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INSTITUTE OF ENGINEERING AND TECHNOLOGY, KALADY
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B TECH COMPUTER SCIENCE & ENGINEERING
2019 Scheme Syllabus- Course Outcomes

S1S2 B.Tech (2019) Syllabus

COURSE NAME	COURSE CODE	COURSE OUTCOME CODE	COURSE OUTCOME STATEMENTS
BASICS OF CIVIL & MECHANICAL ENGINEERING	EST 120	CO 1	Recall the role of civil engineer in society and to relate the various disciplines of Civil Engineering.
		CO 2	Explain different types of buildings, building components, building materials and building construction
		CO 3	Describe the importance, objectives and principles of surveying.
		CO 4	Summarise the basic infrastructure services MEP, HVAC, elevators, escalators and ramps
		CO 5	Discuss the Materials, energy systems, water management and environment for green buildings.
		CO 6	Analyse thermodynamic cycles and calculate its efficiency
		CO 7	Illustrate the working and features of IC Engines
		CO 8	Explain the basic principles of Refrigeration and Air Conditioning
		CO 9	Describe the working of hydraulic machines
		CO 10	Explain the working of power transmission elements
		CO 11	Describe the basic manufacturing, metal joining and machining processes
BASICS OF ELECTRICAL AND ELECTRONICS ENGINEERING	EST 130	CO 1	Apply fundamental concepts and circuit laws to solve simple DC electric circuits
		CO 2	Develop and solve models of magnetic circuits
		CO 3	Apply the fundamental laws of electrical engineering to solve simple ac circuits in steady state
		CO 4	Describe working of a voltage amplifier
		CO 5	Outline the principle of an electronic instrumentation system
		CO 6	Explain the principle of radio and cellular communication
CIVIL & MECHANICAL WORKSHOP	ESL 120	CO 1	Name different devices and tools used for civil engineering measurements
		CO 2	Explain the use of various tools and devices for various field measurements

		CO 3	Demonstrate the steps involved in basic civil engineering activities like plot measurement, setting out operation, evaluating the natural profile of land, plumbing and undertaking simple construction work.
		CO 4	Choose materials and methods required for basic civil engineering activities like field measurements, masonry work and plumbing.
		CO 5	Compare different techniques and devices used in civil engineering measurements
		CO 6	Identify Basic Mechanical workshop operations in accordance with the material and objects
		CO 7	Apply appropriate Tools and Instruments with respect to the mechanical workshop trades
		CO 8	Apply appropriate safety measures with respect to the mechanical workshop trades
PROGRAMIN G IN C	**EST 102**	**CO 1**	Analyze a computational problem and develop an algorithm/flowchart to find its solution
		CO 2	Develop readable* C programs with branching and looping statements, which uses Arithmetic, Logical, Relational or Bitwise operators.
		CO 3	Write readable C programs with arrays, structure or union for storing the data to be processed
		CO 4	Divide a given computational problem into a number of modules and develop a readable multi-function C program by using recursion if required, to find the solution to the computational problem
		CO 5	Write readable C programs which use pointers for array processing and parameter passing
		CO 6	Develop readable C programs with files for reading input and storing output
ELECTRICA L & ELECTRONI CS WORKSHOP	**ESL 130**	**CO 1**	Demonstrate safety measures against electric shocks.
		CO 2	Identify the tools used for electrical wiring, electrical accessories, wires, cables, batteries and standard symbols
		CO 3	Develop the connection diagram, identify the suitable accessories and materials necessary for wiring simple lighting circuits for domestic buildings
		CO 4	Identify and test various electronic components
		CO 5	Draw circuit schematics with EDA tools
		CO 6	Assemble and test electronic circuits on boards
		CO 7	Work in a team with good interpersonal skills
ENGINEERIN G GRAPHICS	**EST 110**	**CO 1**	Draw the projection of points and lines located in different quadrants
		CO 2	Prepare multiview orthographic projections of objects by visualizing them in different positions
		CO 3	Draw sectional views and develop surfaces of a given object
		CO 4	Prepare pictorial drawings using the principles of isometric and perspective projections to visualize objects in three dimensions.
		CO 5	Convert 3D views to orthographic views
		CO 6	Obtain multiview projections and solid models of objects using CAD tools

ENGINEERING MECHANICS	**EST 100**	**CO 1**	Recall principles and theorems related to rigid body mechanics
		CO 2	Identify and describe the components of system of forces acting on the rigid body
		CO 3	Apply the conditions of equilibrium to various practical problems involving different force system.
		CO 4	Choose appropriate theorems, principles or formulae to solve problems of mechanics.
		CO 5	Solve problems involving rigid bodies, applying the properties of distributed areas and masses
ENGINEERING CHEMISTRY	**CYT 100**	**CO 1**	Apply the basic concepts of electrochemistry and corrosion to explore its possible applications in various engineering fields.
		CO 2	Understand applications.
		CO 3	Apply the knowledge of analytical method for characterizing a chemical mixture or a compound. Understand the basic concept of SEM for surface characterisation of nanomaterials.
		CO 4	Learn about the basics of stereochemistry and its application. Apply the knowledge of conducting polymers and advanced polymers in engineering.
		CO 5	Study various types of water treatment methods to develop skills for treating wastewater.
ENGINEERING CHEMISTRY LAB	**CYL 120**	**CO 1**	Understand and practice different techniques of quantitative chemical analysis to generate experimental skills and apply these skills to various analyses
		CO 2	Develop skills relevant to synthesize organic polymers and acquire the practical skill to use TLC for the identification of drugs
		CO 3	Develop the ability to understand and explain the use of modern spectroscopic techniques for analysing and interpreting the IR spectra and NMR spectra of some organic compounds
		CO 4	Acquire the ability to understand, explain and use instrumental techniques for chemical analysis
		CO 5	Learn to design and carry out scientific experiments as well as accurately record and analyze the results of such experiments
		CO 6	Function as a member of a team, communicate effectively and engage in further learning. Also understand how chemistry addresses social, economical and environmental problems and why it is an integral part of curriculum

2019 Scheme Syllabus- Course Outcomes

S3S4 B.Tech (2019) Syllabus

COURSE NAME	COURSE CODE	COURSE OUTCOME CODE	COURSE OUTCOME STATEMENTS
DISCRETE MATHEMATICAL STRUCTURES	**MAT 203**	**CO1**	Check the validity of predicates in Propositional and Quantified Propositional Logic using truth tables, deductive reasoning and inference theory on Propositional Logic **(Cognitive Knowledge Level: Apply)**
		CO2	Solve counting problems by applying the elementary counting techniques - Rule of Sum, Rule of Product, Permutation, Combination, Binomial Theorem, Pigeonhole Principle and Principle of Inclusion and Exclusion **(Cognitive Knowledge Level: Apply)**
		CO3	Classify binary relations into various types and illustrate an application for each type of binary relation, in Computer Science **(Cognitive Knowledge Level: Understand)**
		CO4	Illustrate an application for Partially Ordered Sets and Complete Lattices, in Computer Science **(Cognitive Knowledge Level: Apply)**
		CO5	Explain Generating Functions and solve First Order and Second Order Linear Recurrence Relations with Constant Coefficients **(Cognitive Knowledge Level: Apply)**
		CO6	Illustrate the abstract algebraic systems - Semigroups, Monoids, Groups, Homomorphism and Isomorphism of Monoids and Groups **(Cognitive Knowledge Level: Understand)**
DATA STRUCTURES	**CST 201**	**CO1**	Design an algorithm for a computational task and calculate the time/space complexities of that algorithm **(Cognitive Knowledge Level: Apply)**
		CO2	Identify the suitable data structure (array or linked list) to represent a data item required to be processed to solve a given computational problem and write an algorithm to find the solution of the computational problem **(Cognitive Knowledge Level: Apply)**
		CO3	Write an algorithm to find the solution of a computational problem by selecting an appropriate data structure (binary tree/graph) to represent a data item to be processed **(Cognitive Knowledge Level: Apply)**
		CO4	Store a given dataset using an appropriate Hash Function to enable efficient access of data in the given set **(Cognitive Knowledge Level: Apply)**
		CO5	Select appropriate sorting algorithms to be used in specific circumstances (Cognitive Knowledge Level: **Analyze**)

