KIET GROUP OF INSTITUTIONS, GHAZIABAD

DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

Course Outcomes (CO)

Mathematics – III (NAS-301)

Student will be able:

1. Understand the concept of complex number and complex analysis which are useful to all branches of engineering. So they are able to find any complex roots of equation or system of equations.
2. The concept of Fourier transform and Z transform will enable the students to obtain solutions of heat, wave, Laplace equations and finite difference equations, which are very useful in solution of mathematical model of real life problems.
3. The concept of Statistical Techniques will enable the students to understand data analysis, useful in industries and research. They are also aware of significant test (Chi-Square, t-test etc) useful in hypothesis testing.
4. The concept of Numerical Techniques – I will enable the students to understand the finding roots of transcendental and algebraic equations used in many engineering problems.
5. The concept of Numerical Techniques – II will enable the students to understand the tool of finding solution of system of equations by various methods. They also learn to find the numerical solution of Ordinary differential equation by various numerical techniques help them to solve many engineering problems.

Digital Logic Design (NEC -309)

Student will able to:

1. Apply concepts of mathematics, computer science and engineering after studying code conversions.
2. Formulate and solve simple hardware design problems after studying gate level minimization (K- Map, Q- Map).
3. Understand how basic arithmetic operations are automated in computer system and use these concepts to automate more complex real life problems after studying combinational circuits.
4. Use their technical skills in designing simple sequential circuits which are basic building block of advanced computer hardware after learning the design procedure of synchronous sequential circuit.
5. Design advance hardware like memory system in accordance with economic and environmental constraints after studying various memories and Programmable Logic Devices along with their advantages and disadvantages.
6. See challenges in hardware design, it will motivate students to explore further and they will be able to understand the importance of life-long learning after studying asynchronous sequential circuits.

Data Structures Using C (CS-302)

Student will be able to

1. Apply the knowledge of data structure concepts and the various algorithms while designing and developing software and some hardware.
2. Analyze the complexity and correctness of the new algorithms.
3. Choose the appropriate data structure and algorithm design method for a specified application.
4. Apply and implement learned algorithm design techniques and data structures to solve problems.
5. Understand and apply fundamental algorithmic problems including Tree traversals, Graph traversals, and shortest paths.
6. Write complex applications using structured programming methods.

Discrete structures and Graph Theory (NCS-302)

Students will be able to

1. Apply knowledge of sets, functions, relations, graphs, ring and fields in the real life problems of computer science.
2. Formulate problems in the language of sets and perform set operations and will be able to apply the fundamental principle of counting and multiplication principle.
3. Model and solve real world problems using graphs and trees, such as GPS to find shortest path.
4. Apply various mathematical techniques such as induction towards solving recurrences and other problems in elementary algebra.
5. Construct proofs in propositional and predicate logic towards implementation of digital circuits.
6. Understand the concept of tautology to automate the task of reasoning and proving theorem.
1.

Industrial Psychology(NHU-302)

Student will be able to:

1. Learn about different managerial approaches and their implications.
2. Understand and implement motivational techniques for improvement of personnel.
3. Manage stress; maintain organizational culture through effective leadership.
4. Know about engineering psychology to create effective work environment.
5. Analyze the jobs for right recruitment and selection and get the awareness about different organizational training and development methods.

Computer Based Numerical And Statistical Techniques (NCS-303)

Students will be able to

1. Apply knowledge of mathematical concepts of floating point and various errors in the field of computing.

2. Formulate bairstrow method for quadratic factors for finding roots of complex equation.
3. Acquire knowledge of integration and differentiation to solve real life problem such as classification.
4. Design algorithms for error analysis of different interpolation methods and apply them on various engineering problems.
5. Apply various methods like gauss elimination method and successive over relaxation method to solve the simultaneous linear algebraic equations in the field of computer science.
6. Use of the numerical methods in modern scientific computing and finite precision computation.

Cyber Security(AUC-002)

Student will be able to:
1. Describe and analyze the hardware, software, components of a network and the interrelations.
2. Explain the concepts of confidentiality, availability and integrity in Information Assurance, including physical, software, devices, policies and people. Analyze these factors in an existing system and design implementations.
3. Develop solutions for networking and security problems, balancing business concerns, technical issues and security and apply them to various situations, classifying networks, analyzing performance and implementing new technologies.
4. Identify infrastructure components and the roles they serve, and design infrastructure including devices, topologies, protocols, systems software, management and security and analyze performance of enterprise network systems.
5. Use appropriate resources to stay abreast of the latest industry tools and techniques analyzing the impact on existing systems and applying to future situations and effectively communicate technical information verbally, in writing, and in presentations.
6. Cite and comply with relevant industry and organizational codes of conduct and ethics.

