G. Narayanamma Institute of Technology and Science(For Women)
AUTONOMOUS
Department of IT
Course Outcomes for all the Courses of GNR-18 Regulations

Course Name	CO Number	CO statement	BT level
I Year I Semester			
	CO		
C101 (CHEMISTRY) BS111AA	C101.1	Analyse microscopic chemistry in terms of atomic and molecular orbitals.	L5
	C101.2	Students will gain the basic knowledge of electrochemical procedures related to corrosion and its control.	L3
	C101.3	Rationalise periodic properties such as ionizaion potential, electronegativity and oxidation states.	L2
	C101.4	Students can develop and apply the concepts to identify the hardness and boiler troubles of water.	L2
	C101.5	List major chemical reactions that are used in the synthesis of drugs.	L1
	C101.6	Students can develop and apply the concepts for the solutions of complex engineering problems.	L3
	CO		
C102 (LINEAR ALGEBRA AND MULTIVARIABLE CALCULUS) BS111AB	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
	CO		
C103 (BASIC ELECTRICAL ENGINEERING) ES111AD	C103.1	Analyze the basic circuits with application of Network Reduction Techniques and Network Theorems.	L3
	C103.2	Understand and analyze magnetic circuits.	L2
	C103.3	Analyze the working principles of electrical machines and power Converters.	L3
	C103.4	Understand the components of low voltage electrical installations.	L3
	C103.5	Apply the above conceptual theories to real world Electrical & Electronic problems and applications.	L4
	C103.6	Understand and apply the knowledge of various types of protective systems in real time.	L3
	CO		
C104 (PROGRAMMING FOR PROBLEM SOLVING) ES111AF	C104.1	Formulate and translate algorithms for arithmetic and logical problems to programs(in C language).	L6
	C104.2	Test and execute the programs and correct syntax and logical errors.	L3
	C104.3	Implement conditional branching, iteration and recursion.	L3
	C104.4	Decompose a problem into functions and synthesize a complete program.	L6
	C104.5	Use arrays, pointers and structures to formulate programs.	L3
	C104.6	Understand tha concepts of files and perform operations on them.	L2
	CO		
C105 (CHEMISTRY LAB) BS11101	C105.1	The student is expected to learn from this laboratory coruse the concept of error and its analysis.	L2
	C105.2	Students can demonstrate writing skills and can derive valid conclusions.	L5
	C105.3	Studnts can compare the experimental results with those introduced in lecture, draw relevant conclusions and subsantiate.	L3
	C105.4	Studnts can learn the ability to prepare advandced Drugs.	L4
	C105.5	Students work on time reactions, thereby can get in depth knowledge on chemical kinetics.	L2
	C105.6	The course allows the students to develop and design new experimental skills relevant to the course.	L6
	CO		
C106 (BASIC ELECTRICAL ENGINEERING LAB) ES11103	C106.1	Identify and use basic measuring instruments and their usage.	L3
	C106.2	Verify different network theorems with dc excitation.	L3
	C106.3	Carry out analysis of simple circuits with dc excitation.	L2
	C106.4	Analyze bridge rectifiers	L3
	C106.5	Identify power converters.	L4
	C106.6	Identify different electrical machines and their characteristics.	L3

Course Name	CO Number	CO statement	BT level
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 **(PHYSICS)** **BS112AC**	CO		
	C108.1	Realize the importance of light interaction with matter and its effects of superposition.	L4
	C108.2	Understand the quantum mechanical behavior of particles in different field environments.	L5
	C108.3	Distinguish materials on the basis of their electric and magnetic behavior and their applications.	L2
	C108.4	Estimate the carrier concentration of different types of semiconductors and be able to understand the working of optoelectronic devices.	L3
	C108.5	Realize the importance of Lasers in engineering fields.	L4
	C108.6	Understand the underlying principles of optical fibers and fiber optics.	L1
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 **(ENGINEERING** **GRAPHICS)** **ES112AE**	CO		
	C111.1	Know and understand the conventions and methods of Engineering Graphics.	L2
	C111.2	Construct the conics using different methods and cycloidal curves.	L6
	C111.3	Draw and understand about orthographic projections of points, straight lines and planes.	L2
	C111.4	Improve visualisation skills in different types of solids.	L2
	C111.5	Draw and understand about the development of surfaces of various solids.	L2
	C111.6	Ability to read, understand and interpret engineering drawings.	L2
C112 **(PHYSICS LAB)** **BS11208**	CO		
	C112.1	Handle different measuring instruments and asses their accuracy of measurement.	L1
	C112.2	Experiment and analyze the results to derive valid conclusions.	L4
	C112.3	Compare the experimental results with those introduced in lecture, draw relevant conclusions and substantiate.	L5
	C112.4	Develop the experimental skills to design new experiments in engineering.	L3
	C112.5	Understand the ethics of working environment and deliver the results in time.	L2
	C112.6	Engage themselves in team work and understand each other's strengths.	L2

Course Name	CO Number	CO Statement	BT Level
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 **(COMPUTATIONAL** **MATHEMATICS LAB)** **ES11210**	CO		
	C114.1	Write Flow chart and algorithm for the given program.	L1
	C114.2	Have the ability to write C programs to solve specified problems.	L1
	C114.3	Find the root of a given equation using C program.	L3
	C114.4	Use arrays as part of the software solution.	L3
	C114.5	Utilize pointers to efficiently solve problems.	L3
	C114.6	Use functions from the portable C library.	L1
C115 **(ENGINEERING** **WORKSHOP)** **ES11211**	CO		
	C115.1	Demonstrate and understand the Engineering workshop safety regulations.	L2
	C115.2	Identify and use marking tools, measuring equipment and to work to prescribed accuracies.	L1
	C115.3	Know various operations in basic engineering workshops.	L2
	C115.4	Understand the practical difficulties encountered in industries during any assembly work.	L2
	C115.5	Do simple electrical work through their carrier.	L3
	C115.6	Design different prototype in the fittings, carpentry, foundry, black smithy and sheet metal work.	L6
II Year - I Semester			
Course Name	**CO Number**	**CO Statement**	**BT Level**
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 **ENGINEERING** **MECHANICS** **ES113AP**	CO		
	C203.1	Judge whether the body under the action of planer force system is at rest or in motion.	L5
	C203.2	Analyze equilibrium of a body subjected to a system of forces including free body diagrams.	L4
	C203.3	Solve the problems of Bodies subjected to friction.	L3
	C203.4	Locate centroids/centre of gravity and compute moment of Inertia of various sections.	L3
	C203.5	Compute mass moment of Inertia of standard and composite sections.	L3
	C203.6	Understand the basic concept of kinetics of bodies.	L2

