

G. Narayanamma Institute of Technology and Science(For Women)

AUTONOMOUS

Department of IT

Course Outcomes for all the Courses of GNR-18 Regulations

I Year - I Semester

Course Name	CO Number	CO Statement	BT Level
C101 (PHYSICS) BS112AC	CO		
	C101.1	Realize the importance of light interaction with matter and its effects of superposition.	L4
	C101.2	Understand the quantum mechanical behavior of particles in different field environments.	L5
	C101.3	Distinguish materials on the basis of their electric and magnetic behavior and their applications.	L2
	C101.4	Estimate the carrier concentration of different types of semiconductors and be able to understand the working of optoelectronic devices.	L3
	C101.5	Realize the importance of Lasers in engineering fields.	L4
	C101.6	Understand the underlying principles of optical fibers and fiber optics.	L1
C102 (LINEAR ALGEBRA AND MULTIVARIABLE CALCULUS) BS111AB	CO		
	C102.1	Solve and analyze the solution for the system of equations.	L2
	C102.2	Compute the Eigen values and Eigen Vectors which come across under linear transformations.	L2
	C102.3	Determine the extreme values of functions of two variables with/ without constraints.	L3
	C102.4	Find the solutions of ordinary differential equations.	L5
	C102.5	Evaluate double and triple integrals.	L5
	C102.6	Apply the knowledge of mathematics for real situations.	L3
C103 (PROGRAMMING FOR PROBLEM SOLVING) ES111AF	CO		
	C103.1	Formulate and translate algorithms for arithmetic and logical problems to programs(in C language).	L6
	C103.2	Test and execute the programs and correct syntax and logical errors.	L3
	C103.3	Implement conditional branching, iteration and recursion.	L3
	C103.4	Decompose a problem into functions and synthesize a complete program.	L6
	C103.5	Use arrays, pointers and structures to formulate programs.	L3
	C103.6	Understand the concepts of files and perform operations on them.	L2
C104 (ENGINEERING GRAPHICS) ES112AE	CO		
	C104.1	Know and understand the conventions and methods of Engineering Graphics.	L2
	C104.2	Construct the conics using different methods and cycloidal curves.	L6
	C104.3	Draw and understand about orthographic projections of points, straight lines and planes.	L2
	C104.4	Improve visualisation skills in different types of solids.	L2
	C104.5	Draw and understand about the development of surfaces of various solids.	L2
	C104.6	Ability to read, understand and interpret engineering drawings.	L2
C105 (ENGINEERING WORKSHOP) ES11211	CO		
	C105.1	Demonstrate and understand the Engineering workshop safety regulations.	L2
	C105.2	Identify and use marking tools, measuring equipment and to work to prescribed accuracies.	L1
	C105.3	Know various operations in basic engineering workshops.	L2
	C105.4	Understand the practical difficulties encountered in industries during any assembly work.	L2
	C105.5	Do simple electrical work through their carrier.	L3
	C105.6	Design different prototype in the fittings, carpentry, foundry, black smithy and sheet metal work.	L6

C106 (PHYSICS LAB) BS11208	CO		
	C106.1	Handle different measuring instruments and asses their accuracy of measurement.	L1
	C106.2	Experiment and analyze the results to derive valid conclusions.	L4
	C106.3	Compare the experimental results with those introduced in lecture, draw relevant conclusions and substantiate.	L5
	C106.4	Develop the experimental skills to design new experiments in engineering.	L3
	C106.5	Understand the ethics of working environment and deliver the results in time.	L2
	C106.6	Engage themselves in team work and understand each other's strengths.	L2
C107 (PROGRAMMING LAB) ES11105	CO		
	C107.1	Compile,debug and test the program.	L3
	C107.2	Apply the knowledge in C to write modular, structured programs in solving real world problems.	L3
	C107.3	Design programs to solve mathematical and scientific problems.	L6
	C107.4	Write structured programs using control structures and functions.	L1
	C107.5	Demonstrate usage of pointers and structures.	L2
	C107.6	Solve problems using file concepts.	L3
I Year - II Semester			
Course Name	CO Number	CO statement	BT level
C108 (CHEMISTRY) BS111AA	CO		
	C108.1	Analyse microscopic chemistry in terms of atomic and molecular orbitals.	L5
	C108.2	Students will gain the basic knowledge of electrochemical procedures related to corrosion and its control.	L3
	C108.3	Rationalise periodic properties such as ionizaion potential, electronegativity and oxidation states.	L2
	C108.4	Students can develop and apply the concepts to identify the hardness and boiler troubles of water.	L2
	C108.5	List major chemical reactions that are used in the synthesis of drugs.	L1
	C108.6	Students can develop and apply the concepts for the solutions of complex engineering problems.	L3
C109 (NUMERICAL TECHNIQUES AND TRANSFORM CALCULUS) BS112AG	CO		
	C109.1	Find the root of the equation and solution of a system of equations.	L1
	C109.2	Fit a curve for the given data.	L2
	C109.3	Find the Numerical solutions for a given first order initial value problem.	L3
	C109.4	Use Laplace Transform techniques for solving ODE's.	L3
	C109.5	Verify the irrotational and solenoidal fields and find the potential function.	L4
	C109.6	Evaluate the line, surface and volume integrals and converting them from one to another.	L5
C110 (ENGLISH) HS112AJ	CO		
	C110.1	Read complex texts actively comprehending the literal and figurative use of language and be able to read in-between the lines.	L2
	C110.2	Write grammatically correct sentences and coherently well- developed paragraphs.	L3
	C110.3	Apply the reading techniques and comprehend the passages critically.	L3
	C110.4	Use appropriate vocabulary in the given context.	L3
	C110.5	Appreciate how different genres use language and shape meanings.	L5
	C110.6	Articulate clear questions, to provoke critical thinking, and ideas in class discussion to speak confidently in public.	L4
C111 (BASIC ELECTRICAL ENGINEERING) ES111AD	CO		
	C111.1	Analyze the basic circuits with application of Network Reduction Techniques and Network Theorems.	L3
	C111.2	Understand and analyze magnetic circuits.	L2
	C111.3	Analyze the working principles of electrical machines and power Converters.	L3
	C111.4	Understand the components of low voltage electrical installations.	L3
	C111.5	Apply the above conceptual theories to real world Electrical & Electronic problems and applications.	L4
	C111.6	Understand and apply the knowledge of various types of protective systems in real time.	L3

