

MAHENDRA COLLEGE OF ENGINEERING
(Approved by AICTE, Affiliated to Anna University, Chennai-25)
Chennai Main Road, Minnampalli
Salem – 636106

B.E.COMPUTER SCIENCE AND ENGINEERING

Program Outcomes (POs)

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

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.

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.

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.

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.

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.

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.

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

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

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.

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.

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 (PSOs)

The students will demonstrate the abilities

PSO1: Professional Skills: The ability to understand, analyze and develop computer programs in the areas related to algorithms, system software, multimedia, web design, big data analytics, and networking for efficient design of computer-based systems of varying complexity.

PSO2: Problem-Solving Skills: The ability to apply standard practices and strategies in software project development using open-ended programming environments to deliver a quality product for business success.

PSO3: Successful Career and Entrepreneurship: The ability to employ modern computer languages, environments, and platforms in creating innovative career paths to be an entrepreneur, and a zest for higher studies.

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COURSE OUTCOME STATEMENTS FOR B.E.COMPUTER SCIENCE AND ENGINEERING (2013 REGULATION)

SEMESTER 01

1.Course Code and Name : HS6151 - TECHNICAL ENGLISH I

	CO Statements	Knowledge Level
The students should be able to		
1	Classify the types of listening and writing skills with acquired knowledge	K2
2	Demonstrate speaking skills in various occasions	K2
3	Compare the formal and informal writing skills by using the mail and blocks	K2
4	Apply the speaking etiquette to build up communication proficiency	K3
5	Develop presentations with the use of LSRW skills	K3

2.Course Code and Name : MA6151 - MATHEMATICS I

	CO Statements	Knowledge Level
The students should be able to		
1	Solve the Eigen values and Eigen vectors to diagonalise and reduce a matrix to quadratic form	K3
2	Identify the convergences, divergences of infinite series	K3
3	Solve evolutes and envelopes of a given curve by using radius of curvature and center of curvature	K3
4	Identify the maxima and minima value functions of two variables	K3
5	Solve area of plain curves and volume of solid using double and triple integrals	K3

3.Course Code and Name : PH6151 - ENGINEERING PHYSICS I

3.Course Code and Name : PH6151 - ENGINEERING PHYSICS I		
	CO Statements	Knowledge Level
The students should be able to		
1	Explain the basics of properties of matter and its applications	K2
2	Summarize the concepts of waves and optical devices and their applications in fiber optics	K2
3	Demonstrate the concepts of thermal properties of materials and their applications in expansion joints and heat exchangers	K2
4	Outline the concepts of advanced physics quantum theory and its applications in tunneling microscopes	K2
5	Explain the basics of crystals, their structures and different crystal growth techniques	K2

4.Course Code and Name : CY6151 - ENGINEERING CHEMISTRY I

4.Course Code and Name : CY6151 - ENGINEERING CHEMISTRY I		
	CO Statements	Knowledge Level
The students should be able to		
1	Classify the polymers and their utility in the industries and explain the techniques of polymerization and properties of polymers	K2
2	Relate various thermodynamic functions such as enthalpy, entropy, free energy and their importance	K2
3	Explain the photo physical processes such as fluorescence and phosphorescence and various components of UV and IR spectrophotometer	K2

4	Illustrate the phase transitions of one component and two component systems and the types of alloys and their application in industries	K2
5	Outline the synthesis, characteristics and the applications of nano materials	K2

5.Course Code and Name : GE6151- COMPUTER PROGRAMMING

	CO Statements	Knowledge Level
The students should be able to		
1	Describe the function of a Computer and problem solving techniques.	K2
2	Write simple C programs using basic constructs	K3
3	Implement applications to manage data using arrays and strings	K3
4	Apply functions and pointers for solving problems	K3
5	Develop simple applications using structure and union	K3

6.Course Code and Name : GE6152- ENGINEERING GRAPHICS

	CO Statements	Knowledge Level
The students should be able to		
1	Demonstrate freehand sketching of basic geometrical constructions and multiple views of objects	K2

2	Develop orthographic projections of points, lines and plane surfaces	K3
3	Construct projections of simple solids and truncated solids	K3
4	Develop projection of sectioned solids and utilize development of surfaces	K3
5	Construct isometric and perspective projections of simple solids	K3

