CO STATEMENTS (2022-23) -R18 REGULATION

II-I

1. ANALOG AND DIGITAL ELECTRONICS(CS301ES)

COURSE NAME	COURSE OUTCOMES
C211.1	Ability to Analyze the characteristics of various components(BTL4)
C211.2	Understand the utilization of components(BTL2)
C211.3	Design and analyze small signal amplifier circuits(BTL3)
C211.4	Learn Postulates of Boolean algebra and to minimize combinational functions(BTL1)
C211.5	Design and analyze combinational and sequential circuits(BTL3)
C211.6	To Know about the logic families and realization of logic gates(BTL1)

2. DATA STRUCTURES (CS302PC)

COURSE NAME	COURSE OUTCOMES
C212.1	Understand the basic concepts of data structures(BTL2)
C212.2	Design and implement an appropriate hashing function for an application(BTL3)
C212.3	Understand Tree data structure and operations(BTL2)
C212.4	Perform operations on different types of trees(BTL3)
C212.5	Understand the graph data structures and different sorting techniques(BTL2)
C212.6	Understand the trie and different Pattern Matching algorithms(BTL2)

3. COMPUTER ORIENTED STATISTICAL METHODS (MA303BS)

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, binomial and poisson distribution.(BTL3)
C213.3	Able to 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 (CS304PC)

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(BTL6)
C214.4	Evaluate cost performance and design trade-offs in designing and constructing a computer processor including memory(BTL2)
C214.5	Design a pipeline for consistent execution of instructions with minimum hazards(BTL1)
C214.6	Recognize and manipulate representations of numbers stored in digital computers(BTL2)

5. OBJECT ORIENTED PROGRAMMING USING C++ (CS305PC)

COURSE NAME	**COURSE OUTCOMES**
C215.1	Able to understand basics about object oriented programming(BTL2)
C215.2	Discuss about classes and Data Abstraction(BTL2)
C215.3	Able to categorize between Inheritance ,Virtual Functions(BTL4)
C215.4	Discuss about polymorphism(BTL2)
C215.5	Discuss about I/O streams in C++(BTL2)
C215.6	Discuss about Exception Handling(BTL2)

6. DATA STRUCTURES LAB (CS307PC)

COURSE NAME	COURSE OUTCOMES
C216.1	Design programs using a variety of data structures such as stacks, queues(BTL3)
C216.2	Implement hash table to solve various computing problems(BTL3)
C216.3	Implement binary trees, Priority Queues, heap data structures(BTL3)
C216.4	Analyze various kinds of searching and sorting techniques(BTL3)
C216.5	Implement graphs and balanced search trees(BTL3)
C216.6	Implement time and space complexities of algorithms(BTL3)

7. IT WORKSHOP (CS308PC)

COURSE NAME	COURSE OUTCOMES
C217.1	Apply knowledge for computer assembling and software installation(BTL3)
C217.2	Solve trouble shooting problems(BTL3)
C217.3	Learn tools for preparation of PPTs(BTL1)
C217.4	Learn tools for preparation of documentation(BTL1)
C217.5	Learn tools for preparation of budget sheets(BTL1)
C217.6	Learn installation of OS(BTL1)

8. ANALOG AND DIGITAL ELECTRONICS LAB (CS306ES)

COURSE NAME	COURSE OUTCOMES
C218.1	Know the characteristics of various components(BTL1)
C218.2	Understand the utilization of components(BTL2)
C218.3	Design and analyze small signal amplifier circuits(BTL3)
C218.4	Postulates of Boolean algebra and to minimize combinational functions(BTL1)
C218.5	Design and analyze combinational and sequential circuits(BTL3)
C2186	Known about the logic families and realization of logic gates(BTL1)

9. C++ PROGRAMMING LAB (CS309PC)

COURSE NAME	COURSE OUTCOMES
C219.1	Ability to develop applications for a range of problems using object-oriented programming techniques(BTL3)
C219.2	Understand object-oriented programming concepts using the C++ language(BTL2)
C219.3	Implement the principles of data abstraction, inheritance and polymorphism(BTL3)
C219.4	Implement the principles of virtual functions and polymorphism(BTL3)
C219.5	Implement handling formatted I/O and unformatted I/O(BTL3)
C2196	Implement exception handling(BTL3)

10.GENDER SENSITIZATION LAB (MC309)

COURSE NAME	COURSE OUTCOMES
C210.1	To developed a better understanding of important issues related to gender in contemporary India(BTL2)
C210.2	To sensitized to basic dimensions of the biological, sociological, psychological and legal aspects of gender(BTL2)
C2110.3	To attain a finer grasp of how gender discrimination works in our society and how to counter it(BTL2)
C210.4	To acquire insight into the gendered division of labor and its relation to politics and economics(BTL2)
C210.5	Men and women students and professionals will be better equipped to work and live together as equals(BTL1)
C210.6	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)

II-II

1.DISCRETE MATHEMATICS (CS401PC)

COURSE NAME	COURSE OUTCOMES
C221.1	Ability to understand and construct precise mathematical proofs(BTL2)
C221.2	Ability to use logic and set theory to formulate precise statements(BTL1)
C221.3	Ability to analyze and solve counting problems on finite and discrete structures(BTL4)
C221.4	Ability to describe and manipulate sequences(BTL2)
C221.5	Ability to apply graph theory in solving computing problems(BTL3)
C221.6	Ability to learn the elementary discrete mathematics for computer science and engineering(BTL1)

2. BUSINESS ECONOMICS & FINANCIAL ANALYSIS (SM402MS)

COURSE NAME	COURSE OUTCOMES
C222.1	To learn business types(BTL1)
C222.2	Learn impact of the economy on business and firms specifically(BTL1)
C222.3	To analyze the business from the financial perspective(BTL2)
C222.4	To understand various forms of business(BTL2)
C222.5	To understand the impact of economic variable on business(BTL2)
C222.6	To analyze the financial statements of a company(BTL2)

3. OPERATING SYSTEMS (CS403PC)

COURSE NAME	COURSE OUTCOMES
C223.1	Demonstrate the knowledge of the components of computer and their respective roles in computing.(BTL3)
C223.2	Distinguish different process scheduling algorithms. (BTL4)
C223.3	Distinguish between Deadlock Prevention, Avoidance and Recovery from Deadlock(BTL4)
C223.4	Understanding 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. DATABASE MANAGEMENT SYSTEMS (CS404PC)

