Academic Year: 2019-2020

Odd Semester

Name of the Subject: -Digital Logic Design and Analysis   **Code no. of Subject: - CSC 302**

Class/Sem: - SE Sem III

Course Education Objectives (CEO's)

1	To understand the fundamental concepts of number system and their conversions
2	To analyse Boolean functions and Boolean expression
3	To provide the concept of designing combinational logic circuits.
4	To provide the basic knowledge of designing sequential circuits.
5	To provide the knowledge of how digital building blocks are described in VHDL
6	To understand basic concepts of TTL and CMOS logic families

Course Outcomes (CO's)

After successfully completing the course students will have the ability to:

1	Understand the different number system and their conversions
2	Formulate analyse and minimize Boolean expressions.
3	Design and analyse combinational logic circuits
4	Design and analyse sequential circuits
5	Understand the basic concepts of VHDL
6	Understand the basics of TTL and CMOS logic families

Academic Year: 2019-2020

Odd Semester

Name of the Subject: - Discrete Mathematics   **Code no. of Subject: - CSC303**
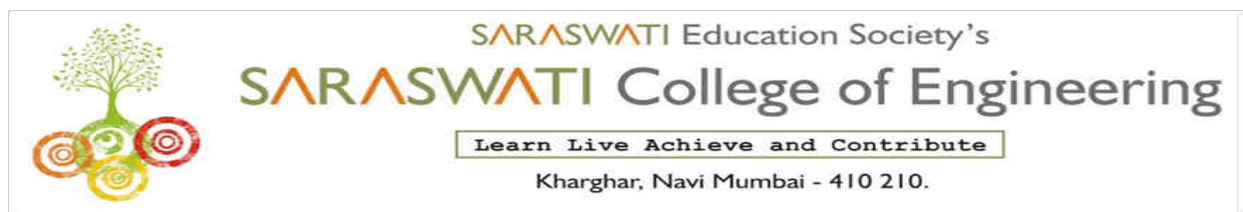
Class/Sem: - SE/III

Course Education Objectives (CEO's)

1	Understand the Discrete Mathematics Concept.
2	Apply clear thinking and creative problem-solving using laws of logic and mathematical Induction.
3	Understand the concepts of relation and functions.
4	Understand the permutation and combination.
5	Understand the basic concept in graph theory and their properties.
6	Understand the technique for detecting and correcting code in transmitted data.

Course Outcomes (CO's)

After successfully completing the course students will have the ability to:

1	Apply the knowledge of Discrete Mathematics to solve complex engineering problem.
2	Identify, select and apply clear thinking for problem solving using laws of logic and mathematical induction.
3	Investigate complex relations and functions to find appropriate solution leading to a valid conclusion.
4	Identify formulate and analyze permutation and combination using principle of mathematics.
5	Apply the background knowledge of Discrete Mathematics to identify type of graph.
6	Apply the knowledge of mathematics to solve algebraic structure and detecting and correcting code in the transmitted data.

Academic Year: 2019-2020

Odd Semester

Name of the Subject: -Data Structure   **Code no. of Subject: -CSC305**

Class/Sem: - SE/III

Course Education Objectives (CEO's)

1	Understand the basic concepts of Data Structure and efficient storage mechanism of data for an easy access.
2	Design and implementation of various basic and advanced data structure.
3	Identify the various techniques for representation of the data in linked list.
4	Learn the different tree techniques.
5	Investigate the logical ability and understand the generic principles of graph as applied to sophisticated data structure.
6	Understand different sorting and searching techniques &Design the project based on Data Structure in a group of students.

Course Outcomes (CO's):

After successfully completing the course students will have the ability to:

1	Understand, identify and Describe various linear and non-linear data structure.
2	Create , select and write different searching ,insertion , deletion, traversing mechanism on s[...] and queue.
3	Investigate and create efficient storage mechanisms of data for given problem like linked list to find appropriate solution.
4	Understand and apply different tree techniques to solve the complex computer engineering problems.
5	Identify and apply concepts of graph in various domain like DBMS , compiler

	construction
6	Apply different sorting and searching techniques. Design and develop project in groups.

Name of the Subject: -Microprocessor   Code no. of Subject: -CSC501

Class/Sem: - TE/V

Course Objective:

1	To understand basic concepts of microprocessor
2	Apply background knowledge and create the appropriate logic for building assembly languag for 8086.
3	Understand the concepts of interrupts and determine the services of interrupts by 8086.
4	Explain various peripheral devices and their interfacing to 8086 and to apply it to design Microprocessor based system.
5	Prepare students for higher processor architecture and understand different modes of execution and extend the importance of protected mode of 80386.
6	Discuss Pentium i.e multicore processor architecture and its organization.

Course Outcomes:
On successful completion of course, students will be able to

1	Understand, Identify and Describe various processor function to cope with changing world o Technology.
2	Write software for 8086 programs.
3	Understand and apply concepts of interrupts with 8086 processor and interrupt controller.
4	Investigate Engineering problems and design embedded system to solve real time problems.
5	Identify and analyze the problems and importance of higher end processors.
6	Investigate complex problems with background knowledge and find the use and importance of multicore processor

Academic Year: 2019-2020

Odd Semester

Name of the Subject: - Database Management System   **Code no. of Subject: - CSC502**

Class/Sem: - TE/V

Course Education Objectives (CEO's)

1	Understand the role of database management system in an organization.
2	Design data modeling using the entity-relationship and developing database designs.
3	Understand the relational algebra operators.
4	Understand the use of Structured Query Language (SQL) and learn SQL syntax.
5	Understand the normalization techniques to normalize the database.
6	Understand the needs of database processing and learn techniques for controlling the consequences of concurrent data access and design appropriate application.

