

Vidya Academy of Science & Technology

(A unit of Vidya International Charitable Trust)

Thalakkottukara PO, Thrissur, Kerala, India, Pin- 680 501

Phone: +91-4885-287751, 287752, Fax: 288366

COURSE OUTCOMES				
Branch: DEPARTMENT OF COMPUTER SCIENCE ENGINEERING				
2019 SCHEME				
After the completion of the course the students will be able to				
S. No.	SEM	Subject	CO	CO statement
1	S1	MAT 101 LINEAR ALGEBRA AND CALCULUS	MAT101.1	solve systems of linear equations, diagonalize matrices and characterise quadratic forms
			MAT101.2	compute the partial and total derivatives and maxima and minima of multivariable functions
			MAT101.3	compute multiple integrals and apply them to find areas and volumes of geometrical shapes, mass and centre of gravity of plane laminas
			MAT101.4	perform various tests to determine whether a given series is convergent, absolutely convergent or conditionally convergent
			MAT101.5	determine the Taylor and Fourier series expansion of functions and learn their applications.
2	S1	PHT 100 ENGINEERING PHYSICS	PHT100.1	compute the quantitative aspects of waves and oscillations in engineering systems.
			PHT100.2	apply the interaction of light with matter through interference, diffraction and identify these phenomena in different natural optical processes and optical instruments.
			PHT100.3	analyze the behaviour of matter in the atomic and subatomic level through the

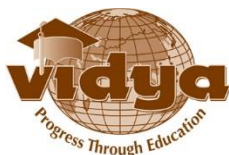


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				principles of quantum mechanics to perceive the microscopic processes in electronic devices.
			PHT100.4	classify the properties of magnetic materials and apply vector calculus to static magnetic fields and use Maxwell's equations to diverse engineering problem
			PHT100.5	analyze the principles behind various superconducting applications, explain the working of solid state lighting devices and fibre optic communication system
3	S1	EST 100 ENGINEERING MECHANICS	EST100.1	recall principles and theorems related to rigid body mechanics
			EST100.2	identify and describe the components of system of forces acting on the rigid body
			EST100.3	apply the conditions of equilibrium to various practical problems involving different force system.
			EST100.4	choose appropriate theorems, principles or formulae to solve problems of mechanics.
			EST100.5	solve problems involving rigid bodies, applying the properties of distributed areas and masses
4	S1	EST 120 BASICS OF CIVIL AND MECHANICAL ENGINEERING	EST120.1	recall the role of civil engineer in society and to relate the various disciplines of Civil Engineering with special focus on Building construction and basics of Surveying
			EST120.2	summarize the basic infrastructure services MEP, HVAC, elevators, escalators and ramps and discuss the

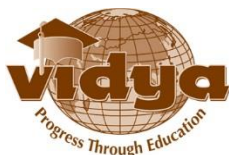


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				Materials, energy systems, water management and environment for green buildings.
			EST120.3	analyse thermodynamic cycles and their efficiency for illustrating working of IC Engines.
			EST120.4	explain the basic principles of refrigeration, air conditioning, hydraulic turbines and power transmission elements.
			EST120.5	describe the basic manufacturing, metal joining and machining processes.
5	S1	HUN 101 LIFE SKILLS	HUN101.1	define and identify different life skills required in personal and professional life
			HUN101.2	develop an awareness of the self and apply well-defined techniques to cope with emotions and stress
			HUN101.3	explain the basic mechanics of effective communication and demonstrate these through presentations and use appropriate thinking and problem solving techniques to solve new problems
			HUN101.4	take part in group discussions
			HUN101.5	understand the basics of teamwork and leadership
6	S1	PHL 120 ENGINEERING PHYSICS LAB	PHL120.1	develop analytical/experimental skills and impart prerequisite hands on experience for engineering laboratories
			PHL120.2	understand the need for precise measurement practices for data recording
			PHL120.3	understand the principle, concept, working and applications of relevant

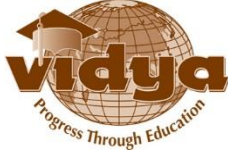


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				technologies and comparison of results with theoretical calculations
			PHL120.4	analyze the techniques and skills associated with modern scientific tools such as lasers and fiber optics
			PHL120.5	develop basic communication skills through working in groups in performing the laboratory experiments and by interpreting the results
7	S1	ESL 120 CIVIL AND MECHANICAL WORKSHOP	ESL120.1	name different devices and tools used for civil engineering measurements and Explain the use of various tools and devices for various field measurements
			ESL120.2	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.
			ESL120.3	choose materials and methods required for basic civil engineering activities like field measurements, masonry work and plumbing and Compare different techniques and devices used in civil engineering measurements
			ESL120.4	identify Basic Mechanical workshop operations with appropriate Tools and Instruments with respect to the mechanical workshop trades in accordance with the material and Objects.
			ESL120.5	apply appropriate safety measures with respect to the mechanical workshop trades.