		CO6	Design and implement Data Structures for solving real world problems efficiently (**Cognitive Knowledge Level: Apply**)
LOGIC SYSTEM DESIGN	**CST 203**	CO1	Illustrate decimal, binary, octal, hexadecimal and BCD number systems, perform conversions among them and do the operations - complementation, addition, subtraction, multiplication and division on binary numbers (**Cognitive Knowledge level: Understand**)
		CO2	Simplify a given Boolean Function and design a combinational circuit to implement the simplified function using Digital Logic Gates (**Cognitive Knowledge level: Apply**)
		CO3	Design combinational circuits - Adders, Code Convertors, Decoders, Magnitude Comparators, Parity Generator/Checker and design the Programmable Logic Devices - ROM and PLA. (**Cognitive Knowledge level: Apply**)
		CO4	Design sequential circuits - Registers, Counters and Shift Registers. (**Cognitive Knowledge level: Apply**)
		CO5	Use algorithms to perform addition and subtraction on binary, BCD and floating point numbers (**Cognitive Knowledge level: Understand**)
OBJECT ORIENTED PROGRAMMING USING JAVA	**CST 205**	CO1	Write Java programs using the object oriented concepts - classes, objects, constructors, data hiding, inheritance and polymorphism (Cognitive Knowledge Level: **Apply**)
		CO2	Utilise datatypes, operators, control statements, built in packages & interfaces, Input/ Output Streams and Files in Java to develop programs (Cognitive Knowledge Level: **Apply**)
		CO3	Illustrate how robust programs can be written in Java using exception handling mechanism (Cognitive Knowledge Level: **Understand**)
		CO4	Write application programs in Java using multithreading and database connectivity (Cognitive Knowledge Level: **Apply**)
		CO5	Write Graphical User Interface based application programs by utilising event handling features and Swing in Java (Cognitive Knowledge Level: **Apply**)
DATA STRUCTURES LAB	**CSL 201**	CO1	Write a time/space efficient program using arrays/linked lists/trees/graphs to provide necessary functionalities meeting a given set of user requirements (**Cognitive Knowledge Level: Analyse**)
		CO2	Write a time/space efficient program to sort a list of records based on a given key in the record (**Cognitive Knowledge Level: Apply**)
		CO3	Examine a given Data Structure to determine its space complexity and time complexities of operations on it (**Cognitive Knowledge Level: Apply**)

		CO4	Design and implement an efficient data structure to represent given data (**Cognitive Knowledge Level: Apply**)
		CO5	Write a time/space efficient program to convert an arithmetic expression from one notation to another (**Cognitive Knowledge Level: Apply**)
		CO6	Write a program using linked lists to simulate Memory Allocation and Garbage Collection (**Cognitive Knowledge Level: Apply**)
OBJECT ORIENTED PROGRAMM ING LAB (IN JAVA)	**CSL 203**	CO1	Implement the Object Oriented concepts - constructors, inheritance, method overloading & overriding and polymorphism in Java (Cognitive Knowledge Level: **Apply**)
		CO2	Implement programs in Java which use datatypes, operators, control statements, built in packages & interfaces, Input/Output streams and Files (Cognitive Knowledge Level: **Apply**)
		CO3	Implement robust application programs (Cognitive Knowledge Level: **Apply**)
		CO4	Implement application programs in Java using multithreading and database connectivity (Cognitive Knowledge Level: **Apply**)
		CO5	Implement Graphical User Interface based application programs by utilizing event handling features and Swing in Java (Cognitive Knowledge Level: **Apply**)
SUSTAINAB LE ENGINEERI NG	**MCN201**	CO 1	Understand the relevance and the concept of sustainability and the global initiatives in this direction
		CO 2	Explain the different types of environmental pollution problems and their sustainable solutions
		CO 3	Discuss the environmental regulations and standards
		CO 4	Outline the concepts related to conventional and non-conventional energy
		CO 5	Demonstrate the broad perspective of sustainable practices by utilizing engineering knowledge and principles
DESIGN AND ENGINEERI NG	**EST 200**	CO 1	Explain the different concepts and principles involved in design engineering.
		CO 2	Apply design thinking while learning and practicing engineering.
		CO 3	Develop innovative, reliable, sustainable and economically viable designs incorporating knowledge in engineering.
PROFESSIO NAL ETHICS	**HUT 200**	CO 1	Understand the core values that shape the ethical behaviour of a professional.
		CO 2	Adopt a good character and follow an ethical life.
		CO 3	Explain the role and responsibility in technological development by keeping personal ethics and legal ethics.
		CO 4	Solve moral and ethical problems through exploration and assessment by established experiments.

		CO 5	Apply the knowledge of human values and social values to contemporary ethical values and global issues.
GRAPH THEORY	**MAT 206**	CO 1	Explain vertices and their properties, types of paths, classification of graphs and trees & their properties. **(Cognitive Knowledge Level: Understand)**
		CO 2	Demonstrate the fundamental theorems on Eulerian and Hamiltonian graphs. **(Cognitive Knowledge Level: Understand)**
		CO 3	Illustrate the working of Prim's and Kruskal's algorithms for finding minimum cost spanning tree and Dijkstra's and Floyd-Warshall algorithms for finding shortest paths. **(Cognitive Knowledge Level: Apply)**
		CO 4	Explain planar graphs, their properties and an application for planar graphs. **(Cognitive Knowledge Level: Apply)**
		CO 5	Illustrate how one can represent a graph in a computer. **(Cognitive Knowledge Level: Apply)**
		CO 6	Explain the Vertex Color problem in graphs and illustrate an example application for vertex coloring. **(Cognitive Knowledge Level: Apply)**
COMPUTER ORGANIZATION AND ARCHITECTURE	**CST 202**	CO1	Recognize and express the relevance of basic components, I/O organization and pipelining schemes in a digital computer **(Cognitive knowledge: Understand)**
		CO2	Explain the types of memory systems and mapping functions used in memory systems **(Cognitive Knowledge Level: Understand)**
		CO3	Demonstrate the control signals required for the execution of a given instruction **(Cognitive Knowledge Level: Apply)**)
		CO4	Illustrate the design of Arithmetic Logic Unit and explain the usage of registers in it **(Cognitive Knowledge Level: Apply)**
		CO5	Explain the implementation aspects of arithmetic algorithms in a digital computer **(Cognitive Knowledge Level:Apply)**
		CO6	Develop the control logic for a given arithmetic problem **(Cognitive Knowledge Level: Apply)**
DATABASE MANAGEMENT SYSTEMS	**CST 204**	CO1	Summarize and exemplify fundamental nature and characteristics of database systems **(Cognitive Knowledge Level: Understand)**
		CO2	Model real word scenarios given as informal descriptions, using Entity Relationship diagrams. **(Cognitive Knowledge Level: Apply)**
		CO3	Model and design solutions for efficiently representing and querying data using relational model **(Cognitive Knowledge Level: Analyze)**