C112 (CHEMISTRY LAB) BS11101	CO		
	C112.1	The student is expected to learn from this laboratory course the concept of error and its analysis.	L2
	C112.2	Students can demonstrate writing skills and can derive valid conclusions.	L5
	C112.3	Students can compare the experimental results with those introduced in lecture, draw relevant conclusions and substantiate.	L3
	C112.4	Students can learn the ability to prepare advanced Drugs.	L4
	C112.5	Students work on time reactions, thereby can get in depth knowledge on chemical kinetics.	L2
	C112.6	The course allows the students to develop and design new experimental skills relevant to the course.	L6
C113 (ENGLISH PROFESSIONAL AND COMMUNICATION SKILLS LAB) HS11212	CO		
	C113.1	Differentiate between the letters of alphabet and the phonetic symbols.	L2
	C113.2	Demonstrate the right pronunciation of the words in English using phonetic transcription and word stress.	L2
	C113.3	Speak with the proper intonation, voice modulation and tonal groups.	L6
	C113.4	Demonstrate the listening skills through language modules.	L2
	C113.5	Speak with clarity and confidence individually and in groups to discuss and present the topics chosen and understand the nuances of team dynamics.	L6
C113.6	Work individually and in teams present the topics and demonstrate their public speaking skills and presentation skills through various aids like posters, PPTs etc.,	L2	
C114 (BASIC ELECTRICAL ENGINEERING LAB) ES11103	CO		
	C114.1	Identify and use basic measuring instruments and their usage.	L3
	C114.2	Verify different network theorems with dc excitation.	L3
	C114.3	Carry out analysis of simple circuits with dc excitation.	L2
	C114.4	Analyze bridge rectifiers	L3
	C114.5	Identify power converters.	L4
C114.6	Identify different electrical machines and their characteristics.	L3	
C115 (COMPUTATIONAL MATHEMATICS LAB) ES11210	CO		
	C115.1	Write Flow chart and algorithm for the given program.	L1
	C115.2	Have the ability to write C programs to solve specified problems.	L1
	C115.3	Find the root of a given equation using C program.	L3
	C115.4	Use arrays as part of the software solution.	L3
	C115.5	Utilize pointers to efficiently solve problems.	L3
C115.6	Use functions from the portable C library.	L1	
II Year - I Semester			
C201 PROBABILITY AND STATISTICS BS113AL	CO		
	C201.1	Differentiate among the random variables involved in the probability models which are useful for all branches of engineering.	L4
	C201.2	Understand probability distributions such as Binomial, Poisson and Normal distributions.	L2
	C201.3	Analyze data and draw conclusion about collection of data under study using theory of estimation.	L4
	C201.4	Apply testing of hypothesis for large samples.	L3
	C201.5	Apply testing of hypothesis for small samples.	L3
C201.6	Estimate and establish relation between variables using correlation and	L5	
C202 DIGITAL LOGIC DESIGN ES113AN	CO		
	C202.1	Demonstrate different Number systems, Binary codes and Boolean algebra.	L2
	C202.2	Solve Boolean expressions using minimization methods.	L3
	C202.3	Understand the concepts of Combinational circuits and design simple applications.	L2
	C202.4	Distinguish different types of Sequential circuits.	L4
	C202.5	Describe functionality of memory devices.	L1
C202.6	Design Hardware that suits various Micro-Operations.	L6	

C203 DISCRETE MATHEMATICS BS113AZ	CO		
	C203.1	Apply mathematical logic to solve problems.	L3
	C203.2	Understand the concepts and perform the operations related to sets, relations and functions.	L2
	C203.3	Gain the conceptual background needed and identify structures of algebraic nature.	L2
	C203.4	Apply basic counting techniques to solve combinatorial problems.	L3
	C203.5	Formulate problems and solve recurrence relations.	L6
	C203.6	Apply Graph Theory in solving computer science problems.	L3
C204 DATA STRUCTURES PC113AS	CO		
	C204.1	Demonstrate the basic concepts of C++ programming.	L2
	C204.2	Analyze the time and space complexities of algorithms.	L4
	C204.3	Use basic data structures such as linked list, stack and queue.	L3
	C204.4	Design programs using advanced data structures like hash tables, binary trees, search trees, heaps and graphs.	L6
	C204.5	Choose appropriate data structures to represent data items in real world problems.	L4
	C204.6	Analyze and implement various kinds of searching and sorting techniques.	L4
C205 DATABASE MANAGEMENT SYSTEMS PC113BJ	CO		
	C205.1	Understand concepts and the applications of database systems and implement in real time applications.	L2
	C205.2	Construct an Entity-Relationship (E-R) model from specifications and transform to relational model.	L3
	C205.3	Demonstrate the basic concepts of relational database management system and construct unary/binary/set/aggregate queries in Relational Algebra and in SQL.	L2
	C205.4	Apply normalization on database.	L3
	C205.5	Understand principles of database transaction management.	L2
	C205.6	Understand the storage and recovery of database.	L2
C206 IT WORKSHOP & PYTHON PROGRAMMING LAB ES11370	CO		
	C206.1	Apply knowledge of PC & its peripherals in assembling PC and installation of OS.	L3
	C206.2	Develop web pages and spreadsheets.	L3
	C206.3	Interpret the fundamental Python syntax and semantics and be fluent in the use of Python control flow statements.	L2
	C206.4	Determine the methods to create and manipulate Python programs by utilizing the data structures like lists, dictionaries, tuples, sets and strings.	L3
	C206.5	Develop the proficiency in handling of files and modules.	L3
	C206.6	Make use of python libraries.	L3
C207 DATA STRUCTURES THROUGH C++ LAB PC11319	CO		
	C207.1	Apply OOP paradigm for implementation of various data structures.	L3
	C207.2	Design and analyze the time and space complexity of algorithm or program.	L6
	C207.3	Develop the programs for various linear data structures like stack, queue and linked list.	L6
	C207.4	Implement various kinds of searching and sorting techniques.	L3
	C207.5	Implement non-linear data structures like graphs and binary search trees.	L3
	C207.6	Choose the appropriate data structure for solving real world problems.	L3
C208 DATABASE MANAGEMENT SYSTEMS LAB PC11328	CO		
	C208.1	Analyze the requirements of database application.	L4
	C208.2	Design ER model for the given problem.	L6
	C208.3	Convert ER diagram to relational database schema.	L3
	C208.4	Apply normalization techniques for development of application software to realistic problems.	L3
	C208.5	Formulate queries using SQL DML/DDI/DCL commands.	L6
	C208.6	Apply triggers, cursors and stored procedures.	L3