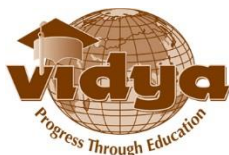


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8	S2	MAT 102 VECTOR CALCULUS, DIFFERENTIAL EQUATIONS AND TRANSFORM	MAT102.1	compute the derivatives and line integrals of vector functions and learn their applications
			MAT102.2	evaluate surface and volume integrals and learn their inter-relations and applications.
			MAT102.3	solve homogeneous and non-homogeneous linear differential equation with constant coefficients
			MAT102.4	compute Laplace transform and apply them to solve ODEs arising in engineering
			MAT102.5	determine the Fourier transforms of functions and apply them to solve problems arising in engineering
9	S2	CYT 100 ENGINEERING CHEMISTRY	CYT100.1	apply the basic concepts of electrochemistry and corrosion to explore its possible applications in various engineering fields.
			CYT100.2	understand various spectroscopic techniques like UV-Visible, IR, NMR and its applications.
			CYT100.3	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.
			CYT100.4	learn about the basics of stereochemistry and its application. Apply the knowledge of conducting polymers and advanced polymers in engineering.
			CYT100.5	study various types of water treatment methods to develop skills for treating wastewater.

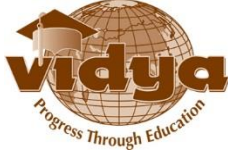


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10	S2	EST 110 ENGINEERING GRAPHICS	EST110.1	draw the projection of points and lines located in different quadrants
			EST110.2	prepare multi-view orthographic projections of objects by visualizing them in different positions
			EST110.3	draw sectional views and develop surfaces of a given object
			EST110.4	prepare pictorial drawings using the principles of isometric and perspective projections to visualize objects in three dimensions
			EST110.5	convert 3D views to orthographic views and vice versa using CAD tools
11	S2	EST 130 BASICS OF ELECTRICAL AND ELECTRONICS ENGINEERING	EST130.1	apply fundamental concepts and circuit laws to solve simple DC electric circuits.
			EST130.2	develop and solve models of magnetic circuits.
			EST130.3	apply the fundamental laws of electrical engineering to solve simple ac circuits in steady state.
			EST130.4	describe the working of a voltage amplifier and to outline the principle of an electronic instrumentation system.
			EST130.5	explain the principle of radio and cellular communication.
12	S2	HUN 102 PROFESSIONAL COMMUNICATION	HUN102.1	develop vocabulary and language skills relevant to engineering as a profession.
			HUN102.2	get the capability to analyze, interpret and effectively summarize a variety of textual content.
			HUN102.3	create effective technical presentations.
			HUN102.4	discuss a topic in a group setting and arrive at generalizations/ conclusions.

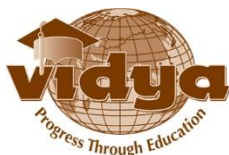


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			HUN102.5	create professional and technical documents with required relevance and clarity.
13	S2	EST 102 PROGRAMING IN C	EST102.1	analyze a computational problem and develop an algorithm/flowchart to find its solution.
			EST102.2	develop readable C programs with branching and looping statements, which uses Arithmetic, Logical, Relational or Bitwise operators.
			EST102.3	write readable C programs with arrays,structure or union for storing the data to be processed.
			EST102.4	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.
			EST102.5	write readable C programs which use pointers for array processing and parameter passing. Develop readable C programs with files for reading input and storing output.
14	S2	CYL 120 ENGINEERING CHEMISTRY LAB	CYL120.1	understand and practice different techniques of quantitative chemical analysis to generate experimental skills and apply these skills to various analyses
			CYL120.2	develop skills relevant to synthesize organic polymers and acquire the practical skill to use TLC for the identification of drugs
			CYL120.3	develop the ability to understand and explain the use of modern spectroscopic techniques for analysing and interpreting

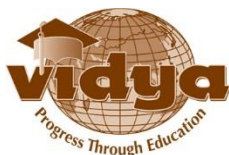


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				the IR spectra and NMR spectra of some organic compounds
			CYL120.4	acquire the ability to understand, explain and use instrumental techniques for chemical analysis
			CYL120.5	learn to design and carry out scientific experiments as well as accurately record and analyze the results of such experiments
15	S2	ESL 130 ELECTRICAL AND ELECTRONICS WORKSHOP	ESL130.1	demonstrate safety measures against electric shocks.
			ESL130.2	identify the tools used for electrical wiring, electrical accessories, wires, cables, batteries and standard symbols.
			ESL130.3	develop the connection diagram, identify the suitable accessories and materials necessary for wiring simple lighting circuits for domestic buildings
			ESL130.4	identify and test various electronic components
			ESL130.5	make use of BIS/IEEE symbols to draw circuit schematics and experiment with and test electronic circuits on board
16	S3	MAT 203 DISCRETE MATHEMATICAL STRUCTURES	MAT203.1	check the validity of predicates in Propositional and Quantified Propositional Logic using truth tables, deductive reasoning and inference theory on Propositional Logic
			MAT203.2	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

