DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

B.E. COMPUTER SCIENCE AND ENGINEERING
REGULATIONS – 2017

Semester-I

SI. No	COURSE CODE	COURSE TITLE	CATEGORY	CONTACT PERIODS	L	T	P	C
THEORY								
1.	HS8151	Communicative English	HS	4	4	0	0	4
2.	MA8151	Engineering Mathematics - I	BS	4	4	0	0	4
3.	PH8151	Engineering Physics	BS	3	3	0	0	3
4.	CY8151	Engineering Chemistry	BS	3	3	0	0	3
5.	GE8151	Problem Solving and Python Programming	ES	3	3	0	0	3
6.	GE8152	Engineering Graphics	ES	6	2	0	4	4
PRACTICALS								
7.	GE8161	Problem Solving and Python Programming Laboratory	ES	4	0	0	4	2
8.	BS8161	Physics and Chemistry Laboratory	BS	4	0	0	4	2
			TOTAL	31	19	0	12	25

	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	Communicate with one or many listeners using appropriate communicative strategies

MA8151 ENGINEERING MATHEMATICS I

CO1	Use both the limit definition and rules of differentiation to differentiate functions.
CO2	Apply differentiation to solve maxima and minima problems.
CO3	Evaluate integrals both by using Riemann sums and by using the Fundamental Theorem of Calculus.
CO4	Apply integration to compute multiple integrals, area, volume, integrals in polar coordinates, in addition to change of order and change of variables..
CO5	Evaluate integrals using techniques of integration, such as substitution, partial fractions and integration by parts

PH8151 ENGINEERING PHYSICS

CO1	The students will gain knowledge on the basics of properties of matter and its applications,
CO2	The students will acquire knowledge on the concepts of waves and optical devices and their applications in fibre optics,
CO3	The students will have adequate knowledge on the concepts of thermal properties of materials and their applications in expansion joints and heat exchangers,
CO4	The students will get knowledge on advanced physics concepts of quantum theory and its applications in tunneling microscopes,
CO5	The students will understand the basics of crystals, their structures and different crystal growth techniques.

CY8151 ENGINEERING CHEMISTRY

CO1	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.
CO2	To make the student acquire sound knowledge of second law of thermodynamics and second law based derivations of importance in engineering applications in all disciplines.
CO3	To acquaint the student with concepts of important photophysical and photochemical processes and spectroscopy.
CO4	To develop an understanding of the basic concepts of phase rule and its applications to single and two component system and appreciate the purpose and significance of alloys.
CO5	To acquaint the students with the basics of nano materials, their properties and applications

GE8151 PROBLEM SOLVING AND PYTHON PROGRAMMING	
CO1	Develop algorithmic solutions to simple computational problems
CO2	Read, write, execute by hand simple Python programs..
CO3	Decompose a Python program into functions.
CO4	Represent compound data using Python lists, tuples, dictionaries.
CO5	Read and write data from/to files in Python Programs

GE8152 ENGINEERING GRAPHICS	
CO1	Familiarize with the fundamentals and standards of Engineering graphics
CO2	Perform freehand sketching of basic geometrical constructions and multiple views of objects.
CO3	Project orthographic projections of lines and plane surfaces.
CO4	Draw projections and solids and development of surfaces.
CO5	Visualize and to project isometric and perspective sections of simple solids.

GE8161 PROBLEM SOLVING AND PYTHON PROGRAMMING LABORATORY	
CO1	Write, test, and debug simple Python programs.
CO2	Implement Python programs with conditionals and loops
CO3	Develop Python programs step-wise by defining functions and calling them.
CO4	Use Python lists, tuples, dictionaries for representing compound data.
CO5	Read and write data from/to files in Python

	BS8161 PHYSICS AND CHEMISTRY LABORATORY	
CO1	Apply principles of elasticity, optics and thermal properties for engineering applications.	
CO2	The students will be outfitted with hands-on knowledge in the quantitative chemical analysis of water quality related parameters.	
CO3	To provide the basic practical exposure to all the engineering and technological streams in the field of chemistry	
CO4	To gain the knowledge about light, sound, laser, fiber optics and magnetism.	
CO5	To develop the knowledge of conductometric titration and viscometry	