Course Outcomes (CO's)

After successfully completing the course students will have the ability to:

1	Identify and analyze the roles and responsibilities of different types of user and investigate the different architecture to find appropriate solution.
2	Design data modeling using ER and Extended ER features to meet the specified needs.
3	Investigate and apply different relational algebra operators to find appropriate solution leading to valid conclusion.
4	Investigate and formulate SQL queries to find appropriate solution to complex Problems.
5	Identify and apply different normalization techniques to process and meet the specified needs with appropriate solution to safety standards and societal consideration.
6	Design a software system effectively as a member and leader in a team for a common goal of database processing and controlling consequences of concurrent data access

Academic Year: 2019-2020

Odd Semester

Name of the Subject: - Computer Networks   **Code no. of Subject: - CSC503**

Class/Sem: - T.E./V

Course Education Objectives (CEO's)

1	To explain and introduce concepts and fundamentals of data communication and computer networks.
2	To interrelate the inter-working of various layers of OSI. To distinguish between different protocols used at data link layer.
3	To discuss the issues and challenges of protocols design while delivering packet in network.
4	To study different protocols used for packet delivery in network layer. To assess the strengths and weaknesses of various routing algorithms.
5	To understand how process to process communication occurs i.e. transport layer and protocols used in this layer.
6	To understand various application layer protocols.

Course Outcomes (CO's)

After successfully completing the course students will have the ability to:

1	Understand the fundamentals of data communication. Apply this knowledge to analyze different types of media used at physical layer. Identify the differences between ISO - OSI model with TCP/IP model.
2	Apply the knowledge of different protocols used at data link layer to investigate appropriate protocol for system. Also analyze the differences in protocols.
3	Select and apply appropriate concepts of subnetting / supernetting of IP addressing. Design the network according to specified needs.
4	Analyze various routing algorithms and protocols at network layer. Understand the impact of protocol on system.
5	Investigate congestion and apply appropriate congestion control algorithm. Also classify and compare transport layer protocols.
6	Identify the protocols used at application layer. Students will be able to analyze the protocols in terms of organization need, its impact.

Academic Year: 2019-2020

Odd Semester

Name of the Subject: -TCS   **Code no. of Subject: - CSC504**

Class/Sem: - TE/V

Course Education Objectives (CEO's):

1	Recognize concepts in theory of computation and differentiate between deterministic and nondeterministic automata
2	Build concepts of theoretical design of deterministic and non-deterministic finite automata.
3	Acquire conceptual understanding of fundamentals of grammars and languages
4	Express the concept of theoretical design of push down automata to recognize the language
5	Develop understanding of different types of Turing machines and applications.
6	Discuss the concept of Undecidability.

Course Outcomes:
On successful completion of course learner will be able to:

1	Identify the central concepts in theory of computation and analyse differentiate between deterministic and nondeterministic automata, apply formulate knowledge to obtain equivalence of NFA and DFA.
2	Investigate the equivalence of languages described by finite automata and regular expressions.
3	Create and apply regular, context free grammars while recognizing the strings and tokens.
4	Design pushdown automata model to recognize the language.
5	Develop an understanding of computation through Turing Machine.
6	Acquire fundamental understanding of decidability and un decidability and apply the knowledge to solve computer engineering problem.

Academic Year: 2019-2020

Odd Semester

Name of the Subject: -Adv.AOA   **Code no. of Subject: -**

Class/Sem: - TE/V

Course Objective:

1	Explain mathematical approach for Analysis of Algorithms.
2	Illustrate advanced data structures.
3	Solve complex problems in real life applications.
4	Determine algorithm to be applied for the various application like geometric modeling, robotics, networking, etc.
5	Analyze probability and randomization in the analysis of algorithm
6	Understand the concept of polynomial and non deterministic polynomial algorithms.

Course Outcomes:
At the end of course, students will attain an ability to:

1	Describe and apply the analysis techniques for algorithms.
2	Identify and analyze the appropriate data structure and design techniques for different problems.
3	Illustrate and select the appropriate algorithm to be applied for the various application like geometric modeling, robotics, networking, etc.
4	Appreciate and Describe the role of probability and randomization in the analysis of algorithm.
5	Analyze and apply probability and randomization in various algorithms.
6	Differentiate and analyze polynomial and non deterministic polynomial algorithms.

Academic Year: 2019-2020

Odd Semester

Name of the Subject: -Multimedia System   **Code no. of Subject: - CSDLO5011 302**

Class/Sem: - TE Sem V

Course Education Objectives (CEO's)

1	Understand the basics of multimedia and multimedia architecture
2	To provide the knowledge of different components of multimedia
3	Understand different file formats for different components
4	Identify and analyse compression techniques and apply them
5	To provide the knowledge of multimedia communication techniques to improve the quality of service.
6	To study different security techniques and apply these techniques of information security in multimedia environments.

Course Outcomes (CO's)

After successfully completing the course students will have the ability to:

1	Understand basics of multimedia and multimedia system architecture and apply the knowledge in engineering profession.
2	Understand the impact of multimedia components on society and environment for sustainable development.
3	Understand file formats for different multimedia components
4	Identify, formulate and analyse different compression techniques and apply them solve complex compute engineering problems.
5	Apply the knowledge of multimedia communication techniques to improve the quality of service.
6	Identify, formulate and analyse different security techniques and apply these techniques of information security in multimedia environments.

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Academic Year: 2019-2020

Odd Semester

Name of the Subject: -Web Design Lab   **Code no. of Subject: - CSL504**

Class/Sem: TE/V

Course Education Objectives (CEO's)

1	Understand basic concept of web technology
2	Design and create web pages using HTML5 and CSS3
3	Create web pages and provide client side validation
4	Design dynamic web pages using server side scripting.
5	Create web pages using XML/XSLT
6	Use MVC framework for web application development

Course Outcomes (CO's)

After successfully completing the course students will have the ability to:

1	Understand the core concepts and features of Web Technology and setting up the lamp/xamp/wamp server
2	Develop static web pages using HTML5 and CSS3
3	Understand and apply the concept of client side validation and design dynamic web pages using JavaScript and JQuery.
4	Design Interactive web pages using PHP , AJAX with database connectivity using MySQL and evaluate client and server side technologies
5	Understand the basics of XML, DTD and XSL and develop web pages using XML / XSLT
6	Identify and analyze end user requirements and develop web application using appropriate web technologies and web development framework

Academic Year: 2019-2020

Odd Semester

Name of the Subject: - Mobile Communication and Computing   Code no. of Subject: - CSC702

Class/Sem: - B.E./VII

Course Education Objectives (CEO's)

1	To define the basic concepts and principles in mobile computing.
2	To explain major techniques involved, and networks & systems issues for the design and implementation of mobile computing systems and applications i.e. GSM, GPRS.
3	To describe or explore both theoretical and practical issues of network layer, transport layer of mobile computing.
4	To distinguish between different protocols used in mobile computing and applications based on it.
5	To study main aspect of mobile computing i.e. mobility in detail.
6	To determine or provide an opportunity for students to understand the key components and technologies involved and to gain hands-on experiences in building mobile applications.