		CO4	Demonstrate the features of indexing and hashing in database applications (**Cognitive Knowledge Level: Apply**)
		CO5	Discuss and compare the aspects of Concurrency Control and Recovery in Database systems (**Cognitive Knowledge Level: Apply**)
		CO6	Explain various types of NoSQL databases (**Cognitive Knowledge Level: Understand**)
OPERATING SYSTEMS	**CST 206**	**CO1**	Explain the relevance, structure and functions of Operating Systems in computing devices. (**Cognitive knowledge: Understand**)
		CO2	Illustrate the concepts of process management and process scheduling mechanisms employed in Operating Systems. (**Cognitive knowledge: Understand**)
		CO3	Explain process synchronization in Operating Systems and illustrate process synchronization mechanisms using Mutex Locks, Semaphores and Monitors (**Cognitive knowledge: Understand**)
		CO4	Explain any one method for detection, prevention, avoidance and recovery for managing deadlocks in Operating Systems. (**Cognitive knowledge: Understand**)
		CO5	Explain the memory management algorithms in Operating Systems. (**Cognitive knowledge: Understand**)
		CO6	Explain the security aspects and algorithms for file and storage management in Operating Systems. (**Cognitive knowledge: Understand**)
DIGITAL LAB	**CSL 202**	**CO 1**	Design and implement combinational logic circuits using Logic Gates (Cognitive Knowledge Level: **Apply**)
		CO 2	Design and implement sequential (Cognitive Knowledge Level: **Apply**)
		CO 3	Simulate functioning of digital circuits using programs written in a Hardware Description Language (Cognitive Knowledge Level: **Apply**)
		CO 4	Function effectively as an individual and in a team to accomplish a given task of designing and implementing digital circuits (Cognitive Knowledge Level: **Apply**)
OPERATING SYSTEMS LAB	**CST 206**	**CO1**	Illustrate the use of systems calls in Operating Systems. (**Cognitive knowledge: Understand**)
		CO2	Implement Process Creation and Inter Process Communication in Operating Systems. (**Cognitive knowledge: Apply**)
		CO3	Implement Fist Come First Served, Shortest Job First, Round Robin and Priority- based CPU Scheduling Algorithms. (**Cognitive knowledge: Apply**)
		CO4	Illustrate the performance of First In First Out, Least Recently Used and Least Frequently Used Page Replacement Algorithms. (**Cognitive knowledge: Apply**)

		CO5	Implement modules for Deadlock Detection and Deadlock Avoidance in Operating Systems. **(Cognitive knowledge: Apply)**
		CO6	Implement modules for Storage Management and Disk Scheduling in Operating Systems. **(Cognitive knowledge: Apply)**

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2019 Scheme Syllabus- Course Outcomes

S5S6 B.Tech (2019) Syllabus

COURSE NAME	COURSE CODE	COURSE OUTCOME CODE	COURSE OUTCOME STATEMENTS
FORMAL LANGUAGES AND AUTOMATA THEORY	**CST 301**	**CO1**	Classify a given formal language into Regular, Context-Free, Context Sensitive, Recursive or Recursively Enumerable. [Cognitive knowledge level: Understand]
		CO2	Explain a formal representation of a given regular language as a finite state automaton, regular grammar, regular expression and Myhill-Nerode relation. [Cognitive knowledge level: Understand]
		CO3	Design a Pushdown Automaton and a Context-Free Grammar for a given context-free language. [Cognitive knowledge level : Apply]
		CO4	Design Turing machines as language acceptors or transducers. [Cognitive knowledge level: Apply]
		CO5	Explain the notion of decidability. [Cognitive knowledge level: Understand]
COMPUTER NETWORKS	**CST 303**	**CO1**	Explain the features of computer networks, protocols, and network design models (Cognitive Knowledge: Understand)
		CO2	Describe the fundamental characteristics of the physical layer and identify the usage in network communication (Cognitive Knowledge: Apply)
		CO3	Explain the design issues of data link layer, link layer protocols, bridges and switches (Cognitive Knowledge: Understand)
		CO4	Illustrate wired LAN protocols (IEEE 802.3) and wireless LAN protocols (IEEE 802.11) (Cognitive Knowledge: Understand)
		CO5	Select appropriate routing algorithms, congestion control techniques, and Quality of Service requirements for a network (Cognitive Knowledge: Apply)
		CO6	Illustrate the functions and protocols of the network layer, transport layer, and application layer in inter-networking (Cognitive Knowledge: Understand)
SYSTEM SOFTWARE	**CST 305**	**CO1**	Distinguish softwares into system and application software categories. (Cognitive Knowledge Level: Understand)
		CO2	Identify standard and extended architectural features of machines. (Cognitive Knowledge Level: Apply)
		CO3	Identify machine dependent features of system software (Cognitive Knowledge Level: Apply)
		CO4	Identify machine independent features of system software. (Cognitive Knowledge Level: Understand)
		CO5	Design algorithms for system softwares and analyze the effect of data structures. (Cognitive Knowledge Level: Apply)

		CO6	Understand the features of device drivers and editing & debugging tools.(Cognitive Knowledge Level: Understand)
MICROPROCES SORS AND MICROCONTRO LLERS	**CST 307**	**CO1**	Illustrate the architecture, modes of operation and addressing modes of microprocessors (Cognitive knowledge: Understand)
		CO2	Develop 8086 assembly language programs. (Cognitive Knowledge Level: Apply)
		CO3	Demonstrate interrupts, its handling and programming in 8086. (Cognitive Knowledge Level: Apply))
		CO4	Illustrate how different peripherals (8255,8254,8257) and memory are interfaced with microprocessors. (Cognitive Knowledge Level: Understand)
		CO5	Outline features of microcontrollers and develop low level programs. (Cognitive Knowledge Level: Understand)
MANAGEMENT OF SOFTWARE SYSTEMS	**CST 309**	**CO1**	Demonstrate Traditional and Agile Software Development approaches (Cognitive Knowledge Level: Apply)
		CO2	Prepare Software Requirement Specification and Software Design for a given problem. (Cognitive Knowledge Level: Apply)
		CO3	Justify the significance of design patterns and licensing terms in software development, prepare testing, maintenance and DevOps strategies for a project. (Cognitive Knowledge Level: Apply)
		CO4	Make use of software project management concepts while planning, estimation, scheduling, tracking and change management of a project, with a traditional/agile framework. (Cognitive Knowledge Level: Apply)
		CO5	Utilize SQA practices, Process Improvement techniques and Technology advancements in cloud based software models and containers & microservices. (Cognitive Knowledge Level: Apply)
SYSTEM SOFTWARE AND MICROPROCES SORS LAB	**CSL 331**	**CO1**	Develop 8086 programs and execute it using a microprocessor kit. (Cognitive Knowledge Level: Apply) .
		CO2	Develop 8086 programs and, debug and execute it using MASM assemblers (Cognitive Knowledge Level: Apply)
		CO3	Develop and execute programs to interface stepper motor, 8255, 8279 and digital to analog converters with 8086 trainer kit (Cognitive Knowledge Level: Apply)
		CO4	Implement and execute different scheduling and paging algorithms in OS (Cognitive Knowledge Level: Apply)
		CO5	Design and implement assemblers, Loaders and macroprocessors. (Cognitive Knowledge Level: Apply)

