

Department-wise Course Outcomes Index

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4	Electronics & Communication Engineering Course Outcomes

Department of Computer Science & Engineering

CO STATEMENTS OF R18 REGULATION

II-I

1. ANALOG AND DIGITAL ELECTRONICS(A1406)

COURSE NAME	COURSE OUTCOMES
C211.1	Analyze the characteristics of various components(BTL4)
C211.2	Understand the utilization of components(BTL2)
C211.3	Design and analyze small signal amplifier circuits(BTL6)
C211.4	Learn Postulates of Boolean algebra and to minimize combinational functions(BTL1)
C211.5	Design and analyze combinational and sequential circuits(BTL6)
C211.6	Know about the logic families and realization of logic gates(BTL1)

2. PYTHON PROGRAMMING(A1513)

COURSE NAME	COURSE OUTCOMES
C212.1	Examine python syntax and semantics and be fluent in the use of python flow control and functions. (BTL2)
C212.2	Demonstrate proficiency in handling strings and file systems. (BTL3)
C212.3	Create, run and manipulate Python Programs using core data structures like Lists, Dictionaries. (BTL6)
C212.4	Implement Exemplary applications related to Multithreading (BTL3)
C212.5	Create Databases using Python. (BTL6)
C212.6	Apply Data Visualization modules in Python. (BTL3)

3. COMPUTER ORIENTED STATISTICAL METHODS (A1011)

COURSE NAME	COURSE OUTCOMES
C213.1	Formulate and solve problems involving probability and random variables. (BTL2)
C213.2	Apply the concepts of probability and mathematical expectations to discrete distributions functions.(BTL3)
C213.3	find area under normal curve and learn concepts of gamma and exponential distribution.(BTL1)
C213.4	The statistical methods of studying data samples. (BTL1)
C213.5	Apply the inferential methods relating to the means and proportions of Normal Distributions.(BTL3)
C213.6	Ability to lean Markov process and demonstrate problems on Markov chain and stochastic process.(BTL1)

4. COMPUTER ORGANIZATION AND ARCHITECTURE (A1515)

COURSE NAME	COURSE OUTCOMES
C214.1	Apply knowledge of number system, codes and Boolean Algebra to the analysis and design of digital logic circuits(BTL3)
C214.2	Recognize and manipulate representations of numbers stored in digital computers(BTL2)
C214.3	Understand the basics of instructions sets and their impact on processor design(BTL2)
C214.4	Evaluate cost performance and design trade-offs in designing and constructing a computer processor including memory(BTL5)
C214.5	Design a pipeline for consistent execution of instructions with minimum hazards(BTL6)
C214.6	Recognize and manipulate representations of numbers stored in digital computers(BTL2)

5. DATABASE MANAGEMENT SYSTEM (A1516)

COURSE NAME	COURSE OUTCOMES
C215.1	Learn the basic concepts and the applications of database systems(BTL1)
C215.2	Demonstrate the basic elements of a relational database management system(BTL3)
C215.3	Design entity relationship model and convert entity relationship diagrams into RDBMS (BTL6)
C215.4	Identify the normalization techniques for the development of application softwares(BTL4)

C215.5	Apply the basics of Transaction management and Concurrency control(BTL3)
C215.6	Outline various indexing techniques and basic database storage structures (BTL2)

6. PYTHON PROGRAMMING LAB (A1514)

COURSE NAME	COURSE OUTCOMES
C216.1	Develop the application specific codes using python(BTL3)
C216.2	Understand Strings,Lists,Tuples and Dictionaries in python(BTL2)
C216.3	Verify programs using modular approach, file I/O, python standard library(BTL2)
C216.4	Implement Digital systems using python(BTL3)
C216.5	Understanding visualization of data using matplotlib, pandas(BTL2)
C216.6	Implement manipulation of data using numpy(BTL3)

7. DATABASE MANAGEMENT SYSTEM LAB (A1517)

COURSE NAME	COURSE OUTCOMES
C217.1	Design Data Base requirement specification with Entity Relationship Model(BTL6)
C217.2	Design Data Base schema using Relational Model(BTL6)
C217.3	Apply normalization techniques for development of application software to realistic problems(BTL3)
C217.4	Solve queries using SQL DML/DDDL/DCL commands(BTL3)
C217.5	Evaluate simple triggers(BTL5)
C217.6	Create stored procedures and cursors(BTL6)

8. GENDER SENSITIZATION LAB (A1018)

COURSE NAME	COURSE OUTCOMES
C218.1	To developed a better understanding of important issues related to gender in contemporary India(BTL2)
C218.2	To sensitized to basic dimensions of the biological, sociological, psychological and legal aspects of gender(BTL2)
C218.3	To attain a finer grasp of how gender discrimination works in our society and how to counter it(BTL2)
C218.4	To acquire insight into the gendered division of labor and its relation to politics and economics(BTL2)
C218.5	Men and women students and professionals will be better equipped to work and live together as equals(BTL1)

C218.6	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(BTL2)
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9. SKILL DEVELOPMENT COURSE (A1518)

COURSE NAME	COURSE OUTCOMES
C219.1	Understand How to import data into Tableau (BTL2)
C219.2	Understand Tableau concepts of Dimensions and Measures(BTL2)
C219.3	Develop programs and understand how to map Visual layouts and Graphical Properties(BTL3)
C219.4	Create a Dashboard that links multiple visualizations(BTL6)
C219.5	Create Frames for providing solutions to real world problems(BTL6)
C219.6	Understand Advanced Visualization Tools(BTL2)

II-II

1. DISCRETE MATHEMATICS (A1519)

COURSE NAME	COURSE OUTCOMES
C221.1	Understand and construct precise mathematical proofs(BTL2)
C221.2	Use logic and set theory to formulate precise statements(BTL6)
C221.3	Analyze and solve counting problems on finite and discrete structures(BTL4)
C221.4	Describe and manipulate sequences(BTL2)
C221.5	Apply graph theory in solving computing problems(BTL3)
C221.6	Learn the elementary discrete mathematics for computer science and engineering(BTL1)

2. BUSINESS ECONOMICS & FINANCIAL ANALYSIS (A1016)

COURSE NAME	COURSE OUTCOMES
C222.1	Learn business types(BTL1)
C222.2	Learn impact of the economy on business and firms specifically(BTL1)
C222.3	Analyze the business from the financial perspective(BTL4)
C222.4	Understand various forms of business(BTL2)
C222.5	Understand the impact of economic variable on business(BTL2)

3. OPERATING SYSTEMS (A1603)

COURSE NAME	COURSE OUTCOMES
C223.1	Demonstrate the knowledge of the components of computer and their respective roles in computing.(BTL3)
C223.2	Apply different process scheduling algorithms. (BTL3)
C223.3	Distinguish between Deadlock Prevention, Avoidance and Recovery from Deadlock(BTL4)
C223.4	Understand the different Synchronization Problems and The Communication between Processes(BTL2)
C223.5	Illustrate different Memory Management Techniques(BTL3)
C223.6	Distinguish different File Allocation Methods and Free space Management Techniques(BTL4)

4. OBJECT ORIENTED PROGRAMMING THROUGH JAVA(A1520)

COURSE NAME	COURSE OUTCOMES
C224.1	Solve real world problems using OOP techniques(BTL3)
C224.2	Understand the use of packages and abstract classes(BTL2)
C224.3	Create user defined exceptions and handle them(BTL6)
C224.4	Develop multithreaded applications with synchronization(BTL6)
C224 .5	Solve problems using java collection framework and I/o classes(BTL3)
C224.6	Design applets for web applications and GUI based applications(BTL6)

5. SOFTWARE ENGINEERING (A1601)

COURSE NAME	COURSE OUTCOMES
C225.1	Explain software engineering process, including view of process and process models methodologies and work flows(BTL2)
C225.2	Differentiate functional requirements and nonfunctional requirements(BTL4)
C225.3	Develop an appropriate software design using different system models (BTL3)
C225.4	Implement system design, domain model, architectural design and component level design using DFD and OOAD diagrams(BTL3)
C225..5	Identify different testing strategies and about product metrics(BTL4)
C225.6	Develop a simple testing report(BTL6)

6. OS LAB (A1604)

COURSE NAME	COURSE OUTCOMES
C226.1	Implement system that minimizes turnaround time, waiting time and response time and also keep CPU as busy as possible(BTL3)
C226.2	Create access controls to protect files (Directory Level)(BTL3)
C226.3	Apply optimization techniques for the improvement of secondary memory allocation(BTL3)
C226.4	Design different memory management techniques (Main Memory)(BTL6)
C226.5	Implement the virtual memory concepts(BTL3)
C226.6	Implement the concepts of Deadlock prevention, occurrence and avoidance(BTL3)

7. OBJECT ORIENTED PROGRAMMING LAB (A1521)

COURSE NAME	COURSE OUTCOMES
C227.1	Write programs for solving real world problems using java collection framework(BTL3)
C227.2	Solve programs using abstract classes(BTL3)
C227.3	Implement multithreaded programs.(BTL3)
C227.4	Demonstrate Exception handling Technique in java(BTL3)
C227.5	Illustrate different types of sorting Techniques(BTL3)
C227.6	Design GUI programs using awt and swing controls in Java(BTL6)

8. SKILL DEVELOPMENT COURSE

COURSE NAME	COURSE OUTCOMES
C228.1	Understand How to import data into Tableau (BTL2)
C228.2	Understand Tableau concepts of Dimensions and Measures(BTL2)
C228.3	Develop programs and understand how to map Visual layouts and Graphical Properties(BTL3)
C228.4	Create a Dashboard that links multiple visualizations(BTL6)
C228.5	Create Frames for providing solutions to real world problems(BTL6)
C228.6	Understand Advanced Visualization Tools(BTL2)

9. CONSTITUTION OF INDIA (A1017)

COURSE NAME	COURSE OUTCOMES
C229.1	Understand the meaning of the constitution law and constitutionalism(BTL2)
C229.2	Learn Historical perspective of the Constitution of India(BTL1)
C229.3	To know Salient features and characteristics of the Constitution of India(BTL1)
C229.4	Understand the Scheme of the fundamental rights(BTL2)
C229.5	Learn the scheme of the Fundamental Duties and its legal status(BTL1)
C229.6	Learn the Directive Principles of State Policy – Its importance and implementation(BTL1)

III-I

1. FORMAL LANGUAGES AND AUTOMATA THEORY (CS501PC)

COURSE NAME	COURSE OUTCOMES
C311.1	Understand the Deterministic and Nondeterministic finite automata to recognize the languages(BTL2)
C311.2	Apply Regular Expressions for modeling and solving computing problems(BTL3)
C311.3	Design context free grammars for formal languages(BTL6)
C311.4	Understand the pushdown automata and their Acceptance to the machine (BTL2)
C311.5	Illustrate the language of Turing machine (BTL3)
C311.6	Analyze the decidability and undecidability problems(BTL4)

