Department of Information Technology
Course Outcomes (COs)-R16

SEMESTER: 1 **COURSE YEAR: 2016-2020**

Course Outcomes for First Year First Semester Course		
COURSE	COURSE OUTCOMES	
ENGLISH B16 ENG 1101	CO1	1. The overall performance of the students will be enhanced after the course; they will be in a position to make presentations on topics of current interests – politics, famous personalities, science and technology, tourism, work and business environment, with increased public speaking skills.
	CO2	Students will be able to read, listen, speak and write effectively in both academic and non-academic environment
	CO3	The students will be updated with certain real life situations, which they can handle when come face to face.
B16 ENG 1102 MATHEMATICS - I	CO1	Find partial derivatives, expand a function of more than one variable in a Taylor series and utilize them for errors and approximations, maxima and minima..
	CO2	Solve a first order ODE and also find orthogonal trajectories and solve problems related to simple applications.
	CO3	Solve a given higher order ODE, an equation with constant coefficients, a Cauchy‟s equation or a Legendre‟s equation.
	CO4	Utilize knowledge of Fourier series for solving partial differential equations and also in understanding courses like Signals & Systems
B16ENG 1103 MATHEMATICS – II	CO1	Utilizing the knowledge of matrices for solving linear simultaneous equations, find Eigen values and Eigen vectors and handle quadratic forms
	CO2	Utilizing the knowledge of Laplace Transforms to find transforms of important functions that arise in applications and also solve ODE
	CO3	Also utilizing the knowledge of Laplace Transforms in courses like Net Works, Signals & Systems and Control Systems
	CO4	Utilizing the knowledge of difference equations and Z-transforms in understanding courses like Discrete Mathematical Structures and also Signals & Systems.
B16ENG 1104 CHEMISTRY	CO1	Students learn in-depth about the topics of desalination of sea water, CNG, LPG Biogas, Semiconductors, Liquid crystals, Conducting polymers, fiber reinforced plastics, building materials
	CO2	Students understand the basic and advanced applied concepts..
	CO3	Students learn to interrelate the theory and with the relevant experiment.
	CO4	Students learn experimental techniques and understand the theory about experiments.
B16 ENG 1106	CO1	Student can understand basic terminology used in C programming

COMPUTER PROGRAMMING USING C & NUMERICAL METHODS	CO2	Student can write programs by applying elementary algorithms to solve problems in C language..
	CO3	Student can write, compile and debug programs in C language.
	CO4	Student can Write programs to solve numerical methods
	CO5	Student can be familiar with finite precision computation.
B16 ENG 1108 HISTORY OF SCIENCE AND TECHNOLOGY	CO1	By the end of this course the students should be able to understand the contribution of Scientific and Technological developments for the benefit of society at large.
B16ENG1110 CHEMISTRY LAB	CO1	
	CO2	
COMPUTER PROGRAMMING USING C & NUMERICAL METHODS LAB B16 ENG 1112	CO1	
	CO2	
	CO3	
	CO4	
TECHNICAL ENGLISH	CO1	Students improve their language skills in formal/ technical contexts
	CO2	They enhance their understanding of technical terms.
	CO3	They improve their personal skills.
Course Outcomes for First Year Second Semester Course		
MATHEMATICS – IIIB16 ENG 1201	CO1	Utilize knowledge of line, sphere etc. in his engineering subjects.
	CO2	Utilize the knowledge of Beta and Gamma functions and multiple integrals to evaluate the integrals they come across in their applications
	CO3	Utilize the knowledge of Fourier Transform in courses like Signals and Systems and in the solution of partial differential equations at a later stage
B16 ENG 1202 PHYSICS		Students learn in depth about the topics of Lasers, fiber optics, quantum mechanical Theory and classical theories of thermodynamics and electromagnetism.
		Students understand the classical and modern concepts
ENGINEERING GRAPHICS B16 ENG 1204	CO1	Apply principles of drawing to represent dimensions of an object.
	CO2	Construct polygons and engineering curves..
	CO3	Draw projections of points, lines, planes and solids.
	CO4	Represent sectional views of solids.
	CO5	Develop the surfaces of regular solids.
	C06	. Draw the isometric views of solids and combination of solidsAt the end of the course the students learn the advantages and limitations of plastic materials and their use in design
PROFESSIONAL ETHICS AND MORAL VALUES B16 ENG 1206	CO1	By the end of the course student should be able to understand the importance of ethics and values in life and society
B16 CE 1208 BUILDING MATERIALS AND BUILDING	CO1	Learn and identify the relevant physical and mechanical properties pertaining to the construction industry..
	CO2	Demonstrate the relevant BIS testing procedure to be carried out to ascertain the quality of building materials..
	CO3	Develop ability to choose the modern construction material appropriate