Course Outcomes (CO's)

After successfully completing the course students will have the ability to:

1	Identify fundamentals or basic concepts and principles in mobile communication & computing, cellular architecture. Analyze the techniques available and understand the impact.
2	Understand all generation of mobile computing i.e. GSM, GPRS, UMTS, UTRAN. Apply the knowledge to analyze its performance, its impact on society, environment for sustainable development.
3	Apply appropriate techniques for communication or routing in mobile computing. Understand fundamentals or different concepts related to it. Investigate problems in communication, discuss its solutions.
4	Identify the difference between WLAN, HIPERLAN1, HIPERLAN2 (802.11a, 802.11b etc.). Analyze it in terms of protocols, bandwidth used etc.
5	Understand the impact of mobility on communication. Select and apply appropriate techniques for mobility management. Design a system to show handover management.
6	Apply the knowledge to understand Long Term Evolution (LTE) architecture, its

| | interfaces, to gain hands-on experiences in building mobile applications. Also how LTE meets the specified need of user. |

Academic Year: 2019-2020

Odd Semester

Name of the Subject: -MIS   **Code no. of Subject: - ILO 7013**

Class/Sem: - BE/VII

Course Education Objectives (CEO's)

1	Describe the blend of Management and Technical field.
2	Classify the principal tools and technologies for accessing information from databases to improve business performance and decision making
3	Discuss the roles played by information technology in today's business and define various technology architectures on which information systems are built
4	Discover the impact information systems have on an organization.
5	Interpret the IT infrastructure and its components and its current trends
6	Define and analyse typical functional information systems and identify how they meet the needs of the firm to deliver efficiency and competitive advantage and judge the basic steps in systems development.

Course Outcomes (CO's)

After successfully completing the course students will have the ability to:

1	Apply and analyse the blend of management technical filed for how information systems Transform Business
2	Understand the principal tools and technologies for accessing information from databases to improve business performance and decision making
3	Understand the roles played by information technology in today's business and define various technology architectures on which information systems are built
4	Identify and understand the impact information systems have on an organization and environment for sustainable development
5	Understand IT infrastructure and its components and its current trends of societal, legal issues safety and responsibility of relevant to engineering profession
6	Identify the types of systems used for enterprise-wide knowledge management and how they provide value for businesses

Academic Year: 2019-2020

Odd Semester

Name of the Subject: -CSL   **Code no. of Subject: - ILO 7013**

Class/Sem: - BE/VII

Course Education Objectives (CEO's)

I.	Understand different types of Cybercrime and Cyberlaw.
II.	Understand about different planned attacks and various security challenges in mobile devices.
III.	Identify different tools and methods in Cybersecurity.
IV.	Understand different aspects of Cyberlaw
V.	Apply different Indian IT Act 2008 and its latest amendments.
VI.	Understand various types of security standard compliance.

Course Outcomes (CO's)

After successfully completing the course students will have the ability to:

I.	Understand and Identify different cybercrimes and its impact on society.
II.	Understand various planned attacks and Identify, select and apply security challenges in electronic device.
III.	Identify appropriate technique to analyse different tools and methods used in cybercrime.
IV.	Communicate effectively regarding different aspects of cyberlaw and understand the impact on society.
V.	Investigate Problems and apply IT law in various legal issues to find appropriate solutions.
VI.	Understand and apply Information security standard compliance during software design and development.

Academic Year: 2019-2020

Odd Semester

Name of the Subject: -Big Data Analytics   **Code no. of Subject: - ILO 7013**

Class/Sem: - BE/VII

Course Objective:

1	Understand basic concepts of Big Data.
2	Identify various map reduce tasks and algorithms using map reduce with concept of Hadoop HDFS.
3	Understand concept of NOSQL and generate Key value stores.
4	Identify and Understand various data mining algorithms to mine streams of data.
5	Understand the concept of clustering and analyze various algorithms to make clusters.
6	Understand the algorithms of Page rank and analyze social-network graphs.

Course Outcomes:
At the end of course, students be able to :

1	Understand and analyze the basic concepts of Big Data.
2	Identify , analyze and compare various map reduce algorithms and apply them to find appropriate solution leading to a valid conclusion.
3	Create and apply various NOSQL commands on Key value stores for Computer Engineering Problems.
4	Identify, formulate and analyze various data mining algorithms and apply them to find appropriate solution.
5	Create, Select and apply appropriate algorithms to form various clusters from a given set of data.
6	Identify and apply various page rank algorithms and apply algorithms to cluster social network graphs.

Academic Year: 2019-2020

Even Semester

Name of the Subject: -Analysis of algorithm   **Code no. of Subject: - CSC402**

Class/Sem: - SE/IV

Course Objective:

1	Explain students to the general tools and techniques for analyzing computer algorithms.
2	Illustrate the students with mathematical preliminaries required to analyze and design computer algorithms.
3	Choose the advanced data structures required to design efficient computer algorithms.
4	Summarize the students with specific algorithms for a number of important computational problems like sorting, searching, and graphs, … etc.
5	Describe the importance of designing efficient algorithms by comparing different complexity classes.
6	Categorize strategies for solving problems not solvable in polynomial time.

Course Outcomes:
At the end of course, student should be able to:

1	Illustrate and analyze the running time and space complexity of algorithms.
2	Describe, apply and analyze the complexity of divide and conquer strategy.
3	Identify, apply and analyze the complexity of greedy strategy.
4	Determine, apply and analyze the complexity of dynamic programming strategy.
5	Explain, design and apply backtracking, branch and bound and string matching techniques to deal with some hard problems.
6	Categorize the classes P, NP, and NP-Complete and be able to prove that a certain Problem is NP-Complete.

