetical machine instructions.
		CO2	To design and implement different phases of compiler ( Lexical Analyzer, Parser, Intermediate code generation)
		CO3	To use the compile generation tools such as "Lex" and "YACC".
		CO4	To apply algorithmic strategies for solving various problems.
		CO5	To compare various algorithmic strategies
		CO6	To analyze the solution using recurrence relation.
<b>314457</b>	<b>Software Laboratory VI</b>	CO1	To apply Big data primitives and fundamentals for application development.
		CO2	To explore different Big data processing techniques with use cases.
		CO3	To apply the Analytical concept of Big data using R/Python.
		CO4	To visualize the Big Data using Tableau.
		CO5	To design algorithms & techniques for Big data analytics.
		CO6	To design Big data analytic application for emerging trends.

## Department of Information Technology

### Course Outcomes

BE – 2015 Course			
Semester –I			
Course Code	Course Name	Course Outcomes	
414453	<b>Information and Cyber Security</b>	CO1	Use basic cryptographic techniques in application development.
		CO2	To understand the foundational theory behind information security
		CO3	Apply methods for authentication, access control, intrusion detection and prevention.
		CO4	To apply the scientific method to digital forensics and perform forensic investigations.
		CO5	To develop computer forensics awareness.
		CO6	Ability to use computer forensics tools.
414454	<b>Machine Learning and Applications</b>	CO1	Model the learning primitives.
		CO2	Build the learning model.
		CO3	Tackle real world problems in the domain of Data Mining and Big Data Analytics, Information Retrieval, Computer vision, Linguistics and Bioinformatics.
414455	<b>Software Design and Modeling</b>	CO1	Understand object oriented methodologies, basics of Unified Modeling Language (UML).
		CO2	Understand analysis process, use case modeling, domain/class modeling
		CO3	Understand interaction and behavior modeling.
		CO4	Understand design process and business, access and view layer class design
		CO5	Get started on study of GRASP principles and GoF design patterns
		CO6	Get started on study of architectural design principles and guidelines in the various type of application

			development
<b>414456E</b>	<b>Elective-I-Business Analytics and Intelligence</b>	CO1	Comprehend the Information Systems and development approaches of Intelligent Systems.
		CO2	Evaluate and rethink business processes using information systems.
		CO3	Propose the Framework for business intelligence.
		CO4	Get acquainted with the Theories, techniques, and considerations for capturing organizational intelligence.
		CO5	Align business intelligence with business strategy.
		CO6	Apply the techniques for implementing business intelligence systems.
<b>414457C</b>	<b>Software Testing and Quality Assurance</b>	CO1	Test the software by applying testing techniques to deliver a product free from bugs.
		CO2	Investigate the scenario and to select the proper testing technique.
		CO3	Explore the test automation concepts and tools and estimation of cost, schedule based on standard metrics
		CO4	Understand how to detect, classify, prevent and remove defects
		CO5	Choose appropriate quality assurance models and develop quality.
		CO6	Ability to conduct formal inspections, record and evaluate results of inspections.
<b>414458</b>	<b>Computer Laboratory VII</b>	CO1	To implement asymmetric key cryptographic algorithm RSA
		CO2	To implement Secure Hash Algorithm(SHA-1)
		CO3	To implement and port controlled and secured access to software systems and networks.
<b>414459</b>	<b>Computer Laboratory VIII</b>	CO1	Draw, discuss different UML 2.0 diagrams, their concepts, notation, advanced notation, forward and reverse engineering aspects.
		CO2	Identify different software artifacts used to develop analysis and design model from requirements.

