

Institute of Engineering
 Department of Information Technology

Course Outcomes

SE (Semester-I) 2019 PATTERN		
214441 : Discrete Mathematics	214441.01	Formulate and apply formal proof techniques and solve the problems with logical reasoning
	214441.02	Analyze and evaluate the combinatorial problems by using probability theory.
	214441.03	Apply the concepts of graph theory to devise mathematical models .
	214441.04	Analyze types of relations and functions to provide solution to computational problems.
	214441.05	Identify techniques of number theory and its application.
	214441.06	Identify fundamental algebraic structures.
214442:Logic Design & Computer Organization	214442.01	Perform basic binary arithmetic & simplify logic expressions
	214442.02	Grasp the operations of logic ICs and Implement combinational logic functions using ICs .
	214442.03	Comprehend the operations of basic memory cell types and Implement sequential logic functions using ICs.
	214442.04	Elucidate the functions & organization of various blocks of CPU.
	214442.05	Understand CPU instruction characteristics, enhancement features of CPU.
	214442.06	Describe an assortment of memory types (with their characteristics) used in computer systems and basic principle of interfacing input, output devices.
214443:Data Structure & Algorithms	214443.01	Perform basic analysis of algorithms with respect to time and space complexity.
	214443.02	Select appropriate searching and/or sorting techniques in the application development.
	214443.03	Implement abstract data type (ADT) and data structures for given application.
	214443.04	Design algorithms based on techniques like brute -force, divide and conquer, greedy, etc
	214443.05	Apply implement learned algorithm design techniques and data structures to solve problems.
	214443.06	Design different hashing functions and use files organizations.
214444: Object-Oriented Programming	214444.01	Differentiate various programming paradigms.
	214444.02	Identify classes, objects, methods, and handle object creation, initialization, and Destruction to model real-world problems
	214444.03	Identify relationship among objects using inheritance and polymorphism principles.
	214444.04	Handle different types of exceptions and perform generic programming.
	214444.05	Use of files for persistent data storage for real world application.
	214444.06	Apply appropriate design patterns to provide object-oriented solutions.
214445: Basics of Computer Network	214445.01	Understand and explain the concepts of communication theory and compare functions of OSI and TCP/IP model.
	214445.02	Analyze data link layer services, error detection and correction, linear block codes, cyclic Codes, framing and flow control protocols.
	214445.03	Compare different access techniques, channelization and IEEE standards.
	214445.04	Apply the skills of subnetting, supernetting and routing mechanisms.
	214445.05	Differentiate IPv4 and IPv6.
	214445.06	Illustrate services and protocols used at transport layer.
	214446.01	Use logic function representation for simplification with K-Maps and design Combinational logic circuits using SSI & MSI chips.

214446: Logic Design & Computer Organization Lab	214446.02	Design Sequential Logic circuits: MOD counters using synchronous counters.
	214446.03	Understand the basics of simulator tool & to simulate basic blocks such as ALU & memory
214447: Data Structure & Algorithms Lab	214447.01	Analyze algorithms and to determine algorithm correctness and time efficiency class.
	214447.02	Implement abstract data type (ADT) and data structures for given application.
	214447.03	Design algorithms based on techniques like brute -force, divide and conquer, greedy, etc.).
	214447.04	Solve problems using algorithmic design techniques and data structures.
	214447.05	Analyze of algorithms with respect to time and space complexity.
214448: Object Oriented Programming Lab	214448.01	Differentiate various programming paradigms.
	214448.02	Identify classes, objects, methods, and handle object creation, initialization, and destruction to model real-world problems.
	214448.03	Identify relationship among objects using inheritance and polymorphism.
	214448.04	Handle different types of exceptions and perform generic programming.
	214448.05	Use file handling for real world application.
	214448.06	Apply appropriate design patterns to provide object-oriented solutions
214449: Soft Skill Lab	214449.01	Introspect about individual's goals, aspirations by evaluating one's SWOC and think creatively.
	214449.02	Develop effective communication skills including Listening, Reading, Writing and Speaking.
	214449.03	Constructively participate in group discussion, meetings and prepare and deliver Presentations.
	214449.04	Write precise briefs or reports and technical documents
	214449.05	Practice professional etiquette, present oneself confidently and successfully handle personal interviews .
	214449.06	Function effectively in multi-disciplinary and heterogeneous teams through the knowledge of team work, Inter-personal relationships, conflict management and leadership quality.
Audit Course I 210250(A) : Ethics and Values in Information Technology	210250.01	Adapt the global ethical principles and modern ethical issues.
	210250.02	Apprehend ethics in the business relationships and practices of IT.
	210250.03	Implement trustworthy computing to manage risk and security vulnerabilities.
	210250.04	Analyse concerns of privacy, privacy rights in information-gathering practices in IT.
Audit Course I 210250(B): Quantitative Aptitude & Logical Reasoning	210250.01	Apply basic concepts of quantitative abilities.
	210250.02	Use logical reasoning for solving real world problems.
	210250.03	Compete in examinations like internships, industry placements, postgraduate admissions, civil services etc.
Audit Course I 210250(C): Language Study Japanese -Module I	210250.01	Converse with simple sentences in Japanese.
	210250.02	Recognize and read simple sentences in Japanese.
	210250.03	Write simple sentences in Japanese.
	210250.04	Be aware about Japanese society and people
Audit Course I 210250(D): Cyber Security and Law	210250.01	Understand the basic concepts of cyber security and its abilities
	210250.02	Analyse and evaluate the cyber security needs of an organization.
	210250.03	Understand the importance of cyber laws and its practices.
	210250.04	Determine and analyse software vulnerabilities and security solutions to reduce the risk of exploitation