2. SOFTWARE ENGINEERING(CS502PC)

COURSE NAME	COURSE OUTCOMES
C312.1	Explain software engineering process, including view of process and process models methodologies and work flows(BTL2)
C312.2	Differentiate functional requirements and nonfunctional requirements(BTL4)
C312.3	Develop an appropriate software design using different system models (BTL3)
C312.4	Implement system design, domain model, architectural design and component level design using DFD and OOAD diagrams(BTL3)
C312.5	Identify different testing strategies and about product metrics(BTL4)
C312.6	Develop a simple testing report(BTL6)

3. COMPUTER NETWORKS(CS503PC)

COURSE NAME	COURSE OUTCOMES
C313.1	Gain the knowledge of the functions of each layer in the OSI and TCP/IP reference model(BTL1)

C313.2	Understand the Data Link layer and its design issues(BTL2)
C313.3	Analyze different routing algorithms in the network layer (BTL4)
C313.4	Apply the congestion control algorithms(BTL3)
C313.5	Understand Transport Layer, its services and protocols(BTL2)
C313.6	Demonstrate various application layer protocols(BTL3)

4. WEB TECHNOLOGIES(CS504PC)

COURSE NAME	COURSE OUTCOMES
C314.1	Learn basics of PHP server side scripting language (BTL1)
C314.2	Develop static websites through HTML and CSS (BTL6)
C314.3	Understand servlets and configure using XML (BTL2)
C314.4	Develop server side components using servlets and JDBC (BTL6)
C314.5	Analyze MVC based applications using JSP, servlets and JDBC technologies (BTL4)
C314.6	Apply client side validations using JavaScript (BTL3)

5. DATA ANALYTICS(CS513PE)

COURSE NAME	COURSE OUTCOMES
C315.1	Understand the impact of data analytics for business decisions and strategy(BTL2)
C315.2	Understand data analysis/statistical analysis and data modeling techniques(BTL2)
C315.3	Learn the Regression concept and model building(BTL1)
C315.4	Solve Model Theory, Model fit Statistics, Model Construction(BTL3)
C315.5	Categorize supervised and unsupervised models and estimate the accuracy of the algorithms.(BTL4)
C315.6	Analyze the various search methods and visualization techniques.(BTL4)

6. INFORMATION RETRIEVAL SYSTEMS(CS523PE)

COURSE NAME	COURSE OUTCOMES
C316.1	Apply IR principles to locate relevant information for large collections of data(BTL3)
C316.2	Design different document clustering algorithms(BTL6)

C316.3	Implement retrieval systems for web search tasks(BTL3)
C316.4	Design an Information Retrieval System for web search tasks(BTL6)
C316.5	Learn the important concepts and algorithms in IRS(BTL1)
C316.6	Understand the data structures that are necessary to design, and implement information(BTL2)

7. SOFTWARE ENGINEERING LAB(CS505PC)

COURSE NAME	COURSE OUTCOMES
C317.1	Develop a software project by using various software engineering principles(BTL3)
C317.2	Understand methods in each of the phases of software development(BTL2)
C317.3	Ability to translate end-user requirements into system and software requirements(BTL2)
C317.4	Ability to generate a high-level design of the system from the software requirements(BTL2)
C317.5	To experience and/or awareness of testing problems(BTL1)
C317.6	Develop a simple testing report(BTL6)

8. COMPUTER NETWORKS AND WEB TECHNOLOGIES LAB(CS506PC)

COURSE NAME	COURSE OUTCOMES
C318.1	Implement data link layer framing methods(BTL3)
C318.2	Analyze error detection and error correction codes(BTL4)
C318.3	Implement and analyze routing and congestion issues in network design(BTL3)
C318.4	Develop website for online book store (BTL6)
C318.5	Create XML Document to store users information(BTL6)
C318.6	Demonstrate Servlet, JSP and JDBC connectivity to Database(BTL3)

9. ADVANCED COMMUNICATION SKILLS LAB(EN508HS)

COURSE NAME	COURSE OUTCOMES
C319.1	To improve the students fluency in English, through a well-developed vocabulary(BTL3)
C319.2	Enable them to listen to English spoken at normal conversational speed by educated English speakers(BTL3)
C319.3	Able respond appropriately in different socio-cultural and professional contexts(BTL3)
C319.4	Able to communicate their ideas relevant BTLy and coherent BTLy in writing(BTL3)

C319.5	To prepare all the students for their placements(BTL3)
C319.6	Taking part in social and professional communication(BTL3)

III-II

1. MACHINE LEARNING(CS601PC)

COURSE NAME	COURSE OUTCOMES
C321.1	Understand the concepts of computational intelligence like machine learning(BTL2)
C321.2	Apply machine learning techniques to address the real time problems in different areas(BTL3)
C321.3	Understand the Neural Networks and its usage in machine learning applications(BTL2)
C321.4	Explain machine learning techniques such as decision tree learning, Bayesian learning etc(BTL2)
C321.5	Study the pattern comparison techniques(BTL1)
C321.6	Understand computational learning theory(BTL2)

2. COMPILER DESIGN(CS602PC)

COURSE NAME	COURSE OUTCOMES
C322.1	Describe translation in each phase of the compilation(BTL1)
C322.2	Design parsers for the compilers(BTL6)
C322.3	Define the specific semantic test and enhance the parser to construct a symbol table(BTL1)
C322.4	Describe the different forms of Intermediate code(BTL1)
C322.5	Perform Code Optimization and understanding runtime environment(BTL3)
C322.6	Design code generation schemes on machine dependent optimizations(BTL6)

3. DESIGN AND ANALYSIS OF ALGORITHMS(CS603PC)

COURSE NAME	COURSE OUTCOMES
C323.1	Describe the performance of algorithms(BTL1)
C323.2	Analyze appropriate data structures and design algorithms for a specified application(BTL4)
C323.3	Understand the data structures algorithm design methods impact on the performance of programs(BTL2)
C323.4	Solve problems using algorithm techniques such as divide-and-conquer, backtracking, dynamic programming, greedy method(BTL3)
C323.5	Compare different algorithms using worst, average, and best case analysis(BTL4)

C323.6	Discuss NP- hard and NP- Complete problems(BTL2)
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4. SCRIPTING LANGUAGES(CS613PE)

COURSE NAME	COURSE OUTCOMES
C324.1	Learn the scripting programming paradigm and Gain the knowledge in RUBY (BTL1)
C324.2	Acquire knowledge in extending RUBY like memory allocation, Embedding a Ruby Interpreter (BTL1)
C324.3	Understand PERL scripting language (BTL2)
C324.4	Apply Control Structures, arrays, list, hashes, strings in PERL (BTL3)
C324.5	Create internet ware applications using Advanced PERL (BTL6)
C324.6	Demonstrate event driven programs, Nuts and Bolts Internet Programming using TCL and Tk (BTL3)

5. DIASTER PREPAREDNESS AND PLANNING MANAGEMENT(CE600OE)

COURSE NAME	COURSE OUTCOMES
C325.1	Understand how to conduct needs assessment(BTL2)
C325.2	Develop the project cycle, and key activities to be undertaken at each stage(BTL3)
C325.3	Understand major roles and responsibilities of the project manager(BTL2)
C325.4	Understand role of the log frame in project monitoring & evaluation(BTL2)
C325.5	Discuss the role of indicators for project preparation, implementation & evaluation (BTL2)
C325.6	Able to formulate and digitize project indicators in log frame format(BTL2)

6. MACHINE LEARNING LAB(CS604PC)

COURSE NAME	COURSE OUTCOMES
C326.1	Understand complexity of Machine Learning algorithms and their limitations(BTL2)
C326.2	Understand modern notions in data analysis-oriented computing(BTL2)
C326.3	Apply Machine Learning algorithms in practice(BTL3)
C326.4	Demonstrate Machine Learning algorithms using Python(BTL3)
C326.5	Performing experiments in Machine Learning using real-world data(BTL3)
C326.6	Analyze the various machine learning techniques(BTL4)

7. COMPILER DESIGN LAB (CS605PC)

COURSE NAME	COURSE OUTCOMES
C327.1	Design and develop interactive and dynamic web applications using HTML, CSS, JavaScript and XML(BTL6)
C327.2	Design and implement LL and LR parsers(BTL6)
C327.3	Apply client-server principles to develop scalable and enterprise web applications(BTL3)
C327.4	Design, develop, and implement a compiler for any language(BTL6)
C327.5	Apply lex and yacc tools for developing a scanner and a parser(BTL3)
C327.6	Design top-down and bottom-up parsers(BTL6)

8. SCRIPTING LANGUAGES LAB(CS623PE)

COURSE NAME	COURSE OUTCOMES
C328.1	Understand the concepts of scripting languages for developing web based projects (BTL2)
C328.2	Understand the applications the of Ruby, TCL, Perl scripting languages (BTL2)
C328.3	Design the applications using Ruby (BTL6)
C328.4	Create the applications using Perl.(BTL6)
C328.5	Design the applications using TCL (BTL6)
C328.6	Analyze the Scripting languages and programming languages (BTL4)

9 ENVIRONMENTAL SCIENCE(MC609)

C329.1	Understand the technologies on the basis of ecological principles and environmental regulations(BTL2)
C329.2	Evaluate technologies on the basis of ecological principles and environmental regulations(BTL3)
C329.3	Develop technologies on the basis of ecological principles and environmental regulations(BTL3)
C329.4	Understanding the importance of ecological balance for sustainable development.(BTL2)
C329.5	Understanding the impacts of developmental activities and mitigation measures(BTL2)
C329.6	Understanding the environmental policies and regulations(BTL2)

IV-I

1. CRYPTOGRAPHY AND NETWORK SECURITY (CS701PC)

COURSE NAME	COURSE OUTCOMES
C411.1	Understand basic cryptographic algorithms, message and web authentication and security issues(BTL2)
C411.2	Identify information system requirements for both client and server(BTL4)
C411.3	Learn the current legal issues towards information security(BTL1)
C411.4	Analyze the basic categories of threats to computers and networks(BTL4)
C411.5	Discuss about wireless network security protocols(BTL2)
C411.6	Apply IP Security protocols(BTL3)

2. DATA MINING (CS702PC)

COURSE NAME	COURSE OUTCOMES
C412.1	Understand the fundamentals of data mining(BTL2)
C412.2	Apply preprocessing methods for any given raw data(BTL3)
C412.3	Apply knowledge on association rules and its uses in real time(BTL3)
C412.4	Differentiate the algorithms on generation frequent patterns(BTL4)
C412.5	Synthesize the information about methods for classification and prediction(BTL2)
C412.6	Analyze the various methods for creating clusters(BTL4)