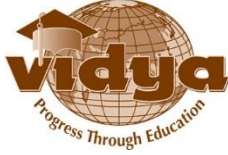


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			MAT203.3	classify binary relations into various types and illustrate an application for each type of binary relation, in Computer Science Illustrate an application for Partially Ordered Sets and Complete Lattices, in Computer Science
			MAT203.4	explain Generating Functions and solve First Order and Second Order Linear Recurrence Relations with Constant Coefficients
			MAT203.5	illustrate the abstract algebraic systems – Semigroups , Monoids, Groups, Homomorphism and Isomorphism of Monoids and Groups
17	S3	CST 201 DATA STRUCTURES	CST201.1	design an algorithm for a computational task and calculate the time/space complexities of that algorithm
			CST201.2	produce algorithms for given computational problems like searching, scheduling and expression conversions by understanding basic data structures such as array, stack and queue.
			CST201.3	identify the suitable data structure (array or linked list) to represent a data item required to be processed and write an algorithm to solve a given computational problem by understanding the basic concepts of memory allocation and deallocation.
			CST201.4	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.

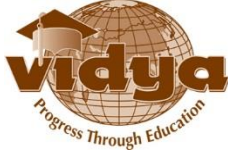


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			CST201.5	store a given dataset using an appropriate hash function to enable efficient access of data in the given set. Understand various sorting algorithms, select appropriate sorting algorithms to be used in specific circumstances
18	S3	CST 203 LOGIC SYSTEM DESIGN	CST203.1	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
			CST203.2	simplify a given Boolean Function and design a combinational circuit to implement the simplified function using Digital Logic Gates
			CST203.3	design combinational circuits - Adders, Code Convertors, Decoders, Magnitude Comparators, Parity Generator/Checker and design the Programmable Logic Devices - ROM and PLA.
			CST203.4	design sequential circuits - Registers, Counters and Shift Registers
			CST203.5	dse algorithms to perform addition and subtraction on binary, BCD and floating point numbers
			19	S3
CST205.2	utilise datatypes, operators, control statements, built in packages & interfaces, Input/ Output Streams and Files in Java to develop programs			

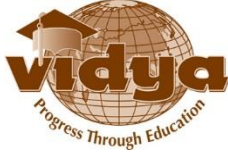


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			CST205.3	illustrate how robust programs can be written in Java using exception handling mechanism
			CST205.4	write application programs in Java using multithreading and database connectivity
			CST205.5	Write Graphical User Interface based application programs by utilising event handling features and Swing in Java
20	S3	EST 200 DESIGN AND ENGINEERING	EST200.1	explain different concepts and principles involved in design engineering.
			EST200.2	discuss and demonstrate the workability of solutions for design problems and Apply design thinking while learning and practicing engineering.
			EST200.3	compare designs covering function, cost, environmental sensitivity, safety factors along with engineering analysis.
			EST200.4	develop innovative, reliable, sustainable and economically viable designs incorporating knowledge in engineering.
			EST200.5	judge the optimal solution from the available choice.
21	S3	MCN 201 SUSTAINABLE ENGINEERING	MCN201.1	understand the relevance and the concept of sustainability and the global initiatives in this direction
			MCN201.2	explain the different types of environmental pollution problems and their sustainable solutions
			MCN201.3	discuss the environmental regulations and standards
			MCN201.4	outline the concepts related to conventional and non-conventional energy

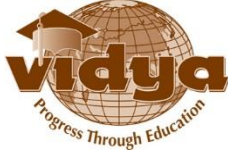


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			MCN201.5	demonstrate the broad perspective of sustainable practices by utilizing engineering knowledge and principles
22	S3	CSL 201 DATA STRUCTURES LAB	CSL201.1	write a time/space efficient program using arrays to provide necessary functionalities meeting a given set of user requirements
			CSL201.2	write a time/space efficient program using linked lists to provide necessary functionalities meeting a given set of user requirements
			CSL201.3	write a time/space efficient program graphs to provide necessary functionalities meeting a given set of user requirements
			CSL201.4	write a time/space efficient program to sort a list of records based on a given key in the record
			CSL201.5	design and implement an efficient data structure to represent given data
23	S3	CSL203 OBJECT ORIENTED PROGRAMMING LAB	CSL203.1	implement the Object Oriented concepts - constructors, inheritance, method overloading & overriding and polymorphism in Java
			CSL203.2	implement programs in Java which use datatypes, operators, control statements, built in packages & interfaces, Input/Output streams and Files
			CSL203.3	implement robust application programs in Java using exception handling
			CSL203.4	implement application programs in Java using multithreading and database connectivity
			CSL203.5	implement Graphical User Interface based application programs by utilizing