C209 GENDER SENSITIZATION MC11317	CO		
	C209.1	Students will be sensitized to basic dimensions of the biological, sociological, psychological and legal aspects of gender. This will be achieved through discussion of materials derived from research, facts, everyday life, literature and film.	L5
	C209.2	Students will attain a finer grasp of how gender discrimination works in our society and how to counter it.	L2
	C209.3	Students will acquire insight into the gendered division of labour and its relation to politics and economics.	L2
	C209.4	Men and women students and professionals will be better equipped to work and live together as equals.	L3
	C209.5	Students will develop a sense of appreciation of women in all walks of life.	L6
	C209.6	Through providing accounts of studies and movements as well as the new laws that provide protection and relief to women, the textbook will empower students to understand and respond to gender violence.	L5
II Year - II Semester			
C210 SOFTWARE ENGINEERING PC114CK	CO		
	C210.1	Get acquaintance of basic software engineering methods and practices, process frame work and process models.	L2
	C210.2	Emphasize on software requirement, SRS documents and Project Management.	L1
	C210.3	Develop different system models that describe the functionality of the system.	L6
	C210.4	Design and maintain efficient, reliable and cost effective software solutions and suitable software metrics.	L6
	C210.5	Understand various software testing approaches.	L2
	C210.6	Emphasize on Software measurement, software risks and quality control.	L1
C211 MANAGERIAL ECONOMICS AND FINANCIAL ANALYSIS HS114BD	CO		
	C211.1	Cognize the Basic Concepts of Economics.	L2
	C211.2	Analyze the economic concepts for using discretion in business problem solving.	L4
	C211.3	Comprehend the concepts of Accounting for business decision making.	L3
	C211.4	Assimilate the basic Accounting Procedure and interpret the statements.	L5
	C211.5	Analogize the external business environment for attainment of business goals.	L4
	C211.6	Enable forecasting and analyzing the external business environment.	L6
C212 COMPUTER ORGANIZATION AND ARCHITECTURE PC114BH	CO		
	C212.1	Recognize the basic components and the design of CPU, ALU and Control Unit.	L1
	C212.2	Know the architecture of 8086.	L2
	C212.3	Realize the instruction set, instruction formats and addressing modes of 8086.	L2
	C212.4	Write assembly language programs for problem solving.	L1
	C212.5	Understand the memory hierarchy and I/O organization.	L2
	C212.6	Comprehend the advantage of instruction level parallelism and pipelining for high performance Processor design.	L2
C213 OPERATING SYSTEMS PC114BN	CO		
	C213.1	Acquire a High-level understanding of what is an operating system and the role it plays and the services it provides.	L2
	C213.2	Understand process management concepts including scheduling, synchronization.	L2
	C213.3	Describe System model for deadlock, Methods for handling deadlocks.	L1
	C213.4	Understand memory management including virtual memory.	L2
	C213.5	Acquire knowledge on issues related to file system interface and implementation.	L2
	C213.6	Understand the issues related to disk management.	L2
C214 OBJECT ORIENTED PROGRAMMING PC114AX	CO		
	C214.1	Understand the object oriented programming concepts and solve real world problems.	L2
	C214.2	Demonstrate the use of inheritance and packages.	L2
	C214.3	Understand and implement the concepts of exception handling.	L2
	C214.4	Develop multithreaded applications with synchronization.	L6
	C214.5	Solve problems using java collection framework and I/O classes.	L3
	C214.6	Design Graphical User Interface using applets and swing controls.	L6

C215 LOGIC CIRCUITS AND MICROPROCESSOR LAB PC11471	CO		
	C215.1	Design combinational circuits using logic gates.	L6
	C215.2	Design sequential circuits using logic gates.	L6
	C215.3	Recognize the representation of data, addressing modes and instructions sets.	L2
	C215.4	Write and execute programs in Assembly language to solve the problems using 8 bit & 16 bit numbers.	L3
	C215.5	Compile and debug the programs.	L5
	C215.6	Write and execute programs in assembly language to read input from monitor using DOS interrupts.	L3
C216 OPERATING SYSTEMS LAB PC11433	CO		
	C216.1	Design and solve synchronization problems.	L6
	C216.2	Simulate and implement scheduling concepts.	L3
	C216.3	Model a deadlock situation and implementing methods for handling deadlocks.	L3
	C216.4	Simulate and implement memory management techniques.	L3
	C216.5	Simulate and implement various file management concepts.	L3
	C216.6	Use different system calls for writing application programs.	L3
C217 OBJECT ORIENTED PROGRAMMING THROUGH JAVA LAB PC11423	CO		
	C217.1	Implement the concepts of object oriented programming to solve problems.	L3
	C217.2	Develop programs using inheritance and interfaces.	L6
	C217.3	Understand and implement the concepts of exception handling.	L2
	C217.4	Develop multithreaded applications with synchronization.	L6
	C217.5	Solve problems using java collection framework and I/O classes.	L3
	C217.6	Develop GUI based applications using applets and swing controls.	L6
C218 ENVIRONMENTAL SCIENCES MC114BE	CO		
	C218.1	Benefited by various ecological principles and environmental regulations for sustainable development.	L2
	C218.2	Able to identify/analyze/evaluate/demonstrate the consequences of developmental activities and mitigation measures.	L5
	C218.3	Develop the advanced technologies in protection/conservation of resources in sustainable approach.	L6
	C218.4	Improved in attitude & thinking of the students will be positively towards earth & environment.	L2
	C218.5	Benefited by knowing the concepts like Green Buildings, Low Carbon Lifestyle, International conventions etc.	L2
	C218.6	It helps the students to improve the quality of life.	L1
III Year - I Semester			
C301 FUNDAMENTALS OF MANAGEMENT HS	CO		
	C301.1	Associate the concept of Management in practical scenario for effective decision making.	L3
	C301.2	Synthesize the preparation of effective plans in strategizing the decision making process.	L5
	C301.3	Circumscribe the authority responsibility conduct in an organization.	L2
	C301.4	Intuit the human resource management in an organization towards achievement of effectiveness.	L4
	C301.5	Cognize the role of leader and motivation in the attainment of objectives of an organization.	L2
	C301.6	Understand articulating techniques of controlling in the process of an organization.	L6
C302 WEB TECHNOLOGIES PC	CO		
	C302.1	Develop a dynamic webpage by the use of java script, DHTML and AJAX Programming.	L6
	C302.2	Write a well formed / valid XML document and understand how to parse and use XML data with java.	L2
	C302.3	Understand the server side scripting with PHP language.	L2
	C302.4	Connect databases to the server side applications.	L3
	C302.5	Write a server side java application called Servlet to retrieve form data sent from client, process it and store it on database.	L1
	C302.6	Develop server side java application called JSP to catch form data sent from client and store it on database.	L6

