

**PRATHYUSHA ENGINEERING COLLEGE**  
**DEPARTMENT OF INFORMATION TECHNOLOGY**  
**COURSE OUTCOMES**  
**REGULATION 2013**

<b>COURSE CODE</b>	<b>COURSE NAME</b>	<b>COURSE OUTCOME</b>
<b>SEMESTER I</b>		
<b>HS6151</b>	<b>TECHNICAL ENGLISH – I</b>	<ul style="list-style-type: none"> <li>• To help students speak clearly, confidently, comprehensibly, and communicate with one or many listeners using appropriate communicative strategies.</li> <li>• To help students write cohesively and coherently and flawlessly avoiding grammatical errors, using a wide vocabulary range, organizing their ideas logically on a topic</li> <li>• To help students read different genres of texts adopting various reading strategies</li> <li>• To help students listen/view and comprehend different spoken discourses/excerpts in different accents.</li> </ul>
<b>MA6151</b>	<b>MATHEMATICS – I</b>	<ul style="list-style-type: none"> <li>• This course equips students to have basic knowledge and understanding in one fields of materials, integral and differential calculus.</li> </ul>
<b>PH6151</b>	<b>ENGINEERING PHYSICS – I</b>	<ul style="list-style-type: none"> <li>• The students will have knowledge on the basics of physics related to properties of matter, Optics, acoustics etc.</li> <li>• They will apply these fundamental principles to solve practical problems related to materials used for engineering applications</li> </ul>
<b>CY6151</b>	<b>ENGINEERING CHEMISTRY – I</b>	<ul style="list-style-type: none"> <li>• The knowledge gained on polymer chemistry thermodynamics. spectroscopy, phase rule and nano materials will provide a strong platform to understand the concepts on these subjects for further learning.</li> </ul>

<b>GE6151</b>	<b>COMPUTER PROGRAMING</b>	<ul style="list-style-type: none"> <li>• Design C Programs for problems</li> <li>• Write and execute C programs for simple applications</li> </ul>
<b>GE6152</b>	<b>ENGINEERING GRAPHICS</b>	<ul style="list-style-type: none"> <li>• Perform free hand sketching of basic geometrical constructions and multiple views of objects.</li> <li>• Do orthographic projection of lines and plane surfaces.</li> <li>• Draw projections and solids and development of surface</li> <li>• Prepare isometric and perspective sections of simple solids</li> <li>• Demonstrate computer aided drafting</li> </ul>
<b>GE6161</b>	<b>COMPUTER PRACTICES LABORATORY</b>	<ul style="list-style-type: none"> <li>• Apply good programming design methods for program development</li> <li>• Design and implement C programs for simple applications.</li> <li>• Develop recursive programs.</li> </ul>
<b>GE6162</b>	<b>ENGINEERING PRACTICES LABORATORY</b>	<ul style="list-style-type: none"> <li>• Ability to fabricate carpentry components and pipe connections including plumbing works.</li> <li>• Ability to use welding equipments to join the structures</li> <li>• Ability to fabricate electrical and electronics circuits.</li> </ul>
<b>GE6163</b>	<b>PHYSICS AND CHEMISTRY LABORATORY – I</b>	<ul style="list-style-type: none"> <li>• Exercises undergone by the students will help them to apply physics principles of optics and thermal physics to evaluate engineering properties of materials.</li> <li>• The students will be outfitted with hands-on knowledge in the quantitative chemical analysis of water quality related parameters</li> </ul>

**SEMESTER II**

<b>HS6251</b>	<b>TECHNICAL ENGLISH-II</b>	<ul style="list-style-type: none"><li>• Speak convincingly, express their opinions clearly, initiate a discussion, negotiate, argue using appropriate communicative strategies</li><li>• Write effectively and persuasively and produce different types of writing such as narration, description, exposition and argument as well as creative, critical, analytical and evaluative writing.</li><li>• Read different genres of texts, infer implied meanings and critically analyse and evaluate them for ideas as well as for method of presentation</li><li>• Listen/view and comprehend different spoken excerpts critically and infer unspoken and implied meanings</li></ul>
<b>MA6251</b>	<b>MATHEMATICS – II</b>	<ul style="list-style-type: none"><li>• The subject helps the students to develop the fundamentals and basic concepts in vector calculus, ODE, Laplace transform and complex functions. Students will be able to solve problems related to engineering applications by using these techniques.</li></ul>
<b>PH6251</b>	<b>ENGINEERING PHYSICS –II</b>	<ul style="list-style-type: none"><li>• The students will have the knowledge on physics of materials and that knowledge will be used by them in different engineering and technology applications</li></ul>
<b>CY6251</b>	<b>ENGINEERING CHEMISTRY– II</b>	<ul style="list-style-type: none"><li>• The knowledge gained on engineering materials, fuels, energy sources and water treatment techniques will facilitate better understanding of engineering processes and applications for further learning..</li></ul>
<b>CS6201</b>	<b>DIGITAL PRINCIPLES AND SYSTEM DESIGN</b>	<ul style="list-style-type: none"><li>• Perform arithmetic operations in any number system.</li><li>• Simplify the Boolean expression using K-Map and Tabulation techniques</li><li>• Use boolean simplification techniques to design a combinational hardware circuit</li><li>• Design and Analysis of a given digital circuit – combinational and sequential</li><li>• Design using PLD.</li></ul>