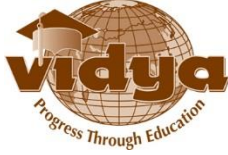


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				event handling features and Swing in Java
24	S4	MAT 206 GRAPH THEORY	MAT206.1	explain vertices and their properties, types of paths, classification of graphs and trees & their properties.
			MAT206.2	demonstrate the fundamental theorems on Eulerian and Hamiltonian graphs.
			MAT206.3	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.
			MAT206.4	explain planar graphs, their properties and an application for planar graphs and illustrate how one can represent a graph in a computer.
			MAT206.5	explain the Vertex Color problem in graphs and illustrate an example application for vertex coloring.
25	S4	CST 202 COMPUTER ORGANIZATION AND ARCHITECTURE	CST202.1	identify the basic structure and roles of various functional units of a computer and analyze the effect of addressing modes during the execution time of a program.
			CST202.2	explore the complete steps in an instruction execution and demonstrate computer arithmetic operations on integer and real numbers
			CST202.3	select appropriate interfacing standards for I/O devices.
			CST202.4	understand memory hierarchy and its impact on computer cost/performance
			CST202.5	build simple arithmetic and logical units. Identify and analyze pros and cons

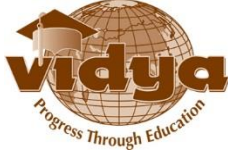


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				of different types of control logic design in processors.
26	S4	CST 204 DATABASE MANAGEMENT SYSTEMS	CST204.1	summarize and exemplify fundamental nature and characteristics of database systems
			CST204.2	model real word scenarios given as informal descriptions, using Entity Relationship diagrams.
			CST204.3	model and design solutions for efficiently representing and querying data using relational model
			CST204.4	demonstrate the features of indexing and hashing in database applications
			CST204.5	discuss and compare the aspects of Concurrency Control and Recovery in Database Systems and Explain various types of NoSQL databases
27	S4	CST 206 OPERATING SYSTEMS	CST206.1	explain the relevance, structure and functions of Operating Systems in computing devices.
			CST206.2	illustrate the concepts of process management and process scheduling mechanisms employed in Operating Systems.
			CST206.3	explain process synchronization in Operating Systems and illustrate process synchronization mechanisms using Mutex Locks, Semaphores and Monitors
			CST206.4	explain any one method for detection, prevention, avoidance and recovery for managing deadlocks in Operating Systems.
			CST206.5	After the completion of the course the students will be able to Explain the memory management algorithms,

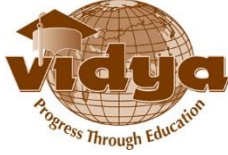


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				security aspects and algorithms for file and storage management in Operating Systems.
28	S4	HUT 200 PROFESSIONAL ETHICS	HUT200.1	understand the core values that shape the ethical behaviour of a professional.
			HUT200.2	adopt a good character and follow an ethical life.
			HUT200.3	explain the role and responsibility in technological development by keeping personal ethics and legal ethics.
			HUT200.4	solve moral and ethical problems through exploration and assessment by established experiments.
			HUT200.5	apply the knowledge of human values and social values to contemporary ethical values and global issues.
29	S4	MCN 202 CONSTITUTION OF INDIA	MCN202.1	explain the background of the present constitution of India and features.
			MCN202.2	utilize the fundamental rights and duties.
			MCN202.3	understand the working of the union executive, parliament and judiciary.
			MCN202.4	understand the working of the state executive, legislature and judiciary.
			MCN202.5	utilize the special provisions and statutory institutions.
30	S4	CSL 202 DIGITAL LAB	CSL202.1	design and implement combinational logic circuits using Logic Gates
			CSL202.2	design and implement sequential logic circuits using Integrated Circuits
			CSL202.3	simulate functioning of digital circuits using programs written in a Hardware Description Language
			CSL202.4	function effectively as an individual and in a team to accomplish a given task of