C303 SOFTWARE ENGINEERING PC115CK	CO		
	C303.1	Get acquaintance of basic software engineering methods and practices, process frame work and process models.	L2
	C303.2	Emphasize on software requirement, SRS documents and Project Management.	L1
	C303.3	Develop different system models that describe the functionality of the system.	L6
	C303.4	Design and maintain efficient, reliable and cost effective software solutions and suitable software metrics.	L6
	C303.5	Understand various software testing approaches.	L2
	C303.6	Emphasize on Software measurement, software risks and quality control.	L1
C304 DATA COMMUNICATIONS & COMPUTER NETWORKS PC	CO		
	C304.1	Understand the basics of computer networks, networking devices and protocols.	L2
	C304.2	Understand the functionalities of different layers of OSI and TCP/IP reference models.	L2
	C304.3	Analyze the performance of link layer and MAC layer protocols.	L4
	C304.4	Acquire the knowledge of addressing and routing protocols and apply the same for different routing problems and applications.	L3
	C304.5	Understand the services offered by transport entities and transport protocols.	L2
	C304.6	Demonstrate various application layer protocols in real time.	L2
C305 DISTRIBUTED SYSTEMS PE	CO		
	C305.1	Understand the concepts, challenges of distributed system and various system models.	L2
	C305.2	Analyze the establishment of Inter process communication and remote invocation between distributed systems.	L4
	C305.3	Comprehend a distributed system with the features that support distributed file system and name services.	L2
	C305.4	Apply virtual time, agreement and consensus protocols in distributed Systems.	L3
	C305.5	Apply and analyze the knowledge of distributed transactions and replication.	L3
	C305.6	Will be familiar with the design, implementation and other issues of distributed system.	L2
C306 REAL-TIME SYSTEMS PE	CO		
	C306.1	Understand real-time concepts such as pre-emptive multitasking, task priorities, priority inversions, mutual exclusion, context switching, and synchronization, interrupt latency and response time and semaphores.	L2
	C306.2	Describe how a real-time operating system kernel is implemented.	L1
	C306.3	Understand how tasks are managed.	L2
	C306.4	Discuss how tasks can communicate using semaphores, mailboxes, and queues.	L2
	C306.5	Implement a real-time system on an embedded processor.	L3
	C306.6	Gain knowledge to work with any real time operating system.	L1
C307 IMAGE PROCESSING PE	CO		
	C307.1	Understand the fundamental concepts of a digital image processing system and analyze images in spatial domain and frequency domain using various transforms.	L2
	C307.2	Apply techniques for image restoration.	L3
	C307.3	Identify different image analysis techniques and concepts for morphological operators.	L1
	C307.4	Interpret image segmentation techniques and understand the basic concepts of color image processing.	L6
	C307.5	Evaluate various compression techniques.	L5
	C307.6	Interpret image representation and description techniques.	L6
C308 FUNDAMENTALS OF DATA STRUCTURES (OE-1)	CO		
	C308.1	Analyse the time and space complexities of algorithms.	L4
	C308.2	Differentiate between linear and non-linear data structures.	L2
	C308.3	Use basic data structures such as linked list, stack and queue for data representation.	L3
	C308.4	Understand advanced data structures like binary trees, search trees and graphs.	L2
	C308.5	Choose appropriate data structures to represent data items in real world problems.	L4
	C308.6	Analyse various kinds of searching and sorting techniques.	L4

C309 JAVA PROGRAMMING (OE-1)	CO		
	C309.1	Understand the object oriented programming concepts and solve real world problems.	L2
	C309.2	Demonstrate the use of inheritance and packages.	L2
	C309.3	Understand and implement the concepts of exception handling.	L2
	C309.4	Develop multithreaded applications with synchronization.	L6
	C309.5	Solve problems using java collection framework and I/O classes.	L3
	C309.6	Design Graphical User Interface using applets and swing controls.	L6
C310 BASIC ELECTRONICS (OE-1)	CO		
	C310.1	Illustrate the fundamental behaviour of various diodes, transistors.	L1
	C310.2	Explain the construction, operation and characteristics of BJT, JFET and MOSFET.	L1
	C310.3	Analyse the various amplifier circuits using small signal hybrid model.	L3
	C310.4	Identify the necessity for biasing.	L1
	C310.5	To know the operation of various special purpose devices like LED, Photo diode and SCR.	L1
	C310.6	Apply the knowledge of Diodes in designing circuits like rectifiers.	L3
C311 ELECTRICAL MATERIALS (OE-1)	CO		
	C311.1	Distinguish between magnetic and non-magnetic materials by acquiring the knowledge of their atomic structures.	L2
	C311.2	Analyse Dielectric and semiconductor materials.	L3
	C311.3	Analyse the magnetic materials using their properties.	L3
	C311.4	Identify special purpose materials for different applications.	L2
	C311.5	Analyse the working of different materials from the point of view of their applications in electrical industry.	L4
	C311.6	Analyse the working of special purpose materials from the point of view of their possible applications electrical & other fields.	L3
C312 OPERATIONS RESEARCH (OE-1)	CO		
	C312.1	Apply linear programming models to several Engineering Applications.	L3
	C312.2	Use several other techniques like Transportation, Assignment and Sequencing Models in the real world applications.	L3
	C312.3	Study selected Dynamic Programming models for real world situations.	L4
	C312.4	Apply simple mathematical models in Inventory into the real Engineering Applications.	L3
	C312.5	Solve Game theory problems related to business applications.	L3
	C312.6	Develop optimum replacement policy.	L6
C313 INTRODUCTION TO DATA ANALYTICS (OE-1)	CO		
	C313.1	Understand the definitions and concepts associated with central tendency and measures of dispersion.	L2
	C313.2	Find the probability of an event and know the properties of distribution.	L1
	C313.3	Determine the regression co-efficient and test the accuracy of co-efficient.	L3
	C313.4	Learn basic concepts in supervised learning.	L1
	C313.5	Attain basic knowledge in unsupervised learning.	L2
	C313.6	Understand past behavior of data and forecast the future behavior using time series analysis.	L5
C314 INTELLECTUAL PROPERTY RIGHTS (OE-1)	CO		
	C314.1	Understand the dynamics and legalistic framework of IPR's	L2
	C314.2	Acquaint with securing patents and its protection.	L5
	C314.3	Seize the dimensions of Copy right protection.	L2
	C314.4	Realize the eminence of Trade Marks in growth of business.	L3
	C314.5	Essentials of safeguarding Industrial designs.	L1
	C314.6	Sustentation of Trade Secrets and aspects of IP audit.	L4

C315 DISASTER MANAGEMENT (OE-1)	CO		
	C315.1	Understand different kinds of disasters and their vulnerabilities.	L2
	C315.2	Identify the causes, effects and mitigation measures of different disasters.	L1
	C315.3	Apply the disaster management mechanism in natural and man induced calamities.	L3
	C315.4	Analyse and solve the unforeseen situations with advanced technologies like Remote Sensing and Geological Information Systems.	L5
C316 EMPLOYABILITY AND SOFT SKILLS LAB HS	CO		
	C316.1	Apply basic communication skills (LSRW) in work-related situations.	L3
	C316.2	Acquire, organize, interpret and evaluate information for effective communications within a group.	L5
	C316.3	Demonstrate the ability to combine ideas or information in new ways and present information on guided and structured format.	L2
	C316.4	Make decisions and solve problems by specifying goals, identifying resources and constraints and evaluating results.	L5
	C316.5	Display personal qualities such as responsibility, self-management, self- confidence, ethical behaviour and respect for self and others.	L2
	C316.6	Work cooperatively with people of diverse backgrounds and abilities, identify group's goals and values and contribute to a group process with ideas, suggestions and efforts.	L1
C317 WEB TECHNOLOGIES LAB PC	CO		
	C317.1	Use LAMP Stack for web applications and MySQL to connect Database using PHP.	L2
	C317.2	Parse XML files using Java (DOM and SAX parsers).	L6
	C317.3	Use Tomcat Server for servlets and JSP's.	L2
	C317.4	Develop web applications using Servlets and JSP's.	L6
	C317.5	Connect Database to Server side applications.	L6
	C317.6	Create dynamic web pages using Java Script and AJAX.	L6
C318 DATA COMMUNICATIONS & COMPUTER NETWORKS LAB PC	CO		
	C318.1	Implement data link layer functions such as framing methods.	L3
	C318.2	Demonstrate error detection at the data link layer.	L2
	C318.3	Evaluate the most suitable algorithm to find shortest path.	L5
	C318.4	Execute basic Linux Networking commands.	L3
	C318.5	Configure IP and MAC addresses.	L2
	C318.6	Demonstrate application layer protocols using software and tools.	L2
III Year - II Semester			
C319 ALGORITHM DESIGN AND ANALYSIS PC	CO		
	C319.1	Identify the appropriate algorithmic design strategy for a given problem and analyze its performance measures.	L1
	C319.2	Understand how the basic data structures like sets are used to improve the algorithmic efficiency.	L2
	C319.3	Apply and analyze the given problem using divide and conquer approach.	L3
	C319.4	List and illustrate various algorithmic paradigms.	L2
	C319.5	Solve the given problem using appropriate algorithmic design.	L3
	C319.6	Demonstrate an understanding of P and NP classes.	L2
C320 CRYPTOGRAPHY & NETWORK SECURITY PC	CO		
	C320.1	Identify network security threats and indicate countermeasures.	L1
	C320.2	Illustrate various cryptographic algorithms.	L2
	C320.3	Understand various message authentication algorithms and applications.	L2
	C320.4	Identify security solutions for E-Mail and IP layer.	L1
	C320.5	Demonstrate security solutions for web and internet.	L2
	C320.6	Analyze vulnerabilities using different case studies.	L4

