Course Outcomes Academic

Year 2019-20

	Discrete Mathematics
C201.1	Apply principles of set theory to solve problems.
C201.2	Identify types of functions and relations in set theory.
C201.3	Apply graph theory principles to solve problems.
C201.4	Make use of properties of trees and solve problems using techniques and algorithms.
C201.5	Solve problems on algebraic structure and coding theory using mathematical methods.

	Digital Electronics & Logic Design
C202.1	Apply minimization techniques to design Combinational and Sequential digital circuits.
C202.2	Analyze and design Algorithmic State Machines and VHDL circuits.
C202.3	Explain and classify Logic families.
C204.4	Draw combinational circuits using PLDs.
C202.5	Illustrate architecture of Microcontroller 8051 and Programming Model.

	Data Structures and algorithm
C203.1	Express the solution of the given problem in an algorithmic form.
C203.2	Identify the data structure and write suitable code for a given problem.
C203.3	Analyze and apply searching and sorting algorithms.
C203.4	Evaluate the problem to trace, debug and test the written code.
C203.5	Write the C++ code using programming ethical practices.

	Computer Organization and Architecture
C204.1	Illustrate computer architecture related to design of processor, memories and I/O.
C204.2	Analyze the impact of memory hierarchy on performance of computers.
C204.3	Explain the architecture of Input and Output system.
C204.4	Explain the instruction set architecture of a processor.
C204.5	Evaluate design alternatives in processor organization.

	Object Oriented Programming

C205.1	Express the solution of the given problem in an algorithmic form.
C205.2	Write a code using basic features of object oriented programming.
C205.3	Utilize the concepts of advanced C++ to solve problems.
C205.4	Evaluate the program to trace, debug and test the written code.
C205.5	Write C++ code using programming ethical practices.

	Digital Electronics Lab
C206.1	Apply minimization techniques to design Combinational and Sequential digital circuits.
C206.2	Analyze and design Algorithmic State Machines and VHDL circuits.
C206.3	Explain and classify Logic families.
C206.4	Draw combinational circuits using PLDs.
C206.5	Illustrate architecture of Microcontroller 8051 and Programming Model.

	Data Structure and Algorithms Lab
C207.1	Express the solution of the given problem in an algorithmic form.
C207.2	Identify the data structure and write suitable code for a given problem.
C207.3	Analyze and apply searching and sorting algorithms.
C207.4	Evaluate the problem to trace, debug and test the written code.
C207.5	Write the c++ code using programming ethical practices.

	Object Oriented Programming Lab
C208.1	Express the solution of the given problem in an algorithmic form.
C208.2	Write a code using basic features of object oriented programming.
C208.3	Utilize the concepts of advanced C++ to solve problems.
C208.4	Evaluate the program to trace, debug and test the written code.
C208.5	Write C++ code using programming ethical practices.

	Soft Skills
C209.1	Demonstrate oral, written communication and listening skills.
C209.2	Make use of Inter-personal skills, conflict management and leadership skills to work effectively in teams.
C209.3	Identify strengths, weaknesses and goals for self-development.
C209.4	Apply ethical principles along with appropriate etiquettes.
C209.5	Make use of intra-personal skills to manage time and stress effectively.

	Audit Course 1
C210.1	Explain the basics of Japanese language.
C210.2	Make use of Japanese language for communication.
C210.3	Demonstrate reading, writing and listening skills.
C210.4	Choose Japanese language as a professional course.

	Engineering Mathematics-III
C211.1	Solve higher order linear Differential equations and model L-C-R electrical circuits
C211.2	Evaluate Fourier Integrals and Z-transform for difference equation.
C211.3	Analyze given data using measures of central tendency, dispersion, moments, skewness, kurtosis, correlation-regression.
C211.4	Apply techniques of Probability, Probability Distributions and Chi-Square Test to analyze on given data.
C211.5	Apply vector differential operators and integration to solve various problems.
C211.6	Interpret complex differentiation, integration and bilinear transformation.

	Computer Graphics
C212.1	Analyze and apply computer graphics algorithms for line-circle drawing, scan conversion and filling.
C212.2	Discover projections and visible surface detection techniques for display of 2D and 3D object
C212.3	Apply the concepts of color models, hidden surface elimination. Lighting and shading models.
C212.4	Apply the logic to implement animation and gaming programs.

	Advanced Data Structure
C213.1	Choose appropriate data structure to solve various computer engineering domain problems.
C213.2	Illustrate and implement various data structures.
C213.3	Make use of appropriate coding standards and apply dynamic programming techniques.
C213.4	Explain primitive operations on different types of file organizations

	Microprocessor
C214.1	Apply basics of microprocessors and coprocessor to develop Assembly Language Programs.
C214.2	Find errors and Debug programs written in assembly language.
C214.3	Illustrate basic memory management of microprocessors and coprocessor.
C214.4	Distinguish various formats of processor to classify architecture of microprocessor.