COURSE NAME	COURSE OUTCOMES
C224.1	Understand the basic concepts and the applications of database systems(BTL2)
C224.2	Demonstrate the basic elements of a relational database management system(BTL3)
C224.3	Design entity relationship model and convert entity relationship diagrams into RDBMS and formulate SQL queries on the data(BTL3)
C224.4	Identify need of schema refinement and Apply normalization techniques for the development of application software's(BTL2)
C224 .5	Identify and apply the basics of Transaction management and Concurrency control(BTL2)
C224.6	Understanding various indexing techniques and basic database storage structures (BTL2)

5. JAVA PROGRAMMING (CS405PC)

COURSE NAME	COURSE OUTCOMES
C225.1	Solve real world problems using OOP techniques(BTL3)
C225.2	Understand the use of packages and abstract classes(BTL2)
C225.3	Able to create user defined exceptions and handle them(BTL3)
C225.4	Develop multithreaded applications with synchronization(BTL3)
C225.5	Able to solve problems using java collection framework and I/o classes(BTL3)
C225.6	Design applets for web applications and GUI based applications(BTL3)

6.DBMS LAB(CS407PC)

COURSE NAME	COURSE OUTCOMES
C226.1	Design Data Base requirement specification with Entity Relationship Model(BTL6)
C226.2	Design Data Base schema using Relational Model(BTL6)
C226.3	Apply normalization techniques for development of application software to realistic problems(BTL3)
C226.4	Formulate queries using SQL DML/DDL/DCL commands(BTL3)
C226.5	Formulate simple triggers(BTL3)
C226.6	Create stored procedures and cursors(BTL3)

7.OS LAB(CS406PC)

COURSE NAME	COURSE OUTCOMES
C227.1	implement system that minimizes turnaround time, waiting time and response time and also maximize throughput by keeping CPU as busy as possible(BTL3)
C227.2	create access controls to protect files (Directory Level)(BTL3)
C227.3	Apply optimization techniques for the improvement of secondary memory allocation(BTL3)
C227.4	design different memory management techniques (Main Memory)(BTL6)
C227.5	Implement the virtual memory concepts(BTL3)
C227.6	implementing the concepts of Deadlock prevention, occurrence and avoidance(BTL3)

8. JAVA PROGRAMMING LAB (CS408PC)

COURSE NAME	COURSE OUTCOMES
C228.1	Able to write programs for solving real world problems using java collection frame work(BTL3)
C228.2	Able to write programs using abstract classes(BTL3)
C228.3	Ability to write multithreaded programs.(BTL3)
C228.4	Able to write GUI programs using swing controls in Java(BTL3)
C228.5	To introduce java compiler and eclipse platform(BTL1)
C228.6	To impart hands on experience with java programming(BTL2)

9. CONSTITUTION OF INDIA (MC409)

COURS	COURSE OUTCOMES

E NAME	
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 known 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	Able to understand the concept of abstract machines and their power to recognize the languages(BTL2)
C311.2	Able to employ finite state machines for modeling and solving computing problems(BTL2)
C311.3	Able to design context free grammars for formal languages(BTL3)
C311.4	Understand the pushdown automata and Understand the language of Turing machine(BTL2)
C311.5	Able to gain proficiency with mathematical tools and formal methods(BTL2)
C311.6	To understand the differences between decidability and undecidability(BTL2)

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	Identify the requirements and differentiate functional requirements and nonfunctional requirements(BTL2)
C312.3	Make use of different system models through analysis of requirements and develop an appropriate software design(BTL1)
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 know more about product metrics(BTL2)
C312.6	Identify risk in the product by using different techniques and know how to maintain the quality of the product and experience and/or awareness of testing problems and will be able to develop a simple testing report(BTL2)

3. COMPUTER NETWORKS(CS503PC)

COURS	COURSE OUTCOMES

E NAME	
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	Understand the Network layer and its design issues(BTL2)
C313.4	Understand the congestion control algorithms(BTL2)
C313.5	Understand Transport Layer, its services and protocols(BTL2)
C313.6	Understand application layer and its protocols(BTL2)

4. WEB TECHNOLOGIES(CS504PC)

COURSE NAME	COURSE OUTCOMES
C314.1	Able to solve real world problems using PHP (BTL3)
C314.2	Able to develop static websites through HTML and CSS (BTL3)
C314.3	Able to configure servlets using XML (BTL3)
C314.4	Able to develop server side components using servlets and JDBC (BTL3)
C314.5	Able to develop MVC based applications using JSP, servlets and JDBC technologies (BTL3)
C314.6	Able to perform 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	Learn Model Theory, Model fit Statistics, Model Construction(BTL1)
C315.5	Analyze supervised and unsupervised models and estimate the accuracy of the algorithms.(BTL4)
C315.6	Understand the various search methods and visualization techniques.(BTL2)

6. INFORMATION RETRIEVAL SYSTEMS(CS523PE)

COURSE NAME	COURSE OUTCOMES
C316.1	Ability to apply IR principles to locate relevant information large collections of data(BTL3)
C316.2	Ability to design different document clustering algorithms(BTL3)
C316.3	Implement retrieval systems for web search tasks(BTL3)
C316.4	Design an Information Retrieval System for web search tasks(BTL3)
C316.5	To learn the important concepts and algorithms in IRS(BTL1)
C316.6	To understand the data/file structures that are necessary to design, and implement information(BTL2)

7. SOFTWARE ENGINEERING LAB(CS505PC)

COURSE NAME	COURSE OUTCOMES
C317.1	Ability to develop a software project by using various softwareengineering 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	Able to develop a simple testing report(BTL3)

8. COMPUTER NETWORKS AND WEB TECHNOLOGIES LAB(CS506PC)

COURSE NAME	COURSE OUTCOMES
C318.1	Implement data link layer farming 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	Implement Encoding and Decoding techniques used in presentation layer(BTL4)
C318.5	To be able to work with different network tools(BTL2)
C318.6	To understand the network simulator environment and visualize a network topology and observe its performance(BTL2)

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 relevanBTLy and coherenBTLy 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	Ability to get the skill to apply machine learning techniques to address the real time problems in different areas(BTL1)
C321.3	Understand the Neural Networks and its usage in machine learning application(BTL3)
C321.4	To explains machine learning techniques such as decision tree learning, Bayesian learning etc(BTL2)
C321.5	To study the pattern comparison techniques(BTL1)
C321.6	To understand computational learning theory(BTL2)