<b>CS6202</b>	<b>PROGRAMMING AND DATA STRUCTURES I</b>	<ul style="list-style-type: none"> <li>• Use the control structures of C appropriately for problems.</li> <li>• Implement abstract data types for linear data structures</li> <li>• Apply the different linear data structures to problem solutions.</li> <li>• Critically analyse the various algorithms</li> </ul>
<b>GE6262</b>	<b>PHYSICS AND CHEMISTRY LABORATORY - II</b>	<ul style="list-style-type: none"> <li>• The students will have the ability to test materials by using their knowledge of applied physics principles in optics and properties of matter</li> <li>• The students will be conversant with hands-on knowledge in the quantitative chemical analysis of water quality related parameters, corrosion measurement and cement analysis</li> </ul>
<b>IT6211</b>	<b>DIGITAL LABORATORY</b>	<ul style="list-style-type: none"> <li>• Use boolean simplification techniques to design a combinational hardware circuit.</li> <li>• Design and Implement combinational and sequential circuits</li> <li>• Analyze a given digital circuit – combinational and sequential</li> <li>• Design the different functional units in a digital computer system</li> <li>• Design and Implement a simple digital system.</li> </ul>
<b>IT6212</b>	<b>PROGRAMMING AND DATA STRUCTURES LABORATORY I</b>	<ul style="list-style-type: none"> <li>• Design and implement C programs for implementing stacks, queues, linked lists</li> <li>• Apply good programming design methods for program development</li> <li>• Apply the different data structures for implementing solutions to practical problems</li> <li>• Develop searching and sorting programs.</li> </ul>
<b>SEMESTER III</b>		
<b>MA6351</b>	<b>TRANSFORMS &amp; PARTIAL DIFFERENTIAL EQUATIONS</b>	<ul style="list-style-type: none"> <li>• The understanding of the mathematical principles on transforms and partial differential equations would provide them the ability to formulate and solve some of the physical problems of engineering.</li> </ul>

<p><b>CS6301</b></p>	<p><b>PROGRAMMING AND DATA STRUCTURES II</b></p>	<ul style="list-style-type: none"> <li>• Design problem solutions using Object Oriented Techniques.</li> <li>• Apply the concepts of data abstraction, encapsulation and inheritance for problem solutions.</li> <li>• Apply the different data structures to problem solutions.</li> </ul>
<p><b>CS6302</b></p>	<p><b>DATABASE MANAGEMENT SYSTEMS</b></p>	<ul style="list-style-type: none"> <li>• Design Databases for applications</li> <li>• Use the Relational model, ER diagrams.</li> <li>• Apply concurrency control and recovery mechanisms for practical problems</li> <li>• Design the Query Processor and Transaction Processor</li> <li>• Apply security concepts to databases.</li> </ul>
<p><b>CS6303</b></p>	<p><b>COMPUTER ARCHITECTURE</b></p>	<ul style="list-style-type: none"> <li>• Design arithmetic and logic unit.</li> <li>• Design and analyse pipelined control units</li> <li>• Evaluate performance of memory systems</li> <li>• Understand parallel processing architectures</li> </ul>
<p><b>CS6304</b></p>	<p><b>ANALOG AND DIGITAL COMMUNICATION</b></p>	<ul style="list-style-type: none"> <li>• Apply analog and digital communication techniques</li> <li>• Use data and pulse communication techniques</li> <li>• Analyze Source and Error control coding</li> <li>• Utilize multi-user radio communication.</li> </ul>
<p><b>GE6351</b></p>	<p><b>ENVIRONMENTAL SCIENCE AND ENGINEERING</b></p>	<ul style="list-style-type: none"> <li>• One will obtain knowledge on the following after completing the course.</li> <li>• Public awareness of environmental is at infant stage.</li> <li>• Ignorance and incomplete knowledge has lead to misconceptions.</li> <li>• Development and improvement in std. of living has lead to serious environmental disasters</li> </ul>

<b>IT6311</b>	<b>PROGRAMMING AND DATA STRUCTURES LABORATORY II</b>	<ul style="list-style-type: none"> <li>• Design and implement C++ programs for manipulating stacks, queues, linked lists, trees, and graphs.</li> <li>• Apply good programming design methods for program development.</li> <li>• Apply the different data structures for implementing solutions to practical problems</li> <li>• Develop recursive programs using trees and graphs.</li> </ul>
<b>IT6312</b>	<b>DATABASE MANAGEMENT SYSTEMS LABORATORY</b>	<ul style="list-style-type: none"> <li>• Design and implement a database schema for a given problem-domain</li> <li>• Populate and query a database</li> <li>• Create and maintain tables using PL/SQL</li> </ul>
<b>IT6313</b>	<b>DIGITAL COMMUNICATION LABORATORY</b>	<ul style="list-style-type: none"> <li>• To develop necessary skill in designing, analyzing and constructing digital electronic circuits.</li> </ul>
<b>SEMESTER IV</b>		
<b>MA6453</b>	<b>PROBABILITY AND QUEUING THEORY</b>	<ul style="list-style-type: none"> <li>• The students will have a fundamental knowledge of the probability concepts</li> <li>• Acquire skills in analyzing queueing models.</li> <li>• It also helps to understand and characterize phenomenon which evolve with respect to time in a probabilistic manner</li> </ul>
<b>EC6504</b>	<b>MICROPROCESSOR AND MICROCONTROLLER</b>	<ul style="list-style-type: none"> <li>• Design and implement programs on 8086 microprocessor</li> <li>• Design and implement 8051 microcontroller based systems.</li> <li>• Design Memory Interfacing circuits and I/O circuits.</li> </ul>
<b>CS6402</b>	<b>DESIGN AND ANALYSIS OF ALGORITHMS</b>	<ul style="list-style-type: none"> <li>• Design algorithms for various computing problems.</li> <li>• Analyze the time and space complexity of algorithms.</li> <li>• Critically analyze the different algorithm design techniques for a given problem.</li> <li>• Modify existing algorithms to improve efficiency.</li> </ul>