Semester-II

SI.No	COURSE CODE	COURSE TITLE	CATEGORY	CONTACT PERIODS	L	T	P	C
THEORY								
1.	HS8251	Technical English	HS	4	4	0	0	4
2.	MA8251	Engineering Mathematics - II	BS	4	4	0	0	4
3.	PH8252	Physics for Information Science	BS	3	3	0	0	3
4.	BE8255	Basic Electrical, Electronics and Measurement Engineering	ES	3	3	0	0	3
5.	GE8291	Environmental Science and Engineering	HS	3	3	0	0	3
6.	CS8251	Programming in C	PC	3	3	0	0	3
PRACTICALS								
7.	GE8261	Engineering Practices Laboratory	ES	4	0	0	4	2
8.	CS8261	C Programming Laboratory	PC	4	0	0	4	2
			TOTAL	28	20	0	8	24

	HS8251 TECHNICAL ENGLISH	
CO1	Read technical texts and write area- specific texts effortlessly.	
CO2	Listen and comprehend lectures and talks in their area of specialisation successfully.	
CO3	Speak appropriately and effectively in varied formal and informal contexts..	

CO4	Write reports and winning job applications.
CO5	Initiate a discussion, negotiate, argue using appropriate communicative strategies

MA8251 ENGINEERING MATHEMATICS II	
CO1	Eigen values and eigenvectors, diagonalization of a matrix, Symmetric matrices, Positive definite matrices and similar matrices.
CO2	Gradient, divergence and curl of a vector point function and related identities.
CO3	Evaluation of line, surface and volume integrals using Gauss, Stokes and Green's theorems and their verification.
CO4	Analytic functions, conformal mapping and complex integration.
CO5	Laplace transform and inverse transform of simple functions, properties, various related theorems and application to differential equations with constant coefficients

PH8252 PHYSICS FOR INFORMATION SCIENCE	
CO1	Gain knowledge on classical and quantum electron theories, and energy band structures,
CO2	Acquire knowledge on basics of semiconductor physics and its applications in various devices
CO3	Get knowledge on magnetic properties of materials and their applications in data storage
CO4	Have the necessary understanding on the functioning of optical materials for optoelectronics,
CO5	Understand the basics of quantum structures and their applications in carbon electronics..

BE8255 BASIC ELECTRICAL, ELECTRONICS AND MEASUREMENT ENGINEERING	
CO1	Discuss the essentials of electric circuits and analysis
CO2	Discuss the basic operation of electric machines and transformers
CO3	Introduction of renewable sources and common domestic loads.
CO4	Outline the characteristics and applications of semiconductor diodes. .
CO5	Introduction to measurement and metering for electric circuits

	GE8291 ENVIRONMENTAL SCIENCE AND ENGINEERING
CO1	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.
CO2	Public awareness of environmental is at infant stage
CO3	Ignorance and incomplete knowledge has lead to misconceptions
CO4	Development and improvement in std. of living has lead to serious environmental disasters
CO5	Discuss scientific, technological, economic and social solutions to environmental problems

	CS8251 PROGRAMMING IN C
CO1	Develop simple applications in C using basic constructs
CO2	Design and implement applications using arrays and strings
CO3	Develop and implement applications in C using functions and pointers.
CO4	Develop applications in C using structures.
CO5	Design applications using sequential and random access file processing.

	GE8261 ENGINEERING PRACTICES LABORATORY
CO1	Fabricate carpentry components and pipe connections including plumbing works.
CO2	Use welding equipments to join the structures.
CO3	Carry out the basic machining operations
CO4	Make the models using sheet metal works
CO5	Illustrate on centrifugal pump, Air conditioner, operations of smithy, foundary and fittings

CS8261 C PROGRAMMING LABORATORY	
CO1	Develop C programs for simple applications making use of basic constructs
CO2	Apply the concept of conditionals and loops in C programs.
CO3	Develop the C programs with arrays and strings.
CO4	Apply the concept of functions, recursion in C programs
CO5	Analyze the concept of pointers, and structures in C

Semester-3

Sl.No	COURSE CODE	COURSE TITLE	CATEGORY	CONTACT PERIODS	L	T	P	C
THEORY								
1.	MA8351	Discrete Mathematics	BS	4	4	0	0	4
2.	CS8351	Digital Principles andSystem Design	ES	4	4	0	0	4
3.	CS8391	Data Structures	PC	3	3	0	0	3
4.	CS8392	Object Oriented Programming	PC	3	3	0	0	3
5.	EC8395	Communication Engineering	ES	3	3	0	0	3
PRACTICALS								
6.	CS8381	Data Structures Laboratory	PC	4	0	0	4	2
7.	CS8383	Object Oriented Programming Laboratory	PC	4	0	0	4	2
8.	CS8382	Digital Systems Laboratory	ES	4	0	0	4	2
9.	HS8381	Interpersonal Skills/Listenin g&Speaking	EEC	2	0	0	2	1
			TOTAL	**31**	**17**	**0**	**14**	**24**