Academic Year: 2019-2020

Even Semester

Name of the Subject: - Computer Organization and Architecture   Code no. of Subject: - CSC403

Class/Sem: - SE/IV

Course Education Objectives (CEO's)

1	To understand the basic structure of computer and discuss in detail arithmetic unit for solving arithmetic operations
2	To understand instruction level parallelism and hazards in typical processor pipeline
3	To understand control unit design
4	To understand different types of memory and memory mapping techniques
5	To understand the different way of communicating with I/O devices and standard I/O interfaces
6	To understand various types of buses and describe architecture of parallel processor

Course Outcomes (CO's)

After successfully completing the course students will have the ability to:

1	Apply the knowledge of mathematical science and engineering fundamentals to solve arithmetic operations and understand processing in ALU
2	Analyze the instruction level parallelism and identify and investigate the hazards in typical processor pipeline
3	Understand and apply the hardwired and microprogrammed control unit design to meet the specified needs
4	Understand the different types of memory and apply the appropriate memory mapping technique
5	Apply the knowledge to analyze different I/O devices and I/O interfaces
6	Understand and identify different types of buses and investigate different type of parallel processing architecture

Academic Year: 2019-2020

Even Semester

Name of the Subject: -Computer Networks   **Code no. of Subject: - CSC503**

Class/Sem: - T.E./V

Course Education Objectives (CEO's)

1	To explain and introduce concepts and fundamentals of data communication and computer networks.
2	To interrelate the inter-working of various layers of OSI. To distinguish between different protocols used at data link layer.
3	To discuss the issues and challenges of protocols design while delivering packet in network.
4	To study different protocols used for packet delivery in network layer. To assess the strengths and weaknesses of various routing algorithms.
5	To understand how process to process communication occurs i.e. transport layer and protocols used in this layer.
6	To understand various application layer protocols.

Course Outcomes (CO's)
After successfully completing the course students will have the ability to:

1	Understand the fundamentals of data communication. Apply this knowledge to analyze different types of media used at physical layer. Identify the differences between ISO - OSI model with TCP/IP model.
2	Apply the knowledge of different protocols used at data link layer to investigate appropriate protocol for system. Also analyze the differences in protocols.
3	Select and apply appropriate concepts of subnetting / supernetting of IP addressing. Design the network according to specified needs.
4	Analyze various routing algorithms and protocols at network layer. Understand the impact of protocol on system.
5	Investigate congestion and apply appropriate congestion control algorithm. Also classify and compare transport layer protocols.
6	Identify the protocols used at application layer. Students will be able to analyze the protocols in terms of organization need, its impact.

Academic Year: 2019-2020

Even Semester

Name of the Subject: -System Programming and compiler construction

Code no. of Subject: - CSC503

Class/Sem: - T.E./V

Course Objective:

1	Explain the role and functioning of various system programs over application program.
2	Understand the basic concepts and designing of assembler.
3	Describe the designing concept of Macro processor.
4	Illustrate the role and responsibilities of static and dynamic loaders and linkers.
5	Summarize the need to follow the syntax in writing an application program and to learn the how the analysis phase of compiler is designed to understand the programmer's requirements without ambiguity.
6	Synthesize the analysis phase outcomes to produce the object code that is efficient in terms of space and execution time.

Course Outcomes:
At the end of course, students will attain an ability to:

1	Identify and understand the relevance of different system programs.
2	Describe and create the various data structures and passes of assembler design.
3	Identify and analyze the need for different features and designing of macros.
4	Distinguish different loaders and linkers and their contribution in developing efficient user applications.
5	Construct different parsers for given context free grammars.
6	Justify the need synthesis phase to produce object code optimized in terms of high execution speed and less memory usage

Academic Year: 2019-2020

Even Semester

Name of the Subject: -Data warehousing and mining   Code no. of Subject: -CSC605

Class/Sem: - TE/V

Course Education Objectives (CEO's)

1	Identify the scope and essentiality of Data ware house
2	Understand the ETL process.
3	Understand and analyze techniques of data mining for data exploration and preprocessing
4	Identify the scope of task in Data Mining such as Classification , Prediction etc.
5	Analyze the different methods of association rules and patterns
6	Understand the spatial and web data mining.

Course Outcomes (CO's)

After successfully completing the course students will have the ability to:

1	Understand, identify and apply essentiality of data warehouse.
2	Apply the ETL process and analyze different OLAP Operation and Models .
3	Select and apply appropriate data mining technique .
4	Understand and apply different task in data mining to solve the complex computer engineering problems.
5	Identify and apply concepts of of association rule for real time application
6	Understand and apply the concept of spatial and web mining.

Academic Year: 2019-2020

Even Semester

Name of the Subject: -Machine Learning   **Code no. of Subject: - CSDL0621**

Class/Sem: - TE/V

Course Education Objectives (CEO's)

1	Understand basic concepts of Machine Learning
2	Apply different learning rule
3	Understand different optimization technique
4	Apply and select various ML learning technique.
5	Understand Dimensionality Reduction Technique
6	Design Application using Machine Learning

Course Outcomes:

On successful completion of course, students will be able to

1	Apply and Understand the basic concepts of ML
2	Identify and analyze different learning rule
3	Identify and apply different optimization technique to solve problem.
4	Identify, formulate and analyze problems to solve using ML learning techniques
5	Apply Dimensionality Reduction techniques.
6	Design and Develop application using ML techniques

Academic Year: 2019-2020

Even Semester

Name of the Subject: -Human Machine Interaction   **Code no. of Subject: - CSC801**

Class/Sem: - BE/VIII

Course Education Objectives (CEO's)

1	Understand the fundamental of Human Machine Interaction
2	Understand the importance of human psychology in designing good interface
3	Understand the various design technologies to meet user requirement
4	Understand good screen designing and its impact on society
5	Understand the mobile interaction design and its usage in day to day life
6	Identify different interaction style and design application

Course Outcomes (CO's)

After successfully completing the course students will have the ability to:

1	Apply and understand the fundamental of Human Machine Interaction to solve complex problems
2	Analyze and understand the human psychology to communicate effectively in society by using HMI
3	Understand the Impact of Computer Engineering solution on society and motivate the students for research in machine interface design
4	Investigate different design technologies to meet user requirement and valid conclusion
5	Identify and apply appropriate technique for mobile interaction design and its usage in society
6	Design and develop application for social and technical task

Academic Year: 2019-2020

Even Semester

Name of the Subject: - Distributed Computing   **Code no. of Subject: - CSC802**

Class/Sem: - B.E./VIII

Course Education Objectives (CEO's)

1	To provide students with contemporary knowledge in distributed systems.
2	To equip students with skills to analyze and design distributed applications.
3	To learn master skills to measure the performance of distributed synchronization algorithm.
4	To study different resources and process management techniques in distributed environment.
5	To explain techniques to maintain data consistent in distributed computing.
6	To understand and explore knowledge of distributed file system.