<b>CS6401</b>	<b>OPERATING SYSTEMS</b>	<ul style="list-style-type: none"> <li>• Design various Scheduling algorithms.</li> <li>• Apply the principles of concurrency</li> <li>• Design deadlock, prevention and avoidance algorithms.</li> <li>• Compare and contrast various memory management schemes.</li> <li>• Design and Implement a prototype file systems and perform administrative tasks on Linux Servers</li> </ul>
<b>CS6403</b>	<b>SOFTWARE ENGINEERING</b>	<ul style="list-style-type: none"> <li>• Identify the key activities in managing a software project</li> <li>• Compare different process models</li> <li>• and contrast the various testing and maintenance</li> <li>• Apply systematic procedure for software design and deployment</li> </ul>
<b>IT6411</b>	<b>MICROPROCESSOR AND MICROCONTROLLER LABORATORY</b>	<ul style="list-style-type: none"> <li>• Write ALP Programmes for fixed and Floating Point and Arithmetic</li> <li>• Explain the difference between simulator and Emulator</li> <li>• Interface different I/Os with processor and execute Programs in 8051</li> </ul>
<b>IT6412</b>	<b>OPERATING SYSTEMS LABORATORY</b>	<ul style="list-style-type: none"> <li>• Implement deadlock avoidance, and Detection Algorithms</li> <li>• Compare the performance of various CPU Scheduling Algorithm</li> <li>• Create processes and implement IPC</li> </ul>
<b>IT6413</b>	<b>SOFTWARE ENGINEERING LABORATORY</b>	<ul style="list-style-type: none"> <li>• Use open source case tools to develop software.</li> <li>• Analyze and design software requirements in efficient manner</li> </ul>
<b>SEMESTER V</b>		
<b>CS6551</b>	<b>COMPUTER NETWORKS</b>	<ul style="list-style-type: none"> <li>• Identify the components required to build different types of networks</li> <li>• Trace the flow of information from one node to another node in the network</li> <li>• Identify solution for each functionality at each layer</li> </ul>

<b>IT6501</b>	<b>GRAPHICS AND MULTIMEDIA</b>	<ul style="list-style-type: none"> <li>• Effectively and creatively solve a wide range of graphic design problems</li> <li>• Use various software programs used in the creation and implementation of multi-media</li> <li>• Discuss issues related to emerging electronic technologies and graphic design</li> </ul>
<b>CS6502</b>	<b>OBJECT ORIENTED ANALYSIS AND DESIGN</b>	<ul style="list-style-type: none"> <li>• Design and implement projects using OO concepts</li> <li>• Use the UML analysis and design diagrams</li> <li>• Create code from design</li> <li>• Compare and contrast various testing technique</li> </ul>
<b>IT6502</b>	<b>DIGITAL SIGNAL PROCESSING</b>	<ul style="list-style-type: none"> <li>• Perform frequency transforms for the signals</li> <li>• Design IIR and FIR filters.</li> <li>• Finite word length effects in digital filters</li> </ul>
<b>IT6503</b>	<b>WEB PROGRAMMING</b>	<ul style="list-style-type: none"> <li>• Design web pages. and use technologies of Web Programming</li> <li>• Apply object oriented aspects to Scripting.</li> <li>• Create databases with connectivity using JDBC.</li> <li>• Build web based application using sockets.</li> </ul>
<b>EC6801</b>	<b>WIRELESS COMMUNICATION</b>	<ul style="list-style-type: none"> <li>• Design and implement various signaling schemes for fading channels</li> <li>• Design a cellular system and compare multipath mitigation techniques and analyze their performance</li> <li>• Design and implement systems with transmit/receive diversity and MIMO systems and analyze their performance</li> </ul>
<b>IT6511</b>	<b>NETWORKS LABORATORY</b>	<ul style="list-style-type: none"> <li>•</li> <li>• Analyse the performance of the protocols in different layers and various routing algorithms</li> <li>• Use simulation tools</li> <li>• Implement the various protocols</li> <li>• Analyze various routing algorithms</li> </ul>
<b>IT6512</b>	<b>WEB PROGRAMMING LABORATORY</b>	<ul style="list-style-type: none"> <li>• Design Web pages using HTML/DHTML and style sheets</li> <li>• Design and Implement database applications</li> <li>• Create dynamic web pages using server side scripting</li> <li>• Write Client Server applications</li> </ul>



<b>IT6513</b>	<b>CASE TOOLS LABORATORY</b>	<ul style="list-style-type: none"> <li>• Design and implement projects using OO concepts.</li> <li>• Use the UML analysis and design diagrams</li> <li>• Create code from design</li> <li>• Compare and contrast various testing techniques</li> </ul>
<b>CS6601</b>	<b>DISTRIBUTED SYSTEMS</b>	<ul style="list-style-type: none"> <li>• Discuss trends in Distributed Systems and Apply network virtualization</li> <li>• Apply remote method invocation and objects</li> <li>• Design process and resource management systems</li> </ul>
<b>IT6601</b>	<b>MOBILE COMPUTING</b>	<ul style="list-style-type: none"> <li>• Explain the basics of mobile telecommunication system</li> <li>• Choose the required functionality at each layer for given application</li> <li>• Identify solution for each functionality at each layer</li> <li>• Use simulator tools and design Ad hoc networks</li> </ul>
<b>CS6659</b>	<b>ARTIFICIAL INTELLIGENCE</b>	<ul style="list-style-type: none"> <li>• Identify problems that are amenable to solution by AI methods.</li> <li>• Formalise a given problem in the language/framework of different AI methods</li> <li>• Design and carry out an empirical evaluation of different algorithms on a problem formalisation, and state the conclusions that the evaluation supports</li> </ul>
<b>CS6660</b>	<b>COMPILER DESIGN</b>	<ul style="list-style-type: none"> <li>• Design and implement a prototype compiler.</li> <li>• Apply the various optimization techniques.</li> <li>• Use the different compiler construction tools.</li> </ul>
<b>IT6602</b>	<b>SOFTWARE ARCHITECTURES</b>	<ul style="list-style-type: none"> <li>• Explain influence of software architecture on business and technical activities</li> <li>• Identify key architectural structures</li> <li>• Use styles and views to specify architecture</li> <li>• Design document for a given architecture</li> </ul>
<b>GE6757</b>	<b>TOTAL QUALITY MANAGEMENT</b>	<ul style="list-style-type: none"> <li>• The student would be able to apply the tools and techniques of quality management to manufacturing and services processes.</li> </ul>