MA8351-DISCRETE MATHEMATICS	
CO1	Have knowledge of the concepts needed to test the logic of a program
CO2	Have an understanding in identifying structures on many levels.
CO3	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.

CO4	Be aware of the counting principles.
CO5	Be exposed to concepts and properties of algebraic structures such as groups, rings and fields.

CS8351 --DIGITAL PRINCIPLES AND SYSTEM DESIGN	
CO1	Simplify Boolean functions using KMap
CO2	Design and Analyze Combinational and Sequential Circuits
CO3	Implement designs using Programmable Logic Devices
CO4	Write HDL code for combinational and Sequential Circuits
CO5	Implement sequential circuits like registers and counters

CS8391 --DATA STRUCTURES	
CO1	Implement abstract data types for linear data structures
CO2	Apply the different linear and non-linear data structures to problem solutions.
CO3	Critically analyze the various sorting algorithms.
CO4	Critically analyze the various sorting algorithms.
CO5	Ability to have knowledge of tree and graph concepts

CS8392 OBJECT ORIENTED PROGRAMMING	
CO1	Develop Java programs using OOP principles
CO2	Develop Java programs with the concepts inheritance and interfaces
CO3	Build Java applications using exceptions and I/O streams
CO4	Develop Java applications with threads and generics classes
CO5	Develop interactive Java programs using swing

EC8395 COMMUNICATION ENGINEERING

CO1	Ability to comprehend and appreciate the significance and role of this course in the present contemporary world
CO2	Apply analog and digital communication techniques
CO3	.Use data and pulse communication techniques
CO4	.Analyze Source and Error control coding.
CO5	Use data and pulse communication techniques.

CS8381 DATA STRUCTURES LABORATORY	
CO1	Implement Linear data structure algorithms.
CO2	Implement applications using Stacks and Linked lists
CO3	Implement Binary Search tree and AVL tree operations
CO4	Implement graph algorithms
CO5	Analyze the various searching and sorting algorithms

CS8383 OBJECT ORIENTED PROGRAMMING LABORATORY	
CO1	Design and develop java programs using object oriented programming concepts
CO2	Develop simple applications using object oriented concepts such as package, exceptions
CO3	Implement multithreading, and generics concepts
CO4	Create GUIs and event driven programming applications for real world problems
CO5	: Implement and deploy web applications using Java

CS8382 DIGITAL SYSTEMS LABORATORY	
CO1	Design various combinational digital circuits using logic gates
CO2	Design sequential circuits and analyze the design procedures
CO3	State the fundamentals of computer systems and analyze the execution of an instruction

CO4	Analyze different types of control design and identify hazards
CO5	Identify the characteristics of various memory systems and I/O communication

HS8381 INTERPERSONAL SKILLS/LISTENING&SPEAKING	
CO1	Listen and respond appropriately
CO2	Participate in group discussions
CO3	Make effective presentations
CO4	Participate confidently and appropriately in conversations both formal and informal
CO5	Make effective presentations.

Semester-IV

Sl. No	COURSE CODE	COURSE TITLE	CATEGORY	CONTACT PERIODS	L	T	P	C
THEORY								
1.	MA8402	Probability and Queueing Theory	BS	4	4	0	0	4
2.	CS8491	Computer Architecture	PC	3	3	0	0	3
3.	CS8492	Database Management Systems	PC	3	3	0	0	3
4.	CS8451	Design and Analysis of Algorithms	PC	3	3	0	0	3
5.	CS8493	Operating Systems	PC	3	3	0	0	3
6.	CS8494	Software Engineering	PC	3	3	0	0	3
PRACTICALS								
7.	CS8481	Database Management Systems Laboratory	PC	4	0	0	4	2
8.	CS8461	Operating Systems Laboratory	PC	4	0	0	4	2
9.	HS8461	Advanced Reading and Writing	EEC	2	0	0	2	1
			TOTAL	**29**	**19**	**0**	**10**	**24**

MA8402 PROBABILITY AND QUEUING THEORY	
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 random processes in engineering disciplines.
CO4	Acquire skills in analyzing queueing models.
CO5	Understand and characterize phenomenon which evolve with respect to time in a probabilistic manner

CS8491 COMPUTER ARCHITECTURE	
CO1	Understand the basics structure of computers, operations and instruction
CO2	Design arithmetic and logic unit.
CO3	Understand pipelined execution and design control unit
CO4	Understand parallel processing architectures.
CO5	Understand the various memory systems and I/O communication.