Introduction to Soft Computing(NOE-041)

Student will be able to:

1. Apply fuzzy logic and reasoning to handle uncertainty and solve engineering problems.
2. Apply neural networks to pattern classification and regression problems and compare their solutions by various other soft computing approaches.
3. Acquire a working knowledge of various software tools to solve real life problems using a Soft Computing approach that will help them in industry oriented learning.
4. Analyze and integrate various soft computing techniques that help in extending the capabilities of the technologies to more effective and efficient problem solving methodology.
5. Scrutinize and identify the roles of neural network, fuzzy logic and genetic algorithms to build intelligent machines.
6. Identify and select a suitable Soft Computing technology to solve the problem and construct a solution and implement a Soft Computing solution.

Industrial Sociology (NHU-402)

Students will be able to:

1. Understand society with their responsibility and accountability for it, as an engineer.
2. Learn about different managerial approaches and their implications.
3. Know the impacts of industrialization on different social institutions.
4. Become familiar with industrial grievances and grievances handling procedures.
5. Gets awareness about different regulations/ acts regarding employees welfare in the industry.

Introduction to Microprocessor (NEC-409)

Student will able to:

1. Understand how the knowledge of mathematics, computer science and engineering are applied to the field of computer hardware and software after studying various code conversion programs.
2. Formulate and solve hardware and software problems after studying instruction set of 8085 and programming techniques.
3. Design hardware and interface I/O devices after interfacing output displays and input devices.
4. Automate the real life problems after generating pulse waveforms, time delays and learning the advanced subroutine concepts.
5. Understand techniques skills and hardware tool necessary for computer engineering practice after studying 8237 DMA, 8255 PPI, 8254 programmable interval timer and 8259A programmable interrupt controller.

Operating System(NCS-401)

By the end of course student will be able to:

1. Gain in depth knowledge about the structures of the operating system, different types of operating system and functions performed by modern operating system.
2. Identify and apply knowledge of various software and hardware synchronization tools for solving critical section problem in concurrent processes.
3. Understand and apply process management and memory management concepts to solve various hardware and software problems.
4. Identify various system protection and security mechanisms in order to design efficient software system by using various access control techniques.
5. Understand the concepts of deadlock in operating systems and employ the deadlock avoidance techniques in multiprogramming system.
6. Understand the various operating systems like UNIX and LINUX and also analyze and design various real time operating systems to automate real time problems in multidisciplinary environments.

Theory of Automata and Formal Languages (NCS-402)

Students will be able to :

1. Apply knowledge of mathematics, theoretical computer science and engineering to formulate and design the problems related to formal languages and computational machines.
2. Identify, formulate and solve the problems related to digital circuits and computing.
3. Use of AUTOSIM too to design the machines.
4. Classify machines by their power to recognize languages,
5. Employ finite state machines to solve real time problems in computing,
6. Comprehend the hierarchy of problems arising in the computer sciences

Computer Graphics(NCS-403)

Student will be able to:

1. Use the mathematical concepts, supporting computer graphics- Composite 2D-3D transformations, Hidden surface detection/ removal and various graphical algorithms
2. Analyse and implement interactive graphics applications in programming language using one or more graphics application programming interfaces.
3. Design the new algorithm for various graphics shapes e.g. ellipse, hyperbola, triangle etc.
4. Students will able to use various graphical tools and software's used in 3D Graphics API (e.g. OpenGL or DirectX).
5. Students would be able to know that how geometrical transformation and computer graphics can apply in multidisciplinary field of engineering.
6. Discuss hardware system architecture for computer graphics- graphics pipeline, frame buffers, and graphic accelerators/co-processors.

Human Values and Professional Ethics (AUC-001)

Student will be able to:

1. Appreciate the essential complementarily between 'VALUES' and 'SKILLS' to ensure sustained happiness and prosperity which are the core aspirations of all human beings.
2. Develop a holistic perspective towards life, profession and happiness, based on the correct understanding of the Human reality and the rest of the Existence.
3. To highlight plausible implications of such a Holistic understanding in terms of ethical human conduct, trustful and mutually satisfying human behaviour and mutually enriching interaction with Nature.
4. Understand the significance of value inputs and apply them in their life and profession. Understand the value of harmonious relationship based on trust and respect in their life and profession.
5. Understand the role of a human being in ensuring harmony in society and nature.
6. Distinguish between ethical and unethical practices, and start working out the strategy to actualize a harmonious environment wherever they work.

Database Management System (ECS- 402)

Student will able to

1. Apply knowledge of database design methodology which give a good formal foundation in relational data model.
2. Identify and formulate information storage and derive an information model expressed in the form of ER diagram and other optional analysis forms.
3. Apply query processing techniques to automate the real time problems of databases.
4. Familiar with relational DB theory and will able to write relational algebra expressions for query.
5. Identify and solve the redundancy problem in database tables using normalization.
6. Understand the concepts of transactions, their processing so they will familiar with broad range of database management issues including data integrity, security and recovery.
7. Design, develop and implement a small database project using database tools.