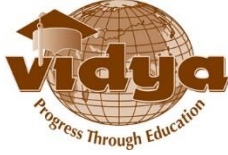


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				designing and implementing digital circuits.
			CSL202.5	familiarize with different logic gates and IC's
31	S4	CSL 204 OPERATING SYSTEMS LAB	CSL204.1	illustrate the use of systems calls in Operating Systems
			CSL204.2	implement Process Creation and Inter Process Communication in Operating Systems.
			CSL204.3	implement First Come First Served, Shortest Job First, Round Robin and Priority- based CPU Scheduling Algorithms
			CSL204.4	illustrate the performance of First In First Out, Least Recently Used and Least Frequently Used Page Replacement Algorithms
			CSL204.5	implement modules for Deadlock Detection and Deadlock Avoidance in Operating Systems, implement storage management and disk scheduling algorithms
32	S5	CST 301 FORMAL LANGUAGES AND AUTOMATA THEORY	CST301.1	classify a given formal language into Regular, Context-Free, Context Sensitive, Recursive or Recursively Enumerable.
			CST301.2	explain a formal representation of a given regular language as a finite state automaton, regular grammar, regular expression and Myhill-Nerode relation
			CST301.3	design a Pushdown Automaton and a Context-Free Grammar for a given context-free language
			CST301.4	design Turing machines as language acceptors or transducers.

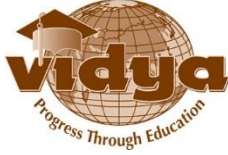


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			CST301.5	explain the notion of decidability.
33	S5	CST 303 COMPUTER NETWORKS	CST303.1	explain the features of computer networks, protocols, and network design models.
			CST303.2	describe the fundamental characteristics of the physical layer and identify the usage in network communication
			CST303.3	explain the design issues of data link layer, link layer protocols, bridges and switches.
			CST303.4	select appropriate routing algorithms, congestion control techniques, and Quality of Service requirements for a network.
			CST303.5	illustrate the functions and protocols of the network layer, transport layer, and application layer in inter-networking
			34	S5
CST305.2	identify standard and extended architectural features of machines.			
CST305.3	identify machine dependent features of system software			
CST305.4	identify machine independent features of system software.			
CST305.5	design algorithms for system softwares and analyze the effect of data structures.			
35	S5	CST 307 MICROPROCESSORS AND MICROCONTROLLERS	CST307.1	illustrate the architecture, modes of operation and addressing modes of microprocessors
			CST307.2	develop 8086 assembly language programs.
			CST307.3	demonstrate interrupts, its handling and programming in 8086.

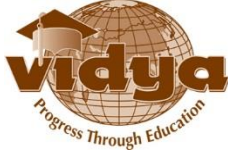


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			CST307.4	illustrate how different peripherals (8255,8254,8257) and memory are interfaced with microprocessors
			CST307.5	outline features of microcontrollers and develop low level programs.
36	S5	CST 309 MANAGEMENT OF SOFTWARE SYSTEMS	CST309.1	demonstrate Traditional and Agile Software Development approaches
			CST309.2	prepare Software Requirement Specification and Software Design for a given problem
			CST309.3	justify the significance of design patterns and licensing terms in software development, prepare testing, maintenance and DevOps strategies for a project.
			CST309.4	make use of software project management concepts while planning, estimation, scheduling, tracking and change management of a project, with a traditional/agile framework.
			CST309.5	utilize SQA practices, Process Improvement techniques and Technology advancements in cloud based software models and containers & microservices.
37	S5	MCN 301 DISASTER MANAGEMENT	MCN301.1	define and use various terminologies in use in disaster management parlance and organise each of these terms in relation to the disaster management cycle
			MCN301.2	distinguish between different hazard types and vulnerability types and do vulnerability assessment
			MCN301.3	identify the components and describe the process of risk assessment, and apply appropriate methodologies to assess risk

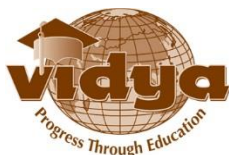


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			MCN301.4	explain the core elements and phases of Disaster Risk Management and develop possible measures to reduce disaster risks across sector and community
			MCN301.5	identify factors that determine the nature of disaster response and discuss the various disaster response actions along with the best practices for disaster management and risk reduction at national and international level
38	S5	CSL 331 SYSTEM SOFTWARES AND MICROPROCESSORS LAB	CSL331.1	develop 8086 programs and execute it using a microprocessor kit.
			CSL331.2	develop 8086 programs and, debug and execute it using MASM assemblers
			CSL331.3	develop and execute programs to interface stepper motor, 8255, 8279 and digital to analog converters with 8086 trainer kit
			CSL331.4	design and implement assemblers, Loaders and macroprocessors.
			CSL331.5	implement and execute different scheduling and paging algorithms in OS
39	S5	CSL 333 DATABASE MANAGEMENT SYSTEMS LAB	CSL333.1	design database schema for a given real world problem-domain using standard design and modeling approaches
			CSL333.2	construct queries using SQL for database creation, interaction, modification, and updation
			CSL333.3	design and implement triggers and cursors
			CSL333.4	implement procedures, functions, and control structures using PL/SQL
			CSL333.5	develop database applications using front-end tools and back-end DBMS