	Principles of Programming Languages
C215.1	Write efficient and effective programs using appropriate syntax and semantics for programming languages.
C215.2	Make use of various data types, programming structures and different programming paradigms to write programs.
C215.3	Apply Object oriented programming features to write program in JAVA.
C215.4	Make use of applet and exception handling effectively in application development.

	Computer Graphics Lab
C216.1	Analyze and apply computer graphics algorithms for line-circle drawing, scan conversion and filling.
C216.2	Discover projections and visible surface detection techniques for display of 2D and 3D object
C216.3	Apply the concepts of color models, hidden surface elimination. Lighting and shading models.
C216.4	Apply the logic to implement animation and gaming programs.

	Advanced Data Structure Lab

C217.1	Choose appropriate data structure to solve various computer engineering domain problems.
C217.2	Illustrate and implement various data structures
C217.3	Make use of appropriate coding standards and apply dynamic programming techniques
C217.4	Explain primitive operations on different types of file organizations

	Microprocessor Lab
C218.1	Apply basics of microprocessors and coprocessor to develop Assembly Language Programs.
C218.2	Find errors and Debug programs written in assembly language.
C218.3	Illustrate basic memory management of microprocessors and coprocessor.
C218.4	Distinguish various formats of processor to classify architecture of microprocessor.

	Audit Course II
C219.1	Interpret Japanese script.
C219.2	Express the knowledge in Japanese language through basic communication.
C219.3	Choose to pursue professional Japanese language course.

	Theory of Computation
C301.1	Construct the finite automata for the given patterns and Explain the working and design principles.
C301.2	Write the regular expressions for the given patterns.
C301.3	Design the grammar for the given language specifications.
C301.4	Design and Verify the pushdown automata for the given language specification and Explain the underlying working principles.
C301.5	Design and Verify the Turing Machine for the given language specification and Explain the underlying working principles.
C301.6	Classify problems into P and NP classes.

	Database Management Systems

C302.1	Draw ER diagram and represent it in relational database.
C302.2	Apply normalization on relational database.
C302.3	Write queries using SQL, PLSQL and NoSQL for data manipulation.
C302.4	Explain principles of transaction and recovery management.
C302.5	Illustrate distributed and parallel database architecture.

	Software Engineering & Project Management
C303.1	Apply software engineering principles to develop software.
C303.2	Analyze software requirements and formulate design solution for a software.
C303.3	Explain concepts of project management & planning.
C303.4	Explain quality management & different types of metrics used in software development.
C303.5	Explain types of testing for software.

	Information Systems & Engineering Economics
C304.1	Explain the need, usage and importance of information systems in an organization.
C304.2	Summarize management information system with respect to ethical and social issues.
C304.3	Apply principles of engineering economics for the design of information systems.
C304.4	Apply the appropriate engineering economics analysis methods for problem solving.

	Computer Networks
C305.1	**Analyze** the requirements of a given organization and **select** the most appropriate network architecture, topology and transmission media.
C305.2	**Identify** design issues in data link layer and **apply** standard techniques to resolve them.
C305.3	**Apply** routing algorithms to find shortest path for a given network.
C305.4	**Explain** transport layer protocols and apply socket programming for various applications.
C305.5	**Explain** and **simulate** application layer protocols.

	Skill Development Lab

C306.1	Identify and Implement a solution for designing systems by using advanced technologies.
C306.2	Create data-driven applications.
C306.3	Make use of software engineering practices for building applications.
C306.4	Use IDE for developing software applications.
C306.5	Solve problems on quantitative and logical reasoning.

	Database Management System Lab
C307.1	Draw ER diagram and represent it in relational database.
C307.2	Apply normalization on relational database.
C307.3	Write queries using SQL, PLSQL and NoSQL for data manipulation.
C307.4	Explain principles of transaction and recovery management.
C307.5	Illustrate distributed and parallel database architecture.

	Computer Networks Lab
C308.1	**Analyze** the requirements of a given organization and **select** the most appropriate network architecture, topology and transmission media.
C308.2	**Identify** design issues in data link layer and **apply** standard techniques to resolve them.
C308.3	**Apply** routing algorithms to find shortest path for a given network.
C308.4	**Explain** transport layer protocols and apply socket programming for various applications.
C308.5	**Explain** and **simulate** application layer protocols.

	Audit Course 3 (AC-IV: MOOC-Learn New Skill)
C309.1	Apply the acquired knowledge for product development.
C309.2	Make use of modern technologies for development of applications.
C309.3	Recognize the need and engage in independent learning.