3. CLOUD COMPUTING (CS714PE)

COURSE NAME	COURSE OUTCOMES
C413.1	Analyze the system models with its vulnerabilities(BTL4)
C413.2	Understand various service delivery models of a cloud computing architecture. (BTL2)
C413.3	Understanding different services model of cloud computing(BTL2)
C413.4	Analyze cloud storage systems and cloud security, the risks involved, its impact(BTL4)
C413.5	Understand cloud service providers(BTL2)
C413.6	Design the ways in which the cloud can be programmed and deployed. (BTL6)

4. INTERNET OF THINGS (CS724PE)

COURSE NAME	COURSE OUTCOMES
C414.1	Learn the terminology, technology and its applications(BTL1)
C414.2	Understand the concept of M2M (machine to machine) with necessary protocols(BTL2)
C414.3	Design IoT devices using Python Scripting Language (BTL6)
C414.4	Understand Exception handling Python packages - JSON, XML, HTTPLib, URLLib, SMTPLib(BTL2)
C414.5	Demonstrate Raspberry PI platform in IoT applications(BTL3)
C414.6	Implement web based services on IoT devices(BTL3)

5. PRINCIPLES OF ENTREPRENEURSHIP (MT701OE)

COURSE NAME	COURSE OUTCOMES
C415.1	Understanding basic concepts in the area of entrepreneurship(BTL2)
C415.2	Understanding the financing and managing the new ventures(BTL2)
C415.3	Developing industrial financial support for new and young entrepreneurs(BTL3)
C415.4	Developing the industrial financial schemes and functions for start ups and new establishments(BTL3)
C415.5	Understanding production and marketing management(BTL2)
C415.6	Understanding the acts of labour legislations and their laws. (BTL2)

6. CRYPTOGRAPHY AND NETWORK SECURITY LAB (CS703PC)

COURSE NAME	COURSE OUTCOMES
C416.1	Implement the Diffie-Hellman Key Exchange mechanism using HTML and JavaScript(BTL3)
C416.2	Calculate the message digest of a text using the SHA-1 algorithm in JAVA(BTL2)
C416.3	Calculate the message digest of a text using the MD5 algorithm in JAVA(BTL2)
C416.4	Implement the DES , Blowfish , Rijndael algorithm logic(BTL3)
C416.5	Perform encryption and decryption using Ceaser cipher Substitution cipher Hill Cipher(BTL3)

C416.6	Create your own key using Java key tool(BTL6)
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IV-II

1. ORGANIZATIONAL BEHAVIOUR (SM801MS)

COURSE NAME	COURSE OUTCOMES
C421.1	Demonstrate the applicability of the concept of organizational behavior to understand the behavior of people in the organization(BTL2)
C421.2	Demonstrate the applicability of analyzing the complexities associated with management of individual behavior in the organization(BTL2)
C421.3	Analyze the complexities associated with management of the group behavior in the organization(BTL4)
C421.4	Demonstrate how the organizational behavior can integrate in understanding the motivation (why) behind behavior of people in the organization(BTL2)
C421.5	To provide the students to analyze specific strategic human resources demands for future action(BTL1)
C421.6	To enable students to describe how people behave under different conditions and understand why people behave(BTL1)

2. HUMAN COMPUTER INTERACTION (CS814PE)

COURSE NAME	COURSE OUTCOMES
C422.1	Understand The Importance Of Graphical User Interface (BTL2)
C422.2	Design the screen for easy navigation of data , content, screen elements(BTL6)
C422.3	Apply screen designing for different applications(BTL3)
C422.4	Analyze navigation schemes based on window and device(BTL4)
C422.5	Design HCI patterns Evaluation techniques through expert analysis (BTL6)
C422.6	Identify components involved in designing a GUI(BTL4)

3. ENVIRONMENTAL IMPACT ASSESSMENT (CE800OE)

COURSE NAME	COURSE OUTCOMES
C423.1	Learn the concept of Environmental impact assessment(BTL1)
C423.2	Identify the objectives and scope of Environmental impact assessment (BTL4)
C423.3	Illustrate the necessity of public participation in EIA studies(BTL3)
C423.4	Summarize the importance of environmental attributes(BTL4)

C423.5	Understand the phenomena of impacts on environment(BTL2)
C423.6	Describe the impacts for various development projects(BTL1)

Department of Computer Science & Engineering (AI & ML)

DISCRETE MATHEMATICS (A1519):

Course Name	Course Outcomes
C201.1	Ability to understand and construct elementary mathematic. Ability to analyze and examine the validity of arguments by using propositional and predicate calculus.cal logical arguments (BTL1).
C201.2	Ability to apply sets, relations to solve applied problems.(BTL-4)
C201.3	Ability to identify algebraic structures and group theory concept. (BTL1)
C201.4	Ability to apply Boolean algebra on poset and lattices.(BTL1)
C201.5	Ability to analyze and solve counting problems on permutations and combinations.(BTL1)
C201.6	Able to model and solve real world problems using graphs and trees.(BTL1)

OBJECT ORIENTED PROGRAMMING THROUGH JAVA (A1520):

Course Name	Course Outcomes
C202.1	Understand and real world problems using OOP techniques. (BTL1)
C202.2	Demonstrate the use of abstract classes and inheritance.(BTL2)
C202.3	Develop reusable programs and solve using java collection framework and I/O classes.(BTL6)
C202.4	Apply concepts of multithreaded applications using synchronization. (BTL4)
C202.5	Develop applets for web applications using AWT concepts(BTL6)
C202.6	Design GUI based applications (BTL6)

COMPUTER ORGAIZATION AND ARCHITECTURE (A1515)

Course Name	Course Outcomes
C203.1	understanding of the design of the functional units of a digital computer system (BTL1)
C203.2	Understand the basics of instruction sets and their impact on computer design(BTL1)
C203.3	Recognize and manipulate representations of numbers stored in digital computer(BTL4)
C203.4	Recognize and manipulate representations of numbers stored in digital computer(BTL1)
C203.5	Evaluate cost performance and design trade-offs in designing and constructing a computer processor including memory(BTL1)
C203.6	Design a pipeline for consistent execution of instructions with minimum hazards(BTL1)

Software Engineering (A1601)

Course Name	Course Outcomes
C204.1	Understand the evolving and changing nature of software , process framework, and set of process models. (BTL1)
C204.2	Analyze functional and non-functional requirements, and the requirements engineering process. (BTL4)
C204.3	Understand the Design engineering process (BTL1)

C204.4	Design and Implementing the structural and behavioral modeling diagrams in UML for different case studies(BTL6)
C204.5	Apply the testing strategies, and software quality metrics .(BTL4)
C204.6	Understand the principles and practices of risk, and quality management in software engineering, ISO 9000 quality standards. (BTL1)

OPERATING SYSTEMS (A1603)

Course Name	Course Outcomes
C205.1	Describe the basics of the operating systems, mechanisms of OS to handle processes, threads, and their communication.(BTL1)
C205.2	Implement scheduling algorithms and Illustrate different conditions for deadlocks.(BTL1)
C205.3	Differentiate IPC processes and the process management and its allocation policies.(BTL1)
C205.4	Analyze process management and synchronization techniques.(BTL1)
C205.5	Discuss the storage management policies with respect to different storage management technologies(BTL1)
C205.6	Understand I/O management and File systems. (BTL1)

Java Lab (A1608)

Course Name	Course Outcomes
C206.1	Able to write programs for solving real world problems using java collection framework(BTL2)
C206.2	Able to write programs using abstract classes(BTL4)
C206.3	Ability to write multithreaded programs.(BTL6)
C206.4	Able to write GUI programs using swing controls in Java(BTL3)Formulate queries using SQL DML/DDDL/DCL commands(BTL3)
C206.5	To introduce java compiler and eclipse platform(BTL2)
C206.6	To impart hands on experience with java programming(BTL2)

OS Lab (A1604)

Course Name	Course Outcomes
C204.1	implement system that minimizes turnaround time, waiting time and response time and also maximize through and also maximize throughput by keeping CPU as busy as possible(BTL3)
C204.2	create access controls to protect files (Directory Level)(BTL3)
C204.3	Apply optimization techniques for the improvement of secondary memory allocation (BTL3)
C204.4	Design different memory management techniques (Main Memory)(BTL6)
C204.5	Debug and optimize Python code for correctness, efficiency, and robustness.BTL-5 (Evaluate)
C204.6	Implementing the concepts of Deadlock prevention, occurrence and avoidance(BTL-3)

Software Engineering Lab (A1602)

Course Name	Course Outcomes
C208.1	Understand the User requirements(BTL2)
C208.2	Analyze the software Requirements Specifications document(BTL4)
C208.3	Develop the concepts of the Design for a given case study. Model Use case, class ,object diagrams(BTL6)
C208.4	Model the Use Sequence, Collaboration,& Activity diagram using Star UML(BTL4)
C208.5	Design the Test Cases required for Unit& Integration, White& Black Box Testing Strategies.(BTL-6)
C208.6	Identify the Risk analysis, Risk mitigation& Configuration Management and prepare the necessary documentations(BTL-2)

SDC Lab (A1605)

Course Name	Course Outcomes
C209.1	Build a custom website with HTML,CSS, and Bootstrap and little JavaScript (BTL3)
C209.2	Demonstrate Advanced features of Java Script and learn about JDBC(BTL3)
C209.3	Develop server-side implementation using Java Technologies (BTL3)
C209.4	Develop the server side implementation using Node js (BTL4)
C209.5	Design a single page Application using React (BTL6)
C209.6	Deploy dynamic web applications using modern technologies (BTL6)

MATHEMATICAL STATISTICAL METHODS (A1012):

Course Name	Course Outcomes
C211.1	Apply the number theory concepts to cryptography etc(BTL3)
C211.2	Apply the concepts of probability and distributions to some case studies(BTL3)
C211.3	correlate the material of one unit to the materials in other units(BTL4)
C211.4	Resolve the potential misconceptions and hazards in each topic of study(BTL2)
C211.5	Apply simple linear regression model to real life examples(BTL3)
C211.6	Understand common probability distributions for discrete and continuous variables(BTL1)

AUTOMATA THEORY AND COMPILER DESIGN (A1606):

Course Name	Course Outcomes
C212.1	Identify and understand the concept of abstract machines and their power to recognize the languages (BTL2)
C212.2	Explore Context free grammar for formal languages. (BTL4)
C212.3	Able to distinguish between decidability and undecidability (BTL4)
C212.4	Implement LL and LR parsers(BTL3)
C212.5	Design and develop Intermediate code for a given language(BTL6)
C212.6	Design a compiler if given a set of language features. (BTL6)

DBMS (A1516)

Course Name	Course Outcomes
C213.1	Understand the basics of Database Systems and its Design(BTL1)
C213.2	Implementing the Integrity constraints on Relations and querying the Views(BTL3)
C213.3	Apply SQL to find solutions to broad range of queries(BT33)
C213.4	Apply normalization techniques to improve DB design(BTL3)
C213.5	Understand the Transaction concepts and Lock protocol(BTL1)
C213.6	Differentiate the file organizations methods and Index data structure(BTL4)