Computer Organization (CS 401)

Student will be able to:

1. Understand the internal functioning of CPU that includes analyzing performance of computer system using performance equations.
2. Make use of the binary number system and apply knowledge of mathematics to perform basic arithmetic operations performed by the processor for computation.
3. Understand the organization of a modern computer system and relate them to real examples implemented in commercially successful projects.
4. To develop independent learning skills and to learn more about different computer architectures and hardware using modern tools.
5. Design hardware and software components by studying hardwired and micro programmed control techniques of designing processor.
6. Identify, study and optimize various problems based on memory design and performance issues.

Object Oriented Techniques with C++(CS-403)

Student would be able to

1. Apply knowledge of OOT in creation of solution of given problem.
2. To identify event and establish transition between those, using behavioral modeling, while formulating problem solution.
3. Use concept learned in C++ while creating desktop applications for a given automation problem.
4. Formulate solution of given problem using concept of OOT and C++.
5. Work as a team member while developing application for some real life problem.
6. Convey the idea of the solution for the problem in graphical manner using different modeling tools.

Digital Logic Design Lab (NEC -359)

Student will able to:

1. Apply the knowledge of mathematics, computer science and engineering to the field of computer hardware and software after implementing arithmetic circuits.
2. Automate real time problems after designing 4-bit synchronous and asynchronous counters and implementing boolean function in SOP and POS form.
3. Identify formulate and solve hardware and software problems using engineering principles after implementing 1-bit programmable ALU.
4. Learn techniques, skills and hardware tools necessary for computer engineering practice after implementing decoder, encoder and multiplexer.
5. Design hardware under economic and environmental constraints after implementing synchronous sequential circuit from state diagram.
6. Explore further and will be motivated for life-long learning after studying various Flip-flops (RS, JK, T and D) and their significance in computer hardware design.

Data Structures using C Lab(NCS-351)

Student will be able to

1. Demonstrate familiarity with major algorithms and data structures.
2. Calculate and analyze performance of algorithms.
3. Choose the appropriate data structure and algorithm design method for a specified application.
4. Identify which algorithm or data structure to use in different scenarios.
5. Familiar with writing recursive methods.
6. Implement indexing and hashing techniques used in several other fields of computer science eg Database, Networks etc.

Numerical Techniques Lab(NCS-353)

Students will be able to

1. Obtain an intuitive and working understanding of numerical methods for the basic problems of numerical analysis.
2. Use various software tools for the implementation and application of numerical methods and visualization of results.
3. Apply various statistical models and methods for drawing conclusions and making decision under uncertainty in engineering context.
4. Apply graphical and data analysis methods for summarizing and interpretation of data.
5. Apply knowledge of statistics to find solutions of complicated mathematical business applications.
6. Learn and implement frequency chart, regression analysis, linear square fit and polynomial fitting methods of problem solving.

Advance programming Lab (NCS -355)

Student will be able to:

1. Analyze and Understand basic concepts of C Programming Language and the pieces of software required for them to work.
2. Understand and implement the Object Oriented Programming concepts.
3. Understand various real life projects and implement them with the help of Object Oriented Technique.
4. Identify, understand and solve memory allocation problem by Dynamic Memory Allocation methods.
5. Design and automate real time problems using File handling mechanisms.
6. Apply the best of procedural and object oriented programming techniques to solve problems of varying complexity.

Discrete Structure Lab (CS-302P)

Students will be able to

1. Learn basic terminologies used in computer science courses and application of ideas to solve practical problems.
2. Use graph as tools to visualize and simplify real life scenarios.
3. Solve the problems using counting techniques and combinatorics in the context of discrete probability.
4. Construct mathematical arguments using logical connectives and quantifiers.
5. Apply algorithms and use definitions to solve problems to prove statements in elementary number theory.
6. Extend his/her logical and mathematical maturity and ability to deal with mathematical arguments.

Microprocessor Lab (NEC -459)

Student will able to:

1. Understand how the concepts of mathematics, computer science and engineering are applied to the field of computer hardware and software after writing and executing programs for various arithmetic operations.
2. Understand how computer hardware is designed within economic and environmental constraints after studying Intel 8085 and 8086.
3. Understand how to identify, formulate and solve hardware and software problems using engineering principles after learning to interface UART/USART and keyboard.
4. Learn how to automate real time problems after learning the interfacing of traffic light controller.
5. Learn techniques and skills necessary for computer engineering practice after implementing assembly language program for square root of a number, ascending/descending order and interfacing of traffic light controller.
6. Explore further and will be motivated for life-long learning after using instruction set of Intel 8086.