CONSTRUCTION		to the climate and functional aspects of the buildings.
	CO4	. Ability to supervise the construction technique to be followed in brick, stone and hollow block masonry, concreting, flooring, roofing, plastering and painting etc.
	CO5	Learn about the causes of deterioration, crack pattern, and assessment of damages.
	CO6	Learn about the construction techniques in repairing of buildings.
B16 CS 1208 PROBABILITY, STATISTICS AND QUEUING THEORY	CO1	Handle the situation of uncertainty in decision making in our day-to-day life.
	CO2	Identify the random variable as discrete/continuous and analyse it..
	CO3	Predict the distribution suitable for the given data from its moments.
	CO4	Measure the intensity of association between the variables and to fit a best suitable Curve for the given data.
	CO5	Decide the test applicable for giving inference about Population Parameter based on Sample statistic.
	CO6	Make business decisions about the resources needed to provide a service in day-to-day life applications including telecommunication, traffic engineering, computing and the design of factories, shops, offices and hospitals.
B16 ENG 1209 PHYSICS LAB	CO1	
	CO2	
	CO3	
	CO4	
	CO5	
	CO6	
B16 ENG 1211 WORKSHOP	CO1	Use various tools to prepare basic carpentry and fitting joints. 2. Fabricate simple components using tin smithy..
	CO2	Fabricate simple components using tin smithy...
B16 ENG 1213 ENGLISH LANGUAGE LAB	CO1	Students will be sensitized towards recognition of English sound pattern.
	CO 2	The fluency in speech will be enhanced.
B16 ENG 1214TECHNOLOGY COURSE – I (Professional C Programming)	CO1	Students will be able to solve a series of graduated problems Students will be able to do projects in „C‟ Language.
	CO2	Students will be able to do projects in „C‟ Language.
Course Outcomes for Second Year First Semester Course		
DATA STRUCTURS B16 IT 2101	CO1	Describe how arrays, records, linked structures, stacks, queues, trees, and graphs are represented in memory and used by algorithm.
	CO2	Demonstrate different methods for traversing trees.
	CO3	Compare alternative implementations of data structures with respect To performance.
	CO4	Discuss the computational efficiency of the principal algorithms for sorting and searching.
ELEMENTS OF ELECTRONICS ENGINEERING B16 EC 2103	CO1	Understand the physical structure, principles of operation, electrical characteristics and circuit models of diodes, BJTs and FETs
	CO2	Use this knowledge to analyze and design basic electronic application circuits
	CO3	Extend the understanding of how electronic circuits and their functions fit into larger electronic systems..

DISCRETE MATHEMATICAL STRUCTURES B16 ENG 2102	CO1	Rewrite the mathematical arguments using logical connectives and quantifiers and verify the validity of the arguments using propositional and predicate logic..
	CO2	Solve different counting problems..
	CO3	Solve the recurrence relations which occur in many fields.
	CO4	Identify and give examples of various types of relations and describe various properties of relations..
	CO5	. Determine isomorphism of graphs and utilize the concepts in graphs & trees in their fields
	CO6	Understand the importance of Groups, lattice structures and their diagrammatic representations and also the importance of Boolean algebra in computer science.
OBJECT ORIENTED PROGRAMMING USING C++ B16 IT 2102	CO1	Able to outline and describe difference between OOP and POP..
	CO2	Able to recognize and differentiate classes and objects , construct and apply Classes and Objects for real time applications.
	CO3	Able to recognize and construct constructors and destructors and can apply usage of inheritance
	C04	Able to understand polymorphism concepts and can apply real time applications
	CO5	Able to illustrate, identify and apply generic programming concepts with exception handling
B16 IT 2103 DIGITAL LOGIC DESIGN	CO1	An ability to define different number systems, binary addition and subtraction, 2‟s complement representation and operations with this representation
	CO2	An ability to understand the different Boolean algebra theorems and apply them for logic function
	CO3	An ability to define the Karnaugh map for a few variables and perform an algorithmic reduction of logic functions.
		An ability to define the following combinational circuits: multiplexer, de-multiplexers encoders/decoders, comparators, arithmetic-logic units; and to be able to build simple circuits.
	CO4	An ability to understand asynchronous and synchronous sequential circuits, like counters and shift registers..
	CO5	An ability to understand memories like RAM and ROM, Programmable Logic Array and Programmable Array Logic.
ENVIRONMENTAL STUDIESB16 ENG 2103	CO1	Get awareness among the students about the nature and natural ecosystems.
	CO2	Learn sustainable utilization of natural resources like water, land, minerals, air.
	CO3	Learn resource pollution and over exploitation of land, water, air and catastrophic (events) impacts of climate change, global warming, ozone layer depletion, marine, radioactive pollution etc to inculcate the students about environmental awareness and safe transfer of our mother earth and its natural resources to the next generation.
	CO4	Safe guard against industrial accidents particularly nuclear accidents
	CO5	Learn Constitutional provisions for the protection of natural resources
	CO6	Perform sorting and searching using different algorithms.
DATA STRUCTURES	CO1	Student will be able to write programs to implement stacks and queues
	CO2	Ability to implement various searching and sorting techniques.