CS8492 DATABASE MANAGEMENT SYSTEMS	
CO1	Classify the modern and futuristic database applications based on size and complexity
CO2	Map ER model to Relational model to perform database design effectively
CO3	Write queries using normalization criteria and optimize queries
CO4	Compare and contrast various indexing strategies in different database systems
CO5	Appraise how advanced databases differ from traditional databases.

CS8451 DESIGN AND ANALYSIS OF ALGORITHMS	
CO1	Analyze the efficiency of algorithms using various framework
CO2	Apply graph algorithms to solve problems and analyze their efficiency.
CO3	Make use of algorithm design techniques like divide and conquer, dynamic programming and greedy techniques to solve problems
CO4	Use the state space tree method for solving problems.
CO5	Solve problems using approximation algorithms and randomized algorithms

CS8493 OPERATING SYSTEMS	
CO1	Analyze various scheduling algorithms.
CO2	Understand deadlock, prevention and avoidance algorithms
CO3	Compare and contrast various memory management schemes
CO4	Understand the functionality of file systems.
CO5	Perform administrative tasks on Linux Servers and Compare iOS and Android Operating Systems.

CS8494 SOFTWARE ENGINEERING	
CO1	Identify the key activities in managing a software project.
CO2	Compare different process models and Concepts of requirements engineering and Analysis Modeling
CO3	Apply systematic procedure for software design and deployment.
CO4	Compare and contrast the various testing and maintenance.
CO5	Manage project schedule, estimate project cost and effort required..

CS8481 DATABASE MANAGEMENT SYSTEMS LABORATORY	
CO1	Use typical data definitions and manipulation commands.
CO2	Design applications to test Nested and Join Queries
CO3	Implement simple applications that use Views
CO4	Implement applications that require a Front-end Tool
CO5	Critically analyze the use of Tables, Views, Functions and Procedures

CS8481 DATABASE MANAGEMENT SYSTEMS LABORATORY	
CO1	Use typical data definitions and manipulation commands.
CO2	Design applications to test Nested and Join Queries
CO3	Implement simple applications that use Views
CO4	Implement applications that require a Front-end Tool
CO5	Critically analyze the use of Tables, Views, Functions and Procedures

CS8461-OPERATING SYSTEMS LABORATORY	
CO1	Compare the performance of various CPU Scheduling Algorithms
CO2	Implement Deadlock avoidance and Detection Algorithms
CO3	Implement Semaphores and Create processes and implement IPC
CO4	Analyze the performance of the various Page Replacement Algorithms
CO5	Implement File Organization and File Allocation Strategies

HS8461-ADVANCED READING AND WRITING	
CO1	Read and evaluate the text intelligently.
CO2	Understand parts of speech and use appropriate connectives in writing a paragraph.
CO3	To write effective job application letter and Implement speed reading techniques
CO4	Display critical thinking in various professional contexts
CO5	Perform task as an individual and / or team member to manage the task in time

Semester-V

Sl. No	COURSE CODE	COURSE TITLE	CATEGORY	CONTACT PERIODS	L	T	P	C
THEORY								
1.	MA8551	Algebra and Number Theory	BS	4	4	0	0	4
2.	CS8591	Computer Networks	PC	3	3	0	0	3
3.	EC8691	Microprocessors and Microcontrollers	PC	3	3	0	0	3
4.	CS8501	Theory of Computation	PC	3	3	0	0	3
5.	CS8592	Object Oriented Analysis and Design	PC	3	3	0	0	3
6.		Open Elective I	OE	3	3	0	0	3
PRACTICALS								
7.	EC8681	Microprocessors and Microcontrollers Laboratory	PC	4	0	0	4	2
8.	CS8582	Object Oriented Analysis and Design Laboratory	PC	4	0	0	4	2
9.	CS8581	Networks Laboratory	PC	4	0	0	4	2
			TOTAL	**31**	**19**	**0**	**12**	**25**