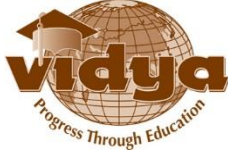


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40	S6	CST 302, COMPILER DESIGN	CST302.1	Identify the suitable design strategy to solve a given problem.
			CST302.2	illustrate line drawing, circle drawing and polygon filling Algorithms.
			CST302.3	demonstrate geometric representations, transformations on 2D & 3D objects, clipping algorithms and projection algorithms.
			CST302.4	summarize visible surface detection methods, concepts of digital image representation, processing and demonstrate pixel relationships.
			CST302.5	solve image enhancement and segmentation problems using spatial domain techniques
41	S6	CST 304 COMPUTER GRAPHICS AND IMAGE PROCESSING	CST304.1	describe the working principles of graphics devices and illustrate line drawing, circle drawing and polygon filling algorithms.
			CST304.2	demonstrate geometric representations, transformations on 2D & 3D objects, clipping algorithms and projection algorithms
			CST304.3	summarize visible surface detection methods
			CST304.4	Summarize the concepts of digital image representation, processing and demonstrate pixel relationships
			CST304.5	Solve image enhancement and segmentation problems using spatial domain techniques
42	S6	CST 306, ALGORITHM ANALYSIS AND DESIGN	CST306.1	analyze any given algorithm and express its time and space complexities in asymptotic notations

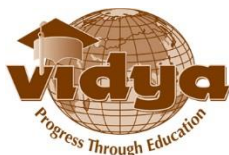


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			CST306.2	derive recurrence equations and solve it using Iteration, Recurrence Tree, Substitution and Master's Method to compute time complexity of algorithms
			CST306.3	illustrate Graph traversal algorithms & applications and Advanced Data structures like AVL trees and Disjoint set operations.
			CST306.4	demonstrate Divide-and-conquer, Greedy Strategy, Dynamic programming, Branch-and Bound and Backtracking algorithm design techniques
			CST306.5	classify a problem as computationally tractable or intractable, and discuss strategies to address intractability
43	S6	CST 362, PROGRAMMING IN PYTHON	CST362.1	write, test and debug Python programs
			CST362.2	illustrate uses of conditional (if, if-else and if-elif-else) and iterative (while and for) statements in Python programs.
			CST362.3	develop programs by utilizing the Python programming constructs such as Lists, Tuples, Sets and Dictionaries.
			CST362.4	develop graphical user interface for solutions using Python libraries.
			CST362.5	implement Object Oriented programs with exception handling, NumPy, Matplotlib, pandas
44	S6	HUT300, INDUSTRIAL ECONOMICS & FOREIGN TRADE	HUT300.1	explain the problem of scarcity of resources and consumer behaviour, and to evaluate the impact of government policies on the general economic welfare
			HUT300.2	take appropriate decisions regarding volume of output and to evaluate the social cost of production.

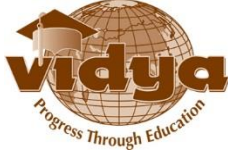


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			HUT300.3	determine the functional requirement of a firm under various competitive conditions.
			HUT300.4	examine the overall performance of the economy, and the regulation of economic fluctuations and its impact on various sections in the society.
			HUT300.5	determine the impact of changes in global economic policies on the business opportunities of a firm.
45	S6	CST308, COMPREHENSIVE COURSE WORK	CST308.1	comprehend the concepts of discrete mathematical structures
			CST308.2	comprehend the concepts and applications of data structures
			CST308.3	comprehend the concepts, functions and algorithms in Operating System
			CST308.4	comprehend the organization and architecture of computer systems
			CST308.5	comprehend the fundamental principles of database design and manipulation
46	S6	CSL332 NETWORKING LAB	CSL332.1	use network related commands and configuration files in Linux Operating System.
			CSL332.2	develop network application programs and protocols.
			CSL332.3	analyze network traffic using network monitoring tools.
			CSL332.4	design and setup a network and configure different network
			CSL332.5	develop simulation of fundamental network concepts using a network simulator.
47	S6	CSD334, MINIPROJECT	CSD334.1	identify technically and economically feasible problems