2. COMPILER DESIGN(CS602PC)

COURSE NAME	COURSE OUTCOMES
C322.1	Describing translation in each phase of the compilation(BTL2)
C322.2	Design parsers for the compilers(BTL3)
C322.3	Define the specific semantic test and enhance the parser to construct a symbol table(BTL1)
C322.4	Describing the different forms of Intermediate code(BTL2)
C322.5	Perform Code Optimization and understanding runtime environment(BTL2)
C322.6	Design code generation schemes on machine dependent optimizations(BTL3)

3. DESIGN AND ANALYSIS OF ALGORITHMS(CS603PC)

COURSE NAME	COURSE OUTCOMES
C323.1	Ability to analyze the performance of algorithms(BTL4)
C323.2	Ability to choose appropriate data structures and algorithm design methods for a specified application(BTL2)
C323.3	Ability to understand how the choice of data structures and the algorithm design methods impact the performance of programs(BTL2)
C323.4	Describes major algorithmic techniques (divide-and-conquer, backtracking, dynamic programming, greedy(BTL3)
C323.5	Describes branch and bound methods) and mention problems for which each technique is appropriate(BTL3)
C323.6	To evaluate and compare different algorithms using worst-, average-, and bestcase analysis(BTL4)

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	Learn the scripting languages (BTL1)
C324.4	Gain knowledge of the strengths and weakness of Perl (BTL1)
C324.5	Gain knowledge of advanced perl (BTL1)
C324.6	Gain knowledge of TCL and Tk(BTL1)

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	Able to 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. ENVIRONMENTAL SCIENCE(MC609)

C326.1	Understand the technologies on the basis of ecological principles and environmental regulations(BTL2)
C326.2	Evaluate technologies on the basis of ecological principles and environmental regulations(BTL3)
C326.3	Develop technologies on the basis of ecological principles and environmental regulations(BTL3)
C326.4	Understanding the importance of ecological balance for sustainable development.(BTL2)
C326.5	Understanding the impacts of developmental activities and mitigation measures(BTL2)
C326.6	Understanding the environmental policies and regulations(BTL2)

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(BTL3)
C327.2	Able to design and implement LL and LR parsers(BTL3)
C327.3	Apply client-server principles to develop scalable and enterprise web applications(BTL3)
C327.4	Ability to design, develop, and implement a compiler for any language(BTL3)
C327.5	Able to use lex and yacc tools for developing a scanner and a parser(BTL1)
C327.6	To understand the design of top-down and bottom-up parsers(BTL2)

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 (BTL3)
C328.4	Design the applications using Perl.(BTL3)
C328.5	Design the applications using TCL (BTL3)
C328.6	Understand the differences between Scripting languages and programming languages (BTL2)

9. MACHINE LEARNING LAB(CS604PC)

COURSE NAME	COURSE OUTCOMES
C329.1	Understand complexity of Machine Learning algorithms and their limitations(BTL2)
C329.2	Understand modern notions in data analysis-oriented computing(BTL2)
C329.3	Apply common Machine Learning algorithms in practice(BTL3)
C329.4	Implementing Machine Learning algorithms(BTL4)
C329.5	Performing experiments in Machine Learning using real-world data(BTL1)
C329.6	Overview of the various machine learning techniques(BTL1)

IV-I

1. CRYPTOGRAPHY AND NETWORK SECURITY(CS701PC)

COURSE NAME	COURSE OUTCOMES
C411.1	Able to understand basic cryptographic algorithms, message and web authentication and security issues(BTL2)
C411.2	Ability to identify information system requirements for both of them such as client and server(BTL1)
C411.3	Ability to understand the current legal issues towards information security(BTL2)
C411.4	Understand the basic categories of threats to computers and networks(BTL2)
C411.5	Understand Intrusions and intrusion detection(BTL2)
C411.6	Generate and distribute a PGP key pair and use the PGP package to send an encrypted email message(BTL2)

2. DATA MINING (CS702PC)

COURSE NAME	COURSE OUTCOMES
C412.1	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(BTL4)
C412.2	Apply preprocessing methods for any given raw data and understand the fundamentals of data mining(BTL2)
C412.3	Apply knowledge on association rules and its uses in real time(BTL3)
C412.4	Understanding about different algorithms on generation on frequent patterns(BTL2)
C412.5	Synthesize the information about methods for classification and prediction(BTL2)
C412.6	Extract interesting patterns from large amounts of data and 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 and applications using different architectures for data centers(BTL4)
C413.2	Understanding of different evaluating computer model cloud computing(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 and develop cloud scientific application(BTL4)
C413.5	Understand the design of federation concept, sla management and cloud mash up(BTL2)
C413.6	Broadly educate to know the impact of engineering on legal and societal issues involved in addressing the security issues of cloud computing(BTL1)

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	Learn the Python Scripting Language which is used in many IoT devices(BTL1)
C414.4	Learn Exception handling Python packages - JSON, XML, HTTPLib, URLLib, SMTPLib(BTL1)
C414.5	Learn the Raspberry PI platform, that is widely used in IoT applications(BTL1)
C414.6	Understand the implementation of web based services on IoT devices(BTL2)

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(BTL4)
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	To implement the DES , Blowfish , Rijndael algorithm logic(BTL4)
C416.5	To perform encryption and decryption using Ceaser cipher Substitution cipher Hill Cipher(BTL3)
C416.6	Able create your own key using Java key tool(BTL3)

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. ENVIRONMENTAL IMPACT ASSESSMENT(CE800OE)

COURSE NAME	COURSE OUTCOMES
C422.1	Explicate the concept of EIA(BTL1)
C422.2	Identify the objectives and scope of EIA(BTL1)
C422.3	Illustrate the necessity of public participation in EIA studies(BTL3)
C422.4	Summarize the importance of environmental attributes(BTL4)
C422.5	Understand the phenomena of impacts on environment(BTL2)
C422.6	quantify impacts for various development projects(BTL3)

3. HUMAN COMPUTER INTERACTION (CS814PE)

COURSE NAME	COURSE OUTCOMES
C423.1	Ability to apply HCI and principles to interaction design(BTL2)
C423.2	Ability to design certain tools for blind or PH people(BTL2)
C423.3	To formulate a good design knowledge(BTL2)
C423.4	Formulate information about design process(BTL2)
C423.5	Identify components involved in designing a process(BTL2)
C423.6	Identify components involved in designing a GUI(BTL2)

MANUAL

FOR

CO – PO

STATEMENTS

(Approved by AICTE, New Delhi | Affiliated to JNTUH, Hyderabad | Accredited by NAAC| Accredited by NBA | Hyderabad | PIN: 500068)

DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

CONTENT

1. INSTITUTE VISION AND MISSION

VISION

- To be a center of excellence in technical education to empower the young talent through quality education and innovative engineering for well-being of the society.