MA8551 ALGEBRA AND NUMBER THEORY	
CO1	Apply the basic notions of groups, rings, fields which will then be used to solve relatedproblems.
CO2	Explain the fundamental concepts of advanced algebra and their role in modernmathematics and applied contexts.
CO3	Demonstrate accurate and efficient use of advanced algebraic techniques.
CO4	Demonstrate their mastery by solving non - trivial problems related to the concepts, and byproving simple theorems about the, statements proven by the text.
CO5	Apply integrated approach to number theory and abstract algebra, and provide a firmbasis for further reading and study in the subject

CS8591 COMPUTER NETWORKS	
CO1	Understand the basic layers and its functions in computer networks.
CO2	Evaluate the performance of a network and Understand the basics of how data flows from one node to another
CO3	Analyze and design routing algorithms.
CO4	Design protocols for various functions in the network.

CO5	Understand the working of various application layer protocols

EC8691-MICROPROCESSORS AND MICROCONTROLLERS	
CO1	Understand and execute programs based on 8086 microprocessor.
CO2	Design Memory Interfacing circuits.
CO3	Design and interface I/O circuits.
CO4	Design and implement 8051 microcontroller based systems
CO5	Design a microcontroller based system

CS8501-THEORY OF COMPUTATION	
CO1	Construct automata, regular expression for any pattern.
CO2	Write Context free grammar for any construct.
CO3	Design Turing machines for any language.
CO4	Propose computation solutions using Turing machines.
CO5	Derive whether a problem is decidable or not

CS8592-OBJECT ORIENTED ANALYSIS AND DESIGN	
CO1	Express software design with UML diagrams
CO2	Design software applications using OO concepts.
CO3	Identify various scenarios based on software requirements
CO4	Transform UML based software design into pattern based design using design patterns
CO5	Understand the various testing methodologies for OO software

OCE551-AIR POLLUTION AND CONTROL ENGINEERING (OPEN ELECTIVE-1)	
CO1	An understanding of the nature and characteristics of air pollutants, noise pollution and basic concepts of air quality managemen

CO2	Ability to identify, formulate and solve air and noise pollution problems
CO3	Ability to design stacks and particulate air pollution control devices to meet applicable standards.
CO4	Ability to select control equipments
CO5	Ability to ensure quality, control and preventive measures.

EC8681-MICROPROCESSORS AND MICROCONTROLLERS LABORATORY	
CO1	Write ALP Programmes for fixed and Floating Point and Arithmetic operations
CO2	Interface different I/Os with processor
CO3	Generate waveforms using Microprocessors
CO4	Execute Programs in 8051
CO5	Explain the difference between simulator and Emulator

CS8582-OBJECT ORIENTED ANALYSIS AND DESIGN LABORATORY	
CO1	Perform OO analysis and design for a given problem specification.
CO2	Identify and map basic software requirements in UML mapping
CO3	Improve the software quality using design patterns and to explain the rationale behind applying specific design patterns
CO4	Test the compliance of the software with the SRS
CO5	To test the software against its requirements specification

CS8581- NETWORKS LABORATORY	
CO1	Implement various protocols using TCP and UDP.
CO2	Compare the performance of different transport layer protocols.
CO3	Use simulation tools to analyze the performance of various network protocols.
CO4	Analyze various routing algorithms.
CO5	Implement error correction codes

Semester –VI

Sl. No	COURSE CODE	COURSE TITLE	CATEGORY	CONTACT PERIODS	L	T	P	C
THEORY								
1.	CS8651	Internet Programming	PC	3	3	0	0	3
2.	CS8691	Artificial Intelligence	PC	3	3	0	0	3
3.	CS8601	Mobile Computing	PC	3	3	0	0	3
4.	CS8602	Compiler Design	PC	5	3	0	2	4
5.	CS8603	Distributed Systems	PC	3	3	0	0	3
6.		Professional Elective I	PE	3	3	0	0	3
PRACTICALS								
7.	CS8661	Internet Programming Laboratory	PC	4	0	0	4	2
8.	CS8662	Mobile Application Development Laboratory	PC	4	0	0	4	2
9.	CS8611	Mini Project	EEC	2	0	0	2	1
10.	HS8581	Professional Communication	EEC	2	0	0	2	1
			TOTAL	**30**	**18**	**0**	**12**	**24**