C321 DATA MINING PC	CO		
	C321.1	Understand the fundamental concepts and tasks of data mining.	L2
	C321.2	Perform the pre-processing of data.	L3
	C321.3	Formulate the association rules using different Algorithms.	L6
	C321.4	Understand different classification techniques.	L2
	C321.5	Understand different clustering techniques.	L2
	C321.6	Understand algorithms used for web mining, text mining.	L2
C322 CLOUD COMPUTING PE	CO		
	C322.1	Articulate the main concepts, key technologies, strengths, and limitations of cloud computing.	L2
	C322.2	Illustrate the broad perceive of cloud architecture and model.	L2
	C322.3	Apply and design suitable Virtualization concept.	L3
	C322.4	Explore some important cloud computing driven commercial systems such as Google Apps, Microsoft Azure and Amazon Web Services and other businesses cloud applications.	L4
	C322.5	Assess cloud Storage systems and Cloud security, the risks involved, its impact and develop cloud application.	L5
C322.6	Analyze the various standards for Cloud computing and its management.	L4	
C323 MACHINE LEARNING(PE-2) PE	CO		
	C323.1	Gain Knowledge on the basic theory in machine learning.	L2
	C323.2	Understand machine learning problems corresponding to different applications.	L2
	C323.3	Identify machine learning techniques appropriate to respective problems.	L1
	C323.4	Compare various machine learning algorithms along with their strengths and weaknesses.	L4
	C323.5	Analyze the machine learning algorithms under supervised and unsupervised paradigms.	L4
C323.6	Apply different learning algorithms to solve problems of moderate complexity.	L3	
C324 MOBILE APPLICATION DEVELOPMENT (PE-2) PE	CO		
	C324.1	Understanding android application development components.	L2
	C324.2	Create user interfaces.	L6
	C324.3	Create user interfaces with the support of persistent data management.	L6
	C324.4	Create user interfaces for managing the data with SQL Lite.	L6
	C324.5	Create user interfaces with the support for processing messages.	L6
C324.6	Create User Interfaces with support for access to internet.	L6	
C324 OPERATING SYSTEMS (OE-2) OE116KJ	CO		
	C324.1	Acquire a High-level understanding of what is an operating system and the role it plays and the services it provides.	L2
	C324.2	Understand process management concepts including scheduling, synchronization.	L2
	C324.3	Describe System model for deadlock, Methods for handling deadlocks.	L1
	C324.4	Understand of memory management including virtual memory.	L2
	C324.5	Acquire Knowledge on issues related to file system interface and implementation.	L2
C324.6	Understand the issues related to disk management.	L2	
C325 DATABASE MANAGEMENT SYSTEMS (OE-2) OE116KK	CO		
	C325.1	Understand concepts and the applications of database systems and ability to implement in real time applications.	L2
	C325.2	Construct an Entity-Relationship (E-R) model from specifications and transform to relational model.	L6
	C325.3	Demonstrate the basic concepts of relational database management system and construct unary/binary/set/aggregate queries in Relational Algebra and in SQL	L2
	C325.4	Apply normalization on database.	L3
	C325.5	Understand principles of database transaction management.	L2
C325.6	Understand the storage and recovery of database	L2	

C326 PRINCIPLES OF ELECTRONIC COMMUNICATIONS (OE-2) OE116KL	CO		
	C326.1	Analyze the basic concepts of modulation and understand the different kinds of analog modulation techniques.	L4
	C326.2	Understand and analyze the different types of pulse analog and digital modulation systems.	L1
	C326.3	Describe the Telephone systems and network fundamentals.	L2
	C326.4	State the operative physical principle of launching satellites and explain the concept & operation of GPS.	L1
	C326.5	Comprehend about the principle of optical communication system, functioning of optical cables and wave division multiplexing.	L1
	C326.6	Describe the cell phone operational concepts.	L2
C327 RENEWABLE ENERGY SOURCES (OE-2) OE116KM	CO		
	C327.1	Estimate the solar energy, Utilization of solar energy, Principles involved in solar energy collection and conversion of it to electricity generation	L2
	C327.2	Explore the concepts involved in wind energy conversion system by studying its components, types and performance	L4
	C327.3	Understand the concept of Biomass energy resources and their classification, types of biogas Plants- applications	L2
	C327.4	Acquire the knowledge on Geothermal energy and it's harnessing methods	L3
	C327.5	Illustrate ocean energy and explain the operational methods of their utilization.	L4
	C327.6	Describe the concept of direct energy conversion and their types and working principle	L2
C328 OPERATIONS RESEARCH (OE-2) OE 116KE	CO		
	C328.1	Apply linear programming models to several Engineering Applications.	L3
	C328.2	Use several other techniques like Transportation, Assignment and Sequencing Models in the real world applications.	L3
	C328.3	Study selected Dynamic Programming models for real world situations.	L4
	C328.4	Apply simple mathematical models in Inventory into the real Engineering Applications.	L3
	C328.5	Solve Game theory problems related to business applications.	L3
	C328.6	Develop optimum replacement policy.	L6
C329 RESEARCH METHODOLOGY (OE-2) OE116KN	CO		
	C329.1	Develop an understanding on various kinds of research and objectives of doing research.	L5
	C329.2	Perform literature reviews using print and online databases.	L6
	C329.3	Design good research.	L6
	C329.4	Collect required data for Research and to adopt methods for data collection.	L6
	C329.5	Interpret the data from research perception.	L6
	C329.6	Write and present a substantial technical report and document.	L5
C330 BEHAVIOURAL SKILLS AND PROFESSIONAL COMMUNICATION (OE-2) OE116KP	CO		
	C330.1	Communicate with more confidence and self-esteem.	L2
	C330.2	Give better presentation and explanation using digital aids and tools.	L5
	C330.3	Perform effectively and efficiently in the work place environment.	L3
	C330.4	Exhibit better tolerance and receptiveness in understanding and accepting diversity.	L2
	C330.5	Apply higher thinking order in the self-development process.	L3
	C330.6	Equip oneself to handle the work related challenges and conflicts professionally.	L5
C331 INTELLECTUAL PROPERTY RIGHTS (OE-2) OE116KQ	CO		
	C331.1	Understand the dynamics and legalistic framework of IPR's	L2
	C331.2	Acquaint with securing patents and its protection.	L5
	C331.3	Seize the dimensions of Copy right protection.	L2
	C331.4	Realize the eminence of Trade Marks in growth of business.	L3
	C331.5	Essentials of safeguarding Industrial designs.	L1
	C331.6	Sustentation of Trade Secrets and aspects of IP audit.	L4