	CO		
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 **OBJECT ORIENTED** **PROGRAMMING** **PC113AX**	CO		
	C205.1	Understand the object oriented programming concepts and solve real world problems.	L2
	C205.2	Demonstrate the use of inheritance and packages.	L2
	C205.3	Understand and implement the concepts of exception handling.	L2
	C205.4	Develop multithreaded applications with synchronization.	L6
	C205.5	Solve problems using java collection framework and I/O classes.	L3
	C205.6	Design Graphical User Interface using applets and swing controls.	L6
C206 **IT WORKSHOP LAB** **ES11316**	CO		
	C206.1	Apply basic computer knowledge in identifying peripherals and perform Computer Assembling.	L3
	C206.2	Apply the office tools for preparing Documents, Presentations, Data Analyzing and visualizing.	L3
	C206.3	Apply the tools for creating, importing & exporting Databases and Generate reports.	L3
	C206.4	Analyze various resources available on the internet and the World Wide Web.	L4
	C206.5	Develop static Web Pages using HTML.	L6
	C206.6	Apply LaTeX Tools for preparing documents and slides.	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 **OBJECT ORIENTED** **PROGRAMMING** **THROUGH JAVA LAB** **PC11323**	CO		
	C208.1	Implement the concepts of object oriented programming to solve problems.	L3
	C208.2	Develop programs using inheritance and interfaces.	L6
	C208.3	Understand and implement the concepts of exception handling.	L2
	C208.4	Develop multithreaded applications with synchronization.	L6
	C208.5	Solve problems using java collection framework and I/O classes.	L3
	C208.6	Develop GUI based applications using applets and swing controls.	L6
C209 **(GENDER** **SENSITIZATION)**	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 **DISCRETE** **MATHEMATICS** **BS114AZ**	CO		
	C210.1	Apply mathematical logic to solve problems.	L3
	C210.2	Understand the concepts and perform the operations related to sets, relations and functions.	L2
	C210.3	Gain the conceptual background needed and identify structures of algebraic nature.	L2
	C210.4	Apply basic counting techniques to solve combinatorial problems.	L3
	C210.5	Formulate problems and solve recurrence relations.	L6
	C210.6	Apply Graph Theory in solving computer science problems.	L3
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 **DATABASE** **MANAGEMENT SYSTEMS** **PC114BJ**	CO		
	C214.1	Understand concepts and the applications of database systems and implement in real time applications.	L2
	C214.2	Construct an Entity-Relationship (E-R) model from specifications and transform to relational model.	L3
	C214.3	Demonstrate the basic concepts of relational database management system and construct unary/binary/set/aggregate queries in Relational Algebra and in SQL.	L2
	C214.4	Apply normalization on database.	L3
	C214.5	Understand principles of database transaction management.	L2
	C214.6	Understand the storage and recovery of database.	L2
C215 **COMPUTER** **ORGANIZATION AND** **MICROPROCESSOR LAB** **PC11427**	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.	L1
	C215.4	Write and execute programs in Assembly language to solve the problems.	L1
	C215.5	Compile and debug the programs.	L3
	C215.6	Analyze and interface different peripherals with the microprocessor.	L4

	CO		
C216 **OPERATING SYSTEMS** **LAB** **PC11433**	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
	CO		
C217 **DATABASE** **MANAGEMENT** **SYSTEMS LAB** **PC11428**	C217.1	Analyze the requirements of database application.	L4
	C217.2	Design ER model for the given problem.	L6
	C217.3	Convert ER diagram to relational database schema.	L3
	C217.4	Apply normalization techniques for development of application software to realistic problems.	L3
	C217.5	Formulate queries using SQL DML/DDL/DCL commands.	L6
	C217.6	Apply triggers, cursors and stored procedures.	L3
	CO		
C218 **ENVIRONMENTAL** **SCIENCES** **MC114BE**	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			
	CO		
C301 **FUNDAMENTALS OF** **MANAGEMENT** **HS115CE**	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
	CO		
C302 **SOFTWARE** **ENGINEERING** **PC115CK**	C302.1	Get acquaintance of basic software engineering methods and practices, process frame work and process models.	L2
	C302.2	Emphasize on software requirement, SRS documents and Project Management.	L1
	C302.3	Develop different system models that describe the functionality of the system.	L6
	C302.4	Design and maintain efficient, reliable and cost effective software solutions and suitable software metrics.	L6
	C302.5	Understand various software testing approaches.	L2
	C302.6	Emphasize on Software measurement, software risks and quality control.	L1
	CO		
C303 **DATA** **COMMUNICATIONS &** **COMPUTER NETWORKS** **PC115BW**	C303.1	Understand the basics of computer networks, networking devices and protocols.	L2
	C303.2	Understand the functionalities of different layers of OSI and TCP/IP reference models.	L2
	C303.3	Analyze the performance of link layer and MAC layer protocols.	L4
	C303.4	Acquire the knowledge of addressing and routing protocols and apply the same for different routing problems and applications.	L3
	C303.5	Understand the services offered by transport entities and transport protocols.	L2
	C303.6	Demonstrate various application layer protocols in real time.	L2
	CO		
C304 **DISTRIBUTED SYSTEMS** **(PE-1)** **PE115BZ**	C304.1	Understand the concepts, challenges of distributed system and various system models.	L2
	C304.2	Analyze the establishment of Inter process communication and remote invocation between distributed systems.	L4
	C304.3	Comprehend a distributed system with the features that support distributed file system and name services.	L2
	C304.4	Apply virtual time, agreement and consensus protocols in distributed Systems.	L3
	C304.5	Apply and analyze the knowledge of distributed transactions and replication.	L3
	C304.6	Will be familiar with the design, implementation and other issues of distributed system.	L2

	CO		
C305 **ARTIFICIAL** **INTELLIGENCE** **(PE-1)** **PE115BR**	CO		
	C305.1	Understand the basics of AI and knowledge representation using appropriate technique.	L2
	C305.2	Apply AI techniques for problem solving using various search and game playing algorithms.	L3
	C305.3	Interpret architectures of different intelligent agents and Expert Systems.	L2
	C305.4	Interpret probabilistic and logical reasoning for knowledge.	L2
	C305.5	Analyze different Machine Learning approaches for problem solving.	L4
	C305.6	Recognize basics of Natural Language Processing.	L2
C306 **COMPUTER GRAPHICS** **(PE-1)** **PE115BT**	CO		
	C306.1	Learn the basics of computer graphics and graphics display devices.	L1
	C306.2	Understand different types of graphics drawing algorithms and two dimensional transformations.	L2
	C306.3	Familiarize the techniques of clipping, three dimensional graphics and three dimensional transformations.	L2
	C306.4	Design, develop and test various techniques which includes modelling, rendering and shading.	L6
	C306.5	Apply the basic techniques of animation.	L3
	C306.6	Work in computer aided design for content presentation.	L3
C307 **FUNDAMENTALS OF** **DATA STRUCTURES** **(OE-1)** **OE115KA**	CO		
	C307.1	Analyse the time and space complexities of algorithms.	L4
	C307.2	Differentiate between linear and non-linear data structures.	L2
	C307.3	Use basic data structures such as linked list, stack and queue for data representation.	L3
	C307.4	Understand advanced data structures like binary trees, search trees and graphs.	L2
	C307.5	Choose appropriate data structures to represent data items in real world problems.	L4
	C307.6	Analyse various kinds of searching and sorting techniques.	L4
C308 **JAVA PROGRAMMING** **(OE-1)** **OE115KB**	CO		
	C308.1	Understand the object oriented programming concepts and solve real world problems.	L2
	C308.2	Demonstrate the use of inheritance and packages.	L2
	C308.3	Understand and implement the concepts of exception handling.	L2
	C308.4	Develop multithreaded applications with synchronization.	L6
	C308.5	Solve problems using java collection framework and I/O classes.	L3
	C308.6	Design Graphical User Interface using applets and swing controls.	L6
C309 **BASIC ELECTRONICS** **(OE-1)** **OE115KC**	CO		
	C309.1	Illustrate the fundamental behaviour of various diodes, transistors.	L1
	C309.2	Explain the construction, operation and characteristics of BJT, JFET and MOSFET.	L1
	C309.3	Analyse the various amplifier circuits using small signal hybrid model.	L3
	C309.4	Identify the necessity for biasing.	L1
	C309.5	To know the operation of various special purpose devices like LED, Photo diode and SCR.	L1
	C309.6	Apply the knowledge of Diodes in designing circuits like rectifiers.	L3
C310 **ELECTRICAL** **MATERIALS** **(OE-1)** **OE115KD**	CO		
	C310.1	Distinguish between magnetic and non-magnetic materials by acquiring the knowledge of their atomic structures.	L2
	C310.2	Analyse Dielectric and semiconductor materials.	L3
	C310.3	Analyse the magnetic materials using their properties.	L3
	C310.4	Identify special purpose materials for different applications.	L2
	C310.5	Analyse the working of different materials from the point of view of their applications in electrical industry.	L4
	C310.6	Analyse the working of special purpose materials from the point of view of their possible applications electrical & other fields.	L3
C311 **OPERATIONS RESEARCH** **(OE-1)** **OE115KE**	CO		
	C311.1	Apply linear programming models to several Engineering Applications.	L3
	C311.2	Use several other techniques like Transportation, Assignment and Sequencing Models in the real world applications.	L3
	C311.3	Study selected Dynamic Programming models for real world situations.	L4
	C311.4	Apply simple mathematical models in Inventory into the real Engineering Applications.	L3
	C311.5	Solve Game theory problems related to business applications.	L3
	C311.6	Develop optimum replacement policy.	L6