7.Course Code and Name : GE6161- COMPUTER PRACTICES LABORATORY

	CO Statements	Knowledge Level
The students should be able to		
1	Apply the usage of office automation tools.	K2
2	Apply good programming design methods for program development.	K3
3	Design and implement C programs for simple applications.	K3
4	Develop recursive programs.	K3

8.Course Code and Name : GE6162 - ENGINEERING PRACTICES LABORATORY

	CO Statements	Knowledge Level
The students should be able to		

1	Construct carpentry components and pipe connections including plumbing works	K2
2	Make use of welding equipments to join the structures	K3
3	Develop models using sheet metal work	K3
4	Illustrate the working of centrifugal pump and air conditioner	K3
5	Demonstrate basic home electrical works, measurement of the electrical quantities and soldering practices	K3

9.Course Code and Name : GE6163 - PHYSICS AND CHEMISTRY LABORATORY - I

	CO Statements	Knowledge Level
The students should be able to		
1	Make use of spectrometer to find the wavelength of spectral lines, and laser	K3
2	Make use of ultrasonic interferometer and Lee's disc apparatus to find the velocity of sound, compressibility of the liquid and thermal conductivity	K3
3	Demonstrate the estimation of DO content in water sample by Winkler's method and molecular weight of polymer by Ostwald viscometer	K2
4	Experiment with the strength of an acid using pH meter and conductometer	K3
5	Demonstrate the estimation of weak and strong acids in a mixture by conductometer	K2

SEMESTER 02

1.Course Code and Name : HS6251 - TECHNICAL ENGLISH II

	CO Statements	Knowledge Level
The students should be able to		
1	Develop the communication skills with proper grammar usage	K2
2	Summarize the various advanced technical and non-technical english tools	K2
3	Classify the speaking skills and expression through professional english	K2
4	Apply the interview techniques for career development	K3
5	Outline the use of writing skills to express innovatiove ideas	K3

2.Course Code and Name : MA6251 - MATHEMATICS II

	CO Statements	Knowledge Level
1	Apply solenoidal, irrotational vectors and make use of the concepts of Green's, Gauss divergence , Stokes theorem to evaluate single, double and triple integrals	K3
2	Solve simultaneous linear equations and P.I. of Cauchy and Legendre Equation	K3
3	Solve Laplace Transforms of periodic functions and ODE using Inverse Laplace Transform	K3
4	Make use of the properties of analytic functions for verifying C-R equations for determination of Bilinear Transformation	K3
5	Develop the functions of two variables as Taylor's and Laurent's series and Contour integrals by using Cauchy's Integral formula	K3

3.Course Code and Name : PH6251 - ENGINEERING PHYSICS II

	CO Statements	Knowledge Level
1	Explain the basics, properties and applications of conducting materials	K2
2	Summarize the properties of semiconducting materials and semiconductor devices.	K2
3	Explain the basics, properties and applications of the magnetic materials and super conducting material	K2
4	Illustrate the concepts, mechanisms and applications of dielectric materials	K2

5	Outline the method of synthesis and explain the properties of Nano materials, SMA, Metallic glasses and Ceramics	K2
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4.Course Code and Name : CY6251 - ENGINEERING CHEMISTRY I

	CO Statements	Knowledge Level
1	Explain the problems of using hard water in boilers and methods of treatment of water for boiler use	K2
2	Apply the design principles to electro chemical cell. Identify the types of corrosion and the methods of prevention	K3
3	Illustrate the methods of harnessing energy from non-conventional energy sources	K2
4	Classify various engineering materials and explain their importance	K2
5	Relate the significance of solid, liquid and gaseous fuels. Explain the calorific values of fuels and air requirement for combustion in furnaces	K2

5.Course Code and Name : CS6201 Digital Principles and System Design

	CO Statements	Knowledge Level
1	Demonstrate the concept of Boolean algebra and show the correlation between Boolean expressions	K2
2	Simplify Boolean functions using KMap	K4
3	Design and Analyze Combinational and Sequential Circuits	K6
4	Implement designs using Programmable Logic Devices	K6
5	Build HDL code for combinational and Sequential Circuits	K3