DATABASE MANAGEMENT SYSTEMS LAB	**CSL 333**	**CO1**	Design database schema for a given real world problem-domain using standard design and modeling approaches. (Cognitive Knowledge Level: Apply)
		CO2	Construct queries using SQL for database creation, interaction, modification, and updation. (Cognitive Knowledge Level: Apply)
		C03	Design and implement triggers and cursors. (Cognitive Knowledge Level: Apply)
		C04	Implement procedures, functions, and control structures using PL/SQL. (Cognitive Knowledge Level: Apply)
		CO5	Perform CRUD operations in NoSQL Databases. (Cognitive Knowledge Level: Apply)
		C06	Develop database applications using front-end tools and back-end DBMS. (Cognitive Knowledge Level: Create)
DISASTER MANAGEMENT	**MCN 301**	**CO1**	Define and use various terminologies in use in disaster management parlance and organise each of these terms in relation to the disaster management cycle (Cognitive knowledge level: Understand).
		CO2	Distinguish between different hazard types and vulnerability types and do vulnerability assessment (Cognitive knowledge level: Understand).
		CO3	Identify the components and describe the process of risk assessment, and apply appropriate methodologies to assess risk (Cognitive knowledge level: Understand).
		CO4	Explain the core elements and phases of Disaster Risk Management and develop possible measures to reduce disaster risks across sector and community (Cognitive knowledge level: Apply)
		CO5	Identify factors that determine the nature of disaster response and discuss the various disaster response actions (Cognitive knowledge level: Understand).
		CO6	Explain the various legislations and best practices for disaster management and risk reduction at national and international level (Cognitive knowledge level: Understand).
INDUSTRIAL ECONOMICS & FOREIGN TRADE	**HUT 300**	**CO1**	Explain the problem of scarcity of resources and consumer behaviour, and to evaluate the impact of government policies on the general economic welfare. (Cognitive knowledge level: Understand)
		CO2	Take appropriate decisions regarding volume of output and to evaluate the social cost of production. (Cognitive knowledge level: Apply)
		CO3	Determine the functional requirement of a firm under various competitive conditions. (Cognitive knowledge level: Analyse)
		CO4	Examine the overall performance of the economy, and the regulation of economic fluctuations and its impact on various sections in the society. (Cognitive knowledge level: Analyse)

		CO5	Determine the impact of changes in global economic policies on the business opportunities of a firm. (Cognitive knowledge level: Analyse)
MANAGEMENT FOR ENGINEERS	**HUT 310**	**CO1**	Explain the characteristics of management in the contemporary context (Cognitive Knowledge level: Understand).
		CO2	Describe the functions of management (Cognitive Knowledge level: Understand).
		CO3	Demonstrate ability in decision making process and productivity analysis (Cognitive Knowledge level: Understand).
		CO4	Illustrate project management technique and develop a project schedule (Cognitive Knowledge level: Apply).
		CO5	Summarize the functional areas of management (Cognitive Knowledge level: Understand).
		CO6	Comprehend the concept of entrepreneurship and create business plans (Cognitive Knowledge level: Understand).
COMPILER DESIGN	**CST 302**	**CO1**	Explain the phases in compilation process(lexical analysis, syntax analysis, semantic analysis, intermediate code generation, code optimization and code generation) and model a lexical analyzer (Cognitive Knowledge Level: Apply)
		CO2	Model language syntax using Context Free Grammar and develop parse tree representation using leftmost and rightmost derivations (Cognitive Knowledge Level: Apply)
		CO3	Compare different types of parsers(Bottom-up and Top-down) and construct parser for a given grammar (Cognitive Knowledge Level: Apply)
		CO4	Build Syntax Directed Translation for a context free grammar, compare various storage allocation strategies and classify intermediate representations (Cognitive Knowledge Level: Apply)
		CO5	Illustrate code optimization and code generation techniques in compilation (Cognitive Knowledge Level: Apply)
COMPUTER GRAPHICS AND IMAGE PROCESSING	**CST 304**	**CO1**	Describe the working principles of graphics devices(Cognitive Knowledge level: Understand)
		CO2	Illustrate line drawing, circle drawing and polygon filling algorithms(Cognitive Knowledge level: Apply)
		CO3	Demonstrate geometric representations, transformations on 2D & 3D objects, clipping algorithms and projection algorithms(Cognitive Knowledge level: Apply)
		CO4	Summarize visible surface detection methods(Cognitive Knowledge level: Understand)

		CO5	Summarize the concepts of digital image representation, processing and demonstrate pixel relationships(Cognitive Knowledge level: Apply)
		CO6	Solve image enhancement and segmentation problems using spatial domain techniques(Cognitive Knowledge level: Apply)
ALGORITHM ANALYSIS AND DESIGN	**CST 306**	**CO1**	Analyze any given algorithm and express its time and space complexities in asymptotic notations. (Cognitive Level: Apply)
		CO2	Derive recurrence equations and solve it using Iteration, Recurrence Tree, Substitution and Master's Method to compute time complexity of algorithms. (Cognitive Level: Apply)
		CO3	Illustrate Graph traversal algorithms & applications and Advanced Data structures like AVL trees and Disjoint set operations. (Cognitive Level: Apply)
		CO4	Demonstrate Divide-and-conquer, Greedy Strategy, Dynamic programming, Branch-and Bound and Backtracking algorithm design techniques (Cognitive Level: Apply)
		CO5	Classify a problem as computationally tractable or intractable, and discuss strategies to address intractability (Cognitive Level: Understand)
		CO6	Identify the suitable design strategy to solve a given problem. (Cognitive Level: Analyze)
COMPREHENSIVE COURSE WORK	**CST 308**	**CO1**	Comprehend the concepts of discrete mathematical structures (Cognitive Knowledge Level: Understand)
		CO2	Comprehend the concepts and applications of data structures (Cognitive Knowledge Level: Understand)
		CO3	Comprehend the concepts, functions and algorithms in Operating System (Cognitive Knowledge Level: Understand))
		CO4	Comprehend the organization and architecture of computer systems (Cognitive Knowledge Level: Understand)
		CO5	Comprehend the fundamental principles of database design and manipulation (Cognitive Knowledge Level: Understand)
		CO6	Comprehend the concepts in formal languages and automata theory Cognitive Knowledge Level: Understand)
NETWORKING LAB	**CSL332**	**CO1**	Use network related commands and configuration files in Linux Operating System. (Cognitive Knowledge Level: Understand).
		CO2	Develop network application programs and protocols. (Cognitive Knowledge Level: Apply)
		CO3	Analyze network traffic using network monitoring tools. (Cognitive Knowledge Level: Apply)

		CO4	Design and setup a network and configure different network protocols. (Cognitive Knowledge Level: Apply)
		CO5	Develop simulation of fundamental network concepts using a network simulator. (Cognitive Knowledge Level: Apply)
MINI PROJECT	**CSD 334**	CO1	Identify technically and economically feasible problems (Cognitive Knowledge Level: Apply)
		CO2	Identify and survey the relevant literature for getting exposed to related solutions and get familiarized with software development processes (Cognitive Knowledge Level: Apply)
		CO3	Perform requirement analysis, identify design methodologies and develop adaptable & reusable solutions of minimal complexity by using modern tools & advanced programming techniques (Cognitive Knowledge Level: Apply)
		CO4	Prepare technical report and deliver presentation (Cognitive Knowledge Level: Apply)
		CO5	Apply engineering and management principles to achieve the goal of the project (Cognitive Knowledge Level: Apply)
DATA ANALYTICS	**CST 322**	CO1	Illustrate the mathematical concepts for data analytics (Cognitive Knowledge Level: Apply)
		CO2	Explain the basic concepts of data analytics (Cognitive Knowledge Level: Understand)
		CO3	Illustrate various predictive and descriptive analytics algorithms (Cognitive Knowledge Level: Apply)
		CO4	Describe the key concepts and applications of Big Data Analytics (Cognitive Knowledge Level: Understand)
		CO5	Demonstrate the usage of Map Reduce paradigm for Big Data Analytics (Cognitive Knowledge Level: Apply)
		CO6	Use R programming tool to perform data analysis and visualization (Cognitive Knowledge Level: Apply)