	CO		
C312 **INTRODUCTION TO** **DATA ANALYTICS** **(OE-1)** **OE115KF**	C312.1	Understand the definitions and concepts associated with central tendency and measures of dispersion.	L2
	C312.2	Find the probability of an event and know the properties of distribution.	L1
	C312.3	Determine the regression co-efficient and test the accuracy of co-efficient.	L3
	C312.4	Learn basic concepts in supervised learning.	L1
	C312.5	Attain basic knowledge in unsupervised learning.	L2
	C312.6	Understand past behavior of data and forecast the future behavior using time series analysis.	L5
	CO		
C313 **INTELLECTUAL** **PROPERTY RIGHTS** **(OE-1)** **OE115KG**	C313.1	Understand the dynamics and legalistic framework of IPR's	L2
	C313.2	Acquaint with securing patents and its protection.	L5
	C313.3	Seize the dimensions of Copy right protection.	L2
	C313.4	Realize the eminence of Trade Marks in growth of business.	L3
	C313.5	Essentials of safeguarding Industrial designs.	L1
	C313.6	Sustentation of Trade Secrets and aspects of IP audit.	L4
C314 **DISASTER** **MANAGEMENT** **(OE-1)** **OE115KH**	CO		
	C314.1	Understand different kinds of disasters and their vulnerabilities.	L2
	C314.2	Identify the causes, effects and mitigation measures of different disasters.	L1
	C314.3	Apply the disaster management mechanism in natural and man induced calamities.	L3
	C314.4	Analyse and solve the unforeseen situations with advanced technologies like Remote Sensing and Geological Information Systems.	L5
	CO		
C315 **EMPLOYABILITY AND** **SOFT SKILLS LAB** **HS11542**	C315.1	Apply basic communication skills (LSRW) in work-related situations.	L3
	C315.2	Acquire, organize, interpret and evaluate information for effective communications within a group.	L5
	C315.3	Demonstrate the ability to combine ideas or information in new ways and present information on guided and structured format.	L2
	C315.4	Make decisions and solve problems by specifying goals, identifying resources and constraints and evaluating results.	L5
	C315.5	Display personal qualities such as responsibility, self-management, self- confidence, ethical behaviour and respect for self and others.	L2
	C315.6	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
	CO		
C316 **SOFTWARE** **ENGINEERING LAB** **PC11543**	C316.1	Demonstrate the phase of life cycle during Software Development.	L2
	C316.2	Define the activities involved in requirement gathering for a software.	L1
	C316.3	Design and plan proper architectural design using data modeling (UML) for an Application.	L6
	C316.4	Specify appropriate methodology and technology for the implementation.	L3
	C316.5	Develop suitable test cases required for a quality based Software.	L6
	C316.6	Recognize the methodology for building the product to meet the desired functionality.	L2
	CO		
C317 **DATA** **COMMUNICATIONS &** **COMPUTER NETWORKS** **LAB** **PC11536**	C317.1	Implement data link layer functions such as framing methods.	L3
	C317.2	Demonstrate error detection at the data link layer.	L2
	C317.3	Evaluate the most suitable algorithm to find shortest path.	L5
	C317.4	Execute basic Linux Networking commands.	L3
	C317.5	Configure IP and MAC addresses.	L2
	C317.6	Demonstrate application layer protocols using software and tools.	L2
III Year - II Semester			
	CO		
C318 **ALGORITHM DESIGN** **AND ANALYSIS** **PC116CP**	C318.1	Identify the appropriate algorithmic design strategy for a given problem and analyze its performance measures.	L1
	C318.2	Understand how the basic data structures like sets are used to improve the algorithmic efficiency.	L2
	C318.3	Apply and analyze the given problem using divide and conquer approach.	L3
	C318.4	List and illustrate various algorithmic paradigms.	L2
	C318.5	Solve the given problem using appropriate algorithmic design.	L3
	C318.6	Demonstrate an understanding of P and NP classes.	L2

	CO		
C319 **AUTOMATA &** **COMPILER DESIGN** **PC116CR**	C319.1	Illustrate the concept of abstract machines and their power to recognize the languages.	L4
	C319.2	Classify language classes, regular expressions, grammars and the relationship among them with the help of Chomsky hierarchy.	L2
	C319.3	Demonstrate different parsing methods typically used in compilers.	L2
	C319.4	Describe language translation techniques and their applications.	L2
	C319.5	Illustrate storage allocation and access strategies of compilers.	L4
	C319.6	Demonstrate various techniques used in backend of a compiler.	L2
C320 **WEB TECHNOLOGIES** **PC116DM**	CO		
	C320.1	Develop a dynamic webpage by the use of java script, DHTML and AJAX Programming.	L6
	C320.2	Write a well formed / valid XML document and understand how to parse and use XML data with java.	L2
	C320.3	Understand the server side scripting with PHP language.	L2
	C320.4	Connect databases to the server side applications.	L3
	C320.5	Write a server side java application called Servlet to retrieve form data sent from client, process it and store it on database.	L1
	C320.6	Develop server side java application called JSP to catch form data sent from client and store it on database.	L6
C321 **INTERNET OF THINGS** **(PE-2)** **PE116DB**	CO		
	C321.1	Understand the IoT Systems.	L2
	C321.2	Understand the concept of M2M (machine to machine) with necessary protocols.	L2
	C321.3	Create programs using python scripting language in IoT devices.	L6
	C321.4	Create programs for Raspberry Pi interfaces.	L6
	C321.5	Understand to communicate with IoT Systems through web-interface.	L2
	C321.6	Apply IoT principles for domain specific applications.	L3
C322 **MACHINE LEARNING** **(PE-2)** **PE116DD**	CO		
	C322.1	Gain Knowledge on the basic theory in machine learning.	L2
	C322.2	Understand machine learning problems corresponding to different applications.	L2
	C322.3	Identify machine learning techniques appropriate to respective problems.	L1
	C322.4	Compare various machine learning algorithms along with their strengths and weaknesses.	L4
	C322.5	Analyze the machine learning algorithms under supervised and unsupervised paradigms.	L4
	C322.6	Apply different learning algorithms to solve problems of moderate complexity.	L3
C323 **MOBILE APPLICATION** **DEVELOPMENT** **(PE-2)** **PE116DG**	CO		
	C323.1	Understanding android application development components.	L2
	C323.2	Create user interfaces.	L6
	C323.3	Create user interfaces with the support of persistent data management.	L6
	C323.4	Create user interfaces for managing the data with SQL Lite.	L6
	C323.5	Create user interfaces with the support for processing messages.	L6
	C323.6	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	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