6.Course Code and Name : CS6202 and Programming and Data Structures I

	CO Statements	Knowledge Level
1	Design programs using control structures, functions, pointers and files.	K2
2	Implement applications using structures, union and files.	K3
3	Implement abstract data type (ADT) for Linear data structures.	K3
4	Apply the different Linear data structures for solving problems.	K3
5	Analyze the various searching and sorting algorithms.	K3

7.Course Code and Name :GE6262- PHYSICS AND CHEMISTRY LABORATORY - II

	CO Statements	Knowledge Level
1	Illustrate the determination of Young's modulus of the beam and moment of inertia and rigidity modules of thin wire Torsion pendulum	K2
2	Make use of Poiseuille's method to determine the coefficient of viscosity of the liquid	K3
3	Illustrate the determination of dispersive power of a prism and the thickness of a thin wire through interference fringes using Air wedge apparatus	K2
4	Experiment with the type, amount of alkalinity, hardness in a given water sample and evaluate the Amount of copper using EDTA method	K3
5	Demonstrate titration by potentiometric redox and conductometric precipitation methods	K2

8.Course Code and Name : CS6211 - Digital Laboratory

	CO Statements	Knowledge Level
1	Summarize simplified combinational circuits using basic logic gates	K2
2	Explain combinational circuits using MSI devices	K2
3	Build sequential circuits like registers and counters	K3
4	Construct combinational and sequential circuits using HDL	K3
5	Design and implement simple digital system	K6

9.Course Code and Name : CS6212 and Programming and Data Structures

	CO Statements	Knowledge Level
1	Apply good programming design methods for program development.	K3
2	Design and implement C programs for Linear data structures	K3
3	Develop applications using different data structures	K3
4	Implement searching and sorting algorithms	K3

SEMESTER 03

1.Course Code and Name :MA6351- TRANSFORMS AND PARTIAL DIFFERENTIAL EQUATIONS		
	CO Statements	Knowledge Level
The students should be able to		
1	Solve differential equations using Fourier series analysis for engineering applications.	K3
2	Utilize Dirichlet's condition for finding the Fourier series of a given function	K3
3	Apply Fourier series to solve one dimensional wave, one and two dimensional heat equations.	K3
4	Solve Fourier transform for a given function and make use of them to evaluate certain definite Integrals	K3
5	Solve z transforms of standard functions and make use of use them to solve difference equations	K3
2.Course Code and Name : CS6301 and Programming and Data Structures II		
	CO Statements	Knowledge Level
1	Describe various concepts of Object Oriented programming.	K2
2	Apply the concepts of data abstraction, encapsulation and inheritance for problem solutions.	K3
3	Implement exception, generic programming and file concepts for various problems.	K3
4	Apply the different Non-Linear data structures for solving problems.	K3
5	Analyze the various traversing techniques and algorithms for Non-Linear data structure.	K3
3.Course Code and Name : CS6302 and Database Management System		
	CO Statements	Knowledge Level
1	Explain the basic concepts of Database management system.	K2
2	Design and manipulation of database using structured Query language and optimization techniques.	K3
3	Apply concurrency control and recovery mechanisms for various Applications.	K3
4	Describe various storage structures, indexing, hashing and different types of databases.	K2
5	Apply security concepts to databases.	K3
4.Course Code and Name : CS6303 and Computer Architecture		
	CO Statements	Knowledge Level
1	Explain various operations, instructions and addressing modes of computer systems.	K2
2	Design Arithmetic and Logic Unit.	K3

3	Design and analysis of Control unit and pipelining.	K3
4	Describe various parallelism techniques.	K2
5	Analyse performance of Memory and I/O systems.	K4

5.Course Code and Name : CS6304 and Analog and Digital Communication

	CO Statements	Knowledge Level
1	Summarize the different analog modulation techniques	K2
2	Explain analog and digital communication techniques.	K2
3	Utilize data and pulse communication techniques.	K3
4	Analyze Source and Error control coding.	K3
5	Utilize multi-user radio communication.	K3