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S7S8 B.Tech (2019) Syllabus

COURSE NAME	COURSE CODE	COURSE OUTCOME CODE	COURSE OUTCOME STATEMENTS
ARTIFICIAL INTELLIGENCE	CST401	CO1	Explain the fundamental concepts of intelligent systems and their architecture (Cognitive Knowledge Level: Understanding)
		CO2	Illustrate uninformed and informed search techniques for problem solving in intelligent systems. (Cognitive Knowledge Level: Understanding)
		CO3	Solve Constraint Satisfaction Problems using search techniques. (Cognitive Knowledge Level: Apply)
		CO4	Represent AI domain knowledge using logic systems and use inference techniques for reasoning in intelligent systems. (Cognitive Knowledge Level: Apply)
		CO5	Illustrate different types of learning techniques used in intelligent systems (Cognitive Knowledge Level: Understand)
COMPILER LAB	CSL411	CO1	Implement lexical analyzer using the tool LEX. (Cognitive Knowledge Level: Apply)
		CO2	Implement Syntax analyzer using the tool YACC. (Cognitive Knowledge Level: Apply)
		CO3	Design NFA and DFA for a problem and write programs to perform operations on it. (Cognitive Knowledge Level: Apply)
		CO4	Design and Implement Top-Down parsers. (Cognitive Knowledge Level: Apply)
		CO5	Design and Implement Bottom-Up parsers. (Cognitive Knowledge Level: Apply)
		CO6	Implement intermediate code for expressions. (Cognitive Knowledge Level: Apply)
SEMINAR	CSQ413	CO1	Identify academic documents from the literature which are related to her/his areas of interest (Cognitive knowledge level: Apply).
		CO2	Read and apprehend an academic document from the literature which is related to her/ his areas of interest (Cognitive knowledge level: Analyze).
		CO3	Prepare a presentation about an academic document (Cognitive knowledge level: Create).
		CO4	Give a presentation about an academic document (Cognitive knowledge level: Apply).
		CO5	Prepare a technical report (Cognitive knowledge level:Create)
PROJECT PHASE I	CSD415	CO1	Model and solve real world problems by applying knowledge across domains (Cognitive knowledge level: Apply).
		CO2	Develop products, processes or technologies for sustainable and socially relevant applications (Cognitive knowledge level: Apply).

		CO3	Function effectively as an individual and as a leader in diverse teams and to comprehend and execute designated tasks (Cognitive knowledge level: Apply).
		CO4	Plan and execute tasks utilizing available resources within timelines, following ethical and professional norms (Cognitive knowledge level: Apply).
		CO5	Identify technology/research gaps and propose innovative/creative solutions (Cognitive knowledge level: Analyze).
		CO6	Organize and communicate technical and scientific findings effectively in written and oral forms (Cognitive knowledge level: Apply)
CLOUD COMPUTING	**CST423**	CO1	Explain the various cloud computing models and services. (Cognitive Knowledge Level: Understand)
		CO2	Demonstrate the significance of implementing virtualization techniques. (Cognitive Knowledge Level: Understand)
		CO3	Explain different cloud enabling technologies and compare private cloud platforms (Cognitive Knowledge Level: Understand)
		CO4	Apply appropriate cloud programming methods to solve big data problems. (Cognitive Knowledge Level: Apply)
		CO5	Describe the need for security mechanisms in cloud (Cognitive Knowledge Level: Understand)
		CO6	Compare the different popular cloud computing platforms (Cognitive Knowledge Level: Understand)
DISTRIBUTED COMPUTING	**CST402**	CO1	Summarize various aspects of distributed computation model and logical time. (Cognitive Knowledge Level: Understand)
		CO2	Illustrate election algorithm, global snapshot algorithm and termination detection algorithm. (Cognitive Knowledge Level: Apply)
		CO3	Recognize the significance of deadlock detection and shared memory in distributed systems. (Cognitive Knowledge Level: Understand)
		CO4	Explain the concepts of failure recovery and consensus. (Cognitive Knowledge Level: Understand)
		CO5	Illustrate distributed file system architectures. (Cognitive Knowledge Level: Understand)
NETWORK SECURITY PROTOCOLS	**CST434**	CO1	Explain authentication protocols, X.509 authentication service and Public Key Infrastructure (PKI).(Cognitive Knowledge Level: Understand)
		CO2	Identify the security mechanisms in E mail security services. (Cognitive Knowledge Level: Understand)

		CO3	Summarize the network and transport layer security services provided in a secure communication scenario. (Cognitive Knowledge Level: Apply
		CO4	Describe real time communication security and application layer security protocols. (Cognitive Knowledge Level: Apply)
		CO5	Explain the concepts of firewalls and wireless network security. (Cognitive Knowledge Level: Understand)
CLIENT SERVER ARCHITECTUR E	**CST426**	**CO1**	Explain the basics of client/server systems and the driving force behind the development of client/server systems (Cognitive Knowledge Level: Understand)
		CO2	Outline the architecture and classifications of client/server systems (Cognitive Knowledge Level: Understand)
		CO3	Choose the appropriate client/server network services for a typical application (Cognitive Knowledge Level: Understand)
		CO4	Describe management services and issues in network (Cognitive Knowledge Level: Understand)
		CO5	Compare and summarize the web extensions and choose appropriate web services standards for an application (Cognitive Knowledge Level: Understand)
MOBILE COMPUTING	**CST476**	**CO1**	Explain the various mobile computing applications, services, design considerations and architectures (Cognitive knowledge: Understand)
		CO2	Describe the various technology trends for next generation cellular wireless networks and use the spreading concept on data transmission (Cognitive knowledge: Apply)
		CO3	Summarize the architecture of various wireless LAN technologies (Cognitive knowledge: Understand)
		CO4	Identify the functionalities of mobile network layer and transport layer (Cognitive knowledge: Understand)
		CO5	Explain the features of Wireless Application Protocol (Cognitive knowledge: Understand)
		CO6	Explain the fundamental concepts of next generation mobile networks(Cognitive knowledge: Understand)
INTERNET OF THINGS	**CST448**	**CO1**	Outline the fundamentals of IoT and its underlying physical and logical architecture(Cognitive Knowledge Level: Understand)
		CO2	Explain the hardware architectures for IoT (Cognitive Knowledge Level : Understand)

		CO3	Outline the Network architectures for IoT(Cognitive Knowledge Level : Understand)
		CO4	Implement data analytics on the IoT platforms (Cognitive Knowledge Level : Apply)
		CO5	Appreciate the security considerations in IoT (Cognitive Knowledge Level : Understand)
		CO6	Implement IoT applications using the available hardware and software. (Cognitive Knowledge Level : Apply)
BLOCKCHAIN TECHNOLOGIES	**CST428**	**CO1**	Illustrate the cryptographic building blocks of blockchain technology. (Cognitive Knowledge Level: Understand)
		CO2	Explain the fundamental concepts of blockchain technology. (Cognitive Knowledge Level: Understand)
		CO3	Summarize the classification of consensus algorithms. (Cognitive Knowledge Level: Understand)
		CO4	Explain the concepts of first decentralized cryptocurrency bitcoin. (Cognitive Knowledge Level: Understand)
		CO5	Explain the use of smart contracts and its use cases. (Cognitive Knowledge Level: Understand)
		CO6	Develop simple applications using Solidity language on Ethereum platform. (Cognitive Knowledge Level: Apply)
PROJECT PHASE II	**CSD416**	**CO1**	Model and solve real world problems by applying knowledge across domains (Cognitive knowledge level: Apply).
		CO2	Develop products, processes or technologies for sustainable and socially relevant applications (Cognitive knowledge level: Apply).
		CO3	Function effectively as an individual and as a leader in diverse teams and to comprehend and execute designated tasks (Cognitive knowledge level: Apply).
		CO4	Plan and execute tasks utilizing available resources within timelines, following ethical and professional norms (Cognitive knowledge level: Apply).
		CO5	Identify technology/research gaps and propose innovative/creative solutions (Cognitive knowledge level: Analyze).
		CO6	Organize and communicate technical and scientific findings effectively in written and oral forms (Cognitive knowledge level: Apply).