SE (Semester-II) 2019 Pattern

207003: Engineering Mathematics III	207003.01	Solve Linear differential equations, essential in modelling and design of computer-based systems.
	207003.02	Apply concept of Fourier transform and Z-transform and its applications to continuous and discrete systems and image processing.
	207003.03	Apply Statistical methods like correlation & regression analysis and probability theory for data analysis and predictions in machine

		learning.
	207003.04	Solve Algebraic & Transcendental equations and System of linear equations using numerical techniques.
	207003.05	Obtain Interpolating polynomials, numerical differentiation and integration, numerical solutions of ordinary differential equations used in modern scientific computing.
214451: Processor Architecture	214451.01	Apprehend architecture and memory organization of PIC 18 microcontroller.
	214451.02	Implement embedded C programming for PIC 18.
	214451.03	Use concepts of timers and interrupts of PIC 18.
	214451.04	Demonstrate real life applications using PIC 18.
	214451.05	Analyze architectural details of ARM processor.
214452: Database Management System	214452.01	Apply fundamental elements of database management systems. Learn architectural details of 80386 microprocessor
	214452.02	Design ER-models to represent simple database application scenarios.
	214452.03	Formulate SQL queries on data for relational databases.
	214452.04	Improve the database design by normalization & to incorporate query processing.
	214452.05	Apply ACID properties for transaction management and concurrency control.
	214452.06	Analyze various database architectures and technologies.
214453: Computer Graphics	214453.01	Apply mathematical and logical aspects for developing elementary graphics operations like scan conversion of points, lines, circle, and apply it for problem solving.
	214453.02	Employ techniques of geometrical transforms to produce, position and manipulate Objects in 2 dimensional and 3-dimensional space respectively.
	214453.03	Describe mapping from a world coordinates to device coordinates, clipping, and projections in order to produce 3D images on 2D output device.
	214453.04	Apply concepts of rendering, shading, animation, curves and fractals using computer graphics tools in design, development and testing of 2D, 3D modeling applications.
	214453.05	Perceive the concepts of virtual reality.
214454: Software Engineering	214454.01	Classify various software application domains.
	214454.02	Analyze software requirements by using various modeling techniques.
	214454.03	Translate the requirement models into design models.
	214454.04	Apply planning and estimation to any project.
	214454.05	Use quality attributes and testing principles in software development life cycle.
	214454.06	Discuss recent trends in Software engineering by using CASE and agile tools.
214455: Programming Skill Development Lab	214455.01	Apply concepts related to embedded C programming.
	214455.02	Develop and Execute embedded C program to perform array addition, block transfer, sorting operations
	214455.03	Perform interfacing of real-world input and output devices to PIC18FXXX microcontroller
	214455.04	Use source prototype platform like Raspberry-Pi/Beagle board/Arduino.
214456: Database Management System Lab	214456.01	Install and configure database systems.
	214456.02	Analyze database models & entity relationship models.
	214456.03	Design and implement a database schema for a given problem-domain
	214456.04	Implement relational database systems.
	214456.05	Populate and query a database using SQL DDL / DML / DCL commands.
	214456.06	Design a backend database of any one organization: CASE STUDY
214457: Computer Graphics Lab	214457.01	Apply line & circle drawing algorithms to draw the objects.
	214457.02	Apply polygon filling methods for the object.
	214457.03	Apply polygon clipping algorithms for the object.
	214457.04	Apply the 2D transformations on the object.
	214457.05	Implement the curve generation algorithms.
	214457.06	Demonstrate the animation of any object using animation principles.
	210258.01	Design solution to real life problems and analyze its concerns through shared cognition.