IAI (1607)

Course Name	Course Outcomes
C214.1	Understand the difference between optimal reasoning and human-like reasoning(BTL1)
C214.2	Implement state space and heuristic search strategies(BTL3)
C214.3	Apply AI techniques in real-world applications(BTL3)
C214.4	Master knowledge representation techniques(BTL2)
C214.5	Analyze and implement classical and hierarchical planning approaches(BTL4)
C214.6	Apply probabilistic reasoning and Bayesian networks(BTL3)

PYTHON PROGRAMMING (A1513)

Course Name	Course Outcomes
C215.1	Examine python syntax and semantics and be fluent in the use of python flow control and functions(BTL4)
C215.2	demonstrate proficiency in handling strings and file systems(BTL2)
C215.3	Create, run and manipulate Python Programs using core data structures like Lists, Dictionaries and use of Regular Expressions(BTL6)
C215.4	Implement Exemplary applications related to Multithreading(BTL3)
C215.5	Implement Databases in Python(BTL3)
C215.6	To Implement concepts of Data Visualization in Python(BTL3)

DBMS LAB (1517)

Course Name	Course Outcomes
C216.1	Discuss Data Base requirement specification with Entity Relationship Model(BTL1)
C216.2	Design Data Base schema using Relational Model(BTL6)
C216.3	Apply normalization techniques for development of application software to realistic problems (BTL3)
C216.4	Formulate queries using SQL DML/DDD/DCL commands(BTL6)
C216.5	Formulate simple triggers(BTL6)
C216.6	Create stored procedures and cursors(BTL6)

PP LAB (A1513)

Course Name	Course Outcomes
C217.1	Recall Python syntax, data types, and basic programming constructs.()

C217.2	Explain Python control structures, functions, and object-oriented programming concepts.(BTL-2)
C217.3	Implement Python programs to solve computational problems using data structures and algorithms.(BTL-3)
C217.4	Analyze problem requirements to design modular and efficient Python solutions.(BTL-4)
C217.5	Debug and optimize Python code for correctness, efficiency, and robustness.(BTL-5)
C217.6	Develop real-world applications by integrating Python libraries for data handling, visualization, and automation.(BTL-6)

SDC Lab (A1610)

Course Name	Course Outcomes
C219.1	Demonstrate an understanding of the syntax and semantics of Prolog for declarative programming. (BTL-6)
C219.2	Develop efficient Prolog programs to solve logic-based problems using facts, rules, and queries. (BTL-6)
C219.3	Analyze and debug Prolog programs to identify and resolve logical and syntactical errors. (BTL-4)
C219.4	Design and implement Prolog solutions for real-world problems, such as knowledge representation, and decision-making systems. (BTL-6)
C219.5	Evaluate the performance of Prolog-based algorithms and optimize them for improved execution efficiency. (BTL-5)
C219.6	Apply Prolog in interdisciplinary contexts, such as artificial intelligence and expert systems, to enhance problem-solving capabilities. (BTL-3)

COMPILER DESIGN (155EG)

Course Code	Course Outcomes
C304.1	Understand the fundamentals of language translator and compiler design.
C304.2	Analyze patterns, tokens & regular expressions for lexical analysis.
C304.3	Understand Syntax-Directed Translation to generate intermediate code.
C304.4	Demonstrate parsing using Lex tools.
C304.5	Understand runtime environments and code generation.
C304.6	Apply techniques to perform machine-independent optimization.

COMPUTER NETWORKS (155AN)

Course Code	Course Outcomes
C303.1	Understand the concepts of OSI and TCP/IP reference model and discuss the each layer in these models.

C303.2	Analyze flow control and error control mechanisms and apply them using standard data link layer protocols.
C303.3	Design subnets and apply various routing algorithms to find shortest paths for packet delivery.
C303.4	Identify various congestion control algorithms and calculate the IP addresses of the network.
C303.5	Discuss various services and assess the protocols offered by the transport layer such as TCP and UDP.
C303.6	Explain in detail the features and operations of various protocols of the application layer such as HTTP, DNS, and SMTP.

DESIGN AND ANALYSIS OF ALGORITHMS (155EV)

Course Code	Course Outcomes
C301.1	Understand the performance of algorithms.
C301.2	Design large problems by using the divide-and-conquer method.
C301.3	Understand how the choice of data structures and the algorithm design methods impact the performance of programs.
C301.4	Distinguish, synthesize dynamic-programming algorithms, and analyze them.
C301.5	Describe the greedy paradigm and explain when an algorithmic design situation calls for it.
C301.6	Describe the classes P, NP, and NP-Complete and be able to prove that a certain problem is NP-Complete.

WEB PROGRAMMING (155DM)

Course Code	Course Outcomes
C305.1	Design web pages.
C305.2	Use technologies of Web Programming.
C305.3	Apply object-oriented aspects to scripting.
C305.4	Create databases with connectivity using JDBC.
C305.5	Build web-based applications using sockets.
C305.6	Explore the Inet Address class for network communication.

INFORMATION RETRIEVAL SYSTEMS (155EN)

Course Code	Course Outcomes
C306.2.1	Explain the fundamental concepts, objectives, and functions of information retrieval systems.
C306.2.2	Apply various indexing techniques, including automatic indexing and information extraction.
C306.2.3	Explain the different classes of automatic indexing and their applications.
C306.2.4	Evaluate the quality and effectiveness of clusters using appropriate metrics and validation techniques.
C306.2.5	Implement and manage Selective Dissemination of Information systems to keep users informed about new and relevant information.
C306.2.6	Evaluate the efficiency and effectiveness of different text search algorithms &

retrieval techniques.

MACHINE LEARNING (155BZ)

Course Code	Course Outcomes
C302.1	Understand the fundamental issues hypothesis and version spaces.
C302.2	Analyze the concepts of neural networks for learning linear and non-linear activation functions.
C302.3	Understand the underlying mathematical relationships within and across Machine Learning algorithms.
C302.4	Analyze ML algorithms to identify the size, complexity, the implicit inductive bias, the computational properties of the algorithm, convergence, correctness, and accuracy.
C302.5	Design and implement genetic algorithms for optimization of Engineering Problems.
C302.6	Differentiate Inductive and Analytical Learning, and apply Inductive Analytical Models.

NATURAL LANGUAGE PROCESSING (156FK)

Course Code	Course Outcomes
C313.1	Demonstrate the wide spectrum of problem statements, tasks, Issues, Challenges, and solution approaches within NLP.
C313.2	Understand the use of Context Free Grammar and Probabilistic CFG for Syntax analysis in NLP.
C313.3	Identify the role of Semantic analysis and various System Paradigms for semantic Parsing.
C313.4	Apply various supervised, semi-supervised, and unsupervised methods for Word Sense Disambiguation in NLP.
C313.5	Understand Predicate argument structure for meaning representations in NLP.
C313.6	Understand the concept of Coherence, Cohesion, and various language models.

ARTIFICIAL INTELLIGENCE (156EK)

Course Code	Course Outcomes
C311.1	Understand the difference between optimal reasoning and human-like reasoning.
C311.2	Implement state space and heuristic search strategies.
C311.3	Apply AI techniques in real-world applications.
C311.4	Master knowledge representation techniques.
C311.5	Analyze and implement classical and hierarchical planning approaches.
C311.6	Apply probabilistic reasoning and Bayesian networks.

DEVOPS (156FB)

Course Code	Course Outcomes
C312.1	Identify components of DevOps environment.
C312.2	Describe Software development models and architectures of DevOps.
C312.3	Apply different project management, integration, testing, and code deployn

C312.4	Investigate different DevOps Software development models.
C312.5	Assess various DevOps practices.
C312.6	Collaborate and adopt DevOps in real-time projects.

DISASTER PREPAREDNESS & PLANNING MANAGEMENT (156DP)

Course Code	Course Outcomes
C315.1	The application of Disaster Concepts to Management.
C315.2	Analyzing Relationship between Development and Disasters.
C315.3	Ability to understand Categories of Disasters.
C315.4	Realization of the responsibilities to society.
C315.5	Building codes, infrastructure improvements, and land-use planning.
C315.6	Dams: Can lead to displacement, changes in water flow, and increased seismic activity.

SCRIPTING LANGUAGES (156CU)

Course Code	Course Outcomes
C314.1	Design and implement graphical user interfaces using RubyTk, including handling events and drawing on canvases.
C314.2	Demonstrations of embedding Ruby in different host languages and environments.
C314.3	Apply basic pattern matching and regular expressions in Perl scripts.
C314.4	Explain Perl scripts using conditional statements and loops.
C314.5	Execute reusable code by developing and utilizing packages and modules.
C314.6	Demonstrate proficiency in the basic structure and syntax of TCL.

REINFORCEMENT LEARNING (157HR)

Course Code	Course Outcomes
C402.1	Understand basics of Reinforcement Learning.
C402.2	Understand Reinforcement Learning Framework and design of Markov Decision Process.
C402.3	Analyze Reinforcement Learning through the use of Dynamic Programming and Monte Carlo methods.
C402.4	Analyze Temporal-difference learning, TD(0) algorithm, and TD(λ) algorithm.
C402.5	Understand Linear function approximation and Fitted Q iteration.
C402.6	Apply the Reinforcement Learning techniques to real-world applications.

CLOUD COMPUTING (157AW)

Course Code	Course Outcomes
C403.1	Ability to understand various service delivery models of a cloud computing architecture
C403.2	Ability to understand the ways in which the cloud can be programmed and de
C403.3	Understanding cloud service providers.

C403.4	Develop practical skills and theoretical knowledge essential for working with cloud technologies in various professional settings.
C403.5	Capability to evaluate which service model is appropriate for specific organizational needs and applications.
C403.6	Ability to select the appropriate provider based on organizational needs, application requirements, and budget considerations.

AD-HOC AND SENSOR NETWORKS (157AA)

Course Code	Course Outcomes
C404.1	Ability to design and implement efficient routing algorithms tailored for MANETs.
C404.2	Capability to analyze and mitigate challenges such as the broadcast storm problem in data transmission.
C404.3	Proficiency in evaluating and applying various multicasting techniques in MANETs.
C404.4	Competence in addressing geocasting challenges and implementing geocast protocols for efficient data transmission.
C404.5	Understanding the architecture and lower layer issues of Wireless Sensor Networks, including physical, MAC, link, and routing layers.
C404.6	Ability to adapt to and manage the dynamic nature of Wireless Sensor Networks, ensuring reliable transport and application layer support.