2015 Scheme Syllabus- Course Outcomes

S3 S4 B.Tech

COURSE NAME	COURSE CODE	COURSE OUTCOME CODE	COURSE OUTCOME STATEMENTS
DISCRETE COMPUTATIONAL STRUCTURES	**MAT 202**	CO1	Infer the concepts and operations on discrete structures such as sets, relations and functions. (Understand)
		CO2	Verify the validity of an argument using propositional & predicate logic (Analyze)
		CO3	Construct proofs using direct proof, proof by contraposition, proof by contradiction and proof by cases, and mathematical induction (Analyze)
		CO4	Outline solutions to the problems using algebraic structures (understand)
		CO5	Develop solutions to the problems using counting techniques,combinatorics and recurrence relations (Apply)
		CO6	Build solution to analytical and logical problems (Apply)
SWITCHING THEORY AND LOGIC DESIGN	**CS203**	CO1	Compare various positional number systems and binary codes.(Understand)
		CO2	Apply Boolean algebra,K-map and Quine Mc-Cluskey to minimize logic functions (Apply)
		CO3	Design combinational circuit using gates
		CO4	Design sequential circuits using Flip-Flops
		CO5	Design and implement digital systems using basic programmable blocks and formulate various digital systems using HDL(Apply)
		CO6	Apply algorithms for addition/subtraction operations on Binary,BCD and Floating Point (Apply)
DATA STRUCTURES	**CS205**	CO1	Compute the performance of data structures using asymptotic notations for simple problems.(Apply)
		CO2	Solve real world problems efficiently using different linear data structures(Analyze)
		CO3	Design algorithm for different applications using non linear data structure with at most 1000 lines of code (1 kLoC)(Analyze)
		CO4	Analyze various searching and sorting techniques(Analyze)
		CO5	Implement data structures for basic memory management schemes. (Apply)
		CO6	Recommend a data structure from a set of data structures for a given real-world application. (Evaluate)
ELECTRONICS DEVICES & CIRCUITS	**CS207**	CO1	Students will be able to communivate effectively without mother tongue influence
		CO2	Students will be able to perform well in oratory,interview & group discussion
		CO3	Students will be able to critically think and solve a particular problem
		CO4	Students will be able to understand the significance of engineering ethics and human values
		CO5	Students will demonstrate an effective leadership & team playiong skill
DATA STRUCTURE LAB	**CS231**	CO1	Implement the various operations of linear as well as non-linear data structures. (Apply)
		CO2	Have practical knowledge about the area of application of various data structures(Understand)
		CO3	Solve Problems using dynamic memory allocation(Apply)

		CO4	Implementing various searching and sorting algorithms(Apply)
		CO5	Solve simple problems using non linear data structure(Apply)
		CO6	Develop a Micro project by selecting the most suitable data structure for the given scenario(Create)
ELECTRONICS CIRCUITS LAB	**CS 233**	CO1	Identify basic electronic components, design and develop electronic circuits.
		CO2	Design and demonstrate functioning of given discrete analog circuits
		CO3	Make use of computer simulation software for electronic circuits and how to use it proficiently for design and development of electronic circuits.
		CO4	Develop basic knowledge in solid state electronics including diodes, BJT, and operational amplifier
		CO5	Explain the concepts and their applications in engineering
LIFE SKILLS	**HS210**	CO1	Students will be able to communivate effectively without mother tongue influence
		CO2	Students will be able to perform well in oratory,interview & group discussion
		CO3	Students will be able to critically think and solve a particular problem
		CO4	Students will be able to understand the significance of engineering ethics and human values
		CO5	Students will demonstrate an effective leadership & team playiong skill
LINEAR ALGEBRA & COMPLEX ANALYSIS	**MA 201**	CO1	Construct analytic functions using C-R equation (understand).
		CO2	Construct a region corresponds to certain transformations(analyze)
		CO3	Interpreting different singularities of analytic function.(analyze)
		CO4	Applying residue theorem to solve real definite integral(apply)
		CO5	Applying matrix method to Solve any given system of linear equations(apply)
		CO6	Determination of Eigen values of a matrix for diagonalizing a matrix(apply & analyze)

COMPUTER ORGANIZATION AND ARCHITECTURE	**CS202**	CO1	Infer the basic structure and functional units of a digital computer (Understand)
		CO2	Analyze the effect of addressing modes on the execution time of a program (Analyze)
		CO3	Implement multiplication and division in ALU using different Arithmetic Algorithms(Apply)
		CO4	Select appropriate interfacing standards for I/O devices(Analyze)
		CO5	Identify the pros and cons of different types of control logic design in processors(Understand)
OPERATING SYSTEMS	**CS204**	CO1	Identify the significance of operating system in computing devices. (Understand)
		CO2	Exemplify the communication between application programs and hardware devices through system calls. (Understand)
		CO3	Compare and illustrate various process scheduling algorithms. (Analyse)
		CO4	Apply appropriate memory and file management schemes. (Apply)
		CO5	Illustrate various disk scheduling algorithms. (Apply)

		CO6	Appreciate the need of access control and protection in an operating system.(Understand)
OBJECT ORIENTED DESIGN AND PROGRAMMING	**CS206**	**CO1**	To understand object oriented principles in software design process
		CO2	To apply various object oriented feature like inheritance dataabstraction,encapsulation and polymorphism to solve various computing problem
		CO3	To develop java programs for real application using java construct and libraries
		CO4	To implement exception handling in java
		CO5	To implement gui and event handling in java
		CO6	To develop applet in java techlogies
PRINCIPLES OF DATABASE DESIGN	**CS208**	**CO1**	Illustrate the fundamental concepts of databases. (Understand)
		CO2	Construct an Entity-Relationship (E-R) model from specifications and to perform the transformation of the conceptual model into corresponding logical data structures. (Apply)
		CO3	Model a relational database following the design principles. (Apply)
		CO4	Develop queries for relational database in the context of practical applications (Apply)
		CO5	Illustrate fundamental principles of data organization, query optimization and concurrent transaction processing. (Understand)
		CO6	Appreciate the latest trends in databases. (Understand)
DATA STRUCTURE LAB	**CS231**	**CO1**	Implement the various operations of linear as well as non-linear data structures. (Apply)
		CO2	Have practical knowledge about the area of application of various data structures(Understand)
		CO3	Solve Problems using dynamic memory allocation(Apply)
		CO4	Implementing various searching and sorting algorithms(Apply)
		CO5	Solve simple problems using non linear data structure(Apply)
		CO6	Develop a Micro project by selecting the most suitable data structure for the given scenario(Create)
FREE AND OPEN SOURCE SOFTWARE LAB	**CS232**	**CO1**	Identify and apply various Linux commands
		CO2	Develop shell scripts and GUI for specific needs or application
		CO3	Able to use distributed revision control system tools
		CO4	Perform basic level application deployment using tools
		CO5	Perform kernel configuration, packet management and installations
DIGITAL SYSTEMS LAB	**CS234**	**CO1**	To Realize functions using basic gates and Design Arithmetic Circuits Half Adder, Full Adder, Half Subtractor ,Full Subtractor and BCD adder
		CO2	To Design and implement various combinational circuits like Comparators , Multiplexers , Demultiplexers
		CO3	To Realize flipflops using gates R,S,T,D,JK
		CO4	To Design and implement Shift Registers
		CO5	To Design and implement Synchronous counters , Asynchronous Counters, and Shift register counter
		CO6	To develop projects using digital circuits which has real life applications
BUSINESS ECONOMICS	**HS200**	**CO1**	Understand the basic concepts in Business economics
		CO2	Apprehend the micro economic principles in production function
		CO3	Determine Break Even Point
		CO4	Analyze the basic macro – economic concepts and monetary theory