<b>IT6611</b>	<b>MOBILE APPLICATION DEVELOPMENT LABORATORY</b>	<ul style="list-style-type: none"> <li>• Design and Implement various mobile applications using emulators</li> <li>• Deploy applications to hand-held devices</li> </ul>
<b>IT6612</b>	<b>COMPILER LABORATORY</b>	<ul style="list-style-type: none"> <li>• Implement the different Phases of compiler using tools</li> <li>• Analyze the control flow and data flow of a typical program</li> <li>• Generate an assembly language program equivalent to a source language program</li> </ul>
<b>GE6674</b>	<b>COMMUNICATION AND SOFT SKILLS - LABORATORY BASED</b>	<ul style="list-style-type: none"> <li>• Take international examination such as IELTS and TOEFL</li> <li>• Make presentations and Participate in Group Discussions</li> <li>• Successfully answer questions in interviews</li> </ul>
<b>SEMESTER VII</b>		
<b>IT6701</b>	<b>INFORMATION MANAGEMENT</b>	<ul style="list-style-type: none"> <li>• Cover core relational database topics including logical and physical</li> <li>• design and modeling</li> <li>• Design and implement a complex information system that meets regulatory requirements; define and manage an organization's key master data entities</li> <li>• Design, Create and maintain data warehouses</li> <li>• Learn recent advances in NOSQL , Big Data and related tools.</li> </ul>
<b>CS6701</b>	<b>CRYPTOGRAPHY AND NETWORK SECURITY</b>	<ul style="list-style-type: none"> <li>• Compare various Cryptographic Techniques</li> <li>• Design Secure applications</li> <li>• Inject secure coding in the developed applications</li> </ul>
<b>IT6702</b>	<b>DATA WARE HOUSING AND DATA MINING</b>	<ul style="list-style-type: none"> <li>• Apply data mining techniques and methods to large data sets</li> <li>• Use data mining tools.</li> <li>• Compare and contrast the various classifiers.</li> </ul>

<b>CS6703</b>	<b>GRID AND CLOUD COMPUTING</b>	<ul style="list-style-type: none"> <li>• Apply grid computing techniques to solve large scale scientific problems and concept of virtualization</li> <li>• Use the grid and cloud tool kits</li> <li>• Apply the security models in the grid and the cloud environment</li> </ul>
<b>IT6711</b>	<b>DATA MINING LABORATORY</b>	<ul style="list-style-type: none"> <li>• Apply data mining techniques and methods to large data sets</li> <li>• Use data mining tools.</li> <li>• Compare and contrast the various classifiers</li> </ul>
<b>IT6712</b>	<b>SECURITY LABORATORY</b>	<ul style="list-style-type: none"> <li>• Implement the cipher techniques</li> <li>• Develop the various security algorithms</li> <li>• Use different open source tools for network security and analysis</li> </ul>
<b>IT6713</b>	<b>GRID AND CLOUD COMPUTING LABORATORY</b>	<ul style="list-style-type: none"> <li>• Design and implement applications on the Grid and cloud</li> <li>• Use the grid and cloud tool kits</li> </ul>
<b>CS6001</b>	<b>C# AND .NET PROGRAMMING</b>	<ul style="list-style-type: none"> <li>• List the major elements of the .NET framework</li> <li>• Explain how C# fits into the .NET platform</li> <li>• Analyze the basic structure of a C# application</li> <li>• Debug, compile, and run a simple application</li> <li>• Develop programs using C# on .NET</li> <li>• Design and develop Web based applications on .NET</li> </ul>
<b>GE6757</b>	<b>TOTAL QUALITY MANAGEMENT</b>	<ul style="list-style-type: none"> <li>• The student would be able to apply the tools and techniques of quality management to manufacturing and services processes.</li> </ul>
<b>SEMESTER VIII</b>		
<b>IT6801</b>	<b>SERVICE ORIENTED ARCHITECTURE</b>	<ul style="list-style-type: none"> <li>• Build applications based on XML.</li> <li>• Develop web services using technology elements</li> <li>• Build SOA-based applications for intra-enterprise and inter-enterprise applications</li> </ul>
<b>MG6088</b>	<b>SOFTWARE PROJECT MANAGEMENT</b>	<ul style="list-style-type: none"> <li>• At the end of the course the students will be able to practice Project Management principles while developing a software..</li> </ul>
<b>CS6004</b>	<b>CYBER FORENICS</b>	<ul style="list-style-type: none"> <li>• Discuss the security issues network layer and transport layer.</li> <li>• Apply security principles in the application</li> </ul>

		<p>layer.</p> <ul style="list-style-type: none"> <li>• Explain computer forensics</li> <li>• Use forensics tools</li> <li>• Analyze and validate forensics data.</li> </ul>
GE6075	PROFESSIONAL ETHICS	<ul style="list-style-type: none"> <li>• Student should be able to apply ethics in society, discuss the ethical issues related to engineering and realize the responsibilities and rights in the society</li> </ul>
IT6811	PROJECT WORK	<ul style="list-style-type: none"> <li>• On Completion of the project work students will be in a position to take up any challenging practical problems and find solution by formulating proper methodology.</li> </ul>

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Course Name	Course Outcomes
<b>SEMESTER I</b>	
HS8151- Communicative English	CO1: Read articles of a general kind in magazines and newspapers. CO2: Participate effectively in informal conversations; introduce themselves and their friends and express opinions in English. CO3: Comprehend conversations and short talks delivered in English CO4: Write short essays of a general kind and personal letters and emails in English. CO5: Understand basic grammar principles and be able to synthesize and transform sentences.
MA8151 Engineering Mathematics I	CO1: Apply both the limit definition and rules of differentiation to different functions. solve maxima and minima of functions. CO 2: To analyse and solve the partial differentiation for functions of several variables by various methods. CO 3: Evaluate integrals by using various techniques of integration such as substitution, partial fraction and by parts. CO 4: Apply integration to compute multiple integrals, Area, Volume in Polar in addition to change of order. CO 5: Apply various techniques in solving differential equations.
PH8151- Engineering Physics	CO 1: The students will gain knowledge on the basics of properties of matter and its applications. CO 2: The students will acquire knowledge on the concepts of waves and optical devices and their applications in fibre optics. CO 3: The students will have adequate knowledge on the concepts of thermal properties of materials and their applications in expansion joints and heat exchangers. CO 4: The students will get knowledge on advanced physics concepts of quantum theory and its applications in tunneling microscopes. CO 5: The students will understand the basics of crystals, their structures and different crystal growth techniques.
CY8151 - Engineering Chemistry	CO:1 Design water treatment techniques by analyzing the requirement of boiler feed water and its problems CO:2 Analyse the various Industrial applications of Surface Chemistry and Catalysis by understanding the basic concepts CO:3 Develop the applications to single and two component systems by understanding the basic concepts of phase rule and to appreciate the significance of alloys. CO:4 Analyzing the manufacture of various types of fuels and to interpret its calorific value during combustion CO:5 Evaluating the production of electricity from different non conventional energy sources and to analyse the types of batteries and its efficiency.