MISSION

- Provide quality education with innovative methodology and Intellectual human capital.
- Provide conducive environment for research and developmental activities.
- Inculcate holistic approach towards nature, society and human ethics with lifelong learning attitude.

2. DEPARTMENT VISION AND MISSION

VISION

- To excel in Electronics & Communication Engineering education with the knowledge of innovation, research and ethics.

MISSION

- To provide academic environment that promotes student centric learning through quality education and state of the art infrastructure.
- To make the students aspire towards innovation and research to meet the technological needs of society.
- To engage the students in activities which inculcate professional practices with social concern.

3. PROGRAM OUTCOMES

Engineering Graduates will be able to:

1. **Engineering knowledge:** Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.

2. **Problem analysis:** Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and Engineering sciences.

3. **Design/development of solutions:** Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.

4. **Conduct investigations of complex problems:** Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the Information to provide valid conclusions.

5. **Modern tool usage:** Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.

6. **The engineer and society:** Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.

7. **Environment and sustainability:** Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.

8. **Ethics:** Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.

9. **Individual and team work:** Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.

10. **Communication:** Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.

11. **Project management and finance:** Demonstrate knowledge and understanding of the engineering and management principles and apply these to one’s own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.

12. **Life-long learning:** Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

4. PROGRAM EDUCATIONAL OBJECTIVES, AND PROGRAM SPECIFIC OUTCOMES

Program Educational Objectives (PEOs):

PEO 1

Graduate will be empowered with strong fundamental concepts, analytical capability, programming and problem solving skills.

PEO 2

Graduate will be employed, may pursue higher education or undertake research.

PEO 3

Graduate will embrace Professional Career Growth with Values & Ethics and urge for lifelong learning.

Program Specific Outcomes:

PSO 1

Design, analyze and develop modules and systems for applications in advanced electronics and communication systems.

PSO 2

Utilize modern tools for modeling and computational techniques in IC fabrication and RF technologies.

5. THE COURSE OUTCOMES OF VARIOUS REGULATIONS

REGULATION: R18

I Year I SEMESTER

Course Outcomes

Course Name: Mathematics-I **Course code:** MA101BS

C101.1	Able to write the matrix representation of a set of linear equations and to analyze the solution of the system of equations
C101.2	Able to find the Eigen values and Eigen vectors which come across under linear transformations
C101.3	Able to test the convergence and divergence of positive term series.
C101.4	Able to test for convergence of alternating series and testing for absolute and conditional convergence
C101.5	Able to find surface area and volume using integration. Able to solve improper integrals.
C101.6	Able to apply partial differentiation and able to calculate maximum and minimum.

Course Name: Applied Physics **Course code:** AP102BS

C102.1	Students will be able to demonstrate competency and understanding of the concepts found in Mechanics
C102.2	Students will be able to and understanding of the concepts found in Harmonic Oscillations
C102.3	Students gains a strong foundation on the different kinds of characters of several materials
C102.4	This chapter pave a way for them to use in at various technical and engineering applications
C102.5	Student can apply their knowledge of interference and diffractions in varies engineering fields
C102.6	Student can apply their knowledge of principles of lasers and fiber optics in varies engineering fields

Course Name: Programming for problem solving **Course code:** CS103ES

C103.1	Understand various steps in Program development and basic concepts in C Programming Language.
C103.2	Understand arrays, strings, pointers and apply them for sorting, searching techniques and Differentiate structures and union concepts.
C103.3	Ability to make use of preprocessor directives for file inclusion, macro definition conditional compilation.
C103.4	Able to create, read and write to and from simple text and binary files.
C103.5	Able to develop structured programs using functions and able to implement the concept of dynamic memory allocations.
C103.6	Able to analyze the problem and their requirement for writing the algorithms.

Course Name: Engineering Graphics **Course code:** ME104ES

C104.1	Apply simple geometrical construction methods to construct various engineering curves and scales using the methods described in literature.
C104.2	Apply principles of orthographic projections to draw two dimensional views of points, lines and planes considered in any angle.
C104.3	Construct two dimensional views of prism and cylindrical solids considered in any position with respect to reference planes.
C104.4	Construct two dimensional views of pyramid and cone considered in any position with respect to reference planes.
C104.5	Sketch sectional views and development of surface of sectioned solids that are cut by various positions of section planes.
C104.6	Outline various features of solid by viewing them from front, top & sides and also apply principles of isometric projections to draw three dimensional view of solids

Course Name: Applied Physics Lab **Course code:** AP105BS

C105.1	Students will get the knowledge about the dispersion, interference and diffraction and related experimental skills
C105.2	Students will perform the experiments related to the optical fiber communication system
C105.3	Students will perform experiments related to semiconductor devices
C105.4	Students will get the knowledge about the elastic nature of matter and energy and their experimental verification
C105.5	Once the students perform the experiments they can apply the knowledge in the real life
C105.6	By studying the resonance phenomenon in LCR circuits the student will get the idea about the impedance matching and voltage magnification

Course Name: Programming for problem solving lab **Course code:** CS106ES

C106.1	Able to formulate the algorithms for simple problems.
C106.2	Able to translate given algorithms to a working and correct program.
C106.3	Able to correct syntax errors as reported by the compilers and identify and correct logical errors encountered during execution.
C106.4	Able to represent and manipulate data with arrays, strings and structures.
C106.5	Able to demonstrate the use of pointers of different types and able to create, read and write to and from simple text and binary files.
C106.6	Able to write the code to implement functions.

I Year II SEMESTER(R-18)

Course Name: Mathematics- II **Course code:** MA201BS

C111.1	Able to identify whether the given differential equation of first order is exact or not And solve higher differential equation and apply the concept of differential equation to real world problems
C111.2	Able to find solution of second and higher order differential equations
C111.3	Able to evaluate double and triple integrals
C111.4	Evaluate the multiple integrals and apply the concept to find areas, volumes, centre of mass and Gravity for cubes, sphere and rectangular parallelepiped
C111.5	Able to Understand the concepts of vector function, vector field, scalar field, gradient, divergence and curl

C111.6	Able solve linear and non linear partial differential equation.