COURSE NAME	COURSE CODE	COURSE OUTCOME CODE	COURSE OUTCOME STATEMENTS
		CO5	Apply an appropriate investment method in business decision
		CO6	Understand the basics of financial accounting.
PROBABILITY DISTRIBUTIONS, TRANSFORMS AND NUMERICAL METHODS	**MA202**	**CO1**	Interpreting Discrete and continuous probability density functions and special probability distributions (understand)
		CO2	Interpreting every continuous function as a fourier integral
		CO3	Applying Laplace transforms to solve differential equation(Apply)
		CO4	Discussing different numerical methods to solve various engineering problems(Understand)

2015 Scheme Syllabus- Course Outcomes

S5 S6 B.Tech (2015) Syllabus

COURSE NAME	COURSE CODE	COURSE OUTCOME CODE	COURSE OUTCOME STATEMENTS
	CS301	**CO1**	Classify formal languages into regular, context-free, context sensitive and Recursively Enumerable languages.

THEORY OF COMPUTATION		**CO2**	Design finite state automata, regular grammar, regular expression and Myhill- Nerode relation representations for regular languages.
		CO3	Design push-down automata and context-free grammar representations for context-free languages.
		CO4	Design Turing Machines for accepting recursively enumerable languages.
		CO5	Understand the notions of decidability and undecidability of problems, Halting problem.
		CO6	Simulate Finite State / Pushdown Automata / Turing Machine.
SYSTEM SOFTWARE	**CS303**	**CO1**	Distinguish different software into different categories and Compare the architecture of SIC/SICXE Machine.
		CO2	Design, analyze and implement one pass, two pass or multi pass assembler.
		CO3	Design, analyze and implement loader and linker.
		CO4	Design, analyze and implement macro processors.
		CO5	Critique the features of modern editing /debugging tools.
MICROPROCESSORS AND MICROCONTROLLERS	**CS305**	**CO1**	Describe different modes of operations of a typical microprocessor
		CO2	Develop 8086 assembly language programs using sub routines, macros, stack and passing parameters.
		CO3	Apply interrupts in 8086 programming.
		CO4	Interface microprocessors with various external devices.
		CO5	Compare the architectural features of Microprocessors and microcontrollers.
		CO6	Design assembly language programs using 8051 microcontroller
DATA COMMUNICATION	**CS307**	**CO1**	Apply different data transmission techniques in data communication
		CO2	Compare different transmission media based on transmission impairments and channel capacity.
		CO3	Apply signal encoding techniques of Digital Data Digital Signals and Analog Data Digital Signals
		CO4	Classify different multiplexing techniques for a given scenario.
		CO5	Design suitable error detection and error correction algorithms to achieve error free data communication.
		CO6	Compare different switching techniques in data communication.
GRAPH THEORY AND COMBINATORICS	**CS309**	**CO1**	Demonstrate the knowledge of fundamental concepts in graph theory
		CO2	Discuss the properties and charactrization of graph and trees
		CO3	Use graphs for solving real life problems
		CO4	Distinguish different graph representations like planar, matrix and solve problems
		CO5	Develop different algorithms for graph related problems in different domains of engineering and science
SYSTEM SOFTWARE	**CS331**	**CO1**	Compare and analyze CPU Scheduling Algorithms like FCFS, Round Robin, SJF and Priority
		CO2	Implement synchronization techniques using semaphores.
		CO3	Implement banker's algorithm for deadlock avoidance.
		CO4	Implement file allocation and disk scheduling techniques.
		CO5	Implement system software such as loaders, assemblers and macro processor.
APPLICATION SOFTWARE DEVELOPMENT LAB	**CS333**	**CO1**	Query a database using SQL DMLDDL commands. (Apply)
		CO2	Implement integrity constraints on a database using RDBMS (Apply)
		CO3	Develop PL/SQL programs using procedure and functions.(Apply)

		CO4	Apply cursors and triggers on database (Apply)
		CO5	Design and implement database for a given application.(Apply)

DESIGN ANALYSIS AND ALGORITHM	**CS302**	CO1	Illustrate performance analysis of algorithms using time as a metric.[Apply]
		CO2	Compute the cost for performing a given simple computing operation. [Apply]
		CO3	Implement some of the common graph/tree-based algorithms. [Apply]
		CO4	Solve problems using appropriate strategy.[Analyze]
		CO5	Identify the commonly referred complexity classes.[Comprehend]
COMPILER DESIGN	**CS304**	CO1	Explain the phases of compilation
		CO2	Design Lexical analyzer using finite automata
		CO3	Implement a simple parser using basic parsing algorithms
		CO4	Develop Synthesis phase of a compiler for small programs with simple programming constructs
		CO5	Illustrate storage and error handling techniques used in a typical compiler
COMPUTER NETWORK	**CS306**	CO1	Illustrate the different aspects of Networks, Protocols and Network Reference models.
		CO2	Evaluate the working of various IEEE standards of MAC sub layer and data link layer protocols
		CO3	Apply appropriate routing algorithms for a network.(
		CO4	Describe the important aspects and functions of network layer, transport layer and application layer in internetworking
		CO5	Describe the important aspects and functions of application layer in internetworking.
		CO6	Implement data link or network or application layer protocols within a simulated networking environment
MICROPROCES SOR LAB	**CS332**	CO1	Familiarize 8051 Trainer Kit and MASM to access registers, and Memory (K2)
		CO2	Develop assembly language programs for problem solving using software interrupts and various assembler directives.(K3)
		CO3	Implement interfacing of various I/O devices to the microprocessor/microcontroller through assembly language programming.(K3)
		CO4	Familiarize 8051 Trainer Kit to access registers, Internal RAM & ROM, External ROM(K2)
		CO5	Develop 8051 programs using 8051 Trainer Kit(K3)
NETWORK PROGRAMMIN G LAB	**CS334**	CO1	To familirize network related commands and configuration files in Linuex OS(Applying)
		CO2	Implementing OS programs related to process and threads (Applying)
		CO3	Implement network application programs (Applying)
		CO4	Simulate wired and wireless scenarios using NS2 (Applying)