Course Name	Course Outcomes
GE8152 - Engineering Graphics	CO 1:Familiarize with the fundamentals and standards of Engineering graphics CO2:Perform freehand sketching of basic geometrical constructions and multiple views of objects. CO 3:Draw projections and solids and development of surfaces. CO 4:Visualize and to project isometric and perspective sections of simple solids. CO5: Draw orthographic projection of solids like cylinders, cones, prisms and pyramids including sections.
GE8151 – Problem Solving and Python Programming	CO 1:Adapt and analyse and develop standard algorithm to solve problem CO 2:Identify and use the appropriate data types for variable being critically aware of memory. CO 3:Design and implement control flow and function concept in python program for solving problem. CO 4:Implement python data structure list, tuple and dictionary for representing complex data problem. CO 5:Develop and Implement python file modules and function which reacts robust to exceptional input for solving real world problem.
GE 8161 – Problem Solving and Python Programming Laboratory	CO 1:Write, test, and debug simple Python programs. CO 2:Implement Python programs with conditionals and loops. CO 3:Develop Python programs step-wise by defining functions and calling them CO 4:Use Python lists, tuples, dictionaries for representing compound data CO 5:Read and write data from/to files in Python.
BS8161 - Physics & Chemistry Laboratory	CO 1:Apply physics principles of optics and thermal physics to evaluate engineering properties of material. CO 2:Apply principles of elasticity, optics and thermal properties for engineering applications. CO 3:Evaluating quantitative chemical analysis of water quality related Parameters CO4 :Knowledge of methods to determine the calorific value of fuels, perform flue gas analysis and combustion analysis. Apply the science for understanding corrosion and its prevention. CO5: Demonstrate a knowledge of superconducting and organic electronic materials.
<b>SEMESTER II</b>	
HS8251- Technical English	CO 1:Read technical texts and write area- specific texts effortlessly. CO 2:Listen and comprehend lectures and talks in their area of specialisation successfully. CO 3:Speak appropriately and effectively in varied formal and informal contexts. CO 4:Write reports and winning job applications. CO 5:Learn phonetic symbols and use correct sound, stress and intonation.

Course Name	Course Outcomes
<p>MA8251 - Engineering Mathematics II</p>	<p>CO 1:Evaluate Eigen valus and vectors, Diagonalization of matrices, positive definite matrices and similar matrices. CO2: Analyse and to solve the problem of vector differentiation and vector Integration. CO 3:Analyse and to solve the problem of analytic function, conformal mapping and bilinear transformations. CO 4:Evaluate the real integrals by applying the concept of complex integration CO 5:Analyse and apply the knowledge of Laplace Transform in solving ODE.</p>
<p>PH8252 Physics for Information science</p>	<p>CO 1:Gain knowledge on classical and quantum electron theories, and energy band structuues, CO 2:Acquire knowledge on basics of semiconductor physics and its applications in various devices, CO 3:Get knowledge on magnetic properties of materials and their applications in data storage, CO 4:Have the necessary understanding on the functioning of optical materials for optoelectronics, CO 5:Understand the basics of quantum structures and their applications in carbon electronics.</p>
<p>BE 8255 Basic Electrical, Electronics and Measurement Engineering</p>	<p>CO 1:IDiscuss the essentials of electric circuits and analysis. CO 2:Discuss the basic operation of electric machines and transformers CO 3:Introduction of renewable sources and common domestic loads. CO 4:Introduction to measurement and metering for electric circuits. CO 5:Identify and select appropriate type of transducer for measurement of different quantities.</p>
<p>IT8201 Information Technology Essentials</p>	<p>CO1: Design and deploy web-sites CO2: Design and deploy simple web-applications CO3: Create simple database applications CO4: Develop information system CO5: Describe the basics of networking and mobile communications</p>
<p>CS 8251 Programming in C</p>	<p>CO 1:Develop and manage simple application in C using basic construct. CO 2:Design and implement application to work with array and string. CO 3:Develop and implement application related to good modular design with in the framework of function pointer. CO 4:Develop application in C using structure. CO 5:Design and implement real time application using file processing.</p>

Course Name	Course Outcomes
GE 8261 Engineering Practice Laboratory	CO 1:Fabricate carpentry components and pipe connections including plumbing works. CO 2: Use welding equipments to join the structures. CO 3:Carry out the basic machining operations Make the models using sheet metal works. CO 4:Illustrate on centrifugal pump, Air conditioner, operations of smithy, foundary and fittings. CO 5:Carry out basic home electrical works and appliances Measure the electrical quantities.
CS 8261 C Programming Laboratory	CO 1: Learn the data types and syntax of C language. CO 2: Develop C programs for simple applications making use of basic constructs, arrays and strings. CO 3:Develop C programs involving functions, recursion, pointers, and structures. CO 4:Design applications using sequential and random access file processing. CO 5:Demonstrate capability to choose appropriate algorithm to get the solutions for a problem
IT8211 Information Technology Essentials Lab	CO1: Design interactive websites using basic HTML tags, different styles, links and with all Basic control elements. CO2: Create client side and server side programs using scripts using PHP. CO3: Design dynamic web sites and handle multimedia components CO4: Create applications with PHP connected to database. CO5: Create Personal Information System & Implement the technologies behind computer networks and mobile communication.
<b>SEMESTER III</b>	
MA 8351 Discrete Mathematics	CO 1:Have knowledge of the concepts needed to test the logic of a program. CO 2:Have an understanding in identifying structures on many levels. CO 3:Be aware of a class of functions which transform a finite set into another finite set which relates to input and output functions in computer science. CO 4:Be aware of the counting principles. CO 5:Be exposed to concepts and properties of algebraic structures such as groups, rings and fields
CS 8391 Data Structures	CO 1:Implement abstract data types for linear data structures. CO 2:Identify the appropriate datastructures for the representation CO 3:Apply the different linear and non-linear data structures to problem solutions. CO 4:Apply and analyze the different approaches to solve the problems algorithmically CO 5:Critically analyze the various sorting algorithms.
CS8351 Digital Principles and Systems Design	CO 1:Simplify Boolean functions using KMap CO 2:Design and Analyze Combinational and Sequential Circuits CO 3:Implement designs using Programmable Logic Devices CO 4:Write HDL code for combinational and Sequential Circuits CO 5:Design and analyze synchronous and Asynchronous circuits