6.Course Code and Name : GE6351 and Environmental Science and Engineering

	CO Statements	Knowledge Level
1	Illustrate the concepts of an ecosystem , energy flow and conservation of biodiversity.	K2
2	Explain the causes, effects and control of various types of pollution.	K2
3	Outline the conservation of natural resources.	K2
4	Summarize the social issues of environment and legislative guidelines for disaster management.	K2
5	Relate population growth and its impact on environment and human health.	K2

7.Course Code and Name : CS6312 Database Management Systems Laboratory

	CO Statements	Knowledge Level
1	Design and implement a database schema for a given problem-domain	K3
2	Write SQL query to manipulate database.	K3
3	Create and maintain tables using PL/SQL.	K3
4	Develop an application using Oracle.	K3

8.Course Code and Name : CS6311 Programming and Data Structure Laboratory II

	CO Statements	Knowledge Level
1	Apply good programming design methods for program development using C++.	K3

2	Design and implement C++ programs for Linear data structures	K3
3	Design and implement C++ programs for Non-Linear data structures	K3
4	Implement recursive programs and various algorithms for graph.	K3

SEMESTER 04

1.Course Code and Name : MA6453 and Probability and Queuing Theory

	CO Statements	Knowledge Level
The students should be able to		
1	The probabilityMethods techniques are used to find the solution for the partial problems in engineering.	K3
2	The graduates will be able to grow professionally in their careers throughcontinued development of technical and	K3
3	To afford students with a solid base in scientific, mathematical, and engineeringfundamentals needed to examine,	K3
4	To inculcate professionals relate to computer engineering issues with ethicalattitude, multi-disciplinary projects, social, environmental and economic considerations.	K3
5	A graduate engineer during his course of study should inbuilt social ethics andprofessionalism and should apply them in his carrier.	K3

2.Course Code and Name : CS6551 and Computer Networks

	CO Statements	Knowledge Level
1	Describe the basic layers and its functions in Computer Network.	K2
2	Describe the basics of data flows in a network.	K2
3	Analyze and design various routing algorithms.	K3

4	Apply TCP and UDP protocols for various functions.	K3
5	Describe various protocols for application layer.	K2

3.Course Code and Name : CS6401 and Operating System

	CO Statements	Knowledge Level
1	Describe the basic concepts and functions of Operating System.	K2
2	Design various scheduling algorithms and apply the principles of concurrency.	K3
3	Demonstrate various memory management techniques	K2
4	Design and implement prototype file systems.	K3
5	Implement administrative tasks on Linux Servers.	K3

4.Course Code and Name : CS6402 and Design and Analysis of Algorithm

	CO Statements	Knowledge Level
1	Describe various methods for analyzing algorithms to solve different types of problems.	K2
2	Design and analyze algorithms for various computing problems using brute force and divide-and-conquer techniques.	K3
3	Design and analyze algorithms for various computing problem using dynamic programming and greedy techniques.	K3
4	Analyze different algorithm design techniques for a given problem using Iterative improvement.	K3
5	Describe the limitations of algorithm power for various problems.	K2

5.Course Code and Name : EC6504 and Microprocessor and Microcontroller

	CO Statements	Knowledge Level
1	Design and implement programs on 8086 microprocessor.	K6
2	Design I/O circuits	K2
3	Design Memory Interfacing circuits.	K6
4	Design and implement 8051 microcontroller based systems	K6

5	Explain the architecture and instruction set of ARM microcontroller	K2
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6.Course Code and Name : CS6403 and Software Engineering

	CO Statements	Knowledge Level
1	Describe the concepts of various process models.	K2
2	Describe the concepts of requirement engineering and analysis.	K2
3	Apply systematic procedure for software design and deployment.	K3
4	Compare and contrast the various testing and maintenance.	K2
5	Identify the key activities in managing a software project.	K3

7.Course Code and Name : CS6411 and Networks Laboratory

	CO Statements	Knowledge Level
1	Implement the socket programming and client-server model.	K3
2	Implement the various protocols.	K3
3	Analyze various routing algorithms.	K3
4	Simulate congestion control algorithms using network simulation tool.	K3

8.Course Code and Name : CS6412 and Microprocessor and Microcontroller Laboratory

	CO Statements	Knowledge Level
1	Develop an ALP for fixed and Floating Point and Arithmetic	K3
2	Develop an ALP for Interface different I/Os with processor	K3
3	Develop an ALP to Generate waveforms using Microprocessors	K3
4	Develop an ALP using 8051 microcontroller	K3
5	Explain the difference between simulator and Emulator	K2