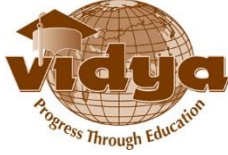


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			CSD334.2	identify and survey the relevant literature for getting exposed to related solutions and get familiarized with software development processes
			CSD334.3	perform requirement analysis, identify design methodologies and develop adaptable & reusable solutions of minimal complexity by using modern tools & advanced programming techniques
			CSD334.4	prepare technical report and deliver presentation
			CSD334.5	apply engineering and management principles to achieve the goal of the project
48	S7	CST 401, ARTIFICIAL INTELLIGENCE	CST401.1	explain the fundamental concepts of intelligent systems and their architecture.
			CST401.2	illustrate uninformed and informed search techniques for problem solving in intelligent systems.
			CST401.3	solve Constraint Satisfaction Problems using search techniques.
			CST401.4	represent AI domain knowledge using logic systems and use inference techniques for reasoning in intelligent systems.
			CST401.5	illustrate different types of learning techniques used in intelligent systems
49	S7	CST 463, WEB PROGRAMMING	CST463.1	use HyperText Markup Language (HTML) for authoring web pages and understand the fundamentals of WWW
			CST463.2	construct and visually format responsive, interactive web pages using CSS and JavaScript (JS)

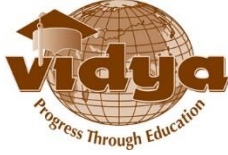


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			CST463.3	construct websites using advanced sever side programming tool PHP
			CST463.4	develop dynamic web applications using PHP and perform MySQL database operations
			CST463.5	explain the importance of object exchange formats using JSON and the MVC based web application development frameworks (Laravel)
50	S7	CST 423, CLOUD COMPUTING	CST423.1	explain the various cloud computing models and services.
			CST423.2	demonstrate the significance of implementing virtualization techniques.
			CST423.3	explain different cloud enabling technologies and compare private cloud platforms
			CST423.4	apply appropriate cloud programming methods to solve big data problems.
			CST423.5	describe the need for security mechanisms in cloud
51	S7	MCN401, INDUSTRIAL SAFETY ENGINEERING	MCN401.1	describe the theories of accident causation and preventive measures of industrial accidents.
			MCN401.2	explain about personal protective equipment, its selection, safety performance & indicators and importance of housekeeping.
			MCN401.3	explain different issues in construction industries.
			MCN401.4	describe various hazards associated with different machines and mechanical material handling.
			MCN401.5	utilise different hazard identification tools in different industries with the

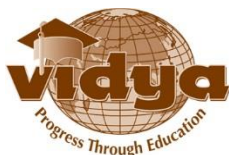


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				knowledge of different types of chemical hazards.
52	S7	CSL411 COMPILER LAB	CSL411.1	implement lexical analyzer using the tool LEX
			CSL411.2	implement Syntax analyzer using the tool YACC.
			CSL411.3	design NFA and DFA for a problem and write programs to perform operations on it
			CSL411.4	design and Implement Bottom-Up parsers and Top-Down parsers.
			CSL411.5	implement intermediate code for expressions
53	S7	CSQ413 SEMINAR	CSQ413.1	identify academic documents from the literature which are related to her/his areas of interest.
			CSQ413.2	read and apprehend an academic document from the literature which is related to her/ his areas of interest.
			CSQ413.3	prepare a presentation about an academic document.
			CSQ413.4	give a presentation about an academic document.
			CSQ413.5	prepare a technical report.
54	S7	CSD415 PROJECT PHASE I	CSD415.1	model and solve real world problems by applying knowledge across domains.
			CSD415.2	develop products, processes or technologies for sustainable and socially relevant applications.
			CSD415.3	function effectively as an individual and as a leader in diverse teams and to comprehend and execute designated tasks.

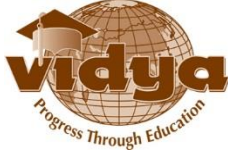


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			CSD415.4	plan and execute tasks utilizing available resources within timelines, following ethical and professional norms.
			CSD415.5	identify technology/research gaps and propose innovative/creative solutions and also Organize and communicate technical and scientific findings effectively in written and oral forms.
55	S8	CST 402 Distributed Computing	CST 402.1	summarize various aspects of distributed computation model and logical time.
			CST 402.2	illustrate election algorithm, global snapshot algorithm and termination detection algorithm
			CST 402.3	compare token based, non-token based and quorum based mutual exclusion algorithms
			CST 402.4	recognize the significance of deadlock detection and shared memory in distributed systems
			CST 402.5	explain the concepts of failure recovery and consensus
56	S8	CST 464 Embedded Systems	CST464.1	describe the characteristics of different hardware/software components of an embedded system.
			CST464.2	map the design of an embedded system to an appropriate computational model.
			CST464.3	recommend appropriate process synchronization / communication / scheduling mechanisms for specific system scenarios.
			CST464.4	describe the role of real-time operating systems in embedded devices.
			CST464.5	make use of design strategies for developing real-world embedded systems.