214458: Project Based Learning	210258.02	Apply learning by doing approach in PBL to promote lifelong learning.
	210258.03	Tackle technical challenges for solving real world problems with team efforts.
	210258.04	Collaborate and engage in multi-disciplinary learning environments.
214459 (A) : Mandatory Audit course 4: Water Supply and Management	210259.01	Relate the relations between the environment and ecology, estimating water requirement for public water supply scheme.
	210259.02	Assess the quality of water as per BIS and select the appropriate treatment method required for the water source.
	210259.03	Analyze the suitable distribution system for a locality and know the appurtenances used.
	210259.04	Summarize the arrangement of water supply and fittings in a building.
	210259.05	Determine the need of conservation of water and rural water supply.
	210259.06	Identify the sources of water pollution and suitable control measures.
214459 (B): Mandatory Audit course 4 : Language Study Japanese : Module - II	210259.01	Have Japanese Communicative competence for primitive Social conversation in Japanese
	210259.02	Comprehend Grammar of Japanese Script
	210259.03	Translate simple sentences from Japanese to English and vice a versa
	210259.04	Be aware about Japanese society and people
214459 (C): Mandatory Audit course 4 : e-Waste Management and Pollution Control	210259.01	Discuss various types of e-waste sources.
	210259.02	Understand impact of various e-wastes.
	210259.03	Identify characteristics of various e-Waste pollutants
	210259.04	Understand process of e-Waste Recycling and relevant technologies.
	210259.05	Discuss causes, effects and control measures of different environment pollution.
	210259.06	Demonstrate Safe methods for disposal of e-waste and controlling the pollution.
214459 (D): Mandatory Audit course 4 : Intellectual Property Rights	210259.01	Exhibit the concepts of Intellectual Property Rights
	210259.02	Differentiate among different IPR
	210259.03	Formulate and characterize innovative ideas and inventions into IPR
	210259.04	Demonstrate knowledge of advances in patent law and IP regulations

**TE(SEMESTER-I)
2019 Pattern**

314441: Theory of Computation	314441.01	Construct finite automata and its variants to solve computing problems.
	314441.02	Write regular expressions for the regular languages and finite automata.
	314441.03	Identify types of grammar, design and simplify Context Free Grammar.
	314441.04	Construct Pushdown Automata machine for the Context Free Language.
	314441.05	Design and analyze Turing machines for formal languages.
	314441.06	Understand decidable and undecidable problems, analyze complexity classes.
314442: Operating Systems	314442.01	Understanding the role of Modern Operating Systems.
	314442.02	Apply the concepts of process and thread scheduling.
	314442.03	Apply the concept of process synchronization, mutual exclusion and the deadlock.
	314442.04	Understand and apply the concepts of various memory management techniques.
	314442.05	Make use of concept of I/O management and File system.
	314442.06	Understand Important of System software.
314443: Machine Learning	314443.01	Apply basic concepts of machine learning and different types of machine learning algorithms.
	314443.02	Differentiate various regression techniques and evaluate their performance.
	314443.03	Compare different types of classification models and their relevant application.
	314443.04	Illustrate the tree-based and probabilistic machine learning algorithms.
	314443.05	Identify different unsupervised learning algorithms for the related

		real world problems.
	314443.06	Apply fundamental concepts of ANN.
314444: Human Computer Interaction	314444.01	Explain importance of HCI study and principles of user-centered design (UCD) approach.
	314444.02	Develop understanding of human factors in HCI design.
	314444.03	Develop understanding of models, paradigms, and context of interactions.
	314444.04	Design effective user-interfaces following a structured and organized UCD process.
	314444.05	Evaluate usability of a user-interface design.
	314444.06	Apply cognitive models for predicting human-computer-interactions.
314445(A) : Elective -I : Design and Analysis of Algorithm	314445.01	Calculate computational complexity using asymptotic notations for various algorithms.
	314445.02	Apply Divide & Conquer as well as Greedy approach to design algorithms.
	314445.03	Understand and analyze optimization problems using dynamic programming.
	314445.04	Illustrate different problems using Backtracking.
	314445.05	Compare different methods of Branch and Bound strategy.
	314445.06	Classify P, NP, NP-complete, NP-Hard problems.
314445(B): Elective -I : Advanced Database Management System	314445.01	Understand relational and object-oriented databases.
	314445.02	Learn and understand of parallel & distributed database architectures.
	314445.03	Learn the concepts of NoSQL Databases.
	314445.04	Understand data warehouse and OLAP technologies.
	314445.05	Apply data mining algorithms and to learn various software tools. CO6: Learn emerging and enhanced data models for advanced applications.
314445(C) : Elective -I : Design Thinking	314445.01	Identify need and features of design thinking.
	314445.02	Identify the opportunities and challenges for design thinking innovation.
	314445.03	Learn the process of design thinking using various tools.
	314445.04	Summarize and learn the various prototyping techniques.
	314445.05	Enlist the activities carried out in Test and reflect phase of design thinking.
	314445.06	Interpret the design thinking disruptive innovations through case studies.
314445(D) : Elective -I : Internet of Things	314445.01	Discuss fundamentals, architecture and framework of IoT.
	314445.02	Select suitable sensors and actuators for real time scenarios.
	314445.03	Justify the significance of protocol for wireless communication and IoT challenges.
	314445.04	Understand the Python programming for development of IoT applications.
	314445.05	Understand the cloud interfacing technologies.
	314445.06	Design and Implement real time IoT applications.
314446 : Operating Systems Lab	314446.01	Apply the basics of Linux commands.
	314446.02	Build shell scripts for various applications.
	314446.03	Implement basic building blocks like processes, threads under the Linux.
	314446.04	Develop various system programs for the functioning of OS concepts in user space like concurrency control, CPU Scheduling, Memory Management and Disk Scheduling in Linux.
	314446.05	Develop system programs for Inter Process Communication in Linux.
314447: Human Computer Interaction Laboratory	314447.01	Differentiate between good design and bad design.
	314447.02	Analyze creative design in the surrounding.
	314447.03	Assess design based on feedback and constraint.
	314447.04	Design paper-based prototypes and use wire frame.
	314447.05	Implement user-interface design using web technology.
	314447.06	Evaluate user-interface design using HCI evaluation techniques.
314448 : Laboratory Practice-I (Machine Learning)	314448.01	Implement different supervised and unsupervised learning algorithms.
	314448.02	Evaluate performance of machine learning algorithms for real-world applications.
314448 (A) : Laboratory Practice-I (Design of Analysis Algorithm)	314448.01	Implement the various algorithmic design strategies and use it to solve real time problems/ applications
	314448.02	Apply Divide & Conquer as well as Greedy approach to design