CS8651 INTERNET PROGRAMMING	
CO1	Construct a basic website using HTML and Cascading Style Sheets.
CO2	Build dynamic web page with validation using Java Script objects and by applying different event handling mechanisms.
CO3	Develop server side programs using Servlets and JSP.
CO4	Construct simple web pages in PHP and to represent data in XML format.
CO5	Use AJAX and web services to develop interactive web applications

CS8691-ARTIFICIAL INTELLIGENCE	
CO1	Use appropriate search algorithms for any AI problem
CO2	Represent a problem using first order and predicate logic
CO3	Provide the apt agent strategy to solve a given problem
CO4	Design software agents to solve a problem

CO5	Design applications for NLP that use Artificial Intelligence

CS8601- MOBILE COMPUTING	
CO1	Explain the basics of mobile telecommunication systems
CO2	Illustrate the generations of telecommunication systems in wireless networks
CO3	Determine the functionality of MAC, network layer and Identify a routing protocol for a given Ad hoc network
CO4	Explain the functionality of Transport and Application layers
CO5	Develop a mobile application using android/blackberry/ios/Windows SDK

CS8602- COMPILER DESIGN	
CO1	Understand the different phases of compiler.
CO2	Design a lexical analyzer for a sample language.
CO3	Apply different parsing algorithms to develop the parsers for a given grammar.
CO4	Understand syntax-directed translation and run-time environment.
CO5	Learn to implement code optimization techniques and a simple code generator.

CS8603- DISTRIBUTED SYSTEMS	
CO1	Elucidate the foundations and issues of distributed systems
CO2	Understand the various synchronization issues and global state for distributed systems.
CO3	Understand the Mutual Exclusion and Deadlock detection algorithms in distributed systems
CO4	Describe the agreement protocols and fault tolerance mechanisms in distributed systems.
CO5	Describe the features of peer-to-peer and distributed shared memory systems

CS8075-DATA WAREHOUSING AND DATA MINING(Professional Elective-1)

CO1	Design a Data warehouse system and perform business analysis with OLAP tools.
CO2	Apply suitable pre-processing and visualization techniques for data analysis
CO3	Apply association rule mining techniques for data analysis
CO4	Apply appropriate classification and clustering techniques for data analysis
CO5	To study algorithms for finding hidden and interesting patterns in data

CS8661- INTERNET PROGRAMMING LABORATORY

CO1	Construct Web pages using HTML/XML and style sheets.
CO2	Build dynamic web pages with validation using Java Script objects and by applying different event handling mechanisms.
CO3	Develop dynamic web pages using server side scripting.
CO4	Use PHP programming to develop web applications.
CO5	Construct web applications using AJAX and web services

CS8662- MOBILE APPLICATION DEVELOPMENT LABORATORY

CO1	Develop mobile applications using GUI and Layouts.
CO2	Develop mobile applications using Event Listener.
CO3	Develop mobile applications using Databases.
CO4	Develop mobile applications using RSS Feed, Internal/External Storage, SMS, Multi- threading and GPS.
CO5	Analyze and discover own mobile app for simple needs

CS8661 MINI PROJECT

CO1	Choose problems with technical importance and societal contribution.
CO2	Identify and survey the relevant literature for getting exposed to related solutions.

CO3	Build project plans with feasible requirements
CO4	Analyse, design and develop adaptable and reusable solutions
CO5	Deploy the solutions for better manageability and provide scope for improvability

HS8581 PROFESSIONAL COMMUNICATION	
CO1	Make effective presentations
CO2	Participate confidently in Group Discussions.
CO3	Attend job interviews and be successful in them.
CO4	Develop adequate Soft Skills required for the workplace
CO5	To equip students with effective speaking and listening skills in English

Semester VII

SI. No	COURSE CODE	COURSE TITLE	CATEGORY	CONTACT PERIODS	L	T	P	C
THEORY								
1.	MG8591	Principles of Management	HS	3	3	0	0	3
2.	CS8792	Cryptography and Network Security	PC	3	3	0	0	3
3.	CS8791	Cloud Computing	PC	3	3	0	0	3
4.		Open Elective II	OE	3	3	0	0	3
5.		Professional Elective III	PE	3	3	0	0	3
PRACTICALS								
6.	CS8711	Cloud Computing Laboratory	PC	4	0	0	4	2
7.	IT8761	Security Laboratory	PC	4	0	0	4	2
			TOTAL	**23**	**15**	**0**	**8**	**19**