		CO3	Develop use case model.
		CO4	Develop, implement analysis model and design model.
		CO5	Develop, implement Interaction and behavior Model.
		CO6	Implement an appropriate design pattern to solve a design problem
414460	Project Phase-I	CO1	To show preparedness to study independently in chosen domain of Information Technology and programming languages and apply their acquired knowledge to variety of real time problem scenarios.
		CO2	To function effectively as a team to accomplish a desired goal.
		CO3	An understanding of professional, ethical, legal, security and social issues and responsibilities related to Information Technology Project.
<b>BE – 2015 Course</b>			
<b>Semester – II</b>			
Course Code	Course Name	Course Outcomes	
414462	Distributed Computing System	CO1	Understand the principles and desired properties of distributed systems based on different application areas.
		CO2	Understand and apply the basic theoretical concepts and algorithms of distributed systems in problem solving.
		CO3	Recognize the inherent difficulties that arise due to distributed-ness of computing resources.
		CO4	Identify the challenges in developing distributed applications
414463	Ubiquitous Computing	CO1	Demonstrate the knowledge of design of Ubicomp and its applications.
		CO2	Explain smart devices and services used Ubiomp.
		CO3	Describe the significance of actuators and controllers in real time application design
		CO4	Use the concept of HCI to understand the design of automation applications.



		CO5	Classify Ubicomp privacy and explain the challenges associated with Ubicomp privacy.
		CO6	Get the knowledge of ubiquitous and service oriented networks along with Ubicomp management.
414464A	<b>Elective III-Internet of Things (IoT)</b>	CO1	Explain what is internet of things.
		CO2	Explain architecture and design of IoT.
		CO3	Describe the objects connected in IoT.
		CO4	Understand the underlying Technologies.
		CO5	Understand the platforms in IoT.
		CO6	Understand cloud interface to IoT.
414464A	<b>Elective III-Internet of Things (IoT) Laboratory</b>	CO1	To understand IoT platforms such as Raspberry-Pi/Beagle board/Arduino.
		CO2	To understand operating systems for platforms such as Raspberry-Pi/Beagle board/Arduino.
		CO3	To communicate with objects using IoT platforms such as Raspberry-Pi/Beagle board/Arduino.
		CO4	To interface cloud environment for IoT application.
		CO5	To implement IoT related protocols such as MQTT / CoAP etc.
		CO6	To implement the web interface for IoT
414465D	<b>Elective IV-Social Media Analytics</b>	CO2	Understand the basics of Social Media Analytics.
			Explain the significance of Data mining in Social media.
		CO3	Demonstrate the algorithms used for text mining
		CO4	Apply network measures for social media data.
		CO5	Explain Behavior Analytics techniques used for social media data.
		CO6	Apply social media analytics for Face book and Twitter kind of applications.
414466	<b>Computer Laboratory IX</b>	CO1	Demonstrate knowledge of the core concepts and techniques in distributed systems
		CO2	Learn how to apply principles of state-of-the-Art Distributed systems in practical application.

		CO3	Design, build and test application programs on distributed systems.
<b>414467</b>	<b>Computer Laboratory X</b>	CO1	Set up the Android environment and explain the Evolution of cellular networks.
		CO2	Develop the User Interfaces using pre-built Android UI components.
		CO3	Create applications for performing CURD SQLite database operations using Android.
		CO4	Create the smart android applications using the data captured through sensors.
		CO5	Implement the authentication protocols between two mobile devices for providing. Security.
		CO6	Analyze the data collected through android sensors using any machine learning algorithm.
<b>414468</b>	<b>Project Phase-II</b>	CO1	Students will be able to Learn teamwork
		CO2	Students will be able to Be well aware about Implementation phase
		CO3	Students will be able to Get exposure of various types of testing methods and tools
		CO4	Students will be able to Understand the importance of documentation
<b>414469A</b>	<b>IoT Applications in Engineering Field.</b>	CO1	Expand your knowledge of Internet of Things.
		CO2	Discover how you can use IoT in your Engineering applications.
		CO3	Build more effective hands on with IoT elements.
		CO4	Expand the practical knowledge of using IoT components like sensors, processors.
		CO5	Expand the understanding of using different protocols.