Operating System Lab (NCS-451)

By the end of course student will be able to:

1. Understand and apply knowledge of basic UNIX/LINUX commands to solve various software problems and to automate real time applications.
2. Understand and implement the concept of process synchronization tool like semaphore to solve mutual exclusion problem in order to coordinate concurrent processes.
3. Apply knowledge of process management techniques to design and solve various process synchronization problems like Producer Consumer problem, Reader Writers problem and dining philosophers' problem.
4. Compare and contrast among various CPU scheduling algorithms and apply knowledge to identify the best scheduling algorithm as per software requirement.
5. Understand and apply the concepts of deadlock in operating systems to design and implement various deadlock avoidance algorithms like Banker's algorithm used in banking system.
6. Apply the concepts page replacement techniques in memory management to simulate various page replacement algorithms.

Computer Graphics Lab(NCS-453)

Student will be able to:

1. Demonstrate an understanding of contemporary graphics hardware.
2. Create and formulate interactive graphics applications in programming language e.g C and C++.
3. Implement program functions to implement graphics primitives API like OpenGL or DirectX.
4. Implement programs that demonstrate geometrical transformations.
5. Understand about the modern softwares that are used in current scenario used in computer graphics.
6. Can be used computer graphics in multidisciplinary fields of engineering e.g. CAD, CAM.

Functional and Logic Programming Lab (NCS-455)

Students will be able to:
1. Select an appropriate programming language for solving computational problem with justification.
2. Understand and analyze principle programming abstractions.
3. Understand various functional programming languages and apply them to solve different real life problems.
4. Develop simple but powerful techniques for writing and reasoning about programs, by recognizing and exploiting their underlying mathematical structure.
5. Effectively choose best programming components and apply them to solve computing problems in real-world.
6. Gain hands-on experience which helps them in industry oriented learning.

Database Management Systems Lab (ECS-452)

Student will be able to

7. Use the techniques of SQL data manipulation language to create and query a sample data
8. Implement different SQL queries which will automate the real life problem related to data storage.
9. Modify the database and provide provide different constraints by implementing techniques like PL/SQL, cursors and triggers.
10. Implement VIEWS, transactions in Database which solve the security problem in databases.
11. Demonstrate and understand relational algebra in Database which is helpful to design related database software components.
12. Effectively participating in team based activities by designing and development of a database application system.

Computer Organization (CS 451) LAB

Students will be able to:

1. Apply knowledge of number systems, Boolean algebra, multiplexers and counters to conduct experiments of digital electronics laboratory.
2. Identify various ways of implementing arithmetic circuits.
3. Identify, formulate, and solve problems in the area related to logic gates.
4. Use techniques and hardware tools for implementing binary adder and subtractor circuits.
5. Develop real time applications by designing counters that can be used as a part of integrated circuit.
6. To correctly analyze and design a digital circuit to meet desired needs within realistic constraints.

Object Oriented Techniques with C++ (CS-403 P)Lab

Student would be able to

1. Design and conduct experiments based on the concept of UML diagrams.
2. Identify the need of different types of diagram while creating structural modeling of a problem in hand.
3. Design a software system in order to solve a real life problem.
4. Provide solution of a given automation problem in terms of implementation.
5. Work in a team while developing application for some real life problem.
6. Convey the idea of the solution for the problem in graphical manner using different modeling tools.

Engineering& Managerial Economics (EHU-501)

Students will be able to:

1. Able to explain succinctly the meaning and definition of managerial economics; elucidate on the characteristics and scope of managerial economics.

2. Able to describe the techniques of managerial economics.
3. Able to explain the applications of managerial economics in various aspects.
4. The end students will be able to develop an estimate cost for any project.

Operating System (ECS-501)

Students will be able to:

5. Gain in depth knowledge about the structures of the operating system, different types of operating system and functions performed by modern operating system.
6. Identify and apply knowledge of various software and hardware synchronization tools for solving critical section problem in concurrent processes.
7. Understand and apply process management and memory management concepts to solve various hardware and software problems.
8. Identify various system protection and security mechanisms in order to design efficient software system by using various access control techniques.
9. Understand the concepts of deadlock in operating systems and employ the deadlock avoidance techniques in multiprogramming system.
10. Understand the various operating systems like UNIX and LINUX and also analyze and design various real time operating systems to automate real time problems in multidisciplinary environments.

Design and Analysis of algorithms (ECS-502)

Students will be able to:

1. Apply mathematical preliminaries to the analysis and design stages of different types of algorithms.
2. Analyze worst-case running times Algorithms using asymptotic methods by applying knowledge of mathematics for programs and software.
3. Apply standard algorithms of Sorting, Searching, finding MST etc to identify and formulate the software based real life problems.
4. Design and Modify graph algorithms and analysis them to find different types of shortest paths solutions for real life problems like TSP.
5. Recognize the general principals and good algorithm design techniques (Dynamic and Greedy) for developing efficient algorithms driven solutions and design relevant software systems.
6. Relate the concepts of NP Completeness for analyze and understand the complexity of real life problems.