		algorithms.
	314448.03	Understand and analyze optimization problems using dynamic programming.
314448 (B) : Laboratory Practice-I (ADBMS)	314448.01	Understand Advanced Database Programming Languages.
	314448.02	Master the basic concepts of NoSQL Databases.
	314448.03	Install and configure database systems.
	314448.04	Populate and query a database using MongoDB commands.
	314448.05	Design data warehouse schema of any one real-time: CASE STUDYC.
	314448.06	Develop small application with NoSQL Database for back-end.
314448 (C) : Laboratory Practice-I (Design Thinking)	314448.01	Frame and Design Challenge by performing STEEP Analysis, Conduct Interviews, design and ask 5x Why and 5W+H questions.
	314448.02	Demonstrate the activities to empathize with the users by creation of Empathy Map, Persona Development, Customer Journey Map.
	314448.03	Define and ideate process of design thinking and perform brainstorming, selection of ideas, create a storyboard and design paper prototyping or digital prototyping for chosen design challenge.
314448 (D) : Laboratory Practice-I (Internet of Things)	314448.01	Design and implement real time applications with sensors and actuators.
	314448.02	Design and develop real time IoT based application by cloud interfacing.
314449 : Seminar	314449.01	Understand, interpret and summarize technical literature.
	314449.02	Demonstrate the techniques used in the paper.
	314449.03	Distinguish the various techniques required to accomplish the task.
	314449.04	Identify intended future work based on the technical review.
	314449.05	Prepare and present the content through various presentation tools and techniques in effective manner.
	314449.06	Keep audience engaged through improved interpersonal skills.
Mandatory Audit Course 5 314450 (A) : Banking and Insurance	314450.01	Differentiate between types of banks and their working.
	314450.02	Carry out banking transactions on their own.
	314450.03	Decide which insurance policy they should buy.
	314450.04	Handle investing in annuities and claim settlements.
Mandatory Audit Course 5 314450 (B) : Startup Ecosystems	314450.01	Identify Startup opportunities.
	314450.02	Explain legal and other requirements for new ventures.
	314450.03	Analyze financial Issues of startups.
Mandatory Audit Course 5 314450 (C) :Foreign Language-(Japanese Language-III)	314450.01	Ability of basic communication.
	314450.02	Knowledge of Japanese script (reading, writing and listening skills).
	314450.03	Knowledge about Japanese culture, life style, manners and etiquettes.
	314450.04	Develop interest to pursue professional Japanese Language course.