	CO		
C326 **PRINCIPLES OF** **ELECTRONIC** **COMMUNICATIONS** **(OE-2)** **OE116KL**	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	Sustenation of Trade Secrets and aspects of IP audit.	L4
C332 **WEB TECHNOLOGIES** **LAB** **PC11654**	CO		
	C332.1	Use LAMP Stack for web applications and MySQL to connect Database using PHP.	L2
	C332.2	Parse XML files using Java (DOM and SAX parsers).	L6
	C332.3	Use Tomcat Server for servlets and JSP's.	L2
	C332.4	Develop web applications using Servlets and JSP's.	L6
	C332.5	Connect Database to Server side applications.	L6
	C332.6	Create dynamic web pages using Java Script and AJAX.	L6

	CO		
C333 **INTERNET OF THINGS** **LAB** **(PE-2)** **PE11647**	CO		
	C333.1	Understand internet of Things and its hardware and software components.	L2
	C333.2	Interface I/O devices, sensors.	L3
	C333.3	Create programs using python scripting language in IoT devices.	L6
	C333.4	Interface IoT communication modules.	L3
	C333.5	Remotely monitor data and control devices.	L2
	C333.6	Develop real life IoT based projects.	L6
C334 **MACHINE LEARNING** **LAB** **(PE-2)** **PE11648**	CO		
	C334.1	Program using basic features of Python.	L3
	C334.2	Apply and analyse concept learning techniques to version spaces.	L3
	C334.3	Design statistical and hierarchical models in Machine Learning.	L6
	C334.4	Analyse lazy and eager learning algorithms.	L4
	C334.5	Identify machine learning techniques appropriate to respective problems.	L1
	C334.6	Compare various machine learning algorithms along with their strengths and weaknesses.	L4
C335 **MOBILE APPLICATION** **DEVELOPMENT LAB** **(PE-2)** **PE11650**	CO		
	C335.1	Create user interfaces.	L6
	C335.2	Create user interfaces with the support of persistent data management.	L6
	C335.3	Create user interfaces for managing the data with SQL Lite.	L6
	C335.4	Create user interfaces with the support for processing messages.	L6
	C335.5	Create User Interfaces with support for access to internet.	L6
	C335.6	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 **ENTREPRENEURSHIP** **AND PROJECT** **MANAGEMENT** **HS117DZ**	CO		
	C401.1	Possess sensibleness and skills required for establishment of business.	L3
	C401.2	Construe the entrepreneurial ingenuity required for business functioning.	L5
	C401.3	Give perception on the probable business structures for entrepreneurial decisions	L4
	C401.4	Scrutinize the probable financial propositions in investment process.	L5
	C401.5	Evaluate the entrepreneurial project feasibility of implementation and its profitability.	L5
	C401.6	Delve the market for the product developed through entrepreneurial establishment.	L6
C402 **NETWORK** **PROGRAMMING** **PC117EK**	CO		
	C402.1	Understand the concept of process and creates processes using system V IPC constructs.	L1
	C402.2	Apply the networking concepts by creating sockets.	L3
	C402.3	Create the client server programs using TCP sockets.	L6
	C402.4	Create client server programs using UDP sockets.	L6
	C402.5	Understand and writes programs using name and address conversions.	L1
	C402.6	Apply I/O multiplexing as well as socket options to the socket programs.	L3

	CO		
C403 **FUNDAMENTALS OF** **MULTIMEDIA** **(PE-3)** **PE117ED**	C403.1	To understand basic concepts of multimedia.	L2
	C403.2	To understand various compression algorithms.	L2
	C403.3	To understand various standards for video.	L2
	C403.4	To understand various standards for audio.	L2
	C403.5	To understand special requirements for multimedia communications.	L2
	C403.6	To understand multimedia application development life cycle.	L2
C404 **CLOUD COMPUTING** **(PE-3)** **PE117DP**	CO		
	C404.1	Articulate the main concepts, key technologies, strengths, and limitations of cloud computing.	L2
	C404.2	Illustrate the broad perceptive of cloud architecture and model.	L2
	C404.3	Apply and design suitable Virtualization concept.	L3
	C404.4	Explore some important cloud computing driven commercial systems such as Google Apps, Microsoft Azure and Amazon Web Services and other businesses cloud applications.	L4
	C404.5	Assess cloud Storage systems and Cloud security, the risks involved, its impact and develop cloud application.	L5
	C404.6	Analyze the various standards for Cloud computing and its management.	L4
C405 **HUMAN COMPUTER** **INTERACTION** **(PE-3)** **PE117EF**	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 **WIRELESS NETWORKS &** **MOBILE COMPUTING** **(PE-4)** **PE117EV**	CO		
	C406.1	Understand the basic components and principles of mobile computing architecture.	L2
	C406.2	Demonstrate the knowledge of WLANs and cellular communication standards.	L2
	C406.3	Illustrate the protocols of various layers in mobile networks.	L3
	C406.4	Understand the database issues and data dissemination models.	L2
	C406.5	Apply the knowledge of MANETs and their routing protocols.	L3
	C406.6	Distinguish various platforms and protocols used in mobile environment.	L4
C407 **DATA MINING** **(PE-4)** **PE117DR**	CO		
	C407.1	Understand the fundamental concepts and tasks of data mining.	L2
	C407.2	Perform the pre-processing of data.	L3
	C407.3	Formulate the association rules using different Algorithms.	L6
	C407.4	Understand different classification techniques.	L2
	C407.5	Understand different clustering techniques.	L2
	C407.6	Understand algorithms used for web mining, text mining.	L2
C408 **E-COMMERCE** **(PE-4)** **PE117DU**	CO		
	C408.1	Understand basic foundations, importance of E-commerce and infrastructure for E-commerce in retailing, pricing strategies.	L2
	C408.2	Identify and access Electronic payment systems.	L1
	C408.3	Understand Internet trading relationships including Business to Consumer, Business-to-Business, Intra-organizational.	L2
	C408.4	Evaluating the effectiveness of market research, Information retrieval, data ware housing and data mining.	L5
	C408.5	Analyse the impact of E-commerce on business models and strategy.	L4
	C408.6	Applying Multimedia in E-Commerce.	L3
C409 **CYBER SECURITY** **(OE-3)** **OE117KR**	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

	CO		
C410 **PYTHON PROGRAMMING** **(OE-3)** **OE117KS**	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
	CO		
C411 **ANDROID** **PROGRAMMING** **(OE-3)** **OE117KT**	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
	CO		
C412 **TELECOMMUNICATION** **SWITCHING SYSTEMS** **(OE-3)** **OE117KU**	C412.1	Acquire knowledge about Telecommunication Switching Systems.	L1
	C412.2	Understand different Telecommunication switching and signaling methodologies.	L1
	C412.3	Apply the concepts to solve the real time telecommunication problems.	L3
	C412.4	Analyse the fundamental telecommunication traffic models.	L4
	C412.5	Evaluate telecommunication switching systems.	L5
	C412.6	Design a telecommunication switching system.	L6
	CO		
C413 **WASTE MANAGEMENT** **TECHNIQUES AND** **POWER GENERATION** **(OE-3)** **OE117KV**	C413.1	Understand technologies for generation of energy from solid waste.	L1
	C413.2	Compare methods of solid waste disposal.	L2
	C413.3	Identify sources of energy from waste using various conversion techniques.	L2
	C413.4	Analyze methods for waste management.	L3
	C413.5	Assess the harmful effects of e-waste.	L4
	C413.6	Differentiate between the normal waste and e-waste.	L2
	CO		
C414 **INDUSTRIAL** **MANGEMENT** **(OE-3)** **OE117KW**	C414.1	Organize the activities of Business efficiently.	L3
	C414.2	Adapt to appropriate method of production yielding productivity.	L6
	C414.3	Identify efficient method of production.	L3
	C414.4	Handle inventory efficiently for improving Productivity.	L3
	C414.5	Implement and maintain Quality standards in Production.	L5
	C414.6	Cohere to dynamic practices to improve Productivity.	L4
	CO		
C415 **NETWORK** **PROGRAMMING LAB** **PC11759**	C415.1	Create scripts using Unix/Linux commands.	L6
	C415.2	Create process and Inter process communication using system V IPC constructs.	L6
	C415.3	Create client server processes using TCP sockets.	L6
	C415.4	Create client server processes using UDP sockets.	L6
	C415.5	Create process to multiplex several sockets using select and poll system calls.	L6
IV Year - II Semester			
	CO		
C416 **CRYPTOGRAPHY &** **NETWORK SECURITY** **PC118FF**	C416.1	Identify network security threats and indicate countermeasures.	L1
	C416.2	Illustrate various cryptographic algorithms.	L2
	C416.3	Understand various message authentication algorithms and applications.	L2
	C416.4	Identify security solutions for E-Mail and IP layer.	L1
	C416.5	Demonstrate security solutions for web and internet.	L2
	C416.6	Analyze vulnerabilities using different case studies.	L4