C334 DATA MINING LAB PC	CO		
	C334.1	Understand the application of data mining tools in real time applications	L2
	C334.2	Preprocess the data.	L3
	C334.3	Apply Associations Rule Generation algorithms.	L3
	C334.4	Classify the data using various Classification algorithms.	L4
	C334.5	Divide data in to groups using Clustering algorithms.	L3
	C334.6	Predict the values using Regression Techniques.	L6
C335 VIRTUALIZATION AND CLOUD COMPUTING LAB (PE -2)	CO		
	C335.1	To learn and implement virtualization, running VMs and their migration.	L6
	C335.2	To apply and build cloud infrastructure in practice.	L3
	C335.3	To create and manage user groups and on the cloud.	L6
	C335.4	To develop web applications on popular cloud platforms like AWS and Google cloud.	L6
	C335.5	To establish database connectivity for storing user information.	L4
C336 MACHINE LEARNING LAB (PE-2)	CO		
	C336.1	Program using basic features of Python.	L3
	C336.2	Apply and analyse concept learning techniques to version spaces.	L3
	C336.3	Design statistical and hierarchical models in Machine Learning.	L6
	C336.4	Analyse lazy and eager learning algorithms.	L4
	C336.5	Identify machine learning techniques appropriate to respective problems.	L1
	C336.6	Compare various machine learning algorithms along with their strengths and weaknesses.	L4
C337 MOBILE APPLICATION DEVELOPMENT LAB (PE-2)	CO		
	C337.1	Create user interfaces.	L6
	C337.2	Create user interfaces with the support of persistent data management.	L6
	C337.3	Create user interfaces for managing the data with SQL Lite.	L6
	C337.4	Create user interfaces with the support for processing messages.	L6
	C337.5	Create User Interfaces with support for access to internet.	L6
	C337.6	Deploy an Android Application.	L6
C336 SEMINAR	CO		
	C336.1	Able to exhibit professional communication skill	L1
	C336.2	Able to prepare a report on an advanced topic and make a meaningful presentation.	L6
	C336.3	Able to acquire knowledge through self learning	L2
	C336.4	To recall previously learned information for knowledge improvement.	L1
	C336.5	Improve cognitive skills by understanding processes in comprehending a concept.	L2
	C336.6	Evaluate both factual and conceptual knowledge.	L6
C337 MINI PROJECT	CO		
	C337.1	Collate information, analyze and solve a technical problem.	L4
	C337.2	Awareness of design methodologies & its implementation	L6
	C337.3	Advanced programming techniques	L3
	C337.4	Work and communicate effectively as a member of a project team	L2
	C337.5	Communicate effectively the results of a project in oral presentations and written	L2
	C337.6	Plan an event by collecting ideas and organizing tasks.	L2

IV Year - I Semester			
C401 AUTOMATA & COMPILER DESIGN PC	CO		
	C401.1	Illustrate the concept of abstract machines and their power to recognize the languages.	L4
	C401.2	Classify language classes, regular expressions, grammars and the relationship among them with the help of Chomsky hierarchy.	L2
	C401.3	Demonstrate different parsing methods typically used in compilers.	L2
	C401.4	Describe language translation techniques and their applications.	L2
	C401.5	Illustrate storage allocation and access strategies of compilers.	L4
	C401.6	Demonstrate various techniques used in backend of a compiler.	L2
C402 INTERNET OF THINGS	CO		
	C402.1	Understand the IoT Systems.	L2
	C402.2	Understand the concept of M2M (machine to machine) with necessary protocols.	L2
	C402.3	Create programs using python scripting language in IoT devices.	L6
	C402.4	Create programs for Raspberry Pi interfaces.	L6
	C402.5	Understand to communicate with IoT Systems through web-interface.	L2
	C402.6	Apply IoT principles for domain specific applications.	L3
C403 ARTIFICIAL INTELLIGENCE (PE- 3)	CO		
	C403.1	Understand the basics of AI and knowledge representation using appropriate technique.	L2
	C403.2	Apply AI techniques for problem solving using various search and game playing algorithms.	L3
	C403.3	Interpret architectures of different intelligent agents and Expert Systems.	L2
	C403.4	Interpret probabilistic and logical reasoning for knowledge.	L2
	C403.5	Analyze different Machine Learning approaches for problem solving.	L4
	C403.6	Recognize basics of Natural Language Processing.	L2
C404 ADVANCED DATABASES (PE-3)	CO		
	C404.1	Describe the stages of Query Processing and understand the fundamentals of Query-Based Optimization techniques.	L1
	C404.2	Understand the concepts of parallel databases.	L2
	C404.3	Illustrate the concept of distributed databases.	L2
	C404.4	Demonstrate the appropriate syntax for SQL OLAP Extensions.	L2
	C404.5	Identify and describe the components and characteristics of the object-oriented databases.	L1
	C404.6	Explain methods suitable for particular types of data such as temporal, Logic Based data.	L2
C405 HUMAN COMPUTER INTERACTION (PE-3)	CO		
	C405.1	Recognize the importance of good screen design and gain knowledge of various Graphical user Interface concepts.	L1
	C405.2	Demonstrate understanding of Human Sensory and Cognitive system and the limitations of human performance in HCI.	L2
	C405.3	Adapt and extend the classic screen design standards and guidelines.	L3
	C405.4	Use various interface paradigms in the implementation of User interface design.	L3
	C405.5	Choose appropriate screen components and employ specification methods for building interactive prototypes.	L3
	C405.6	Determine the Human computer interaction methods to meet the needs of practical software development process.	L2
C406 BLOCKCHAIN TECHNOLOGIES (PE-4)	CO		
	C406.1	Acquire understanding on Blockchain Technology built-in way.	L3
	C406.2	Interpret how various cryptocurrencies work.	L6
	C406.3	Articulate Ethereum Blockchain for developing smart contracts.	L2
	C406.4	Apprehend knowledge on Web3 and Hyperledger Fabric for decentralized apps.	L2
	C406.5	Exemplifying different alternative and emerging Blockchains.	L2
	C406.6	Understand real-time usage of Blockchain.	L2