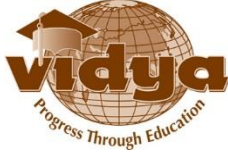


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57	S8	CST 474 Computer Vision	CST474.1	summarize basic concepts, terminology, theories, models and methods in the field of computer vision
			CST474.2	explain basic methods of computer vision related to multi scale representation, edge detection, detection of other primitives, stereo, motion and object recognition
			CST474.3	describe principles of segmentation, motion segmentation and classification
			CST474.4	select appropriate object tracking and detection methods for computer vision applications
			CST474.5	implement a computer vision system for a specific problem
58	S8	CST 424 Programming Paradigms	CST424.1	explain the criteria for evaluating programming languages and compare Imperative, Functional and Logic programming languages
			CST424.2	illustrate the characteristics of data types and variables
			CST424.3	comprehend how control flow structures and subprograms help in developing the structure of a program to solve a computational problem
			CST424.4	explain the characteristics of Object-Oriented Programming Languages
			CST424.5	compare concurrency constructs in different programming languages
59	S8	CST 476 Mobile Computing	CST476.1	explain the various mobile computing applications, services, design considerations and architectures .
			CST476.2	describe the various technology trends for next generation cellular wireless

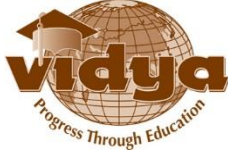


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				networks and use the spreading concept on data transmission
			CST476.3	summarize the architecture of various wireless LAN technologies
			CST476.4	identify the functionalities of mobile network layer and transport layer
			CST476.5	explain the features of Wireless Application Protocol and Interpret the security issues in mobile computing and next generation technologies
60	S8	CST 466 Data Mining	CST466.1	employ the key process of data mining and data warehousing concepts in application domains
			CST466.2	make use of appropriate preprocessing techniques to convert raw data into suitable format for practical data mining tasks
			CST466.3	illustrate the use of classification and clustering algorithms in various application domains
			CST466.4	comprehend the use of association rule mining techniques
			CST466.5	explain advanced data mining concepts and their applications in emerging domains
61	S8	CST 446 Data Compression Techniques	CST446.1	describe the fundamental principles of data compression
			CST446.2	make use of statistical and dictionary based compression techniques for various application
			CST446.3	illustrate various image compression standards
			CST446.4	summarize video compression mechanisms to reduce the redundancy in video

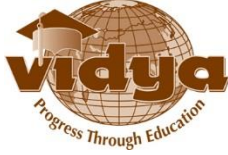


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			CST446.5	use the fundamental properties of digital audio to compress audio data
62	S8	CST 428 Block Chain Technologies	CST428.1	illustrate the cryptographic building blocks of blockchain technology.
			CST428.2	summarize the classification of consensus algorithms.
			CST428.3	explain the concepts of first decentralized cryptocurrency bitcoin.
			CST428.4	explain the use of smart contracts and its use cases.
			CST428.5	develop simple applications using Solidity language on Ethereum platform.
63	S8	CST 438 Image Processing Technique	CST438.1	explain the concepts of image formation and the basis of digital image processing.
			CST438.2	demonstrate the role of image transforms in representing, highlighting, and modifying image features.
			CST438.3	solve image enhancement problems using spatial and frequency domain techniques.
			CST438.4	make use of the concept of image restoration and image segmentation techniques in real-world problems.
			CST438.5	interpret morphological operations, image representation, and description techniques.
64	S8	CST 418 High Performance Computing	CST418.1	describe different types of modern processing environments and parallel computing hardware.
			CST418.2	summarize the concepts of Instruction Level Parallelism
			CST418.3	appreciate the idea of Data Level Parallelism

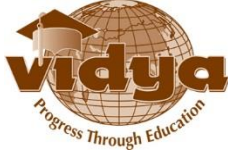


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			CST418.4	demonstrate the concept of Thread Level Parallelism
			CST418.5	describe the basics of GPU architecture
65	S8	CST404 Comprehensive Viva Voce	CST404.1	comprehend the concepts of discrete mathematical structures
			CST404.2	comprehend the concepts and applications of data structures
			CST404.3	comprehend the concepts, functions and algorithms in Operating System
			CST404.4	comprehend the organization and architecture of computer systems
			CST404.5	comprehend the fundamental principles of database design and manipulation
			66	S8
CSD416.2	develop products, processes or technologies for sustainable and socially relevant applications.			
CSD416.3	function effectively as an individual and as a leader in diverse teams and to comprehend and execute designated tasks.			
CSD416.4	plan and execute tasks utilizing available resources within timelines, following ethical and professional norms.			
CSD416.5	identify technology/research gaps and propose innovative/creative solutions and also Organize and communicate technical and scientific findings effectively in written and oral forms.			



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