9.Course Code and Name : CS6413 and Operating Systems Laboratory

	CO Statements	Knowledge Level
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1	Implement various CPU scheduling algorithms	K3
2	Implement deadlock avoidance and detection algorithms.	K3
3	Implement file system concepts and file access control.	K3
4	Implementation of threads and synchronization algorithms	K3

SEMESTER 05

1.Course Code and Name : MA6566 and Discrete Mathematics

	CO Statements	Knowledge Level
The students should be able to		
1	Explain the concepts needed to test the logic of a program.	K2
2	Identify structures on many levels.	K2
3	Apply class of functions which transform a finite set into another finite set which relates to input and output functions in computer science.	K3
4	Explain the counting principles	K2
5	Outline the concepts and properties of algebraic structures such as groups, rings and fields.	K2

2.Course Code and Name : CS6501 and Internet Programming

	CO Statements	Knowledge Level
1	Write Java programs.	K3
2	Develop a basic website using HTML and CSS.	K3
3	Design and implement client side programs using JavaScript and server side programs using servlets and Java Server Pages.	K3
4	Design and implement simple web page in PHP and to present data in XML format.	K3
5	Design rich client presentation using AJAX.	K3

3.Course Code and Name : Cs6502 and Object Oriented Analysis and Design

	CO Statements	Knowledge Level
1	Describe the UML analysis and design diagrams.	K2

2	Interpret the GRASP design pattern and GoF design pattern.	K3
3	Design usecase modeling and domain modeling.	K3
4	Apply appropriate design patterns.	K3
5	Compare and contrast various testing techniques.	K2

4.Course Code and Name : CS6503 and Theory of Computation

	CO Statements	Knowledge Level
1	Construct a minimized Finite Automata to recognize a given regular language.	K3
2	Describe formal relationships among machines, languages and grammars.	K2
3	Construct the Push down automata for all the context free languages and CFG.	K3
4	Construct turing machine using different techniques.	K3
5	Explain the decidability and undecidability of various problems.	K2

5.Course Code and Name : CS6504 and Computer Graphics

	CO Statements	Knowledge Level
1	Describe the basic concepts in computer graphics and various output primitives algorithms.	K2
2	Design and apply two dimensional transformations, Clipping algorithms and viewing functions.	K3
3	Design and apply three dimensional transformations, viewing functions, Bezier Curve, B-spline and Clipping algorithms.	K3
4	Explain various color models and illumination.	K2
5	Design computer graphics realism and animation sequences.	K3

6.Course Code and Name : CS6511 and Case Tools Laboratory

	CO Statements	Knowledge Level
1	Design and Implement projects using OO concepts.	K3
2	Design UML analysis and design diagrams.	K3
3	Apply appropriate design patterns.	K3
4	Create code from design.	K3

7.Course Code and Name : CS6512 Internet Programming Laboratory

	CO Statements	Knowledge Level
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1	Design Web pages using HTML/XML and style sheets	K3
2	Implement user interfaces using Java frames and applets.	K3
3	Implement dynamic web pages using server side scripting.	K3
4	Develop Client Server applications.	K3
5	Develop simple programs using JSP Strut, Hibernate and Spring frameworks.	K3

8.Course Code and Name : CS6513 Computer Graphics Laboratory

	CO Statements	Knowledge Level
1	Implement 2D Output Primitives such as Line, Circle and Elipse drawing algorithms.	K3
2	Implement 2D transformations and various clipping algorithms.	K3
3	Implement 3D transformations and projections of 3D Objects.	K3
4	Develop 2D animations.	K3

SEMESTER 06

1.Course Code and Name : CS6601 and Distributed Systems

	CO Statements	Knowledge Level
The students should be able to		
1	Describe the basic components, concepts, foundation and challenges related to Distributed Systems	K2
2	Apply network virtualization, remote method invocation and objects.	K3
3	Demonstrate peer to peer services and distributed file system.	K2
4	Explain the concepts in synchronization and communication mechanism used in modern Distributed Systems	K2
5	Describe the resource allocation and process management techniques in Distributed operating systems	K2