C407 MODERN SOFTWARE ENGINEERING (PE - 4)	CO		
	C407.1	Articulate the agile principles, practices, and roles of Extreme Programming with XP Practices.	L2
	C407.2	Understanding pair programming and its characteristics, energized work, retrospective of Thinking XP practice	L2
	C407.3	Evaluating team strategies and organizational strategies of Collaborating XP practice.	L5
	C407.4	Gain knowledge about Version Control, Continuous integration, Collective ownership of Releasing XP practice	L1
	C407.5	Emphasizes on planning game, project Vision, Releasing plan, Iteration planning of Planning XP Practice.	L2
	C407.6	To understand Test driven development, refactoring, iterative design and architecture of Developing XP practice.	L2
C408 DATA SCIENCE (PE - 4)	CO		
	C408.1	Understand key principles of Data Science and apply to any real-time Data Analytical Problems.	L2
	C408.2	Demonstrate the usage of various Visualization Tools and Techniques.	L2
	C408.3	Understand the need of Statistical Data Analysis.	L2
	C408.4	Understand the Deep Learning to solve Current Industry Problems.	L2
	C408.5	Understand the importance of Social Media Analytics.	L2
	C408.6	Understand the importance of Business Analytics.	L2
C409 Cyber Security (OE-3)	CO		
	C409.1	Understand the evolution of Internet in the context of emerging Cyber threats and their laws.	L2
	C409.2	Distinguish and classify the forms of Cybercriminal activities and Social Engineering methods used to undertake crimes.	L4
	C409.3	Apply risk management policies to protect organization's critical information and assets.	L3
	C409.4	Analyse the tools and methods used in Cybercrime.	L4
	C409.5	Understand the Security challenges for mobile and wireless devices.	L2
	C409.6	Assess the Cybercrime scenarios in India, Global and Legal Perspectives.	L5
C410 Python Programming (OE-3)	CO		
	C410.1	Gain knowledge on the basic principles of Python programming language.	L1
	C410.2	Understand different Decision Making statements and Functions.	L2
	C410.3	Apply the knowledge of data structures like Lists, Dictionaries and sets.	L3
	C410.4	Understand and summarize different File and exception handling operations.	L2
	C410.5	Implement object oriented concepts.	L3
	C410.6	Design GUI applications using Python.	L6
C411 Android Programming (OE-3)	CO		
	C411.1	Describe Android platform, Architecture and features.	L1
	C411.2	Design User Interface and develop activity for Android App.	L6
	C411.3	Use Intent, Broadcast receivers and Internet services in Android App.	L3
	C411.4	Design and implement Database Application and Content providers.	L6
	C411.5	Use multimedia, camera and Location based services in Android App.	L3
	C411.6	Discuss various security issues in Android platform.	L2
C412 Distributed and Cloud Computing (OE-3)	CO		
	C412.1	Illustrate the Principles of Distributed Computing.	L5
	C412.2	Articulate the main concepts, key technologies, strengths, and limitations of cloud computing.	L1
	C412.3	Illustrate the broad perceptive of cloud architecture and model.	L5
	C412.4	Apply and design suitable Virtualization Technology.	L3
	C412.5	Explore some important cloud computing driven commercial systems such as Google Apps, Microsoft Azure and Amazon Web Services and other businesses cloud applications.	L1
	C412.6	Analyze the various standards for Cloud Computing and Illustrate Management Strategies of Cloud.	L4

C413 Blockchain Technologies (OE-3)	CO		
	C413.1	Acquire understanding on Blockchain Technology built-in way.	L3
	C413.2	Interpret how various cryptocurrencies work.	L6
	C413.3	Articulate Ethereum Blockchain for developing smart contracts.	L2
	C413.4	Apprehend knowledge on Web3 and Hyperledger Fabric for decentralized apps.	L2
	C413.5	Exemplifying different alternative and emerging Blockchains.	L2
	C413.6	Understand real-time usage of Blockchain.	L2
C414 Telecommunication Switching Systems (OE-3)	CO		
	C414.1	Acquire knowledge about Telecommunication Switching Systems.	L1
	C414.2	Understand different Telecommunication switching and signaling methodologies.	L1
	C414.3	Apply the concepts to solve the real time telecommunication problems.	L3
	C414.4	Analyse the fundamental telecommunication traffic models.	L4
	C414.5	Evaluate telecommunication switching systems.	L5
	C414.6	Design a telecommunication switching system.	L6
C415 Waste Management Techniques And Power Generation (OE-3)	CO		
	C415.1	Understand technologies for generation of energy from solid waste.	L1
	C415.2	Compare methods of solid waste disposal.	L2
	C415.3	Identify sources of energy from waste using various conversion techniques.	L2
	C415.4	Analyze methods for waste management.	L3
	C415.5	Assess the harmful effects of e-waste.	L4
	C415.6	Differentiate between the normal waste and e-waste.	L2
C416 Industrial Mangement (OE-3)	CO		
	C416.1	Organize the activities of Business efficiently.	L3
	C416.2	Adapt to appropriate method of production yielding productivity.	L6
	C416.3	Identify efficient method of production.	L3
	C416.4	Handle inventory efficiently for improving Productivity.	L3
	C416.5	Implement and maintain Quality standards in Production.	L5
	C416.6	Cohere to dynamic practices to improve Productivity.	L4
C417 INTERNET OF THINGS LAB	CO		
	C417.1	Understand Internet of Things and its hardware and software components.	L2
	C417.2	Interface I/O devices, sensors.	L3
	C417.3	Create programs using python scripting language in IoT devices.	L6
	C417.4	Interface IoT communication modules.	L3
	C417.5	Remotely monitor data and control devices.	L2
	C417.6	Develop real life IoT based projects.	L6
IV Year - II Semester			
C418 ENTREPRENEURSHIP AND PROJECT MANAGEMENT	CO		
	C418.1	Possess sensibleness and skills required for establishment of business.	L3
	C418.2	Construe the entrepreneurial ingenuity required for business functioning.	L5
	C418.3	Give perception on the probable business structures for entrepreneurial decisions.	L4
	C418.4	Scrutinize the probable financial propositions in investment process.	L5
	C418.5	Evaluate the entrepreneurial project feasibility of implementation and its profitability.	L5
	C418.6	Develop the market for the product developed through entrepreneurial establishment.	L6