	CO		
C417 **ADVANCED OPERATING** **SYSTEMS** **(PE-5)** **PE118FC**	C417.1	Understand the design approaches of advanced operating systems.	L2
	C417.2	Analyze the design issues of distributed operating systems.	L4
	C417.3	Evaluate design issues of multi-processor operating systems.	L5
	C417.4	Formulate the solutions to schedule the real time applications.	L6
	C417.5	Identify the requirements of database operating systems.	L1
	C417.6	Develop modules for mobile devices.	L6
C418 **INFORMATION** **RETRIEVAL SYSTEMS** **(PE-5)** **PE118FQ**	CO		
	C418.1	Have knowledge to store and retrieve textual documents using appropriate strategies.	L1
	C418.2	Understand various retrieval utilities for improving search.	L2
	C418.3	Understand the translation schemes of cross-language information retrieval.	L2
	C418.4	Apply indexing and compression of documents to improve space and time efficiency.	L3
	C418.5	Apply SQL queries for unstructured data.	L3
	C418.6	Analyze and choose appropriate retrieval model.	L4
C419 **ADVANCED DATABASES** **(PE-5)** **PE118FB**	CO		
	C419.1	Describe the stages of Query Processing and understand the fundamentals of Query-Based Optimization techniques.	L1
	C419.2	Understand the concepts of parallel databases.	L2
	C419.3	Illustrate the concept of distributed databases.	L2
	C419.4	Demonstrate the appropriate syntax for SQL OLAP Extensions.	L2
	C419.5	Identify and describe the components and characteristics of the object- oriented data bases.	L1
	C419.6	Explain methods suitable for particular types of data such as temporal, Logic Based data.	L2
C420 **SOFTWARE PROJECT** **MANAGEMENT** **(PE-6)** **PE118FZ**	CO		
	C420.1	Differentiate Conventional Software Management with respect to Modern Practices.	L4
	C420.2	Determine the various lifecycles of a Software Project.	L2
	C420.3	Understand the specific roles with in a Software Organization as related to Project and Process Management.	L2
	C420.4	Analyse the basic infrastructure competences like Process Modeling and Measurement.	L4
	C420.5	Remember the basic steps of Project Planning and Project Management.	L1
	C420.6	Assess the Quality Assurance, Process Management and their relationships along with the Case Study.	L5
C421 **SOFT COMPUTING** **(PE-6)** **PE118FX**	CO		
	C421.1	Identify artificial intelligence and soft computing techniques in building Intelligent machines.	L1
	C421.2	Understand the concept of artificial neural networks.	L2
	C421.3	Analyze the various Supervised and Unsupervised learning networks.	L4
	C421.4	Apply fuzzy logic and reasoning to handle uncertainty.	L3
	C421.5	Understand different operators and basic terminologies of genetic algorithms.	L2
	C421.6	Evaluate different soft computing techniques for suitable applications.	L5
C422 **INTERNET** **TECHNOLOGIES** **(PE-6)** **PE118FT**	CO		
	C422.1	Use knowledge relating to HTML5 and JavaScript Technologies.	L1
	C422.2	Analyze and apply suitable technology in client side applications.	L4
	C422.3	Understand the concepts of various Web Services.	L2
	C422.4	Build suitable applications using struts framework.	L6
	C422.5	Design .Net framework application.	L6
	C422.6	Understand the concepts of Semantic Technology.	L2
C423 **PRINCIPLES OF** **ARTIFICIAL** **INTELLIGENCE** **(OE-4)** **OE118KX**	CO		
	C423.1	Understand the basics of AI and knowledge representation using appropriate technique.	L2
	C423.2	Apply AI techniques for problem solving using various search and game Playing algorithms.	L3
	C423.3	Interpret architectures of different intelligent agents and Expert systems	L2
	C423.4	Interpret probabilistic and logical reasoning for knowledge.	L2
	C423.5	Analyse different Machine Learning approaches for problem solving.	L4
	C423.6	Recognize basics of Natural Language Processing.	L2

	CO		
C424 **CLOUD COMPUTING** **(OE-4)** **OE118KY**	CO		
	C424.1	Articulate the main concepts, key technologies, strengths, and limitations of cloud computing.	L2
	C424.2	Illustrate the broad perceptive of cloud architecture and model.	L2
	C424.3	Apply and design suitable Virtualization concept.	L3
	C424.4	Explore some important cloud computing driven commercial systems such as Google Apps, Microsoft Azure and Amazon Web Services and other businesses cloud applications	L4
	C424.5	Assess cloud Storage systems and Cloud security, the risks involved, its impact and develop cloud application	L5
	C424.6	Analyze the various standards for Cloud computing and its management.	L4
C425 **CELLULAR AND MOBILE** **COMMUNICATIONS** **(OE-4)** **OE118KZ**	CO		
	C425.1	Analyze and design wireless and mobile cellular systems.	L4
	C425.2	Understand impairments due to multipath fading channel.	L1
	C425.3	Understand the fundamental techniques to overcome the different fading effects.	L1
	C425.4	Understand Co-channel and Non Co-channel interferences.	L1
	C425.5	Familiar with cell coverage for signal and traffic, diversity techniques and mobile antennas.	L2
	C425.6	Understanding of frequency management, Channel assignment, and types of handoff.	L1
C426 **ROBOTICS** **(OE-4)** **OE118MA**	CO		
	C426.1	Identify a Robot for a specific application.	L1
	C426.2	Identify parameters required to be controlled in a Robot.	L1
	C426.3	To select suitable sensors and drive system for an application	L4
	C426.4	To learn various robot programming methods and languages	L1
	C426.5	To learn various industrial robot control systems and Mission Vision system	L1
	C426.6	To understand Socio-Economic aspect of robotisation.	L2
C427 **MARKETING** **MANAGEMENT** **(OE-4)** **OE118MB**	CO		
	C427.1	Understand the importance of the Marketing Management Process	L2
	C427.2	Conduct Marketing Research, comprehend buyer behavior and hypothesize market segmentation.	L4
	C427.3	Identify the elements of product mix and pricing strategies.	L3
	C427.4	Enumerate strategies of pricing in fixation.	L5
	C427.5	Select appropriate network of product distribution.	L3
	C427.6	Adapt to befitting promotional strategy.	L6
C428 **ENVIRONMENTAL** **IMPACT ASSESSMENT** **(OE-4)** **OE118MC**	CO		
	C428.1	Understand the basic concepts of Environmental Impact Assessment, Environmental Impact Statement and Environmental Audit.	L2
	C428.2	Identify the environmental aspects to be considered for the Environmental Impact Assessment study.	L1
	C428.3	Apply the knowledge of Environmental Impact Assessment studies in Preparation of Environmental Impact Statement.	L3
	C428.4	Prepare suitable methodology in Environmental Impact Assessment documentation.	L6
	C428.5	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