Course Outcomes (CO's)

After successfully completing the course students will have the ability to:

1	Apply and demonstrate knowledge of the basic elements and concepts related to distributed system technologies.
2	Investigate and illustrate the middleware technologies that support distributed applications such as RPC, RMI and Object based middleware.
3	Analyze the various techniques used for clock synchronization and mutual exclusion.
4	Elaborate the concepts of Resource and Process management and synchronization algorithms.
5	Understand and explain the use of Consistency and Replication Management.
6	Apply the knowledge of Distributed File System to analyze various file systems like NFS, AFS and the experience in building large-scale distributed applications.

Academic Year: 2019-2020

Even Semester

Name of the Subject: -NLP   **Code no. of Subject: -DLO8012**

Class/Sem: BE/VIII

Course Education Objectives (CEO's)

1	Understand the basic concepts of Natural Language Processing
2	Apply the basic algorithm in Natural Language Processing for word level analysis.
3	Understand the concept in main language level: morphology, syntax, semantics and pragmatics.
4	Implement the applications based on Natural language Processing for semantic analysis.
5	Apply the knowledge of NLP to create the various language models.
6	Design a project based on NLP techniques in a group of students.

Course Outcomes (CO's)

After successfully completing the course students will have the ability to:

1	Understand, identify and Describe Processing of natural language to cope with change in A world of technology.
2	Create and apply appropriate techniques for word level analysis in natural language processing.
3	Design and apply the concept of main language level: Morphology, syntax, semantic, prag For a software system to meet specified needs with social consideration.
4	To investigate engineering problem and design model for semantic analysis.
5	Identify difficult issues of society and to create the various language models in world of N
6	Design and develop Miniproject in groups.

Academic Year: 2019-2020

Even Semester

Name of the Subject: -Project /Miniproject

Class/Sem: BE/TE/VI/VII/VIII

Course Education Objectives (CEO's)

1	Apply Practical Knowledge within the chosen area of technology for project development
2	Identify problem with programming projects.
3	Design Engineering Solution to complex problems
4	Work effectively with team or as individual.
5	Communicate with engineers and community at large
6	Identify skills of a professional engineers.

Course Outcomes (CO's)

After successfully completing the course students will have the ability to:

1	Understand societal, health and legal issues and apply practical knowledge within the chosen area of technology for project development.
2	Identify, analyze and formulate problem within programming projects in a comprehensive and systematic approach .
3	Design and develop Engineering solutions to complex problem utilizing a systematic approach
4	Work effectively as an individual or in a team in development of technical projects.
5	Communicate effectively with profession by presenting project related activities
6	Demonstrate knowledge, skills and attitude of a professional engineers and community at large

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Course Objectives and Course Outcomes

Odd Semester

<u>Class: SE</u>

Subject code:**CSC302**	Subject: **Digital Logic Design and Analysis**	Credits:04

Course Objective:

At the end of course, student should be able to:

1	Identify the fundamental concepts for design of digital circuits.
2	Develop the methods for designing of digital circuits and a pre-requisite for computer organization and architecture, microprocessor systems.
3	Use the concept of designing Combinational.
4	Explain the concept of designing sequential circuits.
5	Outline the basic knowledge of how digital building blocks are described in VHDL.
6	Design the truth table for logical gates.

Course Outcomes:

At the end of course, students will attain an ability to:

1	Classify different number systems and their conversions.
2	Distinguish and minimize Boolean expressions.
3	Design and analyze combinational circuits.
4	Design and analyze sequential circuits
5	Illustrate the basic concepts of VHDL.
6	Justify basics of TTL and CMOS Logic families.

Subject code:**CSC303**	Subject: **Discrete Mathematics**	Credits:04

Course Objective:

At the end of course, student should be able to:

1	Discuss discrete Mathematics Concepts.
2	Demonstrate clear thinking and creative problem solving.
3	Construction and understanding of mathematical proofs. Exercise common mathematica and proof strategies.
4	Prepare for the mathematical aspects of other Computer Engineering courses
5	Develop the Technique for detecting and correcting code in transmitted data.
6	Discuss the importance of discrete structures towards simulation of a problem in computer science.

Course Outcomes:

At the end of course, students will attain an ability to:

1	Explain the notion of mathematical thinking, mathematical proofs and to apply them solving.
2	Illustrate reason logically.
3	Infer relations, Diagraph and lattice.
4	Demonstrate the use of functions, graphs and their use in programming applications.
5	Illustrate the use of groups and codes in Encoding-Decoding
6	Use discrete structures into other computing problems such as formal specification, artificial intelligence, cryptography, Data Analysis and Data Mining etc.

Subject code:**CSC305**	Subject :**Data Structure**	Credits:04

Course Objective:

At the end of course, student should be able to:

1	Define the fundamental concept of data structures and emphasize importance of Data Structures in developing and implementing efficient algorithms.
2	Explain efficient storage mechanisms of data for an easy access.
3	Design and demonstrate of various basic and advanced data structures.
4	Develop various techniques for representation of the data in the real world.
5	Discuss different sorting and searching techniques.
6	Extend the logical ability and understand the generic principles of computer programming as applied to sophisticated data structures.