Course Name: Chemistry **Course code:** CH202BS

C112.1	Able to understand LCAO of diatomic and organic molecules along with the reason behind crystal field splitting and its applications in conductance of materials
C112.2	Able to apply the various techniques for prevention of boiler troubles, potable water, disinfection and water treatment methods.
C112.3	Able to apply the concepts and applications of electrochemistry, different electrodes and battery technology in the engineering fields.
C112.4	Able to adapt the various techniques used to prevent corrosion of different materials used in many engineering fields.
C112.5	Able to understand different types of organic reactions, mechanisms and their applications
C112.6	Able to understand different principles, selection rules and applications of different types of spectroscopy

Course Name: BEE **Course code:** EE203ES

C113.1	To analyze and solve DC circuits using network laws and theorems.
C113.2	To analyze basic AC single phase & three phase circuits
C113.3	To analyze the performance of Single-phase Transformers.
C113.4	To learn the in-depth knowledge on DC machines & its applications
C113.5	To analyze the working principles of AC Machines & its applications
C113.6	To introduce components of Low Voltage Electrical Installations

Course Name: EW **Course code:** ME205ES

C114.1	The ability to use the basic tools
C114.2	The ability to apply suitable tools for different manufacturing operations such as materials removal carpentry, fitting ,tin – smithy,
C114.3	To develop the right attitude and team work
C114.4	The ability to connect electrical wirings between input and output source
C114.5	The ability to Apply Different wildings to prepare joints
C114.6	The ability to prepare the Different Castings and black smithy

Course Name: English **Course code:** EN205HS

C115.1	Relate listening skills for effective communication comprehend literary text and enrich vocabulary.
C115.2	Comprehend technical correspondence, learn reading techniques and use grammar structures appropriately.
C115.3	Revise and apply the right format of formal letter writing, drafting Resumes' and know the contextual knowledge of vocabulary used.
C115.4	Compose the literary text, basic grammatical aspects and learning the etymology of words.
C115.5	Employ information transfer intelligibly and express effectively in spoken and written communication.

C115.6	Appraise the linguistic and communication competencies and demonstrate professional and managerial communication.

Course Name: EC LAB **Course code:** CH206BS

C116.1	Able to estimate the hardness of water using EDTA.
C116.2	Able to evaluate the strength of strength of acids using conductometry and potentiometer.
C116.3	Able to measure the concentration of iron in cement sample using photo colorimeter.
C116.4	To estimate the viscosity of a given liquid using Ostwald Viscometer.
C116.5	Able to measure the concentration of copper by iodometry.
C116.6	Able to understand the synthesis method of synthetic polymers.

Course Name: ELCS LAB **Course code:** EN207HS

C117.1	Students will be able to employ the nuances of English speech sounds, word accent, intonation and rhythm.(TL3)
C117.2	Students will be able to differentiate the influence of their mother tongue while speaking English.(TL4)
C117.3	Students will be able to construct required dialogues in Role Plays,debates and GDs. (TL6)
C117.4	Students will be able to comprehend any literary material. (TL2)
C117.5	Students will be able to appraise English (LSRW) skills for acquiring Employability.(TL5)
C117.6	Students will be able to remember the usage of intensive listening.(TL1)

Course Name: BEE LAB **Course code:** EE208ES

C118.1	Understand and remember the technical's involved in functioning and operations of instruments, power supplies and tools identification of components and values of devices
C118.2	The student will analyze the concept of ohm's law , Kirchhoff's laws and resonance circuits
C118.3	Observe the transient response of first order RL,RC,RLC network for D.C. excitation
C118.4	Understand and performance of single phase transformer and its characteristics
C118.5	To understand the operating principles and characteristics of D.C machine
C118.6	To understand the operating principles and characteristics of A.C machine

II Year I SEMESTER(R-18)

Course Name: Electronic Devices and Circuits **Course code:** EC301PC

C201.1	Able to understand the fundamentals of electronic circuits such as diodes and its applications
C201.2	Able to understand BJT and also the applications of BJT
C201.3	Able to understand types of FET as well as principle of operations along with its characteristics curve
C201.4	Able to understand applications of special purpose diodes along with its characteristics curve
C201.5	Able to analyze BJT under different modes such as CB, CE and CC configurations and derive its parameters.
C201.6	Able to analyze FET under different modes such as CS, CD, CG configurations and understand types of MOSFET's as well as MOS Capacitor.

Course Name: Network Analysis and Transmission Lines **Course code:** EC302PC

C202.1	Gains the knowledge on basic network elements
C202.2	Learns and analyze the RLC circuits behavior in detail
C202.3	Learns and gain the knowledge in characteristics of two port network parameters(Z,Y, ABCD, h & g)
C202.4	Learns the concept of attenuators and impedance matching
C202.5	Gains the knowledge on different type of transmission lines and their characteristics
C202.6	Learns smith chart and its applications

Course Name: Digital System Design **Course code:** EC303PC

C203.1	Understand the numerical information in different forms and Boolean Algebra theorems
C203.2	Understand the postulates of Boolean algebra and minimize combinational functions
C203.3	Analyze the differences between Combinational and Sequential circuits and understand the functionality of various Flip-Flops
C203.4	Design and analyze sequential circuits like shift registers and counters using flip-flops
C203.5	Design various state (sequential) machines and realize them as mealy and Moore models
C203.6	Understand the logic families and realization of logic gates

Course Name: Signals And Systems **Course code:** EC304PC

C204.1	To understand signal, types of signals, analogy between vectors and signals, response of LTI system.
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

C204.3	To understand Characteristics of filters, relation between the bandwidth and rise time, convolution in time and frequency domain
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.
C204.5	To apply the ZT and IZT for discrete time signals and to find the ROC of ZT, of different types of signals.
C204.6	nderstand the concepts of sampling, Cross Correlation and Auto correlation.

Course Name: Probability Theory and Stochastic Processes **Course code:** EC305PC

COURSE NAME	COURSE OUTCOMES
C205.1	Understand the axiomatic formulation of modern Probability Theory and think of random variables as an intrinsic need for the analysis of random phenomena.
C205.2	Characterize probability models and function of random variables based on single & multiple random variables
C205.3	Understand the concepts of Random Process and find its temporal Characteristics.
C205.4	Understand the response of linear time Invariant system for a Random Processes.
C205.5	Analyze concepts of Random Process and its spectral Characteristics.
C205.6	Understand the concepts of Noise in Communication systems.