LAB B16 IT 2104	CO3	Ability to implement programs using trees and graphs..
OBJECT ORIENTED PROGRAMMING LAB USING C++B16 IT 2105	CO1	Student will be able to use OOPs concepts.
	CO2	Ability to apply Inheritance concepts to several problems.
	CO3	Ability to use Exception Handling concepts.
ENGLISH PROFICIENCY B16 ENG 2104	CO1	Students enhance their vocabulary and use it in the relevant contexts.
	CO2	They improve speaking skills
	CO3	They learn and practice the skills of composition writing..
	CO4	They enhance their reading and understanding of different texts.
	CO5	They enrich their communication both in formal and informal contexts.
	CO6	They strengthen their confidence in presentation skills.
B16 ENG 2105 INDUSTRY ORIENTED TRAINING (WEB Development)	CO1	Design and develop basic web pages using HTML. 2. Apply cascading style sheets to web pages in order to separate form from content. 3. Understand & Apply basic control of elements with JavaScript. 4. Understand the basic concepts of PHP scripting 5. Able to design & complete a project by applying above all the concepts.
	CO2	Apply cascading style sheets to web pages in order to separate form from content
	CO3	Understand & Apply basic control of elements with JavaScript.
	CO4	Understand the basic concepts of PHP scripting
	CO5	Able to design & complete a project by applying above all the concepts
Course Outcomes for Second Year Second Semester Course		
OPERATING SYSTEMS B16 IT 2201	CO1	The student understands OS evolution, its structure and services provided by it
	CO2	Learn process life cycle, process scheduling objectives, policies and mechanisms, process synchronization, inter process communication, deadlocks and other process subsystem related concepts.
	CO3	Learn memory hierarchy, allocation and de-allocation policies and mechanism for main and auxiliary memory, file system design and implementation issues.
	CO4	Investigate UNIX/ LINUX and Windows OS platforms w.r.t similarities and differences in design philosophies
COMPUTER ORGANIZATION B16 IT 2202	CO1	Apply the basic knowledge about Digital logic to the Functional components of computer.
	CO2	2. Students will be able to Describe the major components of a computer..
	CO3	Students will be able to classify different Computer Instructions..
	CO4	Students will be able to Describe Instruction set architecture.
	CO5	Recognize the importance of peripheral devices. 6. Students should be able classify Computer memories.
	CO6	Students should be able classify Computer memories..
MICROPROCESSORS B16 IT 2203	CO1	Understand the basic architectures of 8085 and 8086 microprocessors. 2. Ability to write ALP using instruction sets of 8085. 3. Understand the various interfacing concepts. 4. Ability to write ALP using instruction sets of 8086. 5. Understand how to interface peripherals with 8086..
	CO2	. 2. Ability to write ALP using instruction sets of 8085..
	CO3	Understand the various interfacing concepts
	C04	Understand how to interface peripherals with 8086.

	CO5	Ability to write ALP using instruction sets of 8086..
DATA COMMUNICATIONSB16 IT 2204	CO1	Students will have the ability to use Data Communications and Networking Protocols and protocol architectures 2. Students will have the ability to develop communication models for providing data transmission facility 3. Students will have the ability to outline Data Communication terminology 4. Students will have the ability to classify various transmission media 5. Students will have the ability to discriminate various types of signals for data transmission and ability to describe data encoding techniques 6. Students will have the ability to describe data communications interface 7. Students will have the ability to apply various flow control , error control techniques of data link control protocols 8. Students will have the ability to use various data communication terminals and processing hardware 9. Students will have the ability to demonstrate multiplexing techniques
	CO2	Students will have the ability to develop communication models for providing data transmission facility
	CO3	Students will have the ability to outline Data Communication terminology
	CO4	Students will have the ability to classify various transmission media.
	CO5	Students will have the ability to discriminate various types of signals for data transmission and ability to describe data encoding techniques
	CO6	Students will have the ability to describe data communications interface
	C07	Students will have the ability to apply various flow control , error control techniques of data link control protocols
	C08	Students will have the ability to use various data communication terminals and processing hardware
	C09	Students will have the ability to demonstrate multiplexing techniques
OPERATIONS RESEARCH B16 IT 2205	CO1	Ability to solve LPP problems using various methods. 2. Ability to solve transportation and assignment problems using several methods. 3. Analyze the PERT and CPM charts 4. Ability to solve replacement problems and game theory problems..
	CO2	Ability to solve transportation and assignment problems using several methods
	CO3	Analyze the PERT and CPM charts.
	CO4	Ability to solve replacement problems and game theory problems.
JAVA PROGRAMMING B16 IT 2206	CO1	Ability to define different procedural and object oriented concepts and will be able to apply and differentiate between them
	CO2	Ability to define, understand and differentiate different types of arrays and apply them
	CO3	Ability to recognize various concepts of java and develops the programs using them.
	CO4	Ability to identify and differentiate the various features of AWT components to construct container based programs
	C05	Ability to describe and explain the concept of networking.
JAVA PROGRAMMING LABB16 IT 2207	CO1	1. Students will be able to understand compiling and interpreting programs.
	CO2	Students will be able to Explore features of Object Oriented Programming.
	CO3	Students will be able to implement various java concepts
	CO4	Students will be able to Develop java Programs to implement applets