<b>Course Name</b>	<b>Course Outcomes</b>
CS8392 Object Oriented Programming	CO 1:Develop Java programs using OOP principles CO 2:Develop Java programs with the concepts inheritance and interfaces CO 3:Build Java applications using exceptions and I/O streams CO 4:Develop Java applications with threads and generics classes CO 5:Develop interactive Java programs using swings
EC8394 Analog and Digital Communication	CO 1: Apply analog and digital communication techniques. CO2:Use data and pulse communication techniques. CO3:Analyze Source and Error control coding. CO4: Utilize multi-user radio communication.
CS 8382 Digital Systems Laboratory	CO 1:Implement simplified combinational circuits using basic logic gates CO 2:Implement combinational circuits using MSI devices CO 3:Implement sequential circuits like registers and counters CO 4: Simulate combinational and sequential circuits using HDL
CS 8381 Data Structures Laboratory	CO 1: Implement linear and non-linear data structure operations. CO 2: Apply appropriate linear / non-linear data structure operations for solving a given problem. CO 3: Appropriately use the linear / non-linear data structure operations for a given problem. CO 4:Apply appropriate hash functions that result in a collision free scenario for data storage and retrieval CO 5:Apply Algorithm for solving problems like sorting, searching, insertion and deletion of data.
<b>CS8382 Object Oriented Programming Laboratory</b>	CO 1: Develop and implement Java programs CO 2:Develop and implement Java programs with arraylist, exception handling and multithreading . CO 3:Design applications using file processing, generic programming and event handling.
HS 8381 Interpersonal Skills/ Listening and Speaking	CO 1:Listen and respond appropriately. CO 2:Participate in group discussions CO 3:Make effective presentations CO 4:Participate confidently and appropriately in conversations both formal and informal CO 5: Develop awareness of appropriate communication strategies.
<b>SEMESTER IV</b>	
MA8391 - Probability and Statistics	CO1: Understand the fundamental knowledge of the concepts of probability and have knowledge of standard distributions which can describe real life phenomenon. CO2:Understand the basic concepts of one and two dimensional random variables and apply in engineering applications. CO3:Apply the concept of testing of hypothesis for small and large samples in real life problems. CO4: Apply the basic concepts of classifications of design of experiments in the

	<p>field of agriculture and statistical quality control.</p> <p>CO5: Have the notion of sampling distributions and statistical techniques used in engineering and management problems.</p>
CS 8451- Design and Analysis of Algorithms	<p>CO 1:Design algorithms for various computing problems.</p> <p>CO 2:Apply the appropriate algorithms to solve the problems.</p> <p>CO 3:Analyze the time and space complexity of algorithms.</p> <p>CO 4:Critically analyze the different algorithm design techniques for a given problem.</p> <p>CO 5:Modify existing algorithms to improve efficiency.</p>
CS 8491 - Computer architecture	<p>CO1:Understand the basics structure of computers, operations and instructions.</p> <p>CO2:Design arithmetic and logic unit.</p> <p>CO3: Design and Analyze pipelined control units</p> <p>CO4::Illustrate parallel processing architectures.</p> <p>CO5: Evaluate performance of memory systems.</p>
GE8291- Environmental Science and Engineering	<p>Environmental Pollution or problems cannot be solved by mere laws. Public participation is an important aspect which serves the environmental Protection. One will obtain knowledge on the following after completing the course.</p> <p>CO1:Public awareness of environment at infant stage.</p> <p>CO2:Ignorance and incomplete knowledge has lead to misconceptions.</p> <p>CO3:Development and improvement in standard of living has lead to serious environmental disasters.</p>
CS 8493 - Operating Systems	<p>CO1:Understand the basics of operating systems like kernel, shell, types and views of operating systems</p> <p>CO 2:Design various Scheduling algorithms and apply the principles of concurrency with the Design of deadlock, prevention and avoidance algorithms and compare various memorymanagement schemes.</p> <p>CO3:Explain various memory management techniques and concept of thrashing</p> <p>CO 4:Use disk management and disk scheduling algorithmsfor better utilization of external memory and Recognize file system interface, protection and securitymechanisms.</p> <p>CO 5:Explore the architecture and features of Andriod OS and Linux.</p>
CS 8492- Database Management Systems	<p>CO 1:Design DB in SQL. Classify the modern and futuristic database applications based on size and complexity</p> <p>CO 2:Analyze and Map ER model to Relational model to perform database design effectively</p> <p>CO 3:Design DB using normalization criteria and optimize queries</p> <p>CO 4:Analyze, Compare and contrast various indexing strategies in different database systems</p> <p>CO 5:Analyze and Appraise how advanced databases differ from traditional databases.</p>