C419 SOFT COMPUTING (PE-5)	CO		
	C419.1	Identify artificial intelligence and soft computing techniques in building Intelligent machines.	L1
	C419.2	Understand the concept of artificial neural networks.	L2
	C419.3	Analyze the various Supervised and Unsupervised learning networks.	L4
	C419.4	Apply fuzzy logic and reasoning to handle uncertainty.	L3
	C419.5	Understand different operators and basic terminologies of genetic algorithms.	L2
	C419.6	Evaluate different soft computing techniques for suitable applications.	L5
C420 INFORMATION RETRIEVAL SYSTEMS (PE-5)	CO		
	C420.1	Have knowledge to store and retrieve textual documents using appropriate strategies.	L1
	C420.2	Understand various retrieval utilities for improving search.	L2
	C420.3	Understand the translation schemes of cross-language information retrieval.	L2
	C420.4	Apply indexing and compression of documents to improve space and time efficiency.	L3
	C420.5	Apply SQL queries for unstructured data.	L3
	C420.6	Analyze and choose appropriate retrieval model.	L4
C421 AD HOC AND SENSOR NETWORKS (PE - 5)	CO		
	C421.1	Use knowledge relating to HTML5 and JavaScript Technologies.	L1
	C421.2	Analyze and apply suitable technology in client side applications.	L4
	C421.3	Understand the concepts of various Web Services.	L2
	C421.4	Build suitable applications using struts framework.	L6
	C421.5	Design .net framework application.	L6
	C421.6	Understand the concepts of Semantic Technology.	L2
C422 WEARABLE TECHNOLOGIES (PE - 6)	CO		
	C422.1	Identify and understand the need for development of wearable devices and its influence on various sectors.	L2
	C422.2	Discuss and analyze the usage of various biochemical and gas sensors as wearable devices and applications of various wearable inertial sensors for biomedical applications.	L4
	C422.3	Understand the concepts of energy harvesting and energy expenditure in wearable devices.	L2
	C422.4	Familiarize the concepts of wireless body area network and their communications	L2
	C422.5	Analyze the wearable algorithms and the data mining techniques involved in body sensor networks.	L4
C423 E-COMMERCE (PE - 6)	CO		
	C423.1	Understand basic foundations, importance of E-commerce and infrastructure for E-commerce in retailing, pricing strategies.	L2
	C423.2	Identify and access Electronic payment systems.	L1
	C423.3	Understand Internet trading relationships including Business to Consumer, Business-to-Business, Intra-organizational.	L2
	C423.4	Evaluating the effectiveness of market research, Information retrieval, data ware housing and data mining.	L5
	C423.5	Analyse the impact of E-commerce on business models and strategy.	L4
	C423.6	Applying Multimedia in E-Commerce.	L3
C424 INTERNET TECHNOLOGIES (PE-6)	CO		
	C424.1	Use knowledge relating to HTML5 and JavaScript Technologies.	L1
	C424.2	Analyze and apply suitable technology in client side applications.	L4
	C424.3	Understand the concepts of various Web Services.	L2
	C424.4	Build suitable applications using struts framework.	L6
	C424.5	Design .Net framework application.	L6
	C424.6	Understand the concepts of Semantic Technology.	L2

C425 PRINCIPLES OF ARTIFICIAL INTELLIGENCE (OE-4)	CO		
	C425.1	Understand the basics of AI and knowledge representation using appropriate technique.	L2
	C425.2	Apply AI techniques for problem solving using various search and game Playing algorithms.	L3
	C425.3	Interpret architectures of different intelligent agents and Expert systems	L2
	C425.4	Interpret probabilistic and logical reasoning for knowledge.	L2
	C425.5	Analyse different Machine Learning approaches for problem solving.	L4
	C425.6	Recognize basics of Natural Language Processing.	L2
C426 CLOUD COMPUTING (OE-4)	CO		
	C426.1	Articulate the main concepts, key technologies, strengths, and limitations of cloud computing.	L2
	C426.2	Illustrate the broad perceptive of cloud architecture and model.	L2
	C426.3	Apply and design suitable Virtualization concept.	L3
	C426.4	Explore some important cloud computing driven commercial systems such as Google Apps, Microsoft Azure and Amazon Web Services and other businesses cloud applications	L4
	C426.5	Assess cloud Storage systems and Cloud security, the risks involved, its impact and develop cloud application	L5
	C426.6	Analyze the various standards for Cloud computing and its management.	L4
C427 DISTRIBUTED AND CLOUD COMPUTING (OE-3)	CO		
	C427.1	Illustrate the Principles of Distributed Computing.	L5
	C427.2	Articulate the main concepts, key technologies, strengths, and limitations of cloud computing.	L1
	C427.3	Illustrate the broad perceptive of cloud architecture and model.	L5
	C427.4	Apply and design suitable Virtualization Technology.	L3
	C427.5	Explore some important cloud computing driven commercial systems such as Google Apps, Microsoft Azure and Amazon Web Services and other businesses cloud applications.	L1
	C427.6	Analyze the various standards for Cloud Computing and Illustrate Management Strategies of Cloud.	L4
C428 BLOCKCHAIN TECHNOLOGIES (OE-3)	CO		
	C428.1	Acquire understanding on Blockchain Technology built-in way.	L3
	C428.2	Interpret how various cryptocurrencies work.	L6
	C428.3	Articulate Ethereum Blockchain for developing smart contracts.	L2
	C428.4	Apprehend knowledge on Web3 and Hyperledger Fabric for decentralized apps.	L2
	C428.5	Exemplifying different alternative and emerging Blockchains.	L2
	C428.6	Understand real-time usage of Blockchain.	L2
C429 CELLULAR AND MOBILE COMMUNICATIONS (OE-4)	CO		
	C429.1	Analyze and design wireless and mobile cellular systems.	L4
	C429.2	Understand impairments due to multipath fading channel.	L1
	C429.3	Understand the fundamental techniques to overcome the different fading effects.	L1
	C429.4	Understand Co-channel and Non Co-channel interferences.	L1
	C429.5	Familiar with cell coverage for signal and traffic, diversity techniques and mobile antennas.	L2
	C429.6	Understanding of frequency management, Channel assignment, and types of handoff.	L1
C430 ROBOTICS (OE-4)	CO		
	C430.1	Identify a Robot for a specific application.	L1
	C430.2	Identify parameters required to be controlled in a Robot.	L1
	C430.3	To select suitable sensors and drive system for an application	L4
	C430.4	To learn various robot programming methods and languages	L1
	C430.5	To learn various industrial robot control systems and Mission Vision system	L1
	C430.6	To understand Socio-Economic aspect of robotisation.	L2

C431 MARKETING MANAGEMENT (OE-4)	CO		
	C431.1	Understand the importance of the Marketing Management Process	L2
	C431.2	Conduct Marketing Research, comprehend buyer behavior and hypothesize market segmentation.	L4
	C431.3	Identify the elements of product mix and pricing strategies.	L3
	C431.4	Enumerate strategies of pricing in fixation.	L5
	C431.5	Select appropriate network of product distribution.	L3
	C431.6	Adapt to befitting promotional strategy.	L6
C432 ENVIRONMENTAL IMPACT ASSESSMENT (OE-4)	CO		
	C432.1	Understand the basic concepts of Environmental Impact Assessment, Environmental Impact Statement and Environmental Audit.	L2
	C432.2	Identify the environmental aspects to be considered for the Environmental Impact Assessment study.	L1
	C432.3	Apply the knowledge of Environmental Impact Assessment studies in Preparation of Environmental Impact Statement.	L3
	C432.4	Prepare suitable methodology in Environmental Impact Assessment documentation.	L6
	C432.5	Analyse and evaluate the mitigation measures of developmental activities on environmental components.	L5
C429 PROJECT WORK	CO		
	C429.1	Collate information, analyze and solve a technical problem.	L4
	C429.2	Awareness of design methodologies & its implementation	L6
	C429.3	Advanced programming techniques	L3
	C429.4	Work and communicate effectively as a member of a project team	L2
	C429.5	Communicate effectively the results of a project in oral presentations and written	L2
	C429.6	Plan an event by collecting ideas and organizing tasks.	L2