NEURAL NETWORKS AND DEEP LEARNING (157HK)

Course Code	Course Outcomes
C401.1	Ability to understand the concepts of Neural Networks.
C401.2	Ability to select the Learning Networks in modeling real-world systems.
C401.3	Ability to use an efficient algorithm for Deep Models.
C401.4	Ability to design, implement, and train deep feed-forward networks for various tasks such as classification and regression.
C401.5	Ability to utilize unlabeled data alongside labeled data to improve model performance, understanding the principles and algorithms of semi-supervised learning.
C401.6	Ability to apply optimization strategies for large-scale applications.

PRINCIPLES OF ENTREPRENEURSHIP (157EX)

Course Code	Course Outcomes
C405.1	Distinguish between Entrepreneur and Manager.
C405.2	Learn how to write project reports for new venture business plans.
C405.3	Explain how to record financial, marketing, and sales activities of startups.
C405.4	Describe maintaining good relationships with the Directorate of Industries for support of schemes and functions.
C405.5	Search, find, and select the most demanded areas of production and promote marketing.

C405.6	Discuss the legal and law aspects of taking permissions for new enterprises.
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SEMANTIC WEB (158FE)

Course Code	Course Outcomes
C412.1	Understand the characteristics of the Semantic Web.
C412.2	Apply SOAP and UDDI to web services.
C412.3	Handle multiple web services using orchestration.
C412.4	Create documents using XML.
C412.5	Construct and use ontologies.
C412.6	Evaluate the strengths and limitations of these tools in practical scenarios.

ORGANIZATIONAL BEHAVIOUR (158CA)

Course Code	Course Outcomes
C411.1	Understand the importance of organizational behavior, environmental, and organizational contexts.
C411.2	Study the concepts of cognitive processes.
C411.3	Understand communication and its strategies.
C411.4	Analyze decision-making and dynamics of organizational behavior.
C411.5	Evaluate power, politics, and group dynamics.
C411.6	Apply leadership theories and performance management strategies.

Department of Computer Science & Engineering (Data Science)

CO STATEMENTS–R22 REGULATION

II-I

Analog and Digital Electronics

COURSE NAME	COURSE OUTCOMES
C211.1	The students will be able to Know the characteristics of various components.
C211.2	The students will be able Understand the utilization of components.
C211.3	The students will be able Design and analyze small signal amplifier circuits.
C211.4	The students will be able Learn Postulates of Boolean algebra and to minimize Combinational functions
C211.5	The students will be able Design and analyze Combinational and sequential circuits
C211.6	The students will be able Know about the logic families and realization of logic gates.

Python Programming

COURSE NAME	COURSE OUTCOMES
C212.1	Examine Python syntax and semantics and be fluent in the use of Python flow control and functions.
C212.2	Demonstrate proficiency in handling Strings and File Systems.
C212.3	Create, run and manipulate Python Programs using core data structures like Lists, Dictionaries and use Regular Expressions.
C212.4	Implement exemplary applications related to Databases in Python.
C212.5	Implement the concepts of data visualization in Python.

Computer Oriented Statistical Methods

COURSE NAME	COURSE OUTCOMES
C213.1	the student must be able to Apply the concepts of probability and distributions to case studies.
C213.2	the student must be able to Formulate and solve problems involving random variables and apply statistical methods for analyzing experimental data.
C213.3	the student must be able to Apply concept of estimation and testing of hypothesis to case studies.
C213.4	the student must be able to Correlate the concepts of one unit to the concept in other units.

COMPUTER ORGANIZATION AND ARCHITECTURE

COURSE NAME	COURSE OUTCOMES
C214.1	Understand the basics of instruction sets and their impact on processor design.
C214.2	Demonstrate an understanding of the design of the functional units of a digital computer System.
C214.3	Evaluate cost performance and design trade-offs in designing and constructing a computer processor including memory.
C214.4	Design a pipeline for consistent execution of instructions with minimum hazards.
C214.5	Recognize and manipulate representations of numbers stored in digital computers

DATABASE MANAGEMENT SYSTEMS

COURSE NAME	COURSE OUTCOMES
C215.1	Gain knowledge of fundamentals of DBMS, database design and normal forms
C215.2	Master the basics of SQL for retrieval and management of data.
C215.3	Be acquainted with the basics of transaction processing and concurrency control.
C215.4	Familiarity with database storage structures and access techniques

PYTHON PROGRAMMING LABORATORY

COURSE NAME	COURSE OUTCOMES
C216.1	the student should be able to Develop the application specific codes using python.
C216.2	the student should be able to Understand Strings, Lists, Tuples and Dictionaries in Python
C216.3	the student should be able to Verify programs using modular approach, file I/O, Python standard library
C216.4	the student should be able to Implement Digital Systems using Python

DATABASE MANAGEMENT SYSTEMS LAB

COURSE NAME	COURSE OUTCOMES
C217.1	Design database schema for a given application and apply normalization
C217.2	Acquire skills in using SQL commands for data definition and data manipulation.
C217.3	Develop solutions for database applications using procedures, cursors and triggers

GENDER SENSITIZATION LAB

COURSE NAME	COURSE OUTCOMES
C218.1	Students will have developed a better understanding of important issues related to gender in contemporary India.
C218.2	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.
C218.3	Students will attain a finer grasp of how gender discrimination works in our society and how to counter it.
C218.4	Students will acquire insight into the gendered division of labor and its relation to politics and economics.
C218.5	Men and women students and professionals will be better equipped to work and live together as equals.
C218.6	Students will develop a sense of appreciation of women in all walks of life.

SKILL DEVELOPMENT COURSE

(DATA VISUALIZATION - R PROGRAMMING/ POWER BI)

COURSE NAME	COURSE OUTCOMES
C219.1	Student should be able to Understand How to import data into Tableau.
C219.2	Student should be able to Understand Tableau concepts of Dimensions and Measures.
C219.3	Student should be able to Develop Programs and understand how to map Visual Layouts and Graphical Properties.
C219.4	Student should be able to Create a Dashboard that links multiple visualizations.
C219.5	Student should be able to Use graphical user interfaces to create Frames for providing solutions to real world problems.

HUMAN VALUES AND ETHICS

COURSE NAME	COURSE OUTCOMES
C219.1	The student will be able to Analyze the process self-exploration, right understanding, relationships, natural acceptance for achieving ultimate happiness To design and work with databases using Java
C219.2	The student will be able to Examine human being as a co-existence of self 'I' and the material Body
C219.3	The student will be able to Correlate the universal harmonious order in society, undivided society and from family to world family.
C219.4	The student will be able to Interpret the harmony in nature, holistic perception at all levels of existence.
C219.5	The student will be able to Analyze professional competence for augmenting universal human order, ethical human conduct for acceptance of human values.

II-II

Discrete Mathematics

COURSE NAME	COURSE OUTCOMES
C221.1	Understand and construct precise mathematical proofs
C221.2	Apply logic and set theory to formulate precise statements
C221.3	Analyze and solve counting problems on finite and discrete structures
C221.4	Describe and manipulate sequences
C221.5	Apply graph theory in solving computing problems

BUSINESS ECONOMICS AND FINANCIAL ANALYSIS

COURSE NAME	COURSE OUTCOMES
C222.1	The students will understand the various Forms of Business and the impact of economic variables on the Business.
C222.2	The Demand, Supply, Production, Cost, Market Structure, Pricing aspects are learnt.
C222.3	The Students can study the firm's financial position by analysing the Financial Statements of a Company.

OPERATING SYSTEMS

COURSE NAME	COURSE OUTCOMES
C223.1	Will be able to control access to a computer and the files that may be shared
C223.2	Demonstrate the knowledge of the components of computers and their respective roles in computing.
C223.3	Ability to recognize and resolve user problems with standard operating environments.
C223.4	Gain practical knowledge of how programming languages, operating systems, and architectures interact and how to use each effectively.

OBJECT ORIENTED PROGRAMMING THROUGH JAVA

COURSE NAME	COURSE OUTCOMES
C224.1	Demonstrate the behavior of programs involving the basic programming constructs like control structures, constructors, string handling and garbage collection.
C224.2	Demonstrate the behavior of programs involving the basic programming constructs like control structures, constructors, string handling and garbage collection.
C224.3	Use multithreading concepts to develop inter process communication.
C224.4	Use multithreading concepts to develop inter process communication.
C224.5	Develop applets that interact abundantly with the client environment and deploy on the server.

SOFTWARE ENGINEERING

COURSE NAME	COURSE OUTCOMES
C225.1	Ability to translate end-user requirements into system and software requirements, using e.g.UML, and structure the requirements in a Software Requirements Document (SRD).
C225.2	Identify and apply appropriate software architectures and patterns to carry out high level design of a system and be able to critically compare alternative choices.
C225.3	Will have experience and/or awareness of testing problems and will be able to develop a simple testing report

OPERATING SYSTEMS LAB

COURSE NAME	COURSE OUTCOMES
C226.1	Simulate and implement operating system concepts such as scheduling, deadlock management, file management and memory management.
C226.2	Able to implement C programs using Unix system calls

OBJECT ORIENTED PROGRAMMING THROUGH JAVA LAB

COURSE NAME	COURSE OUTCOMES
C227.1	Able to write programs for solving real world problems using the java Collection framework.
C227.2	Able to write programs using abstract classes.
C227.3	Able to write multithreaded programs.
C227.4	Able to write GUI programs using swing controls in Java.

SKILL DEVELOPMENT COURSE (NODE JS/ REACT JS/ DJANGO)

COURSE NAME	COURSE OUTCOMES
C228.1	the student will be able to, Build a custom website with HTML, CSS, and Bootstrap and little JavaScript.
C228.2	the student will be able to, Demonstrate Advanced features of JavaScript and learn about JDBC
C228.3	the student will be able to, Develop Server – side implementation using Java technologies
C228.4	the student will be able to, Develop Server – side implementation using Java technologies like
C228.5	the student will be able to, Design a Single Page Application using React.

CONSTITUTION OF INDIA

COURSE NAME	COURSE OUTCOMES
C229.1	Students will be able to Discuss the growth of the demand for civil rights in India for the bulk of Indians before the arrival of Gandhi in Indian politics.
C229.2	Students will be able to Discuss the intellectual origins of the framework of argument that informed the conceptualization of social reforms leading to revolution in India.
C229.3	Students will be able to Discuss the circumstances surrounding the foundation of the Congress Socialist Party [CSP] under the leadership of Jawaharlal Nehru and the eventual failure of the proposal of direct elections through adult suffrage in the Indian Constitution
C229.4	Students will be able to Discuss the passage of the Hindu Code Bill of 1956.