Object Oriented Techniques (ECS-503)

Students will be able to:

1. Apply knowledge of OOT in creation of solution of given problem.
2. Identify event and establish transition between those, using behavioral modeling, while formulating problem solution.
3. Use concept learned in C++ while creating desktop applications for a given automation problem.
4. Formulate solution of given problem using concept of OOT and JAVA.

5. Work as a team member while developing application for some real life problem.
6. Convey the idea of the solution for the problem in graphical manner using different modeling tools.

Computer Graphics (ECS-504)

Students will be able to:

1. Use the mathematical concepts, supporting computer graphics- Composite 2D-3D transformations, Hidden surface detection/ removal and various graphical algorithms.
2. Analyze and implement interactive graphics applications in programming language using one or more graphics application programming interfaces.
3. Design the new algorithm for various graphics shapes e.g. ellipse, hyperbola, triangle etc.
4. Students will able to use various graphical tools and software's used in 3D Graphics API (e.g., OpenGL or DirectX).
5. Students would be able to know that how geometrical transformation and computer graphics can apply in multidisciplinary field of engineering.
6. Discuss hardware system architecture for computer graphics- graphics pipeline, frame buffers, and graphic accelerators/co-processors.

Graph Theory(ECS-505)

Students will be able to:

1. Design the electrical circuit, chip designing, sanitation design by apply the knowledge of graph theory.
2. Apply graph algorithms like shortest path algorithm in a network, minimum spanning tree.
3. Model many type of relations amongst any physical situation like logistics problems.
4. Identify and solve the real time problems like job scheduling, Aircraft scheduling problem with help of graph coloring concepts.
5. Apply the knowledge of graph theory to solve the real life problems like travelling sales man problem.

Human Values and Professional Ethics (AUC 301/401)

Students will be able to:

1. Appreciate the essential complementarily between 'VALUES' and 'SKILLS' to ensure sustained happiness and prosperity which are the core aspirations of all human beings.
2. Develop a holistic perspective towards life, profession and happiness, based on the correct understanding of the Human reality and the rest of the Existence.

3. To highlight plausible implications of such a Holistic understanding in terms of ethical human conduct, trustful and mutually satisfying human behavior and mutually enriching interaction with Nature.
4. Understand the significance of value inputs and apply them in their life and profession. Understand the value of harmonious relationship based on trust and respect in their life and profession.
5. Understand the role of a human being in ensuring harmony in society and nature.
6. Distinguish between ethical and unethical practices, and start working out the strategy to actualize a harmonious environment wherever they work.

Operating System Lab (ECS-551)

Students will be able to:

1. Understand and apply knowledge of basic UNIX/LINUX commands to solve various software problems and to automate real time applications.
2. Understand and implement the concept of process synchronization tool like semaphore to solve mutual exclusion problem in order to coordinate concurrent processes.
3. Apply knowledge of process management techniques to design and solve various process synchronization problems like Producer Consumer problem, Reader Writers problem and dining philosophers' problem.
4. Compare and contrast among various CPU scheduling algorithms and apply knowledge to identify the best scheduling algorithm as per software requirement.
5. Understand and apply the concepts of deadlock in operating systems to design and implement various deadlock avoidance algorithms like Banker's algorithm used in banking system.
6. Apply the concepts page replacement techniques in memory management to simulate various page Replacement Algorithms.

Design Analysis and algorithms lab (ECS-552)

Students will be able to:

1. Apply and adapt fundamental algorithms (sorting, searching, order statistics, graph algorithms) to new real life scenarios.
2. Compare the run time complexity of various sorting and searching techniques after implementing the algorithms and make a decision that for what type of data which algorithm could be better.
3. Map real problems abstractly on graph based solutions and implement them.
4. Design & implement Greedy & Dynamic based solution for different problems like Knapsack, Shortest paths etc both in teams and individually.
5. Understand the importance of approximation and randomized algorithms with respect to standard brute force approaches for varieties of real life problems.
6. Make intelligent decisions individually and as a team about alternative data structures and algorithmic techniques in the context of multidisciplinary problems.

Object Oriented Techniques Lab (ECS-553)

Students will be able to:

1. Design and conduct experiments based on the concept of UML diagrams.
2. Identify the need of different types of diagram while creating structural modeling of a problem in hand.
3. Design a software system in order to solve a real life problem.
4. Provide solution of a given automation problem in terms of implementation.
5. Work in a team while developing application for some real life problem.
6. Convey the idea of the solution for the problem in graphical manner using different modeling tools.