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

AUTONOMOUS

Department of IT - CNIS

Course Outcomes for all the Courses of GNR-18 Regulations

Course Name	CO Number	CO Statement	BT Level
I Year - I Semester			
	CO		
	C101.1	Demonstrate various hashing techniques.	L2
C101	C101.2	Analyse and construct Skip Lists.	L4
ADVANCED DATA	C101.3	Develop and analyse algorithms for red-black trees, B-trees and Splay trees.	L6
STRUCTURES	C101.4	Develop algorithms for text processing applications.	L6
	C101.5	Identify suitable data structures and develop algorithms for computational geometry problems.	L1
	C101.6	Implement advanced data structures using Java	L3
	CO		
	C102.1	Demonstrate the formal foundations of cryptography.	L2
C102	C102.2	Illustrate the basic mathematical principles and functions that form the foundation for cryptographic and cryptanalysis methods.	L2
MATHEMATICAL	C102.3	Identify strong pseudorandom generators for hashing and private-public key cryptosystems.	L5
FOUNDATIONS OF	C102.4	Explain and Analyse various security models for Encryption schemes.	L4
CRYPTOGRAPHY	C102.5	Illustrate and Compare some standard digital signature schemes.	L2
	C102.6	Explain the relevance of Zero knowledge protocol to cryptographic techniques.	L2
	CO		
	C103.1	Familiarity with the basic protocols of computer networks and how they can be used in network design and implementation.	L1
	C103.2	Understand the various application layer protocols.	L2
C103	C103.3	Explain the design issues in transport layer for the different applications and services requirements.	L4
COMPUTER NETWORKING	C103.4	Specify the deficiencies in existing protocols and formulate better protocols.	L2
	C103.5	Illustrate the issues in Mobile and Wireless Networks.	L4
	C103.6	Have a basic knowledge of network security.	L3
	CO		
	C104.1	Design and implement basic IPC using pipes, fifos, System V IPC for client-server applications.	L6
	C104.2	Understand Fundamental concept of Network Programming.	L2
C104	C104.3	Know Contemporary Issues in Network Technologies.	L1
NETWORK PROGRAMMING	C104.4	Design network Client-Server applications using TCP and UDP Sockets	L6
	C104.5	Create client and server applications using the "Socket" API and also analyze Network Programming.	L6
	C104.6	Create RPC for Unix environment.	L6
	CO		
	C105.1	Demonstrate an understanding of the TCP/IP layers to design subnets and supernets.	L2
	C105.2	Identify the services that TCP/IP applications provide.	L2
C105	C105.3	Ability to identify the protocols of transport layer along with frame formats.	L2
TCP/IP INTERNETWORKING	C105.4	To understand and comprehend the use of application layer protocols.	L2
	C105.5	To demonstrate and use the Application layer protocols for developing real time Applications.	L2
	C105.6	To describe current common protocols of file different transferring techniques.	L1

	CO		
C106 **DIGITAL FORENSICS**	C106.1	Understand relevant legislation and codes of ethics.	L2
	C106.2	Computer forensics and digital detective and various processes,policies and procedures.	L1
	C106.3	E-discovery, guidelines and standards, E-evidence, tools and environment.	L1
	C106.4	Email and web forensics and network forensics.	L1
	C106.5	Understand procedures for network forensics.	L2
	C106.6	Understand various forensic tools for a wide variety of investigations.	L2
	CO		
C107 **INTRUSION DETECTION**	C107.1	Possess a fundamental knowledge of Cyber Security.	L1
	C107.2	Understand what vulnerability is and how to address most common vulnerabilities.	L2
	C107.3	Know basic and fundamental risk management principles as it relates to Cyber Security and Mobile Computing.	L1
	C107.4	Have the knowledge needed to practice safer computing and safeguard your information using Digital Forensics.	L1
	C107.5	Understand basic technical controls in use today, such as firewalls and Intrusion Detection systems.	L2
	C107.6	Understand legal perspectives of Cyber Crimes and Cyber Security.	L2
	CO		
C108 **INFORMATION THEORY AND** **CODING**	C108.1	Understand the ideas of entropy and information content and Derive equations for entropy mutual information.	L2
	C108.2	Derive equations for channel capacity for all types of channels.	L3
	C108.3	Analyse information carrying capacity of communication channels.	L4
	C108.4	Distinguish between different types of error correcting codes based on probability of error	L4
	C108.5	Construct efficient codes for data on imperfect communication channels.	L6
	C108.6	Apply the best compression techniques to practical situations.	L3
	CO		
C109 **ADVANCED DATA** **STRUCTURES LAB**	C109.1	Develop the programs for various data structures for stacks, queues.	L6
	C109.2	Develop the programs for various non-linear data structures for linked lists, binary search tree, AVL tree and B-tree.	L6
	C109.3	Develop the programs for various advanced data structures for dictionaries etc.	L6
	C109.4	Implement various text processing algorithms.	L3
	C109.5	Implement computational geometry algorithm.	L3
	C109.6	Choose the appropriate data structure for solving real world problems.	L4
	CO		
C110 **COMPUTER NETWORKING** **LAB**	C110.1	Understand computer network basics, network architecture, and TCP/IP and OSI reference models.	L2
	C110.2	Familiar with contemporary issues in networking technologies.	L3
	C110.3	Familiar with network tools and network programming.	L3
	C110.4	Describe routing and congestion in network layer with routing algorithms.	L2
	C110.5	Describe data link protocols and IEEE 802 standards for LAN.	L2
	C110.6	Have a basic knowledge to write a script.	L1
	CO		
C111 **NETWORK PROGRAMMING** **LAB**	C111.1	Implement basic IPC using pipes, fifos.	L3
	C111.2	Implement system V IPC for client-server applications.	L3
	C111.3	Implement Client, Server applications using TCP and UDP Sockets.	L3
	C111.4	Implement Client-Server applications using multiplexing using select.	L3
	C111.5	Implement client and server applications using the poll.	L3
	C111.6	Implement RPC for Linux environment.	L3

	CO		
C112 **TCP/IP INTERNETWORKING** **LAB**	C112.1	Able to install and use commands in ubuntu OS	L2
	C112.2	Able to identify network tools in Linux and understand their usage to comprehend TCP/IP protocols	L2
	C112.3	Able to use tcpdump , wireshark to look at the packets and understand and analyze protocols	L2
	C112.4	4. Understand a open source network simulator and use it to create a network model and analyze its performance with various parameters	L2
	CO		
C113 **RESEARCH METHODOLOGY** **AND IPR**	C113.1	Understand research problem formulation.	L2
	C113.2	Analyze research related information.	L4
	C113.3	Follow research ethics.	L1
	C113.4	Understanding that when IPR would take such important place in growth of individuals & nation, it is needless to emphasis the need ofinformation about Intellectual Property Right to be promoted among students in general & engineering in particular.	L2
	C113.5	Understand that IPR protection provides an incentive to inventors for further research work and investment in R & D, which leads to creation of new and better products, and in turn brings about, economic growth and social benefits.	L5
	C113.6	Compose and write quality research reports and attain familiarity with intellectual property rights.	L6
	CO		
C114 **ENGLISH FOR RESEARCH** **PAPER WRITING**	C114.1	The student will be able to understand the nuances of research writing	L2
	C114.2	The student will be able to write a research paper with required writing skills and be confident to share their writing with others.	L3
	C114.3	The student will be able to publish a paper using the requisite standard in a journal.	L6
	C114.4	The student will be able to review the research papers and articles in a scientific manner.	L5
	C114.5	The student will be able to work on citations and ably place them in her research paper.	L3
	C114.6	The student will be able to avoid plagiarism and be able to develop her own writing skills in presenting the research work.	L2
	CO		
C115 **DISASTER MANAGEMENT**	C115.1	Learn different disasters and measures to reduce the risk due to these disasters.	L1
	C115.2	Learn institutional frame work for disaster management at national as well as global level.	L1
	C115.3	Develop the capacity to integrate knowledge and to analyze, evaluate and manage the different public health aspects of disaster events at a local and global levels, even when limited information is available.	L6
	C115.4	Demonstrate, describe, analyze and evaluate the environmental, social,cultural, economic, legal and organizational aspects influencing vulnerabilities and capacities to face disasters.	L5
	C115.5	Understand the emergency/disaster management cycle for various types of disasters.	L2
	C115.6	Develop a basic understanding of prevention, mitigation, preparedness,response and recovery on various types of disasters.	L6
	CO		
C116 **PEDAGOGY STUDIES**	C116.1	The pedagogical practices followed by teachers in developing countries both in formal and informal classrooms.	L2
	C116.2	To examine the effectiveness of pedagogical practices.	L4
	C116.3	To understand the concept, characteristics and types of educational research and perspectives of research.	L2
	C116.4	The role of teacher education, school curriculum and guidance materials for effective pedagogy.	L2
	CO		
C117 **PERSONALITY** **DEVELOPMENT THROUGH** **LIFE ENLIGHTENMENT** **SKILLS**	C117.1	Develop their personality and achieve their highest goal of life.	L6
	C117.2	Lead the nation and mankind to peace and prosperity.	L4
	C117.3	Develop versatile personality.	L6