Department of Computer Science & Engineering (Data Science)

CO STATEMENTS–R18 REGULATION

III-I

DESIGN AND ANALYSIS OF ALGORITHMS

COURSE NAME	COURSE OUTCOMES
C311.1	Ability to analyze the performance of algorithms
C311.2	Ability to choose appropriate data structures and algorithm design methods for a specified application
C311.3	Ability to understand how the choice of data structures and the algorithm design methods impact the performance of programs

INTRODUCTION TO DATA SCIENCE

COURSE NAME	COURSE OUTCOMES
C312.1	the student should be able to Understand basic terms what Statistical Inference means.
C312.2	the student should be able to Identify probability distributions commonly used as foundations for statistical modelling. Fit a model to data
C312.3	the student should be able to describe the data using various statistical measures
C312.4	the student should be able to utilize R elements for data handling
C312.5	the student should be able to perform data reduction and apply visualization techniques.

COMPUTER NETWORKS

COURSE NAME	COURSE OUTCOMES
C313.1	Gain the knowledge of the basic computer network technology.
C313.2	Gain the knowledge of the functions of each layer in the OSI and TCP/IP reference model.
C313.3	Obtain the skills of subnetting and routing mechanisms
C313.4	Familiarity with the essential protocols of computer networks, and how they can be applied in network design and implementation.

DATA MINING

COURSE NAME	COURSE OUTCOMES
C314.1	Ability to understand the types of the data to be mined and present a general classification of tasks and primitives to integrate a data mining system.
C314.2	Apply preprocessing methods for any given raw data.
C314.3	Extract interesting patterns from large amounts of data.
C314.4	Discover the role played by data mining in various fields.
C314.5	Choose and employ suitable data mining algorithms to build analytical applications
C314.6	Evaluate the accuracy of supervised and unsupervised models and algorithms.

DATA WAREHOUSING AND BUSINESS INTELLIGENCE (Professional Elective – I)

COURSE NAME	COURSE OUTCOMES
C315.1.1	Understand architecture of data warehouse and OLAP operations.
C315.1.2	Understand Fundamental concepts of BI and Analytics
C315.1.3	Application of BI Key Performance indicators
C315.1.4	Design of Dashboards, Implementation of Web Analytics
C315.1.5	Understand Utilization of Advanced BI Tools and their Implementation.
C315.1.6	Implementation of BI Techniques and BI Ethics.

ARTIFICIAL INTELLIGENCE (Professional Elective – I)

COURSE NAME	COURSE OUTCOMES
C315.2.1	Ability to formulate an efficient problem space for a problem expressed in natural language.
C315.2.2	Select a search algorithm for a problem and estimate its time and space complexities
C315.2.3	Possess the skill for representing knowledge using the appropriate technique for a given problem
C315.2.4	Possess the ability to apply AI techniques to solve problems of game playing, and machine learning.

WEB PROGRAMMING (Professional Elective – I)

COURSE NAME	COURSE OUTCOMES
C315.3.1	the students will be able to Design web pages
C315.3.2	the students will be able to Use technologies of Web Programming.
C315.3.3	the students will be able to Apply object-oriented aspects to Scripting
C315.3.4	the students will be able to Create databases with connectivity using JDBC.
C315.3.5	the students will be able to Build web-based application using sockets.

IMAGE PROCESSING (Professional Elective – I)

COURSE NAME	COURSE OUTCOMES
C315.4.1	Demonstrate the knowledge of the basic concepts of two-dimensional signal acquisition, sampling, and quantization.
C315.4.2	Demonstrate the knowledge of filtering techniques.
C315.4.3	Demonstrate the knowledge of 2D transformation techniques.
C315.4.4	Demonstrate the knowledge of image enhancement, segmentation, restoration and compression techniques.

COMPUTER GRAPHICS (Professional Elective – I)

COURSE NAME	COURSE OUTCOMES
C315.5.1	Acquire familiarity with the relevant mathematics of computer graphics.
C315.5.2	Be able to design basic graphics application programs, including animation
C315.5.3	Be able to design applications that display graphic images to given specifications

SPATIAL AND MULTIMEDIA DATABASES (Professional Elective – II)

COURSE NAME	COURSE OUTCOMES
C316.1.1	Acquire familiarity with the relevant mathematics of computer graphics.
C316.1.2	Be able to design basic graphics application programs, including animation
C316.1.3	Be able to design applications that display graphic images to given specifications

INFORMATION RETRIEVAL SYSTEMS (Professional Elective – II)

COURSE NAME	COURSE OUTCOMES
C316.2.1	Ability to apply IR principles to locate relevant information large collections of data
C316.2.2	Ability to design different document clustering algorithms
C316.2.3	Implement retrieval systems for web search tasks.
C316.2.4	Design an Information Retrieval System for web search tasks.

SOFTWARE PROJECT MANAGEMENT (Professional Elective – II)

COURSE NAME	COURSE OUTCOMES
C316.3.1	Gain knowledge of software economics, phases in the life cycle of software development, project organization, project control and process instrumentation.
C316.3.2	Analyze the major and minor milestones, artifacts and metrics from management and technical perspective.
C316.3.3	Design and develop software product using conventional and modern principles of software project management

DEVOPS (Professional Elective – II)

COURSE NAME	COURSE OUTCOMES
C316.4.1	students will be able to Identify components of Devops environment
C316.4.2	students will be able to Describe Software development models and architectures of DevOps
C316.4.3	students will be able to Apply different project management, integration, testing and code deployment tool
C316.4.4	students will be able to Investigate different DevOps Software development models
C316.4.5	students will be able to Assess various Devops practices
C316.4.6	students will be able to Collaborate and adopt Devops in real-time projects

COMPUTER VISION AND ROBOTICS (Professional Elective – II)

COURSE NAME	COURSE OUTCOMES
C316.5.1	Implement fundamental image processing techniques required for computer vision.
C316.5.2	Implement boundary tracking techniques.
C316.5.3	Apply chain codes and other region descriptors, Hough Transform for line, circle, and ellipse detections
C316.5.4	Apply 3D vision techniques and Implement motion related techniques.
C316.5.5	Develop applications using computer vision techniques.

DATA MINING LAB

COURSE NAME	COURSE OUTCOMES
C317.1	Apply preprocessing statistical methods for any given raw data.
C317.2	Gain practical experience of constructing a data warehouse.
C317.3	Implement various algorithms for data mining in order to interesting patterns from large amounts of data.
C317.4	Apply OLAP operations on data cube construction.

COMPUTER NETWORKS LAB

COURSE NAME	COURSE OUTCOMES
C317.1	Implement data link layer framing methods
C317.2	Analyze error detection and error correction codes.
C317.3	Implement and analyze routing and congestion issues in network design
C317.4	Implement Encoding and Decoding techniques used in presentation layer
C317.5	To be able to work with different network tools

ADVANCED COMMUNICATION SKILLS LAB

COURSE NAME	COURSE OUTCOMES
C318.1	To improve the students' fluency in English, through a well-developed vocabulary and enable them to listen to English spoken at normal conversational speed by educated English speakers and respond appropriately in different socio-cultural and professional contexts.
C318.2	Further, they would be required to communicate their ideas relevantly and coherently in writing.
C318.3	To prepare all the students for their placements.

III-II

COMPILER DESIGN

COURSE NAME	COURSE OUTCOMES
C321.1	Introduce the major concepts of language translation and compiler design and impart the knowledge of practical skills necessary for constructing a compiler.
C321.2	Topics include phases of compiler, parsing, syntax directed translation, type checking use of symbol tables, code optimization techniques, intermediate generation, code generation and data flow analysis.

MACHINE LEARNING

COURSE NAME	COURSE OUTCOMES
C322.1	This course explains machine learning techniques such as decision tree learning, Bayesian learning etc.
C322.2	To understand computational learning theory.
C322.3	To study the pattern comparison techniques.

BIG DATA ANALYTICS

COURSE NAME	COURSE OUTCOMES
C323.1	Ability to explain the foundations, definitions, and challenges of Big Data and various Analytical tools.
C323.2	Ability to program using HADOOP and Map reduce, NOSQL
C323.3	Ability to understand the importance of Big Data in Social Media and Mining.

SOFTWARE TESTING METHODOLOGIES (Professional Elective – III)

COURSE NAME	COURSE OUTCOMES
C324.1.1	Design and develop the best test strategies in accordance to the development model.

DATA VISUALIZATION TECHNIQUES (Professional Elective – III)

COURSE NAME	COURSE OUTCOMES
C324.2.1	Visualize the objects in different dimensions.
C324.2.2	Design and process the data for Virtualization.
C324.2.2	Apply the visualization techniques in physical sciences, computer science, applied mathematics and medical science.
C324.2.2	Apply the virtualization techniques for research projects. K3).

SCRIPTING LANGUAGES (Professional Elective – III)

COURSE NAME	COURSE OUTCOMES
C324.3.1	Comprehend the differences between typical scripting languages and typical system and application programming languages.
C324.3.2	Gain knowledge of the strengths and weakness of Perl, TCL and Ruby; and select an appropriate language for solving a given problem.
C324.3.2	Acquire programming skills in scripting language.

MOBILE APPLICATION DEVELOPMENT (Professional Elective – III)

COURSE NAME	COURSE OUTCOMES
C324.4.1	Student understands the working of Android OS Practically.
C324.4.2	Student will be able to develop Android user interfaces
C324.4.2	Student will be able to develop, deploy and maintain the Android Applications.

CRYPTOGRAPHY AND NETWORK SECURITY (Professional Elective – III)

COURSE NAME	COURSE OUTCOMES
C324.5.1	Student will be able to understand basic cryptographic algorithms, message and web authentication and security issues.
C324.5.2	Ability to identify information system requirements for both of them such as client and server.
C324.5.2	Ability to understand the current legal issues towards info security.

MACHINE LEARNING LAB

COURSE NAME	COURSE OUTCOMES
C325.1	the student can able to understand complexity of Machine Learning algorithms and their limitations;
C325.2	the student can able to understand modern notions in data analysis-oriented computing
C325.3	the student can able to be capable of confidently applying common Machine Learning algorithms in practice and implementing their own
C325.4	the student can able to Be capable of performing experiments in Machine Learning using real-world data

BIG DATA ANALYTICS LAB

COURSE NAME	COURSE OUTCOMES
C326.1	Use Excel as an Analytical tool and visualization tool.
C326.2	Ability to program using HADOOP and Map reduce.
C326.3	Ability to perform data analytics using ML in R.
C326.4	Use Cassandra to perform social media analytics.

SOFTWARE TESTING METHODOLOGIES LAB (PE – III Lab)

COURSE NAME	COURSE OUTCOMES
C327.1.1	Design and develop the best test strategies in accordance to the development model.

DATA VISUALIZATION TECHNIQUES LAB (PE – III Lab)

COURSE NAME	COURSE OUTCOMES
C328.2.1	Identify the different data types, visualization types to bri the insight.

C328.2.2	Relate the visualization towards the problem based on the dataset to analyze and bring out valuable insight on a large dataset.
C328.2.3	Demonstrate the analysis of a large dataset using various visualization techniques and tools.
C328.2.4	Identify the different attributes and showcasing them in plots. Identify and create various visualizations for geospatial and table data.
C328.2.5	Ability to create and interpret plots using R/Python.