Course Name: Electronic Devices and Circuits Lab **Course code:** EC306PC

COURSE NAME	COURSE OUTCOMES
C206.1	Determine the forward and reverse bias Of diode
C206.2	Studying the characteristics of a special purpose diode.
C206.3	Studying the input and output waveform for a full wave rectifier and half wave rectifier
C206.4	Studying the input and output characteristics of CE,CB,CC configuration
C206.5	studying the Analysis of CE,CB,CC amplifier
C206.6	Studying the analysis of CS,CD,CG amplifiers

Course Name: Digital System Design Lab **Course code:** EC307PC

C207.1	Perform various LOGIC Operations
C207.2	Understand the postulates of Boolean algebra and minimize combinational functions
C207.3	Analyze the differences between Combinational and Sequential circuits and understand the functionality of various Flip-Flops
C207.4	Design and analyze sequential circuits like shift registers and counters using flip-flops
C207.5	Design various state (sequential) machines and realize them as mealy and moore models
C207.6	Understand the logic families and realization of logic gates

Course Name: Basic Simulation Lab **Course code:** EC308ES

C208.1	Perform various synthetic signals and sequences
C208.2	Perform various operations on signal, sequences and verify signal properties

C208.3	Analyze the linearity and time invariance characteristics of given system
C208.4	Analyze the waveform in Fourier, Laplace and z-transform of the given signal
C208.5	Demonstrate the noise removal process and extraction of periodic signal using correlation
C208.6	Analyze the noise waveform for random variables and stochastic process

II Year II SEMESTER(R-18)

Course Name: LTNMCV **Course code:** MA401BS

C211.1	Able to find Laplace transforms and inverse L.T of a function and Solving ODE using Laplace transforms.
C211.2	Able to find roots of a given equation and able to estimating the value for given data using interpolation.
C211.3	Able to solve ODE using numerical methods.
C211.4	Able to evaluating integrals using numerical methods.
C211.5	Able to Analyze the complex function for analyticity using CR equations finding harmonic conjugate.
C211.6	Able to evaluate integrals using Cauchy's integrals and residue theorems. Able to expand complex function using Taylors and Laurent's series.

Course Name: Electromagnetic Fields and Waves **Course code:** EC402PC

C212.1	Get the knowledge of basic laws come concepts and proofs related to electro static fields and magneto static fields.
C212.2	Distinguish between static and time varying fields.
C212.3	Establish the corresponding sets of Maxwell's equation and boundary conditions
C212.4	Analyze wave equations for good conductors, good die electrics and evaluate the UPW characteristics for several practical media of interest.
C212.5	To analyze completely Rectangular Wave guides, their mode characteristics and designs wave.
C212.6	The guides for solving practical problems solving.

Course Name: Analog and Digital Communications **Course code:** EC403PC

C213.1	Able to explain and analyze the functionalities of basic components of digital communication systems and different pulse digital modulation techniques such as PCM and DM.
C213.2	Able to understand redundancy present in digital communication and design various source coding techniques to increase average information per bit and error control codes
C213.3	Able to analyze base band pulse transmission and base band signal receiver.
C213.4	Able to design optimum receiver for digital modulation technique.
C213.5	Able to explain and analyze performance of various Digital Modulation in pass band signal transmission
C213.6	Able to analyze the various Spread Spectrum Modulations.

Course Name: Linear IC Applications **Course code:** EC404PC

C214.1	The student will be able to Verify the characteristics of different Logic Family IC'S.
C214.2	A thorough understanding of operational amplifiers with linear integrated circuits
C214.3	Choose appropriate regulator based on the type of application
C214.4	Design filters and oscillators using Op-Amp
C214.5	Attain the knowledge of functional diagrams and applications of IC 555 and IC 565
C214.6	Acquire the knowledge about the Data converters.

Course Name: Electronic Circuit Analysis **Course code:** EC405PC

C215.1	Design of single and multistage amplifiers for required gain of low and mid frequency range.
C215.2	Determine the gain parameters and design amplifiers for high frequency.
C215.3	Design amplifiers with gain control using negative feedback and design signal generators with positive feedback. Evaluation of amplifiers gains stabilization improvement of bandwidth.
C215.4	Design of power amplifier for specified loads.
C215.5	Design of tuned amplifiers for audio and radio frequency range of transmitters and receivers.
C215.6	Determine the gain parameters and design amplifiers for high frequency.

Course Name: Analog and Digital Communication Lab **Course code:** EC406PC

C216.1	Analyze the spectrum of various analog modulation techniques
C216.2	Design a multiplexing system using FDM
C216.3	Examine various pulse modulation techniques
C216.4	Analyze different digital modulation and demodulation schemes
C216.5	Analyze pulse modulation and demodulation techniques
C216.6	Design Digital modulation techniques (FSK, PSK, QPSK, BPSK)

Course Name: IC Applications Lab **Course code:** EC407PC

C217.1	Design and analyze various combinational circuits using Op Amp IC-741
C217.2	Design and analyze various combinational circuits like adder, substractor, Comparator, integrator, Differentiator and Schmitt trigger using IC741
C217.3	Design and analyze for ACTIVE FILTERS Applications and Wave Form Generators using IC 741
C217.4	Design multi vibrators using IC555
C217.5	Design waveform generators and PLL circuits using Ics
C217.6	Analyze the practical applications of Voltage Regulator using various Ics

Course Name: Electronic Circuit Analysis Lab **Course code:** EC408PC

C218.1	Simulate single stage amplifiers for different gain and bandwidth considerations
C218.2	Simulate different multi stage amplifiers for different gain and bandwidth considerations
C218.3	Simulate the performance of diverse types of feedback amplifiers for quality improvement in amplification.
C218.4	Simulate different types of oscillators and understand performance of oscillators
C218.5	Simulate power amplifiers and their performance.
C218.6	Simulate tuned amplifiers and their performance.