Computer Graphics Lab (ECS-554)

Students will be able to:

1. Demonstrate an understanding of contemporary graphics hardware.
2. Create and formulate interactive graphics applications in programming language e.g C and C++.
3. Implement program functions to implement graphics primitives API like OpenGL or DirectX.
4. Implement programs that demonstrate geometrical transformations.
5. Understand about the modern software's that are used in current scenario used in computer graphics.
6. Used computer graphics in multidisciplinary fields of engineering e.g. CAD, CAM.

Industrial Management (EHU-601)

Students will be able to:

1. Identify the main responsibilities and tasks of different organizational functions, such as marketing, product development, production, sourcing, and sales. Also define environmental problems from the perspectives of both environmental problems and resource management.
2. Employ Analytical and Modern tools for decision-making, system design and analysis in Quality Control and Work Simplification Process.
3. Assume managerial and leadership roles in their chosen professional careers while working in multidisciplinary teams.
4. Engage in learning by seeking out opportunities for higher education or on-going training related to their employment in the areas of Quality Assurance, Supply chain management or Inventory Management.
5. Adapt to the changing demands in the workplace and able to perform increasingly complex tasks, as well as tasks outside a field of expertise.
6. Focus on intercultural communication and its challenges in business contexts and to analyze and understand human behavior in multi-cultural situations.

Computer Network (ECS- 601)

Students will be able to:

1. Analyze the requirements for a given organizational structure and select the most appropriate networking architecture and technology.
2. Specify and identify deficiencies in existing protocols, and then go onto formulate new better protocols.
3. Apply knowledge of mathematics, probability, and statistics to model and analyze some networking protocols.
4. Have a working knowledge of datagram and internet socket programming.
5. Explain concepts and theories of networking and apply them to various situations, classifying networks, analyzing performance and implementing new technologies.
6. Explain the concepts of confidentiality, availability and integrity in Information Assurance, including physical, software, devices, policies and people. Analyze these factors in an existing system and design implementations.

Software Engineering (ECS- 602)

Students will be able to:

1. Identify, formulate, analyze, and solve problems, as well as identify the computing requirements appropriate to their solutions.
2. Communicate effectively with a range of audiences.
3. Design, implement, and evaluate software-based systems, components, or programs of varying complexity that meet desired needs, satisfy realistic constraints, and demonstrate accepted design and development principles.
4. Apply knowledge of computing, mathematics, science, and engineering appropriate to the discipline, particularly in the modeling and design of software systems and in the analysis of tradeoffs inherent in design decisions.
5. Use current techniques, skills, and tools necessary for professional practice.
6. Understand ability to engage in life-long maintenance and continuing Software development.

Compiler Design (ECS- 603)

Students will be able to:

1. Apply the knowledge of lex tool & yacc tool to devleop a scanner & parser.
2. Design and conduct experiments for Intermediate Code Generation in compiler.
3. Design and implement a software system for backend of the compiler.
4. Develop program to solve complex problems in compiler
5. Learn the new code optimization techniques to improve the performance of a program in terms of speed and space.
6. Use the knowledge of patterns, tokens & regular expressions for solving a problem in the field of data mining.

Web Technology (ECS-604)

Students will be able to:

1. Apply the knowledge of the internet and related internet concepts that are vital in understanding web application development and analyze the insights of internet programming to implement complete application over the web.

2. Understand, analyze and apply the role of mark up languages like HTML, DHTML, and XML in the workings of the web and web applications.
3. Automate the real time problems by developing & analyzing a web project and identify its elements and attributes in comparison to traditional projects.
4. Design static pages in more organized format by using style sheets and techniques like AJAX for making its content dynamic.
5. Use web application development software tools i.e. Ajax and XML etc. and identify the environments currently available on the market to design web sites.
6. Understand, analyze and build dynamic web pages using client side programming like VBScript and JavaScript and also develop the web application using ASP.NET and JSP.
7. Understanding the impact of web designing in the current market place where everyone use to prefer electronic medium for shopping, commerce, fund transfer and even social life also.

Information Security and Cyber Laws (EIT-505)

Students will be able to:

1. Identify Establishment of responsibility and accountability for information security in organizations and have an overview of the technical basics of computer hardware, software, and networking.
2. Understanding and applying the fundamental concept, theories and the strategic importance of various information systems and the technologies for data and database management.
3. Identify the technologies for information and network security and help the organization to continue its commercial activities in the event of significant real time information security incidents.
4. Gain an understanding of the role of outsourcing and globalization and analyzing the challenges facing global information systems management.
5. Design and implement a new unbreakable cryptosystem and blending the existing cryptographic algorithms with the existing communication protocols and application of cryptography for securing e-Commerce and other secrets.
6. Analyze and interpret how relevant case and statutory law has been applied to legal problems in information assurance and also to identify and articulate legal issues in the discipline not adequately covered by current law.
7. Justify the ethical and security issues in information systems management.