COURSE NAME	COURSE CODE	COURSE OUTCOME CODE	COURSE OUTCOME STATEMENTS
		CO5	Analyze network traffic using network monitoring tools (Analyze)
COMPUTER VISION	CS362	CO1	Understand models of image formation. (Understand)
		CO2	Understand image feature detection and matching techniques. (Understand)
		CO3	Apply various algorithms for pattern recognition. (Apply)
		CO4	Apply various algorithms for clustering. (Apply)
		CO5	Understand structural pattern recognition and feature extraction techniques. (Understand)
WEB TECHNOLOGY	CS368	CO1	Understand dierent components in web technology and to know about CGI & CMS (Understand)
		CO2	Develop Interactive web pages using HTML and XHTML (Apply)
		CO3	Present a professional document using Cascaded Style Sheets(CSS) with responsive frameworks like Bootstrap (Apply)
		CO4	Construct websites for user interactions using JavaScript and JQuery (Apply)
		CO5	Infer different information interchange formats like XML and JSON (Understand)
		CO6	Develop web applications using PHP web based frameworks like Larvel (Apply)
PRINCIPLES OF MANAGEMENT	HS300	CO1	Understand managerial roles and functions
		CO2	Recognize the application of management theories in organizational operations
		CO3	Apprehend the relevance of planning in management
		CO4	Explain different techniques in decision making.
		CO5	Comprehend HRD function.
		CO6	Examine various approaches to leadership

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2015 Scheme Syllabus- Course Outcomes

S7,S8 B.Tech (2015) Syllabus

COURSE NAME	COURSE CODE	COURSE OUTCOME CODE	COURSE OUTCOME STATEMENTS
COMPUTER GRAPHICS	CS401	CO1	Compare various graphics devices. Understand (K2)
		CO2	Implement algorithms for line drawing, circle drawing and polygon filling. Apply (K3)
		CO3	Apply geometrical transformation on 2D and 3D objects.Apply (K3)

		CO4	Understand algorithms for clipping. Understand (K2)
		CO5	Understand projection techniques and visible surface detection methods.Understand (K2)
		CO6	Understand basic concepts of image processing. Understand (K2)
PROGRAMMI NG PARADIGMS	**CS403**	**CO1**	Illustrate scope and binding of names and control flow structures in different programming languages
		CO2	Compare different data types in different programming languages
		CO3	Differentiate control abstraction mechanisms
		CO4	Illustrate functional, logic and scripting languages
		CO5	Understand object oriented constructs in different programming languages
		CO6	Interpret the concepts of run- time program management and different concurrency constructs
COMPUTER SYSTEM ARCHITECHT URE	**CS405**	**CO1**	Summarize the various parallel computer models
		CO2	Analyze the advanced professor technologies
		CO3	Compare different multiprocessor system inter connecting mechanism
		CO4	Analyze different message passing mechanism and different pipelining techniques
		CO5	Interpret the memory hierarchy technology and mechanisms for enforcing cache coherence
		CO6	Appraise the concept of multithreaded and data flow architecture
PROGRAMMI NG PARADIGMS	**CS403**	**CO1**	Illustrate scope and binding of names and control flow structures in different programming languages
		CO2	Compare different data types in different programming languages
		CO3	Differentiate control abstraction mechanisms
		CO4	Illustrate functional, logic and scripting languages
		CO5	Understand object oriented constructs in different programming languages
		CO6	Interpret the concepts of run- time program management and different concurrency constructs
CRYPTOGRAP HY AND NETWORK SECURITY	**CS409**	**CO1**	Classify the Substitution and transposition techniques in Cryptography.
		CO2	Relate different symmetric and asymmetric cryptographic algorithms. (DES, AES, RSA, Diffie Hellman key exchange algorithm etc.)
		CO3	Compare the data integrity algorithms including Hash, Message Authentication Code algorithms, and digital signature.
		CO4	Interpret IP Security and System security.
		CO5	Summarize different web security techniques.
		CO6	Appraise concepts of multithreaded and data flow architectures.
COMPILER DESIGN LAB	**CS431**	**CO1**	Implement the techniques of Lexical and Syntax analysis
		CO2	Apply the knowledge of LEX and YACC to develop programs
		CO3	Generate Intermediate code for a given code
		CO4	Implement Optimization techniques and generate machine code
		CO5	Demonstrate the various phases of compiler for an customized language
SEMINAR AND PROJECT	**CS 451**	**CO1**	identify various problems related to society/industry/research problem, solved by using engineering fundamentals.

PRELIMINARY		**CO2**	To understand how various aspects of projects including planning, analysis, software development and implementation, including cost estimation.
		CO3	To effectively apply knowledge gained to benefit society/industry; or to work towards research outcomes.
		CO4	To effectively and efficiently plan, design and implement projects using modern tools and techniques.
		CO5	To effectively plan and work as a team to meet all criteria of project and to
		CO6	To understand the impact of software project/product related to its usage, impact in environment, security and ethical practice in design and development of project.
BIOINFORMATICS	**CS465**	**CO1**	Interpret the concepts of bioinformatics and computational biology
		CO2	Infer different types of biological databases and tools
		CO3	Construct sequence alignment algorithms and scoring methods for nucleic acids and protein sequences
		CO4	Develop phylogenetic trees and hidden markov models for bioinformatics analysis
		CO5	Infer structure, content and density of prokaryotes and eukaryotes genomes
		CO6	Predict protein folding and RNA structure with different predicting and folding algorithms
MACHINE LEARNING	**CS467**	**CO1**	Differentiate different learning approaches, and to interpret theoretical foundations of supervised learning
		CO2	Contrast the different dimensionality reduction techniques
		CO3	Apply theoretical foundations of decision trees to identify best split and Bayesian classifier to label data points
		CO4	Illustrate the working of classifier models like SVM, Neural Networks and identify classifier model for typical machine learning application.
		CO5	Identify the state sequence and evaluate a sequence emission probability from a given HMM
		CO6	Illustrate and apply clustering algorithms and identify its applicability in real life problems

DISASTER MANAGEMENT	**CE488**	**CO1**	Illustrate various terminologies related to disasters
		CO2	Summarize the impact of various natural disasters and its management measures
		CO3	Outline the nature of impact coastal disasters
		CO4	Illustrate the types of anthropogenic disasters
		CO5	Demonstrate fundamental concepts of water and atmospheric pollution
		CO6	Explain disaster management plans for floods, tidal waves
ENVIRONMENTAL HEALTH AND SAFETY	**CE 494**	**CO1**	Summarize occupational health and toxicology
		CO2	Summarize the noise pollution, radiation hazard, biological hazard and chemical hazard in the work place
		CO3	Illustrate the causes effects and solution for the radiation hazards and air pollution in the workplace
		CO4	Interpret the electrical hazards and construction safety measures in the workplace.
		CO5	Summarize the water pollution and hazardous waste management

		CO6	Compare various pollution controls in process industries
DATA MINING AND WARE HOUSING	**CS 402**	**CO1**	The student will understand the concept of data mining and its applications.
		CO2	To understand various data pre-processing techniques to improve the quality of data and efficiency and the ease of the mining process.
		CO3	The student will understand the concept of data classification methods
		CO4	The student will understand the concept of association rule mining methods
		CO5	To understand the unsupervised learning techniques and the algorithm used for data clustering.
		CO6	The student will understand the advanced data mining techniques and the popular data mining tools used.
EMBEDDED SYSTEMS	**CS 404**	**CO1**	Demonstrate the role of individual components involved in a typical embedded system
		CO2	analyse the characteristics of different computing elements and select the most appropriate one for an embedded system
		CO3	model the operation of a given embedded system
		CO4	substantiate the role of different software modules in the development of an embedded system
		CO5	develop simple tasks to run on an RTOS
		CO6	examine the latest trends prevalent in embedded system design
CLOUD COMPUTING	**CS 468**	**CO1**	Identify the significance of implementing virtualization techniques
		CO2	Interpret the various cloud computing models and services
		CO3	Compare the various public cloud platforms and software environments.
		CO4	Apply appropriate cloud programming methods to solve big data problems.
		CO5	Appreciate the need of security mechanisms and the use of various available cloud services
		CO6	Applying various cloud services in Scheduling Applications etc.