III Year I SEMESTER(R-18)

Course Name: Microprocessors & Microcontrollers **Course code:** EC301PC

C301.1	Understand the internal architecture and organization of 8086 and develop assembly programs using various instructions.
C301.2	Understand the internal architecture, organization and interrupts of 8051 and develop assembly programs using various instructions.
C301.3	Understand the various I/O interfacing techniques to 8086 and 8051.
C301.4	Understand the various onboard and external serial communication standards and schemes.
C301.5	Understand the internal architecture and organization of ARM and develop assembly programs using various instructions
C301.6	Understand the architecture of advanced ARM processors – CORTEX and OMAP

Course Name: Data Communications and Networks **Course code:** EC302PC

C302.1	Know the Categories and functions of various Data communication Networks
C302.2	Design and analyze various error detecting techniques
C302.3	Demonstrate the mechanism of routing the data in network layer
C302.4	know the significance of various Flow control mechanisms
C302.5	Know the significance of various Congestion control mechanism
C302.6	Know the Functioning of various Application layer Protocols

Course Name: Control Systems **Course code:** EC303PC

C303.1	Learn to implement mathematical model of a system through Transfer Function for a LTI system
C303.2	Analyze the response of First and Second order systems in time domain using characteristic Equations for feedback control systems
C303.3	Analyze the stability of a system in Time Domain using RH Criterion and Root Locus
C303.4	Analyze the response of a Control System in Frequency domain and determine the stability of the system using BODE Plots
C303.5	Analyze the stability of a system in frequency domain using polar and nyquist plots and improve the stability by design and implementation of Compensators and Controllers
C303.6	Implement the state model of a system and determine the transfer function for Linear Time Variant Systems

Course Name: Business Economics & Financial Analysis **Course code:** EC304PC

C304.1	Evaluate the various Forms of Business and the impact of economic variables on the Business.
C304.2	Analyze the basic issues governing the business operations namely, the Demand and Supply.
C304.3	Analyze Production function and cost-output relationship
C304.4	Evaluate the pricing strategies under different market structures
C304.5	Evaluate and prepare accounts so that the engineers excel in the business.
C304.6	Evaluate the firm's financial position by analyzing the Financial Statements, Ratios, Funds and Cash flow statements of a Company.

Course Name: Microprocessors And Microcontrollers Lab **Course code:** EC305PC

C305.1	To select appropriate assembly language instructions to perform arithmetic operations, string manipulations for 8086
C305.2	To design and generate assembly language code for digital clock ,analog to digital and digital to analog conversion
C3505.3	Can demonstrate serial communication and parallel communication between two microprocessors using 8051
C305.4	Interface between microprocessors & its peripherals devices using instruction set
C305.5	To develop the program segments for arithmetic logical & bit manipulation for 8051 microcontroller
C305.6	To compose instructions for various operations among microcontroller peripherals and to verify the functionality of timer/counter

Course Name: Data Communications and Networks Lab **Course code:** EC306PC

C306.1	Know the Categories and functions of various Data communication Networks
C306.2	Design and analyze various error detecting techniques
C306.3	Demonstrate the mechanism of routing the data in network layer
C306.4	know the significance of various Flow control mechanisms
C306.5	Know the significance of various Congestion control mechanism
C306.6	Know the Functioning of various Application layer Protocols

Course Name: Advanced Communication Skills Lab **Course code:** EC308PC

C308.1	Gathering ideas and information to organize ideas relevantly and coherently
C308.2	Engaging in debates and participating in group discussions
C308.3	Facing interviews and writing projects/research reports/technical reports
C308.4	Making oral presentations and writing formal letters
C308.5	Transferring information from non-verbal texts and vice-versa
C308.6	Taking part in social and professional communication

III Year II SEMESTER(R-18)

Course Name: Antennas and Propagation **Course code:** EC311PC

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
C311.2	Understand the design issues and the operation of fundamental antennas like Yagi - Uda, Horn antenna and Helical structure
C311.3	Understand the designs of RF and Microwave antennas and Helical structure
C311.4	Analyze the structure and working of Parabolic reflector antenna for a given specification
C311.5	Define the array system for different antennas and field analysis
C311.6	Understand the behavior of nature on EM wave propagation

Course Name: Digital Signal Processing **Course code:** EC312PC

C312.1	Generate synthetic Sinusoidal waveform based on recursive difference equations
C312.2	Compute DFT, IDFT, FFT of a given sequence and determine the power spectrum.
C312.3	Design and implementation of low pass, high pass of FIR and IIR filters for a given sequence.
C312.4	Compute multi-rate Digital signal processing (decimation, Interpolation, sampling rate conversion) of a given sequence
C312.5	Analyze real time applications and verification of audio signals.
C312.6	Analyze the first order and second order system with impulse response

Course Name: VLSI Design **Course code:** EC313PC

C313.1	Analyze the fabrication process steps for developing a IC. Evaluate the types of MOS transistor characteristics for diverse inverters.
C313.2	Understanding VLSI circuit design flow rules with respect to Layout, scaling of MOS, wiring and contacts for fabrication of inverter circuits and gates.
C313.3	Understand and evaluate the factors of developing gate level designs.
C313.4	Understand and evaluate the factors of effecting due to capacitance effect.
C313.5	Design and develop subsystems for reducing design time and cost of developing IC.
C313.6	Evaluation of design approach for array logic memories and cells. Testing principles and strategies for components level and integrated cells level.

Course Name: Digital Signal Processing Lab Co**urse code:** EC314PC

C314.1	Generate synthetic Sinusoidal waveform based on recursive difference equations
C314.2	Compute DFT, IDFT, FFT of a given sequence and determine the power spectrum.
C314.3	Design and implementation of low pass, high pass of FIR and IIR filters for a given sequence.
C314.4	Compute multi-rate Digital signal processing (decimation, Interpolation, sampling rate conversion) of a given sequence
C314.5	Analyze real time applications and verification of audio signals.
C314.6	Analyze the first order and second order system with impulse response

Course Name: E-CAD Lab **Course code:** EC315PC

C315.1	HDL code to realize all the logic gates
C315.2	Design of encoder ,decoder
C315.3	Design of multiplexer, de multiplexer
C315.4	Design of 4 bit binary to gray code converter Design of 4 bit comparator
C315.5	Design of flip flops: SR, D, JK,T and design of 4-bit binary, BCD counters
C315.6	Finite State Machine Design.

IV Year I SEMESTER(R-18)

Course Name: Microwave and Optical communications **Course code:** EC401PC

C401.1	Known power generation at microwave frequencies and derive the performance characteristics.
C401.2	Realize the need for solid state microwave sources and understand the principle of solid state devices.
C401.3	Distinguish between different types of wave guide and ferrite components, and select proper components for engineering Applications
C401.4	Study the performance of specialized microwave tubes such as M-type tubes.
C401.5	Understand the utility of S-parameters in microwave component design and various microwave parameters..
C401.6	Understand the mechanism of light propagation through Optical Fiber.