	Design and Analysis of Algorithms
C310.1	**Apply** knowledge of computing and mathematics for algorithmic design.
C310.2	**Apply** appropriate algorithmic strategy to solve problems**.**
C310.3	**Analyze** the time and space complexity of various algorithms and problems.
C310.4	**Examine** problems on Multithreaded and Distributed Algorithms.

	Systems Programming and Operating System
C311.1	Design and Develop pass – I and pass – II of two pass assembler and macroprocessor.
C311.2	Construct lexical analyzer and parsers using Lex and YACC tools.
C311.3	Apply process management policies and analyze CPU scheduling algorithms.
C311.4	Apply memory management, Storage Management policies.

	Embedded Systems and Internet of Things
C312.1	Apply the concepts of embedded system and classify internet of things levels.
C312.2	Make use of various IOT specifications to design IOT systems.
C312.3	Explain IOT protocols and Develop IOT based real-time application using embedded devices
C312.4	Demonstrate the use of Cloud computing technologies in IOT and develop applications for social relevance.

	Software Modelling and Design

C313.1	Analyze the problem statement (SRS) and choose proper design technique for designing web-based/ desktop application.
C313.2	Analyze the requirements for a problem and apply object-oriented approach for modelling.
C313.3	Illustrate the architecture of the software to be developed.
C313.4	Explain design patterns used in software systems.
C313.5	Explain various testing strategies for software quality assurance.

	Web Technology
C314.1	Explain web development process and Develop web applications using client side technologies.
C314.2	Develop web applications using server-side technologies.
C314.3	Develop web applications using client-side frameworks & server-side frameworks.
C314.4	Develop web applications using web services and Content Management System.

	Seminar and Technical Communication
C315.1	Identify & choose the appropriate domain (area).
C315.2	Summarize the literature survey on problems and deduce the problem statement.
C315.3	Compile the documents for an identified problem.
C315.4	Express the idea, concepts and solution of the selected problem ethically as an individual.

	Web Technology Lab
C316.1	Explain web development process and Develop web applications using client side technologies.
C316.2	Develop web applications using server-side technologies.
C316.3	Develop web applications using client-side frameworks & server-side frameworks.
C316.4	Develop web applications using web services and Content Management System.

	Systems Programming & Operating System Lab
C317.1	**Design** and **Develop** pass – I and pass – II of two pass assembler and macroprocessor.
C317.2	**Construct** lexical analyzer and parsers using Lex and YACC tools.
C317.3	**Apply** process management policies and analyze CPU scheduling algorithms.
C317.4	**Apply** memory management, Storage Management and its allocation policies.

	Embedded Systems & Internet of Things Lab
C318.1	Apply the concepts of embedded system and classify internet of things levels.
C318.2	**Make use of various IOT** specifications to design IOT systems.
C318.3	Explain IOT protocols and **Develop** IOT based real-time application using embedded devices
C318.4	**Demonstrate** the use of Cloud computing technologies in IOT and develop applications for social relevance.

	Audit Course-IV (Digital & Social Media Marketing)
C319.1	Explain major social media marketing portals.
C319.2	Explain effective social media marketing strategies for various types of industries and businesses.
C319.3	Create, post content & measure the effectiveness of social marketing.

	High Performance Computing

C401.1	Explain parallel processing architecture.
C401.2	Develop an efficient parallel algorithm to solve a problem.
C401.3	Analyze and measure performance of parallel programs.
C401.4	Explain the logic to parallelize the sorting and graph algorithms.

	Artificial Intelligence and Robotics
C402.1	Analyze the problem and apply Artificial Intelligence techniques for problem solving.
C402.2	Interpret and solve problems related to planning and constraint satisfaction.
C402.3	Represent various real-life problems using logic-based techniques and draw inference.
C402.4	State and explain the applications of Artificial Intelligence in the real world.
C402.5	Explain various components, functions and applications of robots in real world.

	Data Analytics
C403.1	Apply knowledge for analysis of data and select suitable methods for data pre-processing.
C403.2	Identify and apply analytical methods on data.
C403.3	Apply classification techniques on data to solve problems.
C403.4	Explain data visualization techniques.
C403.5	Make use of Hadoop ecosystem for analysis of unstructured data.

	Elective-I: Data Mining and Warehousing
C404D.1	Analyze the problem and apply suitable pre-processing technique.
C404D.2	Construct a data warehouse model and identify OLAP operations to extract hidden patterns.
C404D.3	Apply basic, intermediate and advanced techniques to mine the data.
C404D.4	Draw inference from the output generated to predict the patterns.
C404D.5	Compare and apply appropriate data mining technique to solve real world problems.