Course Name	CO Number	CO Statement	BT Level
		I Year - II Semester	
	CO		
C118 **ADVANCED ALGORITHMS**	C118.1	Analyze the complexity/performance of different algorithms.	L4
	C118.2	Determine the appropriate design paradigm for solving a particular set of problems.	L3
	C118.3	Categorize the different problems in various classes according to their complexity.	L4
	C118.4	Formulate algorithms for NP hard and NP complete problems.	L6
	C118.5	Develop linear programming algorithms.	L6
	C118.6	Analyse and write efficient algorithms for any complex/ real world problems.	L4
	CO		
C119 **CYBER SECURITY**	C119.1	Possess a fundamental knowledge of Cyber Security.	L1
	C119.2	Understand what vulnerability is and how to address most common vulnerabilities.	L2
	C119.3	Know basic and fundamental risk management principles as it relates to Cyber Security and Mobile Computing.	L1
	C119.4	Have the knowledge needed to practice safer computing and safeguard your information using Digital Forensics.	L1
	C119.5	Understand basic technical controls in use today, such as firewalls and Intrusion Detection systems.	L2
	C119.6	Understand legal perspectives of Cyber Crimes and Cyber Security.	L2
	CO		
C120 **CLOUD COMPUTING**	C120.1	Articulate the main concepts, key technologies, strengths, and limitations of cloud computing.	L2
	C120.2	Illustrate the broad perceptive of cloud architecture and model	L2
	C120.3	Apply and design suitable Virtualization concept.	L3
	C120.4	Explore some important cloud computing driven commercial systems such as Google Apps, Microsoft Azure and Amazon Web Services and other businesses cloud applications.	L3
	C120.5	Assess cloud Storage systems and Cloud security, the risks involved, its impact and develop cloud application.	L5
	C120.6	Develop applications for cloud.	L6
	CO		
C121 **STORAGE AREA NETWORKS**	C121.1	center elements in classic, virtualized environments.	L2
	C121.2	Describe the components of a storage device, evaluate the need for data protection using RAID and illustrate the role of an Intelligent Storage Systems.	L1
	C121.3	Describe storage networking technologies such as FC-SAN, IP-SAN, NAS, and Object-based storage solutions.	L1
	C121.4	Determine the role of business continuity solutions that include backup, recovery, archival, local and remote replication.	L3
	C121.5	providing solutions to the storage infrastructure.	L2
	C121.6	securing Storage infrastructure in research Oriented Style.	L6
	CO		
C122 **DISTRIBUTED DATABASES** **(PSE-3)**	C122.1	Differentiate key concepts and techniques for centralized databases and distributed databases.	L4
	C122.2	Analyze and design distributed database systems based on the principles of distributed indexing, query evaluation, data replication.	L4
	C122.3	Implement storage, indexing, query evaluation and query optimization techniques.	L3
	C122.4	Implement the concepts of transaction management, concurrency control, crash recovery, deadlocks and catalog management.	L3
	C122.5	Apply suitable architecture for distributed databases.	L3
	C122.6	Apply the concepts of inter-operability of databases.	L3
	CO		
C123 **ETHICAL HACKING** **(PSE-4)**	C123.1	Evaluate a network and system architecture to identify the vulnerabilities and attack vectors.	L5
	C123.2	Identify security techniques used to protect the system and data	L1
	C123.3	Gain the knowledge of the use and availability of tools to support an ethical hack.	L2
	C123.4	Gain the knowledge of interpreting the results of a controlled attack.	L2
	C123.5	Understand the role of politics, inherent and imposed limitations and metrics for planning of attest	L2

	CO		
C124 **MALWARE ANALYSIS** **(PSE-4)**	C124.1	techniques.	L3
	C124.2	Have an intimate understanding of executable formats.	L3
	C124.3	Apply Windows internals and API, and analysis techniques.	L3
	C124.4	Extract investigative leads from host and network based indicators associated with a malicious program.	L4
	C124.5	Apply techniques and concepts to unpack, extract, decrypt, or bypass new anti-analysis techniques in future malware samples.	L3
	C124.6	Achieve proficiency with industry standard tools including IDA Pro, OllyDbg, WinDBG, PE Explorer, ProcMon etc	L6
C125 **INFORMATION SECURITY** **(PSE-4)**	CO		
	C125.1	Describe the security model, identify various security threats and indicate countermeasures.	L1
	C125.2	Illustrate various symmetric and asymmetric ciphers.	L4
	C125.3	Demonstrate various message authentication algorithms and applications.	L2
	C125.4	Explain/Present the overview of E-Mail security and IP-Sec.	L1
	C125.5	Explain/Present the overview of Web Security.	L1
	C125.6	Distinguish between various levels of System security.	L4
C126 **ADVANCED ALGORITHMS** **LAB**	CO		
	C126.1	Analyze and implement advanced sorting and searching techniques.	L4
	C126.2	Solve problems related to divide and conquer strategy.	L3
	C126.3	Implement greedy method problems.	L3
	C126.4	Develop the dynamic programming algorithms and analyze it to determine its computational complexity.	L6
	C126.5	Implement linear programming algorithms.	L3
	C126.6	Analyse and write efficient algorithms for any complex/ real world problems	L4
C127 **ETHICAL HACKING LAB** **(PSE-4)**	CO		
	C126.1	Evaluate a network and system architecture to identify the vulnerabilities and attack vectors.	L6
	C126.2	Identify security techniques used to protect the system and data	L4
	C126.3	Gain the knowledge of the use and availability of tools to support an ethical hack.	L3
	C126.4	Gain the knowledge of interpreting the results of a controlled attack	L3
	C126.5	Understand the role of politics, inherent and imposed limitations and metrics for planning of attest	L2
	C126.6	Prepare Deliverables and use them productively for enhancing mitigation and developing remedies for vulnerabilities	L6
C127 **MALWARE ANALYSIS LAB** **(PSE-4)**	CO		
	C127.1	To understand the concept of malware and reverse engineering and various tools.	L2
	C127.2	Implement tools and techniques of malware analysis.	L3
	C127.3	To understand memory forensics tools	L2
	C127.4	To understand dynamic analysis	L2
	C127.5	To learn the application of YARA.	L6
C128 **INFORMATION SECURITY LAB** **(PSE-4)**	CO		
	C128.1	Implement various cipher techniques. 2. 3. 4.	L3
	C128.2	Implement various Cryptographic algorithms.	L3
	C128.3	Implement various authentication techniques.	L3
	C128.4	Understand and implement Key Exchange techniques.	L2
C129 **SANSKRIT FOR TECHNICAL** **KNOWLEDGE** **(AC-2)**	CO		
	C129.1	Gain knowledge in basic SANSKRIT language.	L2
	C129.2	Understand the ancient SANSKRIT literature about Science & Technology.	L2
	C129.3	Develop logical and analytical skills	L6