2.Course Code and Name : IT6601 and Mobile Computing

	CO Statements	Knowledge Level
1	Explain the basics of mobile computing system and MAC protocol.	K2
2	Choose the required functionality at each layer for given application.	K2
3	Explain the basics of mobile telecommunication system and MAC protocol.	K2
4	Design adhoc networks using simulated tools.	K3

5	Develop a mobile application.	K3
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3.Course Code and Name : CS6660 and Compiler Design

	CO Statements	Knowledge Level
1	Explain the basic concepts of compiler and its phases.	K2
2	Implement the functionalities of lexical analyzer and convert the given regular expression to DFA.	K3
3	Construct the parsing table using different parsing techniques and implement lexical analyser using compiler construction tools.	K3
4	Explain the translation processes and run time environment issues.	K2
5	Apply various code optimization techniques for generating machine code.	K3

4.Course Code and Name : CS6659 and Artificial Intelligence

	CO Statements	Knowledge Level
1	Describe the concept of production systems, control and search strategies.	K2
2	Explain the concept of FOL and propositional logic for representation of knowledge.	K2
3	Apply knowledge Inferences to solve problems.	K3
4	Describe various planning strategies and Machine Learning techniques for appropriate problems.	K2
5	Develop Expert Systems for various applications.	K3

5.Course Code and Name : IT6702 and Data Warehousing and Data Mining

	CO Statements	Knowledge Level
1	Describe the steps in building a Data warehouse architecture and schemas for decision support.	K2
2	Explain the usage of OLAP tools to extract knowledge from data warehouse.	K2
3	Describe the data mining functionalities and data preprocessing techniques.	K2
4	Apply the association rule mining and classification algorithms for a given problem.	K3
5	Summarize various clustering methods and applications of data mining techniques in knowledge discovery.	K3

6.Course Code and Name : CS6611 Mobile Application Development Laboratory

	CO Statements	Knowledge Level
1	Choose the required architecture based upon the mobile application to be developed.	K2

2	Design mobile applications using various layout and widgets	K3
3	Implement various mobile applications using emulators.	K3
4	Deploy applications to hand-held devices.	K3

7.Course Code and Name : CS6612 Compiler Laboratory

	CO Statements	Knowledge Level
1	Implement the symbol table and compiler writing tools for lexical analyzer.	K3
2	Design and implement different phases of compiler.	K3
3	Implement the concepts of control flow and data flow analysis.	K3
4	Apply simple optimization techniques for code generation.	K3

8.Course Code and Name : GE6674- Communication and Soft Skills - Laboratory Based

	CO Statements	Knowledge Level
1	Demonstrate reading and writing skills	K2
2	Develop listening and speaking skills	K3
3	Make use of acquired knowledge to take up international examination such as IELTS and TOEFL	K3
4	Apply the interview techniques for career development	K3
5	Illustrate the various aspects of soft skills	K2

SEMESTER 07

1.Course Code and Name : CS6701 and Cryptography and Network Security

	CO Statements	Knowledge Level
The students should be able to		
1	Explain OSI security architecture, classical encryption techniques, finite fields and number theory.	K2
2	Compare various cryptographic techniques.	K2
3	Describe the usage of hash functions and digital signatures.	K2
4	Design secure applications.	K3
5	Describe the various web security techniques.	K2

2.Course Code and Name : CS6702 and Graph Theory and Applications

	CO Statements	Knowledge Level
1	Explain the basic graph and tree related concepts.	K2
2	Construct spanning tree and planar graphs using mathematical definitions.	K2
3	Apply mathematical proofs in graphs and digraphs.	K3
4	Apply the concepts of permutation, combinations and binomial theorem for solving problems.	K3
5	Solve generating functions, homogeneous and non-homogeneous recurrence relations.	K3

3.Course Code and Name : CS6703 and Grid and Cloud Computing

	CO Statements	Knowledge Level
1	Explain the architecture of grid and cloud computing.	K2
2	Describe the various Functional and Non Functional Requirements of OGSA	K2
3	Apply the concept of virtualization.	K2
4	Develop web services using grid and cloud technologies.	K3
5	Describe the security models in grid and cloud environment.	K2