SCRIPTING LANGUAGES LAB (PE – III Lab)

COURSE NAME	COURSE OUTCOMES
C329.3.1	Ability to understand the differences between Scripting languages and programming languages
C329.3.2	Able to gain some fluency programming in Ruby, Perl, TCL

MOBILE APPLICATION DEVELOPMENT LAB (PE - III Lab)

COURSE NAME	COURSE OUTCOMES
C320.4.1	Students understand the working of Android OS Practically.
C320.4.2	Students will be able to develop user interfaces
C320.4.3	Students will be able to develop, deploy and maintain the Android Applications

CRYPTOGRAPHY AND NETWORK SECURITY LAB (PE – III Lab)

COURSE NAME	COURSE OUTCOMES
C320.5.1	Understand basic cryptographic algorithms, message and authentication and security issues

C320.5.2	Identify information system requirements for both of them such as client and server.
C320.5.3	Understand the current legal issues towards information security

ENVIRONMENTAL SCIENCE

COURSE NAME	COURSE OUTCOMES
C320.6.1	Based on this course, the Engineering graduate will understand /evaluate / develop technologies on the basis of ecological principles and environmental regulations which in turn helps in sustainable development

Department of Computer Science & Engineering (Data Science)

CO STATEMENTS–R18 REGULATION

IV-I

PREDICTIVE ANALYTICS

COURSE NAME	COURSE OUTCOMES
C411.1	Understand prediction-related principles, theories and approaches.
C411.2	Learn model assessment and validation.
C411.3	Understand the basics of predictive techniques and statistical approaches.
C411.3	Analyze supervised and unsupervised algorithms.

WEB AND SOCIAL MEDIA ANALYTICS

COURSE NAME	COURSE OUTCOMES
C412.1	Knowledge on decision support systems.
C412.2	Apply natural language processing concepts on text analytics.
C412.3	Understand sentiment analysis.
C412.4	Knowledge on search engine optimization and web analytics.

QUANTUM COMPUTING (Professional Elective – IV)

COURSE NAME	COURSE OUTCOMES
C413.1.1	Understand basics of quantum computing
C413.1.2	Understand physical implementation of Qubit
C413.1.3	Understand Quantum algorithms and their implementation
C413.1.4	Understand the Impact of Quantum Computing on Cryptography

DATABASE SECURITY (Professional Elective – IV)

COURSE NAME	COURSE OUTCOMES
C414.2.1	Ability to carry out a risk analysis for large database.
C414.2.2	Ability to set up, and maintain the accounts with privileged roles.

NATURAL LANGUAGE PROCESSING (Professional Elective – IV)

COURSE NAME	COURSE OUTCOMES
C414.3.1	Show sensitivity to linguistic phenomena and an ability to model them with formal grammars.
C414.3.2	Understand and carry out proper experimental methodology for training and evaluating empirical NLP systems
C414.3.3	Able to manipulate probabilities, construct statistical models over strings and trees, and estimate parameters using supervised and unsupervised training methods.
C414.3.4	Able to design, implement, and analyze NLP algorithms
C414.3.5	Able to design different language modeling Techniques.

INFORMATION STORAGE MANAGEMENT (Professional Elective – IV)

COURSE NAME	COURSE OUTCOMES
C414.4.1	Understand the logical and physical components of a Storage infrastructure.
C414.4.2	Evaluate storage architectures, including storage subsystems, DAS, SAN, NAS, and CAS.
C414.4.3	Understand the various forms and types of Storage Virtualization.
C414.4.4	Describe the different roles in providing disaster recovery and business continuity capabilities.
C414.4.5	Distinguish different remote replication technologies.

INTERNET OF THINGS (Professional Elective – IV)

COURSE NAME	COURSE OUTCOMES
C414.5.1	Interpret the impact and challenges posed by IoT networks leading to new architectural models.
C414.5.2	Compare and contrast the deployment of smart objects and the technologies to connect them to the network.
C414.5.3	Appraise the role of IoT protocols for efficient network communication.
C414.5.4	Elaborate the need for Data Analytics and Security in IoT
C414.5.5	Illustrate different sensor technologies for sensing real world entities and identify the applications of IoT in Industry.

PRIVACY PRESERVING IN DATA MINING (Professional Elective – V)

COURSE NAME	COURSE OUTCOMES
C415.1.1	Understand the concepts of Privacy Preserving Data Mining Models and Algorithms.
C415.1.2	Demonstrate a comprehensive understanding of different tasks associated in Inference Control Methods for Privacy-Preserving Data Mining.
C415.1.3	Understand the concepts of Data Anonymization Methods and its Measures.
C415.1.4	Evaluate and Appraise the solution designed for Multiplicative Perturbation.
C415.1.5	Formulate, Design and Implement the solutions for Utility-based Privacy Preserving Data.

CLOUD COMPUTING (Professional Elective – V)

COURSE NAME	COURSE OUTCOMES
C415.2.1	Ability to understand various service delivery models of a cloud computing architecture.
C415.2.2	Ability to understand the ways in which the cloud can be programmed and deployed.
C415.2.3	Understanding cloud service providers.

DATA SCIENCE APPLICATIONS (Professional Elective – V)

COURSE NAME	COURSE OUTCOMES
C415.3.1	students would To correlate data science and solutions to modern problems.
C415.3.1	students would To decide when to use which type of technique in data science.

MINING MASSIVE DATASETS

COURSE NAME	COURSE OUTCOMES
C416.1	Handle massive data using MapReduce.
C416.2	Develop and implement algorithms for massive data sets and methodologies in the context of data mining
C416.3	Understand the algorithms for extracting models and information from large datasets
C416.4	Develop recommendation systems.
C416.5	Gain experience in matching various algorithms for particular classes of problems.

EXPLORATORY DATA ANALYSIS

COURSE NAME	COURSE OUTCOMES
C417.1	Handle missing data in the real-world data sets by choosing appropriate methods.
C417.2	Summarize the data using basic statistics. Visualize the data using basic graphs and plots.
C417.3	Identify the outliers if any in the data set.
C417.4	Choose appropriate feature selection and dimensionality reduction.
C417.5	Techniques for handling multi-dimensional data.

WEB AND SOCIAL MEDIA ANALYTICS LAB

COURSE NAME	COURSE OUTCOMES
C418.1	Knowledge on decision support systems.
C418.2	Apply natural language processing concepts on text analytics.
C418.3	Understand sentiment analysis.
C418.4	Knowledge on search engine optimization and web analytics.

IV-II

ORGANIZATIONAL BEHAVIOUR

COURSE NAME	COURSE OUTCOMES
C421.1	Demonstrate the applicability of analyzing the complexities associated with management of individual behavior in the organization.
C421.2	Analyze the complexities associated with management of the group behavior in the organization.
C421.3	Demonstrate how the organizational behavior can integrate in understanding the motivation (why) behind behavior of people in the organization.

DATA STREAM MINING (Professional Elective – VI)

COURSE NAME	COURSE OUTCOMES
C422.1.1	The aim of the course is to introduce the fundamentals of Data Stream Mining
C422.1.2	The course gives an overview of – Mining Strategies, methods and algorithms for data stream mining.

WEB SECURITY (Professional Elective – VI) IG DATA ANALYTICS

COURSE NAME	COURSE OUTCOMES
C423.2.1	Students should be able to Understand the Web architecture and applications
C423.2.2	Students should be able to Understand client side and service side programming
C423.2.3	Students should be able to Understand how common mistakes can be bypassed and exploit the application
C423.2.4	Students should be able to Identify common application vulnerabilities

VIDEO ANALYTICS (Professional Elective – VI)

COURSE NAME	COURSE OUTCOMES
C424.3.1	Understand the basics of video- signals and systems.

C424.3.2	Able to estimate motion in a video.
C424.3.3	Able to detect the objects and track them.
C424.3.4	Recognize activity and analyze behaviour
C424.3.5	Evaluate face recognition technologies.

BLOCKCHAIN TECHNOLOGY (Professional Elective – VI)

COURSE NAME	COURSE OUTCOMES
C425.4.1	Learn about research advances related to one of the most popular technological areas today.
C425.4.2	Understand Extensibility of Blockchain concepts.
C425.4.3	Understand Extensibility of Blockchain concepts.
C425.4.4	Understand Technical challenges, Business model challenges.

PARALLEL AND DISTRIBUTED COMPUTING (Professional Elective – VI)

COURSE NAME	COURSE OUTCOMES
C425.5.1	Explore the methodologies adopted for parallel and distributed environments.
C425.5.2	Analyze the networking aspects of Distributed and Parallel Computing.
C425.5.3	Explore the different performance issues and tasks in parallel and distributed computing
C425.5.4	Tools usage for parallel and distributed computing.
C425.5.5	Understanding high performance computing techniques.

Department of Electronics & Communication Engineering

Course Outcomes of R22 Regulation

II-I ECE	
Sub. Code	Subject Name
A1407	Analog circuits
A1409	Network Analysis & Transmission Lines
A1410	Digital Logic Design
A1412	Signals and Systems
A1413	Principles of Communication-I
A1408	Analog Circuits Laboratory
A1411	Digital Logic Design Laboratory
A1414	Signals and Principles of Communication-I Laboratory
A1017	Constitution of India

II-II ECE	
A1013	Numerical Methods, Probability theory and complex analysis
A1415	Electromagnetic Fields and Waves
A1416	Principles of Communication - II
A1418	Linear and Digital IC Applications
A1420	Electronic circuit Analysis
A1417	Principles of Communication-II Laboratory
A1419	Linear and Digital IC Applications Laboratory
A1421	Electronic circuit Analysis Laboratory
A1424	Real Time Project/Field based Project
A1018	Gender Sensitization Lab

III-I ECE	
A1425	Microcontrollers
A1427	Data Communications and Computer Networks
A1429	Control Systems
A1016	Business Economics and Financial Analysis
A1426	Microcontrollers Laboratory
A1428	Data Communications and Computer Networks Laboratory
A1452	Data Structures
A1019	Advanced English Communication Skills Laboratory
A1012	Intellectual Property Rights
A1021	Logical Reasoning-I

III-II ECE	
Sub. Code	Subject Name
A1430	Antennas and Wave Propagation
A1431	Digital Signal Processing
A1433	CMOS VLSI Design
A1455	Embedded System Design
A1432	Digital Signal Processing Laboratory
A1434	CMOS VLSI Design Laboratory
	Cyber Law and Ethics
A1435	Advanced Communication Laboratory