Course Name	CO Number	CO Statement	BT Level
C130 **VALUE EDUCATION** **(AC-2)**	CO		
	C130.1	Gain knowledge on self-development.	L2
	C130.2	Learn the importance of Human Values.	L5
	C130.3	Develop overall personality	L6
C131 **CONSTITUTION OF INDIA** **(AC-2)**	CO		
	C131.1	Get the clarity and idea about function of Indian constitution.	L2
	C131.2	Understand the Rights of equality, the Right of freedom and the Right to constitutional remedies.	L2
	C131.3	Grab the knowledge of union government & their powers and function	L4
	C131.4	Understand state and central policies, fundamental duties.	L2
	C131.5	Understand powers and functions of Municipalities, Panchayats and Co-operative Societies	L2
	C131.6	Understand Electoral Process, special provisions.	L2
C132 **STRESS MANAGEMENT BY YOGA** **(AC-2)**	CO		
	C132.1	Enhancement of Physical strength and flexibility.	L5
	C132.2	Learn to relax and focus.	L3
	C132.3	Relieves physical and mental tension.	L3
	C132.4	Improved work performance/ efficiency	L3
II Year - I Semester			
Course Name	**CO Number**	**CO Statement**	**BT Level**
C201 **WIRELESS NETWORKS** **(PSE-5)**	CO		
	C201.1	Learn to model radio signal propagation issues and analyze their impact on communication system performance.	L6
	C201.2	Understand how the various signal processing and coding techniques combat channel uncertainties.	L2
	C201.3	Understand the techniques of radio spectrum allocation in multi-user systems and their impact on networks capacity.	L2
	C201.4	Introduce various wireless systems and standards and their basic operation cases	L2
	C201.5	Learn to simulate wireless networks and analyze the simulation results	L6
C202 **INTERNET OF THINGS** **(PSE-5)**	CO		
	C202.1	Understand the concepts of Internet of Things	L2
	C202.2	Critical evaluation of IoT & M2M System through understanding of SDN and NFV	L5
	C202.3	Learn basics of python programming language to program in IoT systems	L6
	C202.4	Understanding the Raspberry Pi platform to develop IoT systems	L2
	C202.5	Learn the implementation of web based services in IoT devices.	L6
C203 **NETWORK SECURITY STANDARDS AND APPLICATIONS EVALUATION** **(PSE-5)**	CO		
	C203.1	Identify Security attacks and Systems management.	L4
	C203.2	Acquire good knowledge on Security Auditing and Approaches.	L3
	C203.3	Explain about Access control mechanism and Security tools.	L2
	C203.4	Apply networking and security skills to industrial need.	L3
	C203.5	Understanding Organizational network security related issues and Mitigating Mechanisms.	L2
	C203.6	Summarize the various Application areas of wireless devices	L6
C204 **BUSINESS ANALYTICS** **(OE -1)**	CO		
	C204.1	Knowledge of data analytics.	L1
	C204.2	Think critically in making decisions based on data analytics.	L4
	C204.3	Identify the befitting descriptive tool required for the business problem.	L3
	C204.4	Identify appropriate prescriptive modelling technique for decision making.	L5
	C204.5	Apply suitable predicative method that supports business decision making	L3
	C204.6	Translate data into clear, actionable insights in the decision making process	L6

	CO		
C205 **INDUSTRIAL SAFETY** **(OE -1)**	C205.1	Know the need for safety in industries	L2
	C205.2	Know about factory acts and industrial safety regulations	L5
	C205.3	Analyse causes and types of different hazards on their preventions	L4
	C205.4	Assess quality maintenance processes and maintenance work quality	L5
	C205.5	Assess safety practices and programs.	L5
	C205.6	Know about periodic and preventive maintenance activities in industries	L5
	CO		
C206 **OPERATIONS RESEARCH** **(OE -1)**	C206.1	Apply linear programming models to several Engineering Applications.	L3
	C206.2	Able to apply the concept of nonlinear programming.	L3
	C206.3	In Dynamic Programming selected models were taught.	L2
	C206.4	Apply simple mathematical models in Inventory into the real Engineering Applications.	L3
	C206.5	Solve Game theory problems related to business applications	L3
	C206.6	To minimize waiting time of the customer and optimization of number of servers	L3
	CO		
C207 **COST MANAGEMENT OF** **ENGINEERING PROJECTS** **(OE -1)**	C207.1	Perceive the cost associated in managing engineering projects	L2
	C207.2	Prepare budgets for engineering projects.	L3
	C207.3	Enumerate and effectively handle the inventory management in reducing the project management cost.	L4
	C207.4	Envelope the cost associated in price fixation of the projects.	L6
	C207.5	Orient the cost management decision-making using quantitative methodology in minimizing the cost associated with the projects.	L5
	C207.6	Furnish effective cost management practices for better handling of engineering projects.	L5
	CO		
C208 **COMPOSITE MATERIALS** **(OE -1)**	C208.1	Students will learn different composite materials and their applications	L3
	C208.2	Students will have capacity to integrate knowledge and to analyse, evaluate and manage the different the types of reinforcements.	L4
	C208.3	Develop different types of metal/ceramic/polymer matrix composites and prepare the same for their specific needs as engineers.	L6
	C208.4	Critically enhance strength of the composite materials through Laminar usage.	L3
	CO		
C209 **ENERGY FROM WASTE** **(OE -1)**	C209.1	Understand the methods of recycling of waste.	L2
	C209.2	Compare the methods of waste disposal.	L3
	C209.3	Identify different sources of energy from waste.	L3
	C209.4	Analyze methods for management of waste.	L4
	C209.5	Understand the global trade in hazardous waste	L2
	C209.6	Utilize different sources of energy from waste in an efficient and economical way for practical utilities	L5
	CO		
C210 **POWER FROM RENEWABLE** **ENERGY SOURCES** **(OE -1)**	C210.1	Analyse solar thermal and photovoltaic systems and related technologies for energy conversion	L4
	C210.2	Understand Wind energy conversion and devices available for it	L2
	C210.3	Understand Biomass conversion technologies, Geo thermal resources and energy conversion principles and technologies	L3
	C210.4	Realize Power from oceans (thermal, wave, tidal) and conversion devices	L3
	C210.5	Understand fundamentals of fuel cells and commercial batteries	L2
	C210.6	Suggest suitable method of power generation for a particular region/ organization based on the availability of resources.	L4

	CO		
C211 **PROJECT WORK**	C211.1	Ability to identify an advanced topic & independently carry out research/investigation & development of project work in Computer Networks/Information Security.	L1
	C211.2	Extract information pertinent to the topic through literature survey & comprehend it.	L2
	C211.3	Solve engineering problems pertinent to the chosen topic for feasible solutions in the field of Computer Networks & Information Security.	L3
	C211.4	Identify various security issues & offer solutions to research work in the field of Computer Networks & Information Security for the benefits of society.	L1
	C211.5	Communicate effectively the results of a project in oral presentations and prepare & present an technical report.	L1
	C211.6	Complete an independent research project, resulting in at least a thesis submission and research outputs in terms of publications in journals, conference proceedings etc.	L2