	CO5	Students will be able to Develop java Programs to generate and handle events.
DIGITAL ELECTRONICS AND MICROPROCESSORS LABB16 IT 2208	CO1	The student understands the logic gates, half adders, full adders and flip-flops to design a circuit.
	CO2	The student develops the skill of writing microprocessor programming with 8085.
	CO3	The student understands the interfacing of microprocessor with stepper motor, R-2R ladder
	CO4	The student will be able to write ACP for 8086.
B16 IT 2209 PYTHON PROGRAMMING	CO1	Write programs using python programming 2. Write algorithms 3. Implement various data Structures 4. To apply object oriented mechanisms 5. To Implement various Advance data Structures like AVL trees, B-Trees, Splay trees etc
	CO2	Write algorithms
	CO3	Implement various data Structures
	CO4	To apply object oriented mechanisms
	CO5	To Implement various Advance data Structures like AVL trees, B-Trees, Splay trees etc
INDUSTRY ORIENTED TRAINING (Common to CSE & IT) B16 ENG 2203	CO1	Implement the linked lists in real time applications. 2. Apply the file handling operations. 3. Apply the Searching & Sorting algorithms. 4. Implement Stack & Queue operations. 5. Implement the concepts and applications of Trees and Graphs.
	CO2	Apply the file handling operations.
	CO3	Apply the Searching & Sorting algorithms
	C04	Implement Stack & Queue operations.
	C05	Implement the concepts and applications of Trees and Graphs.
Course Outcomes for Third Year First Semester Course		
COMPUTER NETWORKS B16 IT 3101	CO1	The student must be able to understand the design and estimate the requirements for practical setup of a given network scenario and size.
	CO2	Realize the Operation, maintenance and management of the Internet by mapping the theoretical networking concepts to the real-time network scenarios..
	CO3	. Demonstrate the applications of wireless Networks and over view of advanced networking concepts
	CO4	Identify different networking devices and their usage and functionality..
WEB TECHNOLOGIESB16 IT 3102	CO1	Students will be able to construct web based applications. 2. Students will be able to connect PHP to different databases. 3. Students will be able to develop CRUD based PHP application.
	CO2	Students will be able to connect PHP to different databases
	CO3	Students will be able to develop CRUD based PHP application.
FORMAL LANGUAGES & AUTOMATA THEORYB16 IT 3103	CO1	Ability to think analytically and intuitively for problem solving situations in related areas of theory in computer science. 2. Ability to describe the language accepted by an automaton or generated by a regular expression or a context-free grammar. 3. Ability to Understand the functioning of Finite-State Machines, Deterministic Finite-State Automata, Nondeterministic Finite-State Automata and Pushdown

		Automata and Turing Machines
	CO2	Ability to describe the language accepted by an automaton or generated by a regular expression or a context-free grammar..
	CO3	Ability to Understand the functioning of Finite-State Machines, Deterministic Finite-State Automata, Nondeterministic Finite-State Automata and Pushdown Automata and Turing Machines.
DATABASE MANAGEMENT SYSTEMS B16 IT 3104	CO1	1. The student will understand ER-modeling for conceptual database design and relational model. 2. The student is introduced to formal and commercial query languages: Relational Algebra, calculus and SQL. 3. The student will learn schema refinement and normalization. 4. The Student understands locking protocols concurrency control, and crash recovery methods..
	CO2	The student is introduced to formal and commercial query languages: Relational Algebra, calculus and SQL..
	CO3	The student will learn schema refinement and normalization
	CO4	The Student understands locking protocols concurrency control, and crash recovery methods..
PRINCIPLES OF PROGRAMMING LANGUAGESB 16 IT 3105	CO1	Ability to compare different programming languages. 2. Ability to discuss the significant achievements in programming language history. 3. Ability to assess the programming languages in scientific manner..
	CO2	Ability to discuss the significant achievements in programming language history
	CO3	Ability to assess the programming languages in scientific manner...
ADVANCED COMPUTER ARCHITECTUR EB17IT3106	CO1	Understand the Concept of Parallel Processing and its applications.
	CO2	Implement the Hardware for Arithmetic Operations.
	CO3	Analyze the performance of different scalar Computers .
	CO4	Develop the Pipelining Concept for a given set of Instructions..
	CO5	Distinguish the performance of pipelining and non pipelining environment in a processor
FILE STRUCTURES B16 IT 3107	CO1	Understand the fundamental concepts of file processing operations and storage structures
	CO2	Apply object orientation concepts to manipulate records..
	CO3	Apply concepts of sorting and merging on multiple files.
	CO4	Analyze the sequential and indexing file accessing techniques with appropriate data structures
	CO5	Illustrate the usage of hashing techniques to organize file structures. .
BIO INFORMATICS B16IT3108	CO1	The students will be able to describe the contents and properties of the most important bioinformatics databases, perform text- and sequence-
	CO2	searches, and analyze and discuss the results in light of molecular biological knowledge.
	CO3	The students will be able to explain the major steps in pair wise and multiple sequence alignment, explain the principle for, and execute pair wise
	CO4	sequence alignment by dynamic programming The students will be able to predict the secondary and tertiary structures of protein sequences.
DATABASE MANAGEMEN	CO1	The student is exposed to a commercial RDBMS environment such as ORACLE