Computer Network Lab (ECS-651)

Students will be able to:

1. Develop solutions for networking and security problems, balancing business concerns, technical issues and security.
2. Describe and analyze the hardware, software, components of a network and the interrelations.
3. Understand the basic concepts of application layer protocol design; including client/server models, peer to peer models, and network naming.
4. Understand local area wireless network technologies (802.11, Bluetooth, RFID), and their security weaknesses;

5. Ability to apply knowledge of mathematics, probability, and statistics to model and analyze some networking protocols.
6. Analyze, specify and design the topological and routing strategies for an IP based networking infrastructure.

Web Technology based Software Engineering Lab (ECS-652)

Students would be able to:

1. Identify, formulate and analyze problems as well as identify the computing requirements appropriate to their solutions.
2. Understand and analyze a web page and identify its elements and attributes.
3. Develop web pages using mark up languages like HTML, DHTML and style sheets for making it more presentable to the user.
4. Develop dynamic web pages using client side programming and server side programming.
5. Develop interactive web applications using ASP.NET Framework.
6. Develop XML documents and XML Schema to formulate the web services.

Compiler Design Lab (ECS-653)

Students will be able to implement:

1. Acquire knowledge in different phases and passes of Compiler.
2. Use the Compiler tools like LEX, YACC, etc.
3. Design different types of compiler tools to meet the requirements of the realistic constraints of compilers.
4. Parser and its types i.e. Top-down and Bottom-up parsers. Construction of LL, SLR, CLR and LALR parse table.
5. Build symbol table and intermediate code.
6. Techniques for code optimization.

Seminar (ECS-654)

Students will be able to implement:

1. Gain knowledge on emerging technologies and current professional issues.
2. Learn to speak logically, with clarity, and with originality, and grow in their intellectual curiosity through the process of discussion
3. Recognize and formulate effective written and oral communication, giving appropriate consideration to audience
4. Apply principles of ethical leadership, collaborative engagement, socially responsible behavior and sustain local and global communities.
5. Use multiple thinking strategies to examine real-world issues, explore creative avenues of expression, solve problems, and make consequential decisions

Pattern Recognition (ECS-074)

Students will be able to:-

1. Design systems and algorithms for pattern recognition (signal classification), with focus on sequences of patterns that are analysed using, e.g., hidden Markov models (HMM).
2. Do image analysis, character recognition, speech analysis, man and machine diagnostics, person identification and industrial inspection with the help of pattern recognition.
3. Understand and analyse methods for automatic training of classification systems.
4. Apply Maximum-likelihood parameter estimation in relatively complex probabilistic models, such as mixture density models and hidden Markov models.
5. Understand the principles of Bayesian parameter estimation and apply them in relatively simple probabilistic models.

Distributed System(ECS-701)

Students will be able to:

1. Understand how to apply the knowledge to gain insight of distributed System in solving real world problems.
2. Identify and formulate the broader domain areas where the concept of Distributed System can be used.
3. Develop various web applications and automate the real time problems.
4. Enhanced the concepts of failure recovery in Distributed System and also develop software to recover from failure.
5. Utilize the modern software and technical skills in order to control Concurrency in Distributed Transactions.
6. Implement the concepts of distributed deadlock in order to avoid the deadlock situation.

Digital Image Processing(ECS-702)

Students will be able to:

1. Apply the knowledge of conversion of an analog image into digital form using the techniques of sampling & quantization.
2. Identify the types of filtering, segmentation, edge detection that are useful to enhance an image.
3. Analyze and interpret the effects of high pass and low pass filter in an image.
4. Restore the image in the presence of noise by using modern software of restoration.
5. Use the techniques of morphological image processing and image registration in images.
6. Apply the various tools and techniques in multidisciplinary engineering and medical field like embedded programming, CAD, various web applications, MRI, CT-Scan, Angiography etc.

Data Mining and Data Warehousing (ECS-075)

Students will be able to:-

1. Understand importance of abstraction of Knowledge from unstructured sources at sufficient level to be able to keep upto date and converse with computing professionals.
2. Synthesis of information from a variety of different sources and understands issues surrounding the integration theory of information collected from these sources.

3. Use of high level operational skills and real world case studies for knowledge discovery and data warehousing based principles.
4. Understand the areas of probability, statistics and machine learning algorithms which underpin the knowledge discovery enterprise.
5. Design data mining and data warehousing systems and solutions to meet user requirements and specifications.
6. Focus on design and security issues, architecture and network technologies for building, deploying and managing data warehouse, data mining, data visualization and decision support computing systems.