Course Outcomes:

At the end of course, students will attain an ability to:

1	Explain various linear and nonlinear data structures.
2	Demonstrate operations like searching, insertion, deletion, traversing mechanism etc. on

1	various data structures (Stack and Queue).
3	Illustrate efficient storage mechanisms of data for given problem like linked list.
4	Select appropriate sorting technique and searching technique for given problem
5	Illustrate concepts learned in various domains like DBMS, compiler construction etc.
6	Choose appropriate data structure for specified problem domain.

Subject code: **CSL304**	Subject: **Object Oriented Programming and Methodology Lab**	Credits:02

Course Objective:

At the end of course, student should be able to:

1	Describe Object oriented concepts like object, class, Inheritance, encapsulation, etc.
2	Explain fundamentals of object-oriented programming in Java, including defining classes, invoking methods, using class libraries, etc.
3	Use the Java JDK environment to create, debug and run simple Java programs.
4	Use various model of object oriented programming: abstract data types, encapsulation, inheritance and polymorphism
5	Categorize real-world scenarios using top down approach.
6	Design and develop GUI using different controls

Course Outcomes:

At the end of course, students will attain an ability to:

1	Use fundamental programming concept.
2	Illustrate the concept of packages, classes and objects.
3	Demonstrate the concept of inheritance and interfaces.
4	Explain the concept of string, array and vectors.
5	Implement the notation of exception handling and multithreading.
6	Develop GUI based application.

Class: TE

Subject code: **CSDLO5012**	Subject: **Advanced Operating systems**	Credits:04

Course Objective:

At the end of course, student should be able to:

1	Describe design issues of Advanced Operating systems.
2	Explain design aspects and data structures used for file subsystem, memory subsystem and process subsystem of Unix OS.
3	Explain different architectures used in Multiprocessor OS and analyze the design and data structures used in Multiprocessor operating systems.
4	Differentiate between threads and processes and compare different processor scheduling algorithms used in Multiprocessor OS
5	Classify and compare Real Time OS and analyze various real time scheduling algorithms.
6	Explore architectures and design issues of Mobile OS, Virtual OS, Cloud OS

Course Outcomes:

At the end of course, students will attain ability to:

1	State design issues of Advanced Operating systems.
2	Express design aspects and data structures used for file subsystem, memory subsystem and process subsystem of Unix OS
3	Explain different architectures used in Multiprocessor OS and analyze the design and data structures used in Multiprocessor operating systems.
4	Differentiate between threads and processes and compare different processor scheduling algorithms used in Multiprocessor OS
5	Classify and compare Real Time OS and analyze various real time scheduling algorithms.
6	Explore architectures and design issues of Mobile OS, Virtual OS, Cloud OS

Subjectcode:**CSC502**	Subject: **Database Management System**	Credits:04

Course Objective:

At the end of course, student should be able to:

1	Demonstrate the role of a database management system in an organization.
2	Design data modeling using the entity-relationship and developing database designs.
3	Demonstrate the use of Structured Query Language (SQL) and learn SQL syntax.
4	Construct simple and moderately advanced database queries using Structured Query Language (SQL).
5	Select normalization techniques to normalize the database.
6	Infer the needs of database processing and learn techniques for controlling the consequences of concurrent data access.

Course Outcomes:

At the end of course, students will attain an ability to:

1	Design and draw ER and EER diagram for the real life problem with software tool.
2	Construct and update database and tables with different DDL and DML statements.
3	Use integrity constraints and able to provide security to data.
4	Construct and execute Complex queries.
5	Design triggers and procedures for specific module/task
6	Integrate concurrent transactions and able to access data through front end (using JDBC ODBC connectivity.)

Subject code:**CSC501**	Subject : **Microprocessor**	Credits:04

Course Objective:

At the end of course, student should be able to:

1	Describe the basic concepts of microprocessor and assembly language
2	Know the instructions of basic microprocessor
3	Express the importance of different peripheral devices and their interfacing to 8086
4	Express multiprocessor and high end processor configurations
5	List techniques for faster execution of instructions and improve the speed of operation and performance of microprocessors
6	Outline the concept of multi-core processors.

Course Outcomes:

At the end of course, students will attain an ability to:

1	Know the overview of architecture and basic concepts of microprocessor

2	Implement programs to run on 8086 microprocessor based systems
3	Design systems using memory chip and peripheral chips
4	Understand and devise techniques for faster execution of instructions ,improve speed and enhance performance of microprocessor
5	Distinguish between RISC and CISC processors.
6	Describe multi-core processor and its advantages

Subject code:**CSC504**	Subject: **Theory of Computer Science**	Credits:04

Course Objective:

At the end of course, student should be able to:

1	Describe concepts of fundamentals of grammars and languages.
2	Develop concepts of theoretical design of deterministic and non-deterministic finite automata and Push down automata.
3	Discriminate between different types of grammars.
4	Develop understanding of different types of Turing machines and applications.
5	Understand the concept of Un decidability.
6	Design different types of computing machines.

Course Outcomes:

At the end of course, students will attain an ability to:

1	Identify the central concepts in theory of computation and differentiate between determini nondeterministic automata, also obtain equivalence of NFA and DFA.
2	Infer the equivalence of languages described by finite automata and regular expressions.
3	Devise regular, context free grammars while recognizing the strings and tokens.
4	Design pushdown automata to recognize the language.
5	Develop an understanding of computation through Turing Machine.
6	Understanding of decidability and un decidability.

Class: BE

Subject code:**CPC703**	Subject**: Artificial Intelligence**	Credits:04

Course Objective:

At the end of course, student should be able to:

1	Construct the basic ideas and techniques underlying the design of intelligent systems.
2	Make students understand and Explore the mechanism of mind that enable intelligent thought and action.
3	Know advanced representation formalism.
4	Express search techniques.
5	Design different models of reasoning.
6	Describe the methods to deal with uncertain and incomplete

Course Outcomes:

At the end of course, students will attain an ability to:

1	Develop a basic understanding of AI building blocks presented in intelligent agents.
2	Choose an appropriate problem-solving method.
3	Identify knowledge representation technique for specific condition.
4	Categorize the strength and weaknesses of AI approaches to knowledge– intensive problem solving.
5	Design models for reasoning with uncertainty as well as the use of unreliable information.
6	Implement and develop the AI applications in real world scenario.