Course Name: Scripting Languages **Course code: EC712PE**

C402.1	Student should Known about basics of Linux and Linux Networking.
C402.2	Understand the Use of Linux environment and write programs for automation
C402.3	Understand the concepts of Scripting Languages
C402.4	Create and Run scripts using PER/TCI/Python.
C402.5	Understand the Tk Widgets, List box Widgets Focus
C402.6	Understand the More Control Flow Tools and Brief Tour of Standard Library

Course Name: Database Management System **Course code:** CS722PE

C403.1	Student should gain Knowledge of fundamentals of DBMS, data base design and normal forms.
C403.2	Understand the Master Basics of SQL for retrieval and management of data.
C403.3	Understand the be acquainted with the basics of transaction processing and concurrency control
C403.4	Familiarity with database storage structures and access techniques
C403.5	Understand the Validation –Based protocols, Multiple Granularity
C403.6	Student should learn Schema Refinement

Course Name: Python Programming **Course code:** CS702OE

C402.1	Examine Python syntax and semantics and be fluent in the use of Python flow control and functions..
C402.2	Demonstrate proficiency in handling Strings and File Systems
C402.3	Create, run and manipulate Python Programs using core data structures like Lists, Dictionaries and use Regular Expressions.
C402.4	Create and Run scripts using PER/TCI/Python.
C402.5	Interpret the concepts of Object-Oriented Programming as used in Python
C402.6	Implement exemplary applications related to Network Programming, Web Services and Databases in Python.

Course Name: Professional Practice Law & Ethics **Course code:** SM702MS

C405.1	Understanding basic purpose of profession, professional ethics and various moral and social issues (BT-4)
C405.2	Awareness of professional rights and responsibilities of a Engineer, safety and risk benefit analysis of Industrial Contracts. (BT-4)
C405.3	Acquiring knowledge of various roles of Engineer In applying ethical principles at various professional levels (BT-4)
C405.4	Professional Ethical values and contemporary issues (BT-4)
C405.5	Excelling in competitive and challenging environment to contribute to industrial labor laws and their growth. (BT-4)
C405.6	Analyze the social impact of Intellectual property law and policy. (BT-4)

Course Name: Microwave and Optical communications Engineering Lab
Co**urse code:** EC403PC

C403.1	Able to understand the different microwave components working and their applications.
C403.2	Able to demonstrate microwave bench setup for the generation of microwave frequencies using Gunn and Klystron sources.
C403.3	Able to measure the frequency, attenuation, VSWR, Impedance using Klystron Bench Setup
C403.4	Able to measure the characteristics of microwave junctions like E-Plane, H-Plane, and Magic Tees.
C403.5	Able to measure the characteristics of directional coupler.
C403.6	Able to measure the characteristics of circulator.

R-22 Regulation

Course code: A1001 Applied Physics Credits-4

Course Objectives:

The course objectives for the student are as follows:

1. Explore the fundamental concepts and theories of quantum physics and solid-state physics.
2. Understand the fundamental mechanisms involved in the design and operation of various semiconductor devices.
3. Learn about the fundamental concepts of dielectric and magnetic materials, as well as the properties of energy materials.
4. Describe the significance of quantum confinement, nanotechnology, various fabrication methods, and characterization techniques.
5. Study the characteristics of lasers and optical fibers.

Course Outcomes:

Upon completion of the course, the student will be able to

1. Gaining comprehensive knowledge regarding microscopic particles like electrons and solid categorization will let them distinguish between conductors, semiconductors, and insulators.
2. Interpret the knowledge of semiconductors, devices, and their various uses in science and technology.
3. Demonstrate the dielectric properties of insulators in static, alternating fields and various applications of modern engineering materials.
4. Examine the nanocrystals' structural properties, allowing them to either continue their studies or apply their knowledge to solve industrial problems.
5. Differentiate between types of lasers and optical fibers and their uses, which are needed in the current era of technology.

Faculty Course Lead Head of the Department

COURSE OBJECTIVE – COURSE OUTCOMES STATEMENT

Academic Year: 2023-24

Course Code: A1005
Regulation: R22
Name of the course: ENGLISH FOR SKILL ENHANCEMENT

Course Objectives: The objectives of this course for the student

1. To improve the language proficiency of students in English with an emphasis on Vocabulary, Grammar, Reading and Writing skills.
2. To equip students with components of different forms of writing, narration, paragraph writing, coherence, cohesiveness, description, narration, letters, reports etc.
3. To support students in building the vocabulary, word formation, acronyms, abbreviations, and words from foreign languages.
4. To develop the techniques for effective reading and improve the comprehending skills.
5. To help them to develop study skills and communication skills in formal and informal situations.

Course Outcomes: Upon completion of this course, the student will be able to

CO1: Understand the importance of vocabulary and sentence structures..

CO2: Choose appropriate vocabulary and sentence structures for their oral and written communication.

CO3: Demonstrate their understanding of the rules of functional grammar.

CO4: Develop comprehension skills from the known and unknown passages.

CO5: Take an active part in drafting paragraphs, letters, essays, abstracts, précis and reports in various contexts..

CO6: Acquire basic proficiency in reading and writing modules of English..

Course Lead **Head of the Department**

PEO	**Programme Educational Objectives :** 1. Graduate will be empowered with strong fundamental concepts, analytical capability, programming and problem solving skills. 2. Graduates will be employed or may pursue higher education or undertake research. 3. Graduates will lead in their profession with integrity and civic responsibility and a continuous learning attitude.
	Program Outcomes
PO 1	**Engineering Knowledge:** Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
PO 2	**Problem analysis:** Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
PO 3	**Design/development of solutions:** Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.
PO 4	**Conduct investigations of complex problems:** Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.
PO 5	**Modern tool usage:** Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modelling to complex engineering activities with an understanding of the limitations.
PO 6	**The engineer and society:** Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.
PO 7	**Environment and sustainability:** Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.
PO 8	**Ethics:** Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
PO 9	**Individual and team work:** Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
PO 10	**Communication:** Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.
PO 11	**Project management and finance:** Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.
PO 12	**Life-long learning:** Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.
	Program specific outcomes
PSO1	Learn the fundamental concepts and methodology of computer system and apply them to various areas such as operating system, data structure, computer network, databases in the design and implementation of complex system.
PSO2	The ability to employ modern computer programming languages, tools and platform to address technological challenges in multidisciplinary areas of engineering..

CO-PO Mapping

COURSE OBJECTIVES						COs	PROGRAM OUTCOMES (POs)												PSOs	
A	B	C	D	E			1	2	3	4	5	6	7	8	9	10	11	12	i	ii
						CO1										**2**				
						CO2										**2**				
						CO3										**2**				
						CO4										**2**				
						CO5		**2**								**2**		2		
						CO6										**2**				

Course Lead **Head of the Department**