II-I: Analog Circuits - Course Outcomes

A1407	Analog Circuits: Upon successful completion of this course, the students should be able to.	BT Level
C201.1	Understand the concepts of, load line analysis and biasing techniques and analyze transistor h-parameter model for amplifier in different configuration.	2
C201.2	Compare the concepts of, FET biasing techniques and analyze small signal model for amplifier in different configurations (CG, CS and CD).	2
C201.3	To calculate gain of multi stage amplifier and to learn different coupling schemes.	4
C201.4	To analyze the frequency response of multi stage amplifier with high frequency analysis (Hybrid $-\pi$ model).	5
C201.5	To familiarize the Concept of feedback in amplifiers so as to differentiate between negative and positive feedback.	3
C201.6	Apply the concept of Barkhausen criterion on positive feedback amplifier to generate different types of sinusoidal waveforms	4

II-I: Network Analysis & Transmission Lines - Course Outcomes

A1409	Network Analysis & Transmission Lines: Upon successful completion of this course, the students should be able to.	BT Level
C202.1	Understand the basics of RLC circuits behavior.	2
C202.2	Analyse the steady state and transient state analysis of the RLC circuits	4
C202.3	Design and analyse two port network parameters	6
C202.4	Understand the basics of network functions and transfer functions.	2
C202.5	Analyze the design aspect of various filters and attenuators	4
C202.6	Understand the basic concepts of transmission line.	2

II-I: Digital Logic Design - Course Outcomes

A1410	Digital Logic Design: Upon successful completion of this course, the students should be able to.	BT Level
C203.1	Understand the numerical information in different forms and Boolean Algebra theorems	2
C203.2	Understand the postulates of boolean algebra and minimize combinational functions	2
C203.3	Analyze the differences between Combinational and Sequential circuits and understand the functionality of various Flip-Flops	4
C203.4	Design and analyze sequential circuits like shift registers and counters using flip-flops	6
C203.5	Design various state (sequential) machines and realize them as mealy and moore models	6
C203.6	Realization of logic gates and logic families	4

II-I: Signals and Systems - Course Outcomes

A1412	Signals and Systems: Upon successful completion of this course, the students should be able to.	BT Level
C204.1	To understand signal, types of signals, analogy between vectors and signals, response of LTI system.	2
C204.2	To determine the Fourier series for continuous time and different types of series, to analyze the Fourier transform for standard signals and Hilbert Transform	4
C204.3	To understand Characteristics of filters, relation between the bandwidth and rise time, convolution in time and frequency domain	3
C204.4	To apply the LT and ILT and to find the ROC for different types of signals and the relation between the LT and FT.	4
C204.5	To apply the ZT and IZT for discrete time signals and to find the ROC of ZT, of different types of signals.	2
C204.6	To understand the concepts of sampling, Cross Correlation and Autocorrelation.	2

II-I: Principles of Communication-I - Course Outcomes

A1413	Principles of Communication-I: Upon successful completion of this course, the students should be able to.	BT Level
C205.1	Perform Operations on Single and Multiple Random Variables and to Determine the Spectral and temporal Characteristics of Random process	3
C205.2	Analyze and design of various continuous wave and Amplitude Modulation and Demodulation Techniques.	4
C205.3	Perform the mathematical analysis associate with Angle Modulation of FM	3
C205.4	Perform the mathematical analysis associate with Angle Modulation PM	3
C205.5	Analyze and design AM, FM Radio Receivers.	4
C205.6	Understand the concepts of Noise in Analog Communication Systems	2

II-II: Numerical Methods, Probability theory and complex analysis - Course Outcomes

A1013	Numerical Methods, Probability theory and complex analysis: Upon successful completion of this course, the students should be able to.	BT Level
C211.1	Ability to find the root of a given polynomial and transcendental equations.	3
C211.2	Estimate the value of given data using interpolation	4
C211.3	Find the numerical solutions for a given first ODE'S	3
C211.4	Analyse the complex function with reference to their analyticity, integration using Cauchy's integral and residue theorem.	3
C211.5	Taylor's and Laurent's series expansions in complex function.	4
C211.6	Applying the concept of probability.	2

II-II: Electromagnetic Fields and Waves- Course Outcomes

A1415	Electromagnetic Fields and Waves: Upon successful completion of this course, the students should be able to.	BT Level
C212.1	Able to explain the concepts related to static electric field and to apply them for various applications.	3
C212.2	Able to explain the concepts related to static magnetic field and to apply them for various applications. Demonstrate and analyze the Maxwell's equations for time varying fields.	3
C212.3	Analyze the Wave Equations for good conductors and good dielectrics, and evaluate the UPW Characteristics for several practical media of interest	4
C212.4	Establish the proof and estimate the polarization features, reflection and transmission coefficients for UPW propagation, distinguish between Brewster and Critical Angles, and acquire knowledge of their applications.	4
C212.5	Determine the Transmission Line parameters for different lines, characterize the distortions and estimate the characteristics for different lines.	2
C212.6	Analyze the RF Line features and configure them as SC, OC Lines, QWTs and HWTs, and design the same for effective impedance transformation.	4

II-II: Principles of Communication - II- Course Outcomes

A1416	Principles of Communication - II: Upon successful completion of this course, the students should be able to.	BT Level
C213.1	Understand various components of Digital Communication Systems.	2
C213.2	Analyze and design various Pulse Modulation Techniques	3
C213.3	Design and Analyze various Digital Modulation and Demodulation Techniques	3
C213.4	Analyze Error performance of Digital Communication techniques	3
C213.5	Understand different Error Detecting and Error Correction codes like Block codes, Cyclic codes and Convolution codes.	3
C213.6	Understand the advantages of Spread Spectrum Techniques and performance of Spread Spectrum	4

II-II: Linear and Digital IC Applications- Course Outcomes

A1418	Linear and Digital IC Applications: Upon successful completion of this course, the students should be able to.	BT Level
C214.1	Understand the internal operation of op-amp and its specifications	2
C214.2	Analyze and design linear applications like adder, subtractor, instrumentation amplifier, etc using op amp	6
C214.3	Classify various active filter configurations based on frequency response and construct using 741 op amp	4
C214.4	Understand and analyze different a to d and d to a converter	4
C214.5	Understand different families of digital integrated circuits and design combinational circuits using ICs	4
C214.6	Classify different logic families and design of sequential circuits using ICs	4

II-II: Electronic circuit Analysis- Course Outcomes

A1420	Electronic circuit Analysis: Upon successful completion of this course, the students should be able to.	BT Level
C215.1	Design the power amplifier and calculate their efficiencies.	6
C215.2	Analyse the frequency response of tuned amplifiers and evaluate its Q-factor.	4
C215.3	Design various Multivibrators using transistors to generate pulse signals.	6
C215.4	Design the Schmitt trigger circuit using transistors	6
C215.5	Measuring the frequency and phase angle of the sinusoidal signals using Time base generators.	3
C215.6	Utilize the concepts of synchronization, frequency division and sampling gates in communication.	3

III-I: Microcontrollers - Course Outcomes

A1425	Microcontrollers: Upon successful completion of this course, the students should be able to.	BT Level
C301.1	Able to understand the internal architecture and organization of 8086 and develop assembly programs using various instructions.	3
C301.2	Able to understand the internal architecture, organization and interrupts of 8051 and develop assembly programs using various instructions.	3
C301.3	Able to interface the various I/O devices to 8051	4
C301.4	Able to understand the various onboard and external serial communication standards and schemes.	2
C301.5	Able to understand the internal architecture and organization of ARM and develop assembly programs using various instructions.	3
C301.6	Able to understand the architecture of advanced ARM processors – CORTEX and OMAP	2

III-I: Control Systems - Course Outcomes

A1429	Control Systems: Upon successful completion of this course, the students should be able to.	BT Level
C303.1	Understand the modeling of LTI systems using Transfer Function of a system mathematically and graphically with industrial examples	2
C303.2	Understand the response of a system in time domain and assess their stability for LTI systems	2
C303.3	Understand the response of a system in frequency domain and various methods to assess their stability for LTI systems	4
C303.4	Understand the concept of relative stability and assess the same using Nyquist method in LTI systems	4
C303.5	Design simple Controllers and Compensators based on the frequency domain specifications	6
C303.6	Understand the modeling of Linear Time variant / Discrete systems through state space representation	3

III-I: Business Economics and Financial Analysis - Course Outcomes

A1016	Business Economics and Financial Analysis: Upon successful completion of this course, the students should be able to.	BT Level
C304.1	Evaluate the various Forms of Business and the impact of economic variables on the Business.	5
C304.2	Analyze the basic issues governing the business operations namely, the Demand and Supply.	4
C304.3	Analyze Production function and cost-output relationship	4
C304.4	Evaluate the pricing strategies under different market structures	5
C304.5	Evaluate and prepare accounts so that the engineers excel in the business.	5
C304.6	Evaluate the firm's financial position by analysing the Financial Statements, Ratios, Funds and Cash flow statements of a Company.	5

III-II: Antennas and Wave Propagation - Course Outcomes

A1430	Antennas and Wave Propagation: Upon successful completion of this course, the students should be able to.	BT Level
C311.1	Define the parameters in the design of antenna and field evaluation under various conditions and formulate the electric as well as magnetic field equations	3
C311.2	Analyse the different antenna array systems	4
C311.3	Design fundamental antennas like Yagi - Uda, Helical structure	6
C311.4	Understand the designs of horn antennas	2
C311.5	Understand the designs of RF and Microwave antennas and Helical structure	2
C311.6	Understand the behavior of nature on EM wave propagation	2

III-II: Digital Signal Processing - Course Outcomes

A1431	Digital Signal Processing: Upon successful completion of this course, the students should be able to.	BT Level
C312.1	Apply the principles of Z-transforms to finite difference equations for stability analysis	3
C312.2	Compute the discrete time domain & frequency domain of signals using DFS, DFT, FFT	3
C312.3	Analyze various analog filter approximations and compare Chebyshev and Butterworth filters	4
C312.4	Design of IIR digital filters using Impulse Invariant & Bilinear transformation techniques	6
C312.5	Design FIR digital filters using Fourier series, window method	6
C312.6	Understand the tradeoff between normal and multi-rate DSP techniques, finite word length effects and round-off errors	2

III-II: CMOS VLSI Design - Course Outcomes

A1433	CMOS VLSI Design: Upon successful completion of this course, the students should be able to.	BT Level
C313.1	Acquire qualitative knowledge about the fabrication process of integrated circuits using MOS transistors.	4
C313.2	Draw the stick diagrams and layouts of any logic circuit by understanding the various layers using NMOS and CMOS technologies with scaled structures.	5
C313.3	Understand and evaluate the factors of developing gate level & complex designs.	5
C313.4	Understand the various time delays associated with MOS circuits.	5
C313.5	Understand and design building blocks of data path systems like adders, multipliers, parity generators, comparators and memory subsystem.	1
C313.6	Design simple logic circuits using PLA, PAL, FPGA and CPLD. Understand different types of faults that can occur in a system and learn the concept of testing and adding extra hardware to improve testability of system.	1