T SYSTEMS LAB B16IT3109	CO2	The student will learn SQL commands for data definition and manipulation..
	CO3	The student understands conceptual through physical data base design.
	CO4	The student takes up a case study and applies the design steps.
B16 IT 3110 WEB TECHNOLOGIES LAB	CO1	Understand current and evolving Web languages for integrating media and user interaction in both front end and back end elements of a Web site
	CO2	Create static web pages using HTML and CSS
	CO3	Validate HTML FORM data using JavaScript at the client side
	CO4	Create dynamic web pages using PHP and MySQL
	CO5	To build XML applications with schema and style sheets that span multiple domains for use with legacy browsers
	C06	Install tomcat and run servlet with for authentication and Session Management
B16ENG3102 VERBAL & QUANTITATIVE APTITUDE – I	CO1	Detect grammatical errors in the text/sentences and rectify them while answering their competitive/ company specific tests and frame grammatically correct sentences while writing.
	CO2	Answer questions on synonyms, antonyms and other vocabulary based exercises while attempting CAT, GRE, GATE and other related tests
	CO3	Use their logical thinking ability and solve questions related to analogy, syllogisms and other reasoning based exercises.
	CO4	Choose the appropriate word/s/phrases suitable to the given context in order to make the sentence/paragraph coherent
	CO5	Apply soft skills in the work place and build better personal and professional relationships making informed decisions.
Part-B: Quantitative Aptitude -I	CO1	The students will be able to perform well in calculating on number problems and various units of ratio concepts.
	CO2	Accurate solving problems on time and distance and units related solutions
	CO3	The students will become adept in solving problems related to profit and loss, in specific, quantitative ability.
	C04	The students will present themselves well in the recruitment process using analytical and logical skills which he or she developed during the course as they are very important for any person to be placed in the industry
	CO5	The students will learn to apply Logical thinking to the problems of syllogisms and be able to effectively attempt competitive examinations like CAT, GRE, GATE for further studies
B16 ENG3104 ADVANCED CODING	CO1	Acquire coding knowledge on essential of modular programming
	CO2	Acquire Programming knowledge on linked lists
	CO3	Acquire coding knowledge on ADT
	CO4	Acquire knowledge on time complexities of different methods
	CO5	Acquire Programming skill on Java libraries and Collections
B16 IT 3111A IOS APPLICATION DEVELOPMENT	CO1	Able to know the principles of Swift 2. They can apply the Collections in real – world scenarios 3. Students can understand the features of Swift 4. They can understand the memory management of IOs application 5. Able to know the UI kit in swift
	CO2	They can apply the Collections in real – world scenarios
	CO3	Students can understand the features of Swift
	CO4	They can understand the memory management of IOs application
	CO5	Able to know the UI kit in swift