MG8591 PRINCIPLES OF MANAGEMENT	
CO1	Upon completion of the course, students will be able to have clear understanding of managerial functions like planning, organizing, staffing, leading & controlling.
CO2	Able to direct a group and control the group.
CO3	Have same basic knowledge on international aspect of management
CO4	The students are exposed to the basic knowledge on international aspect of management
CO5	To learn the application of the principles in an organization

CS8792 CRYPTOGRAPHY AND NETWORK SECURITY	
CO1	Understand the fundamentals of networks security, security architecture, threats andvulnerabilities
CO2	Apply the different cryptographic operations of symmetric cryptographic algorithms
CO3	Apply the different cryptographic operations of public key cryptography
CO4	Apply the various Authentication schemes to simulate different applications.
CO5	Understand various Security practices and System security standards

CS8791 CLOUD COMPUTING	
CO1	Articulate the main concepts, key technologies, strengths and limitations of cloudcomputing.
CO2	Learn the key and enabling technologies that help in the development of cloud.
CO3	Develop the ability to understand and use the architecture of compute and storage cloud,service and delivery models.
CO4	Explain the core issues of cloud computing such as resource management and security.
CO5	Be able to install and use current cloud technologies

OIE751-Robotics (Open Elective II)	
CO1	Understand the basics of robot components and its mechanism
CO2	Illustrate the different types of robot drive systems as well as robot end effectors

CO3	Apply the different sensors and image processing techniques in robotics to improve the ability of robots.
CO4	Develop robotic programs for different tasks and familiarize with the kinematics motions of robot.
CO5	Examine the implementation of robots in various industrial sectors and interpolate the economic analysis of robots.

GE8071 DISASTER MANAGEMENT(Professional Elective III)	
CO1	Differentiate the types of disasters, causes and their impact on environment and society
CO2	Assess vulnerability and various methods of risk reduction measures as well as mitigation
CO3	Draw the hazard and vulnerability profile of India, Scenarious in the Indian context, Disaster damage assessment and management
CO4	Able to assess the damage caused by Disaster
CO5	Ability to draw the hazard and vulnerability profile of India, Scenarious in the Indian context, Disaster damage assessment and managemen

CS8711- CLOUD COMPUTING LABORATORY	
CO1	Configure various virtualization tools such as Virtual Box, VMware workstation.
CO2	Design and deploy a web application in a PaaS environment.
CO3	Learn how to simulate a cloud environment to implement new schedulers.
CO4	Install and use a generic cloud environment that can be used as a private cloud.
CO5	Manipulate large data sets in a parallel environment.

IT8761- SECURITY 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

Semester-VIII

Sl. No	COURSE CODE	COURSE TITLE	CATEGORY	CONTACT PERIODS	L	T	P	C
THEORY								
1.		Professional Elective IV	PE	3	3	0	0	3
2.		Professional Elective V	PE	3	3	0	0	3
PRACTICALS								
3.	CS8811	Project Work	EEC	20	0	0	20	10
			TOTAL	26	6	0	20	16

	GE8076 -PROFESSIONAL ETHICS IN ENGINEERING(Professional Elective V)
CO1	Upon completion of the course, the student should be able to apply ethics in society.
CO2	Distinguish between Moral and Ethics.
CO3	Helps to discuss the ethical issues related to engineering
CO4	Realize the responsibility & rights in the society
CO5	Discuss the ethical issues related to engineering and realize the responsibilities and rights in the society.

	CS8080 INFORMATION RETRIEVAL TECHNIQUES (Professional Elective VI)
CO1	Use an open source search engine framework and explore its capabilities
CO2	Apply appropriate method of classification or clustering
CO3	Design and implement innovative features in a search engine.
CO4	Design and implement a recommender system.
CO5	To learn different techniques of recommender system

CS8811 PROJECT WORK	
CO1	Identify technically and economically feasible problems of social relevance
CO2	Plan and build the project team with assigned responsibilities and Identify and survey the relevant literature for getting exposed to related solutions
CO3	Analyse, design and develop adaptable and reusable solutions of minimal complexity by using modern tools
CO4	Implement and test solutions to trace against the user requirements
CO5	Deploy and support the solutions for better manageability of the solutions and provide scope for improvability