Distributed Database (ECS-076)

Students will be able to:

1. Apply the basic knowledge of distributed databases and automate the real time world problems.
2. Develop various software using the concept of fragmentation, replication in distributed databases.
3. Automate the real time problems of query processing and optimization for performance improvement in distributed computing environment.
4. Identify the concepts and software problems of parallel and concurrent transaction processing in distributed database.
5. Implement the various commit protocols and recovery techniques to solve various problems of transactions in banking sectors.
6. Understand the concepts of cost based query optimization for distributed database.

Non- Conventional Energy Resources(EOE-081)

Students will be able to:-

1. Identify available non-conventional (renewable) energy resources and techniques to utilize them effectively for long term purposes.
2. Understand the impact of power solutions on the society and will be aware of contemporary issues
3. Compare the concepts of different types of power generation & power plants in detail so that it will help them in industry oriented learning
4. Gain knowledge about the exploration of nonconventional energy resources and their effective tapping technologies that was environmental friendly also.
5. Scrutinize the advantages and shortcomings of using hydrogen as an energy carrier with application in internal combustion engine and fuel cells.
6. Gain Knowledge about various social issues connected with environment along with Environmental Protection Acts in India that will help to develop a concern toward the environment.

Artificial Intelligence (ECS-801)

Students will be able to understand:

1. Apply basic principles of AI in solutions that require problem solving,   inference, perception, knowledge representation, and learning.
2. Design and implement appropriate solutions for search problems (such as playing two-person games) and for planning problems (such as determining a sequence of actions for a robot).
3. Demonstrate an ability to share in discussions of AI, its current scope and limitations, and societal implications.
4. Master the skills and techniques in machine learning, such as decision tree induction, artificial neural networks, and genetic algorithm.
5. Demonstrate awareness and a fundamental understanding of various applications of AI techniques in intelligent agents, expert systems, artificial neural networks and other machine learning models.
6. Appreciate the rooted philosophical arguments in logic and its impact on human thought.

Mobile Computing(ECS-087)

Students will be able to:-

1. Apply the knowledge and understand the working, characteristics and limitations of mobile hardware devices including their user-interface modalities.
2. Understand and identify the GSM, GPRS and Bluetooth software model for mobile computing.
3. Analyze the process of GSM functioning and learn frequency band, spectrum, air interface and channel structure and interpret and compare the functioning of GSM and CDMA technology.
4. Identify the root causes of call dropping, and concept of call forwarding in roaming.
5. Understand the impact of mobile communication on society either economic or health related issues.
6. Use the techniques to create the adhoc network that are useful in disaster management, war sites etc.

Software Project Management (ECS-042)

Students will be able to:

1. Employ Analytical and Modern project development methodology for the process of project management in delivering successful Real time IT projects.
2. Evaluate a project to develop the scope of work, provide accurate cost estimates ,software development size, effort, and schedule and network diagram for new program proposals or enhancements to existing Software.
3. Understanding and using the risk management analysis techniques that identify the factors that put a project at risk and to quantify the likely effect of risk on project timescales.
4. Identifying the resources required for a project and to produce a work plan and resource Schedule.
5. Adapt to the changing demands in the workplace and able to perform increasingly complex tasks, as well as tasks outside a field of expertise.
6. Focus on communication and its challenges in business contexts by effectively participating in team-based activities.

LAB

Distributed System Lab (ECS-751)

Students will be able to:

1. Apply the basic knowledge of Lamport and Vector clock to solve real world problem.
2. Develop various software's in order to solve problems using Socket Programming.
3. Identify and formulate the concepts of Remote Method Invocation in designing software
4. Enhance the mechanism of Remote Procedure Call in establishing connections.
5. Implement the concepts of Mutual Exclusion to avoid the deadlock situations.
6. Learn the concepts of various recovery mechanism in concurrent system.

Digital Image Processing Lab (ECS-752)

Students will be able to:

1. Learn to know the mathematical tool matlab and apply on fundamentals of image processing.
2. Identify various effects of filters in order to enhance the images.
3. Learn and analyze various transforms used in image processing by using matlab.
4. Use the matlab tool to simulate the various applications of image.
5. Apply the knowledge of image processing tool matlab to implement the softwares like Face recognition system, licence number plate recognition that are useful to serve the society.
6. Process images using mathematical techniques of histogram processing and filtering.

Artificial Intelligence Lab(ECS-851)

Students will be able to understand:

1. Apply and integrate various artificial intelligence techniques in intelligent system development as well as understand the importance of maintaining intelligent systems.
2. Design and carry out an empirical evaluation of different algorithms on a problem formalisation, and state the conclusions that the evaluation supports.
3. Demonstrate proficiency developing applications in an 'AI language', expert system shell, or data mining tool.
4. Understand the programming language Prolog and write programs in declarative programming style.
5. Implement basic AI algorithms (e.g., standard search algorithms or dynamic programming).
6. To evaluate the effectiveness of hybridization of different artificial intelligence techniques.