TE (Semester-II) 2019 Pattern

TE (Semester-II) 2019 Pattern		
314451: Computer Network and Security	314451.01	Know Responsibilities, services offered and protocol used at application layer of network
	314451.02	Understand wireless network and different wireless standards.
	314451.03	Recognize the Adhoc Network's MAC layer, routing protocol and Sensor network architecture.
	314451.04	Define the principal concepts of network security and Understand network security threats, security services, and countermeasures
	314451.05	Apply basic cryptographic techniques in application development.
	314451.06	Gain a good comprehension of the landscape of cyber security Vulnerabilities & describe typical threats to modern digital systems.
314452: Data Science and Big Data Analytics	314452.01	To introduce basic need of Big Data and Data science to handle huge amount of data.
	314452.02	To understand the basic mathematics behind the Big data.
	314452.03	To understand the different Big data processing technologies.
	314452.04	To understand and apply the Analytical concept of Big data using Python.
	314452.05	To visualize the Big Data using different tools.
	314452.06	To understand the application and impact of Big Data.
314453: Web Application Development	314453.01	Develop Static and Dynamic website using technologies like HTML, CSS, Bootstrap.
	314453.02	Demonstrate the use of web scripting languages.

	314453.03	Develop web application with Front End & Back End Technologies.
	314453.04	Develop mobile website using JQuery Mobile.
	314453.05	Deploy web application on cloud using AWS.
314454 (A): Elective-II (Artificial Intelligence)	314454.01	Understand the fundamental concepts of Artificial Intelligence.
	314454.02	Identify and apply appropriate search strategies for any AI problem.
	314454.03	Explore knowledge reasoning and knowledge representation methods (for solving real world problems).
	314454.04	Analyze the suitable techniques of NLP to develop AI applications.
	314454.05	Correlate the appropriate methods of Game Theory to design AI applications.
	314454.06	Understand the concept of deep learning and AI applications.
314454 (B): Elective-II (Cyber Security)	314454.01	To develop basic understanding of cyber security.
	314454.02	Differentiate among different types of cyber threats and cyber-crimes.
	314454.03	Illustrate cyber forensic techniques to identify the criminal activities.
	314454.04	Apply forensic analysis tools to recover important evidence for identifying computer crime.
	314454.05	Distinguish and classify the forms of cybercriminal activity and social the technological and engineering' methods used to undertake such crimes
	314454.06	Evaluate the effectiveness of cyber-security, cyber-laws and other countermeasures against cybercrime
314454 (C): Elective-II-(Cloud Computing)	314454.01	Articulate the main concepts, key technologies and fundamentals of cloud computing.
	314454.02	Understand cloud enabling technologies and virtualization.
	314454.03	Analyze various cloud programming models and apply them to solve problems on the cloud.
	314454.04	Explain data storage and major security issues in the cloud.
	314454.05	Understand trends in ubiquitous cloud and internet of things.
	314454.06	Explore future trends of cloud computing.
314454 (D): Elective –II (Software Modeling and Design)	314454.01	Understand basics of object oriented methodologies and Unified Modeling Language (UML).
	314454.02	Understand and apply analysis process, use case modeling, domain/class modeling
	314454.03	Design and apply interaction and behavior modeling on a given system.
	314454.04	Comprehend OO design process and business, access and view layer class design.
	314454.05	Recognize the software design principles and patterns to be applied on system.
	314454.06	Get started on study of architectural design principles and guidelines in the various type of application development.
314455: Internship	314455.01	To develop professional competence through industry internship.
	314455.02	To apply academic knowledge in a personal and professional environment.
	314455.03	To build the professional network and expose students to future employees.
	314455.04	To Apply professional and societal ethics in their day to day life.
	314455.05	To become a responsible professional having social, economic and administrative considerations.
	314455.06	To make own career goals and personal aspirations.
314456: Computer Network Security Lab	314456.01	Design and configure small size network and associated networking commands.
	314456.02	Understand various client/server environments to use application layer protocols.
	314456.03	Use basic cryptographic techniques in software and system design.
	314456.04	Apply methods for authentication, access control, intrusion detection.
314457: DS & BDA Lab	314457.01	Apply Big data primitives and fundamentals for application development.
	314457.02	Explore different Big data processing techniques with use cases.
	314457.03	Apply the Analytical concept of Big data using Python.
	314457.04	Visualize the Big Data using Tableau.
	314457.05	Design algorithms and techniques for Big data analytics.
	314457.06	Design and develop Big data analytic application for emerging trends.
314458: Laboratory Practice-II (Web Application Development)	314458.01	Develop Static and Dynamic responsive website using technologies HTML, CSS, Bootstrap and AJAX.
	314458.02	Create Version Control Environment.
	314458.03	Develop an application using front end and backend technologies.
	314458.04	Develop mobile website using JQuery Mobile.
	314458.05	Deploy web application on cloud using AWS.
314458 : Lab Practice – II (Artificial Intelligence)	314458.01	Evaluate and apply core knowledge of AI on various real world problems.
	314458.02	Illustrate and demonstrate AI tools for different dynamic applications.