CS8461 – Operating Systems Lab	CO 1:Compare the performance of various CPU Scheduling Algorithms CO 2:Implement Deadlock avoidance and Detection Algorithms CO 3:Implement Semaphores CO 4:Create processes and implement IPC CO 5:Analyze the performance of the various Page Replacement Algorithms
CS8481 - Database Management Systems Lab	CO 1:Design Databases for applications. CO 2:Use the Relational model, ER diagrams. CO 3:Apply concurrency control and recovery mechanisms for practical problems. CO 4:Design the Query Processor and Transaction Processor. CO 5:Apply security concepts to databases.
HS 8461 Advanced Reading and writing	CO 1:Write different types of essays. CO 2:Write winning job applications. CO 3:Read and evaluate texts critically. CO 4:Display critical thinking in various professional contexts CO 5: Analyze a variety of communication acts.
<b>SEMESTER – V</b>	
MA8551 Algebra and Number Theory	CO 1:Apply the basic notions of groups, rings, fields. CO 2:Explain the fundamental concepts of advanced algebra. CO 3:Demonstrate accurate and efficient use of advanced algebraic techniques. CO 4:Demonstrate their manstry by solving non-trivial problems CO 5:Apply integrated approach to number theory and abstract algebra
CS8591- Computer Networks	CO 1:Understand the basic layer and its functions in computer networks CO 2:Evaluate and analysis the performance of network CO 3:Analyze the data flow from one Host to another host CO 4:Analyze and design the various functions and in the network CO 5:Create a node to node connectivity network for data sharing
IT8501 Web Technology	CO1:Design simple web pages using markup languages like HTML and XHTML. CO2:Create dynamic web pages using DHTML and java script that is easy to navigate and use. CO3:Program server side web pages that have to process request from client side web pages. CO4:Represent web data using XML and develop web pages using JSP. CO5:Understand various web services and how these web services interact.
CS8494 Software Engineering	CO1:Identify the key activities in managing a software project. CO2:Compare different process models. CO3:Concepts of requirements engineering and Analysis Modeling. CO4:Apply systematic procedure for software design and deployment. CO5:Compare and contrast the various testing and maintenance & Manage project schedule, estimate project cost and effort required.

EC 8691- Microprocessors and Microcontrollers	CO 1:Design and execute programs based on 8086 microprocessor CO 2:Design memory interfacing circuits CO 3:Design and interface microprocessors with supporting CO 4:Design and analyze the architecture of 8051 microcontroller CO 5:Design and analyze the microcontroller based system
OCE552 Geographic Information systems	CO 1:Having the basic idea of fundamentals of GIS CO 2:Understand the types of data models CO 3:Get knowledge about data inputs and topology CO 4:Get knowledge on data quality and standards CO 5:Understand data management functions and data input.
CS8581 - Networks Laboratory	CO 1:Implement various protocols using TCP and UDP. CO 2:Compare the performance of different transport layer protocols. CO 3:Use simulation tools to analyze the performance of various network protocols. CO 4:Analyze various routing algorithms. CO 5:Implement error correction codes.
IT8511 Web Technology laboratory	CO1:Design simple web pages using markup languages like HTML and XHTML. CO2:Create dynamic web pages using DHTML and java script that is easy to navigate and use. CO3:Program server side web pages that have to process request from client side web pages. CO4:Represent web data using XML and develop web pages using JSP. CO5:Understand various web services and how these web services interact.
EC8681 – Microprocessors and Microcontroller Laboratory Lab	CO 1:Write ALP Programmes for fixed and Floating Point and Arithmetic operations CO 2:Interface different I/Os with processor CO 3:Generate waveforms using Microprocessors CO 4:Execute Programs in 8051 CO 5:Explain the difference between simulator and Emulator
<b>SEMESTER VI</b>	
IT8601 Computational Intelligence	CO1:Provide a basic exposition to the goals and methods of Computational Intelligence. CO2:Study of the design of intelligent computational techniques. CO3:Apply the Intelligent techniques for problem solving CO4:Improve problem solving skills using the acquired knowledge in the areas of, reasoning, natural language understanding, computer vision, automatic programming and machine learning.
CS8592 Object Oriented Analysis and Design	CO1:Express software design with UML diagrams CO2:Design software applications using OO concepts.

	<p>CO3:Identify various scenarios based on software requirements</p> <p>CO4:Transform UML based software design into pattern based design using design patterns</p> <p>CO5:Understand the various testing methodologies for OO software</p>
IT8602 Mobile Communication	<p>CO1:Explain the basics of mobile telecommunication system</p> <p>CO2:Illustrate the generations of telecommunication systems in wireless network</p> <p>CO3:Understand the architecture of Wireless LAN technologies</p> <p>CO4:Determine the functionality of network layer and Identify a routing protocol for a given Ad hoc networks</p> <p>CO5:Explain the functionality of Transport and Application layer</p>
CS8091 Big Data Analytics	<p>CO1:Work with big data tools and its analysis techniques</p> <p>CO2:Analyze data by utilizing clustering and classification algorithms</p> <p>CO3:Learn and apply different mining algorithms and recommendation systems for large volumes of data</p> <p>CO4:Perform analytics on data streams</p> <p>CO5;Learn NoSQL databases and management.</p>
CS8092 Computer Graphics and Multimedia	<p>CO1:Design two dimensional graphics.</p> <p>CO2:Apply two dimensional transformations.</p> <p>CO3:Design three dimensional graphics.</p> <p>CO4:Apply three dimensional transformations &amp; Apply Illumination and color models &amp; Apply clipping techniques to graphics.</p> <p>CO5:Understood Different types of Multimedia File Format &amp; Design Basic 3d Scenes using Blender</p>
IT8076 Software Testing	<p>CO1:Design test cases suitable for a software development for different domains.</p> <p>CO2:Identify suitable tests to be carried out.</p> <p>CO3:Prepare test planning based on the document.</p> <p>CO4:Document test plans and test cases designed.</p> <p>CO5:Use automatic testing tools &amp; Develop and validate a test plan.</p>
CS8582 Object Oriented Analysis and Design Laboratory	<p>CO1:Perform OO analysis and design for a given problem specification.</p> <p>CO2:Identify and map basic software requirements in UML mapping.</p> <p>CO3:Improve the software quality using design patterns and to explain the rationale behind applying specific design patterns</p> <p>CO4:Test the compliance of the software with the SRS.</p>
CS8662 – Mobile Application Development Laboratory	<p>CO 1:Develop mobile applications using GUI and Layouts.</p> <p>CO 2:Develop mobile applications using Event Listener.</p> <p>CO 3:Develop mobile applications using Databases.</p> <p>CO 4:Develop mobile applications using RSS Feed, Internal/External Storage, SMS, Multi-threading and GPS.</p> <p>CO 5:Analyze and discover own mobile app for simple needs.</p>