Subject code:**CPC702**	Subject :**Cryptography & System Security**	Credits:04

Course Objective:

At the end of course, student should be able to:

1	Summarize the students with contemporary knowledge in Cryptography and Security.

2	Produce the basics of cryptography to keep networks, systems, and data secure.
3	Illustrate skills to design security protocols for recognize security problems.
4	Determine the general ideas behind Cryptographic hash function.
5	Describe how crypto can be used as an effective tool in providing assurance concerning privacy and integrity of information.
6	Revise security mechanisms & services related to security goals.

Course Outcomes:

At the end of course, students will attain an ability to:

1	Describe the principles and practices of cryptographic techniques.
2	Classify/Illustrate a variety of generic security threats and vulnerabilities and identify & analyze particular security problems for given application.
3	Use/Apply the application of security techniques and technologies in solving real- life security problems in practical systems.
4	Identify and Use appropriate security techniques to solve security problem.
5	Design security protocols and methods to solve the specific security problems.
6	Demonstrate with current research issues and directions of security.

Subject code:**CPC703**	Subject**: Digital Signal Processing.**	Credits:04

Course Objective:

At the end of course, student should be able to:

1	Understand the fundamental concepts of Digital Signal Processing.
2	Explain the properties of DFT in mathematical problem solving.
3	Use mathematical operation such as Linear convolution, Circular convolution, Linear convolution using circular convolution.
4	Illustrate FFT calculations mathematically and develop FFT based DSP algorithms.
5	Interpret DSP processor for real time signal processing application.
6	Explain real time signal processing.

Course Outcomes:

At the end of course, students will attain an ability to:

1	Summaries the concept of DT Signal and perform signal manipulation 4.
2	Compute analysis of DT system in time domain
3	Demonstrate mathematical operation such as Linear convolution, Circular convolution, Linear convolution using circular convolution.
4	Develop FFT flow-graph.

5	Develop Fast DSP Algorithms.
6	Design DSP system for Real Time Signal Processing.

Subject code:**CPC705**	Subject: **Soft Computing**	Credits:04

Course Objective:

At the end of course, student should be able to:

1	Conceptualize the working of human brain using ANN.
2	Demonstrate neural networks that can learn from available examples and generalize to form appropriate rules for inference systems.
3	Introduce the ideas of fuzzy sets, fuzzy logic and use of heuristics based on human experience.
4	Interpret the mathematical background for carrying out the optimization
5	Identify genetic algorithm for seeking global optimum in self-learning situation.
6	Learn applications of genetic algorithm

Course Outcomes:

At the end of course, students will attain an ability to:

1	Identify and appreciate the applications which can use fuzzy logic, Design inference systems
2	Demonstrate the difference between learning and programming, Explore practical applications of neural networks (NN).
3	Appreciate the importance of optimizations & its use in computer engineering fields and other domains
4	Demonstrate the efficiency of a hybrid system
5	Identify the neural network and fuzzy logic can be hybridized to form a neuro-fuzzy network
6	Design various applications GA.

Course Objectives and Course Outcomes

Even Semester

Class: SE

Subject code:**CSC402**	Subject: **Analysis of Algorithms**	Credits:04

Course Objective:

At the end of course, student should be able to:

1	Explain students to the general tools and techniques for analyzing computer algorithms.
2	Illustrate the students with mathematical preliminaries required to analyze and design computer algorithms.
3	Choose the advanced data structures required to design efficient computer algorithms.
4	Summarize the students with specific algorithms for a number of important computational problems like sorting, searching, and graphs, … etc.
5	Describe the importance of designing efficient algorithms by comparing different complexity classes.
6	Categorize strategies for solving problems not solvable in polynomial time.

Course Outcomes:

At the end of course, students will attain an ability to:

1	Illustrate the running time and space complexity of algorithms.
2	Describe the complexity of divide and conquer strategy.
3	Identify the complexity of greedy strategy.
4	Determine the complexity of dynamic programming strategy.
5	Explain and apply backtracking, branch and bound and string-matching techniques to deal with some hard problems.
6	Categorize the classes P, NP, and NP-Complete and be able to prove that a certain Problem is NP-Complete.

Subject code: **CSC404**	Subject: **Computer Graphics**	Credits:04

Course Objective:

At the end of course, student should be able to:

1	Make students understand the fundamental knowledge and basic technical competence in the field of computer graphics.
2	Emphasize on implementation aspect of Computer Graphics Algorithms.
3	Prepare the student for advance areas like Image Processing or Computer Vision.
4	Prepare the student for Virtual Reality and professional avenues in the field of Computer Graphics.
5	Discuss 2D-3D dimensional geometric transformation.
6	Classify the interdisciplinary nature of computer graphics is emphasized in the wide variety of examples and applications.

Course Outcomes:

At the end of course, students will attain an ability to:

1	Illustrate the basic concepts of Computer Graphics.
2	Demonstrate various algorithms for scan conversion and filling of basic objects and their comparative analysis.
3	Invent knowledge about two and three dimensional transformations.
4	Choose geometric transformations, viewing and clipping on graphical objects.
5	Express solid model representation techniques and projections.
6	Illustrate visible surface detection techniques and illumination models.

Subject code:**CSC403**	Subject**: Computer Organization and Architecture**	Credits:04

Course Objective:

At the end of course, student should be able to:

1	Demonstrate the basic structure and operation of a digital computer.
2	Discus iscuss in detail the operation of the arithmetic unit including the algorithms & implementation of fixed-point and floating-point addition, subtraction, multiplication & division.
3	Illustrate the different ways of communicating with I/O devices and standard I/O interfaces.
4	Explain performance issues in processor and memory design of a digital computer.
5	Classify the hierarchical memory system including cache memories and virtual memory.
6	Infer processor performance improvement using instruction level parallelism

Course Outcomes:

At the end of course, students will attain an ability to:

1	Describe basic structure of the computer system.
2	Demonstrate the arithmetic algorithms for solving ALU operations.
3	Describe instruction level parallelism and hazards in typical processor pipelines.
4	Describe superscalar architectures, multi-core architecture and their advantages
5	Demonstrate the memory mapping techniques.
6	Identify various types of buses, interrupts and I/O operations in a computer system.