B16 IT 3111C PROGRAMMING, DATA STRUCTURES AND ALGORITHMS USING PYTHON	CO1	proficient programming in the Ruby language and programming in general
	CO2	design and revision of Ruby scripts
	CO3	debugging techniques appropriate for the Ruby language
		Ability to apply object oriented concepts in programming
	C04	Ability to define, understand and differentiate different types of data types and apply them.
	C05	Ability to recognize various concepts of python dictionaries as well as classes and objects for defining user defined datatypes such as linked lists and binary search trees
B16 IT 3112AANDROID APP DEVELOPMENT	CO1	By the end of the course, student will be able to develop the android applications on their own, and work with the database to store data locally, and much more.
B16 IT 3112BBLACKCHAIN ARCHITECTURE DESIGN AND USECASE	CO1	Student will able to understand what is Blockchain
	CO2	Student will able to undertstand about Bitcoin and how bitcoin and blockchain are related
	CO3	Student will able to understand consensus in Bitcoin
	CO4	Student will able to apply permissioned Blockchain
	CO5	Student will understand and learn to apply Blockchain in Government.
	CO6	Student will understand and learn to apply Blockchain security.
	C07	Student will understand and learn to apply Blockchain in Research aspects,science and ecosystem
B16 IT 3112CTESTING TOOLS	CO1	By the end of the course, student will be able to know various testing tools like HP-Quality Center-11.00, Performance Test Automation with LOADRUNNER 11.00 & Browser Automation Testing Tool SELENIUM-1.10.0
B16 IT 3112DMACHINE LEARNING	CO1	Have a good understanding of the fundamental issues and challenges of machine learning: data, model selection, model complexity, etc.
	CO2	Have an understanding of the strengths and weaknesses of many popular machine learning approaches.
	C03	Appreciate the underlying mathematical relationships within and across Machine Learning algorithms and the paradigms of supervised and un-supervised learning
	C04	Be able to design and implement various machine learning algorithms in a range of realworld applications.
Course Outcomes for Third Year Second Semester Course		
DATAWAREHOUSING & DATA MININGB16IT3201	CO1	1. The student understands the differences between OLTP and OLAP.
	CO2	The student learns how data cube technology supports summarization and querying high dimensional data.
	CO3	The student is introduced to similarity, distance, information gain and

		other performance and error metrics used for evaluation of mining results
	CO4	The student is introduced to various approaches to association rule mining , supervised and unsupervised learning and the corresponding classification and clustering approaches involving decision trees, Bayesian approaches, model based and agglomerative approaches...
OBJECT ORIENTED SOFTWARE ENGINEERING B16 IT 3202	CO1	Ability to define a problem and perform Requirements Engineering .
	CO2	Ability to draw UML diagrams for the requirements gathered.
	CO3	Ability to implement the designed problem in Object Oriented Programming Language.
	CO4	Test whether all the requirements specified have been achieved or not
DESIGN AND ANALYSIS OF ALGORITHMS B16 IT 3203	CO1	Students will be able to Analyze the algorithms using asymptotic analysis.
	CO2	Student will be able to understand, apply and analyze Divide-and-Conquer technique on computer science problems
	CO3	Student will be able to understand, apply and analyze Greedy technique on computer science problems.
	CO4	Student will be able to understand, apply and analyze Dynamic Programming on computer science problems.
	C05	Student will be able to understand, apply and analyze Basic Traversal and Search techniques and Backtracking on computer science problems.
	CO6	Student will be able to understand, apply and analyze Branch-and-Bound.
COMPILER DESIGNB16 IT 3204	CO1	To apply the knowledge of lex tool & yacc tool to devleop a scanner & parser.
	CO2	To design & conduct experiments for Intermediate Code Generation in compiler.
	CO3	To design & implement a software system for backend of the compiler.
	CO4	To learn the new code optimization techniques to improve the performance of a program in terms of speed & space. .
	CO5	To acquire the knowledge of modern compiler & its features. .
	CO6	To learn & use the new tools and technologies used for designing a compiler
CRYPTOGRAPHY & NETWORK	CO1	Realize the need and importance of network and data security in the Internet and in the distributed environments. To be familiar with some internet security protocols and standards.

SECURITY B16 IT 3205	CO2	2. To be familiar with different means of Authentication mechanisms
	CO3	3. Identify the different types of network security issues and their remedies
	CO4	4. Application of various cryptographic tools and techniques in different contexts.
IMAGE PROCESSINGB 16 IT 3206	CO1	Ability to develop algorithms for fundamental concepts in Image processing.
	CO2	Ability to perform image enhancement , image compression and image segmentation using various methods. .
	CO3	Ability to implement Image transformation techniques
	CO4	Possess the ability to apply AI techniques to solve problems of Game Playing, Expert Systems, Machine Learning and Natural Language Processing
DISTRIBUTED DATABASE SYSTEMS B16 IT 3207	CO1	Explain the techniques used for data fragmentation, replication, and allocation during the distributed database design process.
	CO2	Evaluate simple strategies for executing a distributed query to select the strategy that minimizes the amount of data transfer. .
	CO3	. Explain how the two-phase commit protocol is used to deal with committing a transaction that accesses databases stored on multiple nodes
	CO4	Describe distributed concurrency control based on the distinguished copy techniques and the voting methods.
COMPUTER GRAPHICSB16 IT 3208	CO1	The students will understand graphics principles and graphics hardware.
	CO2	The students can demonstrate geometrical transformations
	CO3	The students can create interactive graphics applications and demonstrate computer graphics animation..
MOBILE COMPUTING B16IT3209	CO1	Able to think and develop new mobile application.
	CO2	Able to take any new technical issue related to s new paradigm and come up with a solution(s).
	CO3	Able to develop new ad hoc network applications and/or/ algorithms/ protocols.
	CO4	Able to understand & develop any existing or new protocol related to mobile environment
	CO5	Be proficient in the use of Maple or Matlab for the simulation of robots
SOFT COMPUTING AND NEURAL NETWORKS B16IT3210	CO1	Apply various soft computing frame works.
	CO2	Design of various neural networks
	CO3	Use fuzzy logic
	CO4	Apply genetic programming.
	CO5	Discuss hybrid soft computing.
SOFTWARE ENGINEERING AND MINI	CO1	Students will be **Construct, Design and implement** complex software solutions. **[K3, K4]**.