IT8611 Miniproject	<p>CO 1: The ability to make links across different areas of domain knowledge and to generate, develop and evaluate ideas and information so as to apply these skills to the project task.</p> <p>CO2 : Acquire the skills to communicate effectively and to present ideas clearly and coherently to specific audience in both the written and oral forms.</p> <p>CO3 : Acquire collaborative skills through working in a team to achieve common goals.</p> <p>CO 4: Acquire collaborative skills through working in a team to achieve common goals.</p> <p>CO 5: Demonstrate and build the project successfully by hardware requirements, coding, emulating and testing.</p>
HS8581 Professional Communication	<p>CO 1: Make effective presentations</p> <p>CO 2: Participate confidently in Group Discussions.</p> <p>CO 3: Attend job interviews and be successful in them.</p> <p>CO 4: Develop adequate Soft Skills required for the workplace</p> <p>CO 5: Develop awareness of appropriate communication strategies.</p>
<b>SEMESTER VII</b>	
MG8591 -Principle of Management	<p>CO 1: Identify and communicate the purpose and functions of management.</p> <p>CO2: Demonstrate an understanding of the impact of globalisation on management and the role cultural factors play in the workplace</p> <p>CO3: Discuss methods of employee compensation and their impact on employee motivation</p> <p>CO 4: Illustrate the components of business strategy.</p> <p>CO 5: Apply the concepts of decision making in a business situation.</p>
CS 8792 - Cryptography and Network Security	<p>CO 1: Understand the fundamentals of networks security, security architecture, threats and vulnerabilities</p> <p>CO 2: Apply the different cryptographic operations of symmetric cryptographic algorithms</p> <p>CO 3: Apply the different cryptographic operations of public key cryptography</p> <p>CO 4: Apply the various Authentication schemes to simulate different applications.</p> <p>CO 5: Understand various Security practices and System security standards.</p>
CS 8791 Cloud computing	<p>CO 1: Articulate the main concepts, key technologies, strengths and limitations of cloud computing.</p> <p>CO 2: Learn the key and enabling technologies that help in the development of cloud.</p> <p>CO 3: Develop the ability to understand and use the architecture of compute and storage cloud, service and delivery models.</p> <p>CO 4: Explain the core issues of cloud computing such as resource management and security.</p> <p>CO 5: Be able to install and use current cloud technologies.</p>
OME753 Systems Engineering	<p>CO 1 : Apply systems engineering principles to make decision for optimization.</p> <p>CO 2 : Describe the most important Systems Engineering standards and best practices as well as newly emerging approaches.</p> <p>CO 3: Apply some of the fundamental methods and tools of systems engineering to a simple cyber-electro-mechanical system as a stepping stone to more complex and real world projects.</p> <p>CO4 : Analyze the important role of humans as beneficiaries, designers, operators and maintainers of aerospace and other systems.</p>

	CO 5: Ability to use the core principles and processes for designing effective system.
CS8082 Machine Learning Techniques (prof elective ii)	CO1: Ability to differentiate between supervised, unsupervised, semi-supervised machine learning approaches. CO2: Ability to discuss the decision tree algorithm and identify and overcome the problem of overfitting CO3: Ability to discuss and apply the back propagation algorithm and genetic algorithms to various problems CO4 :Apply the Bayesian concepts to machine learning CO5: Analyse and suggest appropriate machine learning approaches for various types of problems
CS 8079 Human Computer Interaction (elective iii)	CO 1:Design effective dialog for HCI CO 2:Design effective HCI for individuals and persons with disabilities. CO 3:Assess the importance of user feedback. CO 4:Explain the HCI implications for designing multimedia/ ecommerce/ e-learning Web sites. CO 5:Develop meaningful user interface.
IT8711 FOSS and Cloud Computing Laboratory	CO1:Develop code for classical Encryption Techniques to solve the problems. CO2:Build cryptosystems by applying symmetric and public key encryption algorithms. CO3:Construct code for authentication algorithms. CO4:Develop a signature scheme using Digital signature standard. CO5: Demonstrate the network security system using open source tools
IT8761 Security Laboratory	CO 1:Develop code for classical Encryption Techniques to solve the problems. CO 2:Build cryptosystems by applying symmetric and public key encryption algorithms. CO 3:Construct code for authentication algorithms. CO 4:Develop a signature scheme using Digital signature standard. CO 5:Demonstrate the network security system using open source tools
<b>SEMESTER VIII</b>	
CS 8085 Social Network Analysis	CO1: Knowledge on basic notation and terminology used in network science CO2: Ability to represent knowledge using ontology. CO3: Predict human behavior in social web and related communities. CO4: Visualize social networks. CO5: Develop semantic web related applications.
CS8080 Information Retrieval Techniques	CO 1:Use an open source search engine framework and explore its capabilities CO 2:Apply appropriate method of classification or clustering. CO 3: Ability to use knowledge of data structures and indexing methods in information retrieval Systems CO 4:Design and implement innovative features in a search engine. CO 5:Design and implement a recommender system.

**IT8811 Project Work**

CO 1: The ability to make links across different areas of domain knowledge and to generate, develop and evaluate ideas and information so as to apply these skills to the project task.

CO2 : Acquire the skills to communicate effectively and to present ideas clearly and coherently to specific audience in both the written and oral forms.

CO3 : Acquire collaborative skills through working in a team to achieve common goals.

CO 4: Acquire collaborative skills through working in a team to achieve common goals.

CO 5: Demonstrate and build the project successfully by hardware requirements, coding, emulating and testing.

*Chait*  
HOD/IT