Subject code:**CSC405**	Subject**: Operating System**	Credits:04

Course Objective:

At the end of course, student should be able to:

1	Introduce basic concepts and functions of operating systems.
2	Classify the concept of process, thread and resource management.
3	Discus the concepts of process synchronization and deadlock.
4	Illustrate various Memory and File management techniques.
5	Explain various IO management techniques.
6	Differentiate different operating systems.

Course Outcomes:

At the end of course, students will attain an ability to:

1	Understand role of Operating System in terms of process, memory, file and I/O manageme
2	Explain and analyze the concept of a process, thread, mutual exclusion and deadlock.
3	Evaluate performance of process scheduling algorithms and IPC.
4	Identify and analyze the concepts of memory management techniques.
5	Determine the performance of memory allocation and replacement techniques.
6	Implement and analyze different techniques of file and I/O management.

Class: TE

Subject code:**CPC603**	Subject**: Distributed Databases**	Credits:04

Course Objective:

At the end of course, student should be able to:

1	Enhance the previous knowledge of database systems by deepening the understanding of the theoretical and practical aspects of the database technologies.
2	Identify the need for distributed database technology to tackle deficiencies of the centralized database systems.
3	Understand basic principles and implementation techniques of distributed database systems.
4	Identify architecture, design issues and integrity control of distributed database.
5	Understand query processing and optimization, transactions, and concurrency control.
6	Understand basics of XML and how it can be used for data integration. Build simple XML.

Course Outcomes:

At the end of course, students will attain an ability to:

1	Analyze currently available models, technologies and approaches to build distributed database systems and services. Differentiate the different database systems and integrate them.
2	Construct simple and moderately advanced database queries using Structured Query Language (SQL).
3	Build XML for schema integration.
4	Provides solution for heterogeneous database
5	Apply learned skills to solving practical database related tasks
6	Design and implement distributed database for enterprise application.

Subject code:**CSC601**	Subject: **Software Engineering**	Credits:04

Course Objective:

At the end of course, student should be able to:

1	Give the knowledge of software engineering discipline.
2	Apply analysis, design and testing principles to software project development.
3	Demonstrate and evaluate real time projects with respect to software engineering principles.
4	Identify requirements and apply process model to selected case study.
5	Analyze and design models for the selected case study using UML modeling.
6	Use various software engineering tools.

Course Outcomes:

At the end of course, students will attain an ability to:

1	Understand and demonstrate basic knowledge in software engineering.
2	Identify requirements, analyze and prepare models.
3	Plan, schedule and track the progress of the projects.
4	Design & develop the software projects.
5	Identify risks, manage the change to assure quality in software projects.
6	Apply testing principles on software project and understand the maintenance concepts.

Subject code:**CPC601**	Subject: **System Programming and Compiler Construction**	Credits:04

Course Objective:

At the end of course, student should be able to:

1	Demonstrate the role and functioning of various system programs over application program.
2	Explain the functioning of assembler, macroprocessor.
3	Illustrate to initiate an understanding of compilers in general and brief about phases of compiler.
4	Determine the theoretical framework for optimizing the code.
5	Describe different Intermediate Code Generation techniques.
6	Familiarize and encourage the students to use various software tools for Developing System programs.

Course Outcomes:

At the end of course, students will attain an ability to:

1	Describe different system software.
2	Design assembler and macro-processor.
3	Use Lex tool for generating lexical analyzer and design new language structures with the help of grammars
4	Apply optimization principles on given code.
5	Identify role of Intermediate Code Generation in connection with language designing
6	Recognize various parser types and use YACC.

Class: BE

Subject code:**CPC801**	Subject :**Data warehousing & Mining**	Credits:04

Course Objective:

At the end of course, student should be able to:

1	Identify the methodology of engineering legacy databases for data warehousing.
2	Generalize data mining to derive business rules for decision support systems
3	Identify the data, identify the problems, and choose the relevant models and algorithms to apply
4	Describe business intelligence for an enterprise
5	Generalize web enabled data warehouse.
6	Use the research in data warehousing and data mining

Course Outcomes:

At the end of course, students will attain an ability to:

1	Generalize and implement classical algorithms in data mining and data warehousing
2	Generalize the strengths and weaknesses of the algorithms
3	Identify the application area of algorithms, and apply them
4	Learn data mining techniques as well as methods in integrating.
5	Interpreting the data sets and improving effectiveness, efficiency and quality for data
6	Design application for social and technical task.

Subject code:**CPC802**	Subject : **Human Machine Interaction**	Credits:04

Course Objective:

At the end of course, student should be able to:

1	Choose the good interface design.

2	Explain the importance of human psychology in designing good interfaces
3	Use HMI in their day – to – day activities
4	Invent creativity in each student – build innovative applications that are user friendly.
5	Interrelate research in Machine Interface Design
6	Classify about input and output devices .

Course Outcomes:

At the end of course, students will attain an ability to:

1	Design user centric interfaces.
2	Develop innovative and user friendly interfaces.
3	Implement HMI in their day-to-day activities
4	Define existing interface designs, and improve them.
5	Illustrate application for social and technical task.
6	Distinguish input and output devices .

Subject code: **CPE8031**	Subject : **Machine Learning**	Credits:04

Course Objective:

At the end of course, student should be able to:

1	Express the basic concepts and techniques of Machine Learning.
2	Classify with regression methods.
3	Identify different classification methods
4	Implement different clustering methods
5	Demonstrate Dimensionality reduction Techniques
6	Use concept of SVM

Course Outcomes:

At the end of course, students will attain an ability to:

1	Gain knowledge about basic concepts of Machine Learning
2	Identify machine learning techniques suitable for a given problem
3	Solve the problems using various machine learning techniques
4	Categorise Dimensionality reduction techniques.
5	Design application using machine learning techniques
6	Implement SVM .

Subject code: **CPC803**	Subject: **Parallel and Distributed Systems**	Credits:04

Course Objective:

At the end of course, student should be able to:

1	Explain students with contemporary knowledge in parallel and distributed systems
2	Make students understand with skills