PROJECT LABB16 IT 3211	CO2	Students will be able to test and document the software. **[K3].**
	CO3	Students will be capable of working as part of a software team and develop significant projects under a tight deadline. **[K3].**
	CO4	Students will be able **apply** the deep knowledge of the technologies they used for implementing their project. **[K2].** .
COMPUTER GRAPHICS & MULTIMEDIA LABB16 IT 3212	CO1	Create and evaluate graphic design projects using computer graphics software
VERBAL & QUANTITATIVE APTITUDE – IILAB B16ENG3202	CO1	Construct coherent, cohesive and unambiguous verbal expressions in both oral and written discourses.
	CO2	Analyze the given data/text and find out the correct responses to the questions asked based on the reading exercises; identify relationships or patterns within groups of words or sentences.
	CO3	Write paragraphs on a particular topic, essays (issues and arguments), e mails, summaries of group discussions, reports, make notes, statement of purpose(for admission into foreign universities), letters of recommendation(for professional and educational purposes).
	CO4	Converse with ease during interactive sessions/seminars in their classrooms, compete in literary activities like elocution, debates etc., raise doubts in class, participate in JAM sessions/versant tests with confidence and convey oral information in a professional manner
	CO5	Participate in group discussions/group activities, exhibit team spirit, use language effectively according to the situation, respond to their interviewer/employer with a positive mind, tailor make answers to the questions asked during their technical/personal interviews, exhibit skills required for the different kinds of interviews (stress, technical, HR) that they would face during the course of their recruitment process. management.
B16 ENG 3205COMPETETIVE CODING	CO1	Acquire coding knowledge on essential of competitive coding
	CO2	Acquire Programming knowledge on time & space complexities
	CO3	Acquire coding knowledge on dynamic Arrays, Set & Map structures and sorting
	CO4	Acquire knowledge on time complexities of different methods
	CO5	Acquire Programming skill on String, Tree, Graph Theory algorithms
B16 IT 3213A AMAZON WEBSERVICES	CO1	By the end of the course, student will be able to deploy their projects into cloud and they develop their projects by using AWS
B16 IT 3213B ASP.NET		To successfully build database-driven Web applications and Web Sites. 2. To build web-based enterprise applications using ASP.NET and Visual Studio.

		3. It is easy to develop the Web Services using .Net framework in Service-oriented Architectures.
B16 IT 3213C ROUTING & SWITCHING	CO1	By the end of the course, students will be able to:
B16 IT 3214ADATA SCIENCE USING ADVANCED PYTHON	C01	To work on data easily.
	CO2	Familiar with Various modules for exploring on data like processing , visualization and statistical data analysis.
	CO3	Able to work on real time data
B16 IT 3214B ANGULAR JS	CO1	The main objective of Angular JS is to reduce the code to build user interface application.
	CO2	To create single page applications.
	CO3	To restore data from back-end server and manipulate it easily
B16 IT 3214C C#.NET and VB.NET	CO1	Understand .NET Framework and describe some of the major enhancements to the new version of Visual Basic.
	CO2	Describe the basic structure of a Visual Basic.NET project and use main features of the integrated development environment (IDE).
	CO3	Create applications using Microsoft Windows Forms Create applications that use ADO. NET
B16 IT 3214D MATLAB	CO1	Understand the main features of the MATLAB development environment.
	CO2	Use the MATLAB GUI effectively.
	C03	Design simple algorithms to solve problems
	CO4	Write simple programs in MATLAB to solve scientific and mathematical problems
Course Outcomes for Fourth Year First Semester Course		
CLOUD COMPUTING B16IT4101	CO1	The student will understand the cloud environment.
	CO2	The student will understand and learn the various Cloud based Services.
	CO3	The student will able to develop cloud based applications.
	CO4	The Student understands the security, governance and Economic in Cloud computing.
BIG DATA ANALYTICS B16IT4102	CO1	Understand Big Data and its characteristics.
	CO2	Understand basic Building Blocks of Hadoop and its