314458: Lab Practice –II (Cyber Security)	314458.01	To know the different guidelines for Packet Sniffing in networking and internetworking environment.
	314458.02	To know the different types of cyber-attacks and will be able analyze the attacks.
	314458.03	Apply the knowledge of IDS to secure network and performing analysis of IDS attack on network.
314458: Laboratory Practice-II (Cloud Computing)	314458.01	To design and develop cloud based applications.
	314458.02	To Simulate a cloud scenario using CloudSim.
	314458.03	To design and deploy web applications in cloud environment.
314458 :Laboratory Practice-II (Software Modeling Design)	314458.01	Develop use case model with the help of UML notations.
	314458.02	Develop and implement analysis model and design model.
	314458.03	Develop and implement Interaction and behavior Model.
Mandatory Audit Course 6 314459 (A) : Green and Unconventional Energy	314459.01	List and explain the main sources of energy and their primary applications in the India, and the world.
	314459.02	Describe the challenges and problems associated with the use of various energy sources and its conservation.
	314459.03	List and describe the primary renewable energy resources and technologies.
	314459.04	Collect and organize information on renewable energy technologies as a basis for further analysis and evaluation.
Mandatory Audit Course 6 314459 (B): Leadership and Personality Development	314459.01	Practice responsible decision-making and personal accountability.
	314459.02	Demonstrate an understanding of group dynamics and effective teamwork.
	314459.03	Develop a range of leadership skills and abilities such as effectively leading change, resolving conflict, and motivating others.
	314459.04	Develop multi-dimensional personality.
Mandatory Audit Course 6 314459 (C): Foreign Language-(Japanese Language- IV)	314459.01	Do Better Communication in Japanese language.
	314459.02	Demonstrate knowledge of Japanese Language Scripts (Reading, Writing, etc).
	314459.03	Demonstrate knowledge of Japanese culture, lifestyle, etc.
	314459.04	Pursue advanced Professional Japanese Language course.

BE (Semester-I) 2015 Pattern

414453: INFORMATION AND CYBER SECURITY	414453.01	Be able to use basic cryptographic techniques in software and system design.
	414453.02	Apply methods for authentication, access control, intrusion detection and prevention.
	414453.03	Able to apply the scientific method to digital forensics and perform forensic investigations
	414453.04	To develop computer forensics awareness.
	414453.05	Ability to use computer forensics tools.
MACHINE LEARNING AND APPLICATION (414454) 2015 PATTERN	414454.01	Model the learning primitives.
	414454.02	Build the learning model.
	414454.03	Tackle real world problems in the domain of Data Mining and Big Data Analytics, Information Retrieval, Computer vision, Linguistics and Bio-informatics.
	414454.04 (Added)	Acquire fundamental knowledge of classification theory.
	414454.05 (Added)	Design and evaluate various machine learning algorithms.
414455: SOFTWARE DESIGN AND MODELING	414455.01	Understand object oriented methodologies, basics of Unified Modelling Language (UML).
	414455.02	Understand analysis process, use case modelling, domain/class modelling
	414455.03	Understand interaction and behaviour modelling.
	414455.04	Understand design process and business, access and view layer class design
	414455.05	Get started on study of GRASP principles and GoF design patterns.
	414455.06	Get started on study of architectural design principles and guidelines in the various type of application development
414456A: Elective-I Wireless Communications	414456.01	Understand the basics of propagation of radio signals.
	414456.02	Understand the basic concepts of basic Cellular System and the design requirements.
	414456.03	Have an understanding of the basic principles behind radio resource management techniques such as power control, channel allocation and handoffs.
	414456.04	Gain insights into various mobile radio propagation models and how the

		diversity can be exploited to improve performance.
	414456.05	Gain knowledge and awareness of the technologies for how to effectively share spectrum through multiple access techniques i.e. TDMA, CDMA, FDMA etc.
	414456.06	Have in-depth understanding of the design consideration and architecture for different Wireless Systems like GSM, CDMA, GPRS etc.
	414456.07	Understanding of the emerging trends in Wireless communication like WiFi, WiMAX, Software Defined Radio (SDR) and related issues and challenges.
414456B: Elective-I Natural Language Processing	414456.01	Understand automatic processing of human languages using computers
	414456.02	Understand various applications of natural language processing.
414456C: ELECTIVE-I USABILITY ENGINEERING	414456.01	Justify the theory and practice of usability evaluation approaches, methods and techniques.
	414456.02	Compare and evaluate strengths and weaknesses of various approaches, methods and techniques for evaluating usability.
	414456.03	Design and implement a usability test plan, based on modelling or requirements specification
	414456.04	Choose appropriate approaches, methods and techniques to evaluate the usability of a specified interactive system.
414456D: Elective-I Multicore and Concurrent Systems	414456.01	Know types of parallel machine and to know multicore and concurrent systems in detail.
	414456.02	Know the ways to measure the performance of multicore systems.
	414456.03	Understand need of multicore and concurrent system programming.
	414456.04	Know the different approaches for multicore and concurrent programming
	414456.05	Use and apply the approaches learned, for application development.
	414456.06	Understand and explore recent trends in multicore and concurrent system programming.
414456E: Elective-I Business Analytics and Intelligence	414456.01	Comprehend the Information Systems and development approaches of Intelligent Systems
	414456.02	Evaluate and rethink business processes using information systems.
	414456.03	Propose the Framework for business intelligence.
	414456.04	Get acquainted with the Theories, techniques, and considerations for capturing organizational intelligence
	414456.05	Align business intelligence with business strategy.
	414456.06	Apply the techniques for implementing business intelligence systems
414457A: Elective-II Software Defined Networks	414457.01	Acquire fundamental knowledge of SDN exploring the need, characteristics, and architecture of SDN
	414457.02	Recognize Open Flow protocols and its forwarding, pipeline model.
	414457.03	Understand different methodologies for sustainable SDN.
	414457.04	Comprehend IT Infrastructure for SDN
	414457.05	Acquiring knowledge of OpenFlow protocols, visualization
414457B: Elective-II Soft Computing	414457.01	Tackle problems of interdisciplinary nature.
	414457.02	Find an alternate solution, which may offer more adaptability, resilience and optimization
	414457.03	Gain knowledge of soft computing domain which opens up a whole new career option.
	414457.04	Tackle real world research problems.
414457C: ELECTIVE-II SOFTWARE TESTING AND QUALITY ASSURANCE	414457.01	Test the software by applying testing techniques to deliver a product free from bugs.
	414457.02	Investigate the scenario and to select the proper testing technique.
	414457.03	Explore the test automation concepts and tools and estimation of cost, schedule based on standard metrics.
	414457.04	Understand how to detect, classify, prevent and remove defects.
	414457.05	Choose appropriate quality assurance models and develop quality.
	414457.06	Ability to conduct formal inspections, record and evaluate results of inspections.
414457D: Elective-II Compiler Construction	414457.01	Understand the structure of compilers.
	414457.02	Understand the basic and advanced techniques used in compiler construction.
	414457.03	Understand the basic data structures used in compiler construction such as abstract syntax.
	414457.04	Cognitive skills (thinking and analysis)- Design and implement a compiler using a software engineering approach
	414457.05	Communication skills (personal and academic).
	414457.06	Practical and subject specific skills (Transferable Skills) - Use generators (e.g. Lex and Yacc).
414457E: Elective-II Gamification	414457.01	Write programs to solve problems using gamification and open source tools.
	414457.02	Apply gamification for Mobile and Web Applications.
	414457.03	Solve problems for multi-core or distributed, concurrent/Parallel environments.
414458: COMPUTER	414458.01	The students will be able to implement and port controlled and secured access to software

LABORATORY VII		systems and networks.
	414458.02	The students will be able to build learning software in various domains.
414459: COMPUTER LABORATORY VIII	414459.01	Draw, discuss different UML 2.0 diagrams, their concepts, notation, advanced notation, forward and reverse engineering aspects.
	414459.02	Identify different software artifacts used to develop analysis and design model from requirements.
	414459.03	Develop use case model
	414459.04	Develop, implement analysis model and design model
	414459.05	Develop, implement Interaction and behaviour Model
	414459.06	Implement an appropriate design pattern to solve a design problem.
414460: PROJECT PHASE-I	414460.01	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
	414460.02	To function effectively as a team to accomplish a desired goal.
	414460.03	An understanding of professional, ethical, legal, security and social issues and responsibilities related to Information Technology Project.
414461A: Audit Course-V Emotional Intelligence	414461.01	Expand your knowledge of emotional patterns in yourself and others.
	414461.02	Discover how you can manage your emotions, and positively influence yourself and others.
	414461.03	Build more effective relationships with people at work and at home.
	414461.04	Positively influence and motivate colleagues, team members, and managers.
	414461.05	Increase your leadership effectiveness by creating an atmosphere that engages others.
	414461.06	Apply EI behaviors and supports high performance.
414461B: Audit Course-V Green Computing	414461.01	Understand the concept of green IT and relate it to sustainable development.
	414461.02	Apply the green computing practices to save energy.
	414461.03	Discuss how the choice of hardware and software can facilitate a more sustainable Operation.
	414461.04	Use methods and tools to measure energy consumption.
414461C: Audit Course-V Critical Thinking	414461.01	If students whole-heartedly participate in the course, they can expect to be smarter, stronger and more confident thinkers.
	414461.02	They can embark on a life-long journey of “self-directed learning”.
414461D: Audit Course-V Statistical Learning Model using R	414461.01	Students will be familiar with concepts related to “data science”, ”analytics”, “machine learning”, etc. These are important topics, and will enable students to embark on highly rewarding careers.
	414461.02	Students will capable of learning “big data” concepts on their own.
BEIT 2015 Pattern Semester-II		
414462: DISTRIBUTED COMPUTING SYSTEM	414462.01	Understand the principles and desired properties of distributed systems based on different application areas.
	414462.02	Understand and apply the basic theoretical concepts and algorithms of distributed systems in problem solving.
	414462.03	Recognize the inherent difficulties that arise due to distributed-ness of computing resources.
	414462.04	Identify the challenges in developing distributed applications
414463: UBIQUITOUS COMPUTING	414463.01	Demonstrate the knowledge of design of Ubicomp and its applications.
	414463.02	Explain smart devices and services used Ubicomp.
	414463.03	Describe the significance of actuators and controllers in real time application design.
	414463.04	Use the concept of HCI to understand the design of automation applications.
	414463.05	Classify Ubicomp privacy and explain the challenges associated with Ubicomp privacy.
	414463.06	Get the knowledge of ubiquitous and service oriented networks along with Ubicomp management.
414464A: Elective III INTERNET of THINGS (IoT)	414464A.01	Explain what is internet of things.
	414464A.02	Explain architecture and design of IoT
	414464A.03	Describe the objects connected in IoT
	414464A.04	Understand the underlying Technologies.
	414464A.05	Understand the platforms in IoT.
	414464A.06	Understand cloud interface to IoT.
414464A: ELECTIVE III INTERNET OF THINGS LABORATORY	414464A.01	To understand IoT platforms such as Raspberry-Pi/Beagle board/Arduino
	414464A.02	To understand operating systems for platforms such as Raspberry-Pi/Beagle board/Arduino.
	414464A.03	To communicate with objects using IoT platforms such as Raspberry-Pi/Beagle board/Arduino.
	414464A.04	To interface cloud environment for IoT application.
	414464A.05	To implement IoT related protocols such as MQTT / CoAP etc.

	414464A.06	To implement the web interface for IoT.
414464D: ELECTIVE IV SOCIAL MEDIA ANALYTICS	414464D.01	Understand the basics of Social Media Analytics.
	414464D.02	Explain the significance of Data mining in Social media.
	414464D.03	Demonstrate the algorithms used for text mining.
	414464D.04	Apply network measures for social media data.
	414464D.05	Explain Behaviour Analytics techniques used for social media data.
	414464D.06	Apply social media analytics for Face book and Twitter kind of applications
414466: COMPUTER LABORATORY-IX	414466.01	Demonstrate knowledge of the core concepts and techniques in distributed systems.
	414466.02	Learn how to apply principles of state-of-the-Art Distributed systems in practical application.
	414466.03	Design, build and test application programs on distributed systems.
414467: COMPUTER LABORATORY-X	414467.01	Set up the Android environment and explain the Evolution of cellular networks (BT-2).
	414467.02	Develop the User Interfaces using pre-built Android UI components (BT -6)
	414467.03	Create applications for performing CURD SQLite database operations using Android(BT-6).
	414467.04	Create the smart android applications using the data captured through sensors (BT-6).
	414467.05	Implement the authentication protocols between two mobile devices for providing security(BT-3).
	414467.06	Analyze the data collected through android sensors using any machine learning algorithm (BT-4).
414468: PROJECT WORK	414468.01	Learn teamwork.
	414468.02	Be well aware about Implementation phase.
	414468.03	Get exposure of various types of testing methods and tools.
	414468.04	Understand the importance of documentation.
414469A: Audit Course- VI IoT Applications in Engineering Field.	414469.01	Expand your knowledge of Internet of Things.
	414469.02	Discover how you can use IoT in your Engineering applications.
	414469.03	Build more effective hands on with IoT elements.
	414469.04	Expand the practical knowledge of using IoT components like sensors, processors.
	414469.05	Expand the understanding of using different protocols.
414469B: Audit Course- VI Entrepreneurship	414469.01	Expand your knowledge of Entrepreneurship & Startups.
	414469.02	Discover how you can use Entrepreneur Qualities.
	414469.03	Expand the practical knowledge of Finance, Legal-Patents, Intellectual Property, and Business Associations.
	414469.04	Expand the understanding of Deliverables & Achieving Target.
414469C: Audit Course- VI Cognitive computing	414469.01	Understand and discuss what cognitive computing is, and how it differs from traditional approaches.
	414469.02	Plan and use the primary tools associated with cognitive computing.
	414469.03	Plan and execute a project that leverages cognitive computing.
	414469.04	Understand and discuss the business implications of cognitive computing.
414469D: Audit Course- VI AI and Robotics	414469.01	The goal of this course is to familiarize the students with the basic concepts of robotics, artificial intelligence and intelligent machines.
	414469.02	It will help students to understand and apply principles, methodology and techniques of intelligent systems to robotics.