4.Course Code and Name : CS6704 and Resource Management Techniques

	CO Statements	Knowledge Level
1	Apply Linear Programming Problem (LPP) concepts to solve operational problems with constraints.	K3
2	Solve LPP using dual simplex methods, transportation and assignment problems.	K3
3	Apply Integer Programming to solve real life applications.	K3
4	Solve problems in classical optimization theory.	K3
5	Apply PERT and CPM for problems in project management.	K3

5.Course Code and Name : CS6003 and Ad Hoc and Sensor Networks

	CO Statements	Knowledge Level
1	Explain the concepts, network architecture and applications of ad hoc and sensor networks.	K2
2	Describe the different types of MAC protocols in ad hoc networks.	K2
3	Describe various adhoc routing protocols and TCP issues in adhoc networks.	K2
4	Explain the architecture and MAC protocols of wireless sensor networks.	K3
5	Describe the routing, localization and QOS in WSN	K3

6.Course Code and Name : IT6005 and Digital Image Processing		
	CO Statements	Knowledge Level
1	Describe the concepts of digital imaging.	K2
2	Explain image enhancement techniques in spatial and frequency domain.	K2
3	Apply various filters and segmentation techniques to segment digital image.	K2
4	Discuss wavelet and image compression .	K3
5	Develop applications for representation and recognition of digital image.	K3

7.Course Code and Name : CS6007 & Information Retrieval		
	CO Statements	Knowledge Level
1	Explain the components of information retrieval and search engine.	K2
2	Describe the various information retrieval models.	K2
3	Describe the web search engine and crawling concepts.	K2
4	Apply link analysis and specialised search techniques in web search.	K3
5	Apply various document text mining techniques in information retrieval.	K3

8.Course Code and Name : CS6004 & Cyber Forensics		
	CO Statements	Knowledge Level
1	Describe the security issues in network and transport layer.	K2
2	Apply security principles in application layer.	K3
3	Describe the fundamental concepts of computer forensics.	K2
4	Explain the basics concepts in forensic tools and evidence collection.	K3
5	Describe the various techniques to validate the forensic data.	K2

9.Course Code and Name : CS6711 Security Laboratory		
	CO Statements	Knowledge Level
1	Implement the cipher techniques	K3
2	Develop the various security algorithms	K3
3	Implement different network security and analysis using open source tools.	K3
4	Demonstrate the installation of rootkits.	K2

10.Course Code and Name : CS6712 Grid and Cloud Computing Laboratory		
	CO Statements	Knowledge Level
1	Design and Implement the applications of Grid	K3
2	Develop the Grid Service using Apache Axis	K3
3	Design and Implement the applications of Cloud	K3
4	Implement the Hadoop Cluster using FUSE .	K2

SEMESTER 08		
1.Course Code and Name : CS6801 and Multicore Architecture &Programming		
	CO Statements	Knowledge Level
The students should be able to		
1	Explain the various concepts of multicore processor.	K2
2	Describe the various challenges in parallel programming.	K2
3	Develop shared memory programming using OpenMP.	K3
4	Develop distributed memory programming using MPI.	K3
5	Apply n-body-solvers and tree search using OpenMP and MPI in parallel programming.	K3

2.Course Code and Name : CS6702 and Graph Theory and Applications		
	CO Statements	Knowledge Level
1	Design the Human Computer Interaction(HCI) process	K2
2	Analyze the performance of interactive systems for HCI	K2
3	Develop the appropriate design model for HCI	K3
4	Describe the various steps in Mobile HCI	K3
5	Develop the web applications based Inlays and Overlays	K3

3.Course Code and Name : CS6703 and Grid and Cloud Computing		
	CO Statements	Knowledge Level
1	Illustrate the principles of human values	K2
2	Demonstrate the techniques and theories of Engineering Ethics	K2

3	Explain the procedure for Engineering As Social Experimentation	K2
4	Summarize the concept of Safety, Responsibilities And Rights	K2
5	Explain the different Global Issues	K2

4.Course Code and Name : CS6811 and Project Work

	CO Statements	Knowledge Level
1	Analyze Problems in various domains and formulate methodology	K4
2	Develop different solutions and select the optimum solution	K3
3	Conclude using proper evidence to support them	K4