		functionalities
	CO3	Understand how the big data is stored in HDFS and how Map Reduce processes this data stored in HDFS.
	CO4	4. Design Map Reduce programs to handle basic and advanced problems by using Hadoop architecture.
	CO5	5. Identify the challenges in Big Data with respect to IT Industry
PRINCIPLES OF ECONOMICS & MANAGEMENT B16ENG4101	CO1	Understand the links between production costs and the economic models of supply. .
	CO2	Represent supply, in graphical form, including the upward slope of the supply curve and what shifts the supply curve.
	CO3	Understand the efficiency and equity implications of market interference, including government policy.
	CO4	Understand how different degrees of competition in a market affect pricing and output
	CO5	Apply economic reasoning to individual and firm behavior.
KNOWLEDGE ENGINEERING LABB16IT4103	CO1	Student will be able to write R programs to perform several data analytics operations on datasets .
	CO2	Ability to extract patterns by applying appropriate data mining techniques from different types of datasets using WEKA
	CO3	Ability to apply knowledge represented in the form of rules to draw conclusions using either forward or backward chaining using CLIPS /PROLOG
NETWORK PROGRAMMING LAB B16IT4104	CO1	Students will be able to design and create well known ports on a Local/Remote System.
	CO2	Students will be able to design One-One and many-many chat application by socket connection and displaying what is written by one party to the other
	CO3	Students will be able to design data retrieval from a Remote database
	CO4	Students will be able to design SMTP Mail Client: Gives the server name, send email to the recipient
	C05	using SMTP commands and POP Client for retrieve the mails
PROJECT PHASE-I B16IT4105		
Course Outcomes for Fourth Year Second Semester Course		
EMBEDDED SYTEMS B16IT4201	CO1	I 1. Student will be understand the basic architecture of 8051 micro controller.
	CO2	ability to write ALP programs using 8051 instruction set.

	CO3	Ability to understand the concepts related to RTOS and its Inter Task Communication methods
	CO4	4. Ability to understand various design issues of RTOS.
	CO5	5. Understand about embedded software development tools
ARTIFICIAL INTELLIGENCEB16IT4202	CO1	Possess the ability to formulate an efficient problem space for a problem expressed in English.
	CO2	Possess the ability to select a search algorithm for a problem and characterize its time and space complexities.
	CO3	Possess the skill for representing knowledge using the appropriate technique.
	CO4	Possess the ability to apply AI techniques to solve problems of Game Playing, Expert Systems, Machine Learning and Natural Language Processing
INFORMATION RETRIEVAL B16IT4203	CO1	I 1. Identify basic theories in information retrieval systems
	CO2	2. Identify the analysis tools as they apply to information retrieval systems .
	CO3	3. Understands the problems solved in current IR systems .
	CO4	4. Understand the difficulty of representing and retrieving documents.
	CO5	5. Explain the concepts of indexing, vocabulary, normalization and dictionary in information retrieval.
ADVANCED OPERATING SYSTEMSB16IT4204	CO1	I 1. Students will be able to understand distributed systems and hardware and software concepts and their combinations.
	CO2	2. Students will be able to understand communication in ATM networks and Client – Server architecture.
	CO3	3. Students will be able to understand principles of remote procedure execution and address related issues and discuss related problems
	CO4	4. Students will be able to understand clock synchronization and mutual exclusion in distributed systems and relevant protocols.
	CO5	Students will be able to understand multiple processors organization and their allocation
SOFTWARE PROJECT MANAGEMENT B16IT4205	CO1	To match organizational needs to the most effective software development model
	CO2	To understand the basic concepts and issues of software project

		management
	CO3	To effectively Planning the software projects ..
	CO4	To implement the project plans through managing people, communications and change
	CO5	To select and employ mechanisms for tracking the software projects
	CO6	To conduct activities necessary to successfully complete and close the Software projects To develop the skills for tracking and controlling software deliverables
	CO7	To create project plans that address real-world management challenges
E-COMMERCE B16IT4206	CO1	1. Ability to discuss the e-Commerce process. Describe an example of system architecture for ane-Business. List the seven major elements of web design.
	CO2	2. Ability to Identify and explain fundamental web site tools including design tools ,programming tools, and data processing tools. Identify the major electronic payment issues and options.
	CO3	3. Ability to discuss security issues and explain procedures used to protect against security threats. .
	CO4	4. Ability to Identify and discuss management issues underlying e-Commerce issues including organizational structure, strategic planning, goal setting, corporate social responsibility ,changing market intermediaries, resource allocation and customer service.
B16IT4207INTERNET OF THINGS LAB	CO1	Ability to interpret the vision of IoT from a global context.
	CO2	Ability to determine the Market perspective of IoT
	CO3	Ability to Compare and Contrast the use of Devices, Gateways and Data Management in IoT.
	C04	Implement state of the art architecture in IoT.
	C05	. Illustrate the application of IoT in Industrial Automation and identify Real World Design Constraints.