	Software Testing and Quality Assurance
C405B.1	Identify type of software testing for a given scenario.
C405B.2	Design test plan, test cases and test using sample data.
C405B.3	Make use of automation tools for testing software.
C405B.4	Explain quality management, assurance and quality standards for software systems.
C405B.5	Explain Software Quality Tools.

	Laboratory Practice– I
C406.1	**Develop** and **analyze** various parallel programs.
C406.2	**Apply** AI algorithmic strategies for solving various problems.
C406.3	**Analyze** datasets using analytical techniques and tools.
C406.4	**Apply** data visualization technique for datasets.

	Laboratory Practice– II
C407.1	Make use of data mining Tools.
C407.2	Analyze and compare classification techniques.
C407.3	Develop an application and Apply manual testing.
C407.4	Develop web based application & apply automation testing using automation tool.

	Project Work Stage – I
C408.1	Identify and formulate the problem.
C408.2	Analyze the problem scenario and propose solutions to engineering problem using software engineering principles.
C408.3	Prepare the SRS, plan and estimate the project cost as per proposed solution.
C408.4	Work as an individual and as a part of multidisciplinary team to design and develop quality project.
C408.5	Prepare report of proposed solution and communicate effectively through presentation.

	Audit Course 5 (AC5: VI -MOOC-Learn New Skill)
C409.1	Apply the acquired knowledge for product development.
C409.2	Make use of modern technologies for development of applications.
C409.3	Recognize the need and engage in independent learning.

	Machine Learning
C410.1	Apply preprocessing methods to prepare training data set for machine learning.
C410.2	Apply regression techniques to evaluate and interpret the results of the various regression algorithms.
C410.3	Choose and apply supervised machine learning algorithms for real world applications.
C410.4	Solve problems using clustering techniques.

	Information and Cyber Security
C411.1	Apply data encryption techniques for system level security.
C411.2	Apply various Public key cryptographic techniques.
C411.3	Evaluate various cryptography measures to ensure privacy & confidentiality.
C411.4	Identify network and cyber security threats and related laws.

	Compilers
C412B.1	Make use of LEX and YACC to construct scanner and parser.
C412B.2	Construct various types of grammar and Apply it for intermediate code generation.
C412B.3	Apply translation for control structures of high level language.
C412B.4	Apply code generation and code optimization techniques for the given code.

	Soft Computing and Optimization Algorithms
C412D.1	Apply various soft computing methodologies.
C412D.2	Explain how evolutionary system and algorithms work.
C412D.3	Apply genetic algorithms to combinatorial optimization problems.
C412D.4	Explain the use of swarm intelligence algorithms to solve certain problems.

	Cloud Computing
C413C.1	**Identify** the architecture, infrastructure and service models of cloud computing.
C413C.2	**Explain** cloud security and cloud file systems.
C413C.3	**Choose** virtualization structures, tools and mechanisms.
C413C.4	**Design** and **Develop** cloud solutions for an application scenario using AWS core services.

	Business Intelligence

C413D.1	**Apply** visualization and Knowledge Delivery techniques to develop BI applications.
C413D.2	**Analyze** the real world problems & **Apply** Decision support techniques.
C413D.3	**Apply** various data Pre-processing techniques on BI applications.
C413D.4	**Choose & Apply** various Data Mining Techniques to explore the hidden patterns.
C413D.5	**Make use of** business intelligence applications in various sectors.

	Laboratory Practice III
C414.1	Analyze the data set and apply different supervised learning techniques.
C414.2	Analyze the data set and apply different unsupervised learning techniques.
C414.3	Apply standard encryption techniques to provide security.
C414.4	Apply an algorithm for authentication and confidentiality.

	Laboratory Practice IV
C415.1	Apply various soft computing methodologies. / Construct Lexical analyzer and Parsers using LEX and YACC tools.
C415.2	Make use of swarm intelligence algorithms to solve real world problems. / Make use of various code optimization and generation algorithms to build the compiler.
C415.3	Make use of BAI techniques to analyze the data. / Design and Develop cloud applications for the given problem.
C415.4	Analyze the output generated by the process of Business Intelligence. / Analyze the components of Openstack, Google Cloud Platform, Amazon Web Services, Microsoft Azure.

	Project Work Stage – II
C416.1	Make use of various modern technologies / tools required to develop the project.
C416.2	Evaluate quality and performance of the developed solution, and ensure environmental context and sustainability.
C416.3	Compile the project report and demonstrate the working of the project.
C416.4	Present themselves in a professional manner as a team ethically.

	Audit Course 6 (AC6: VI -MOOC-Learn New Skill)
C417.1	Identify an appropriate course for skill improvement.
C417.2	Apply additional understanding to develop applications through self-learning.
C417.3	Utilize various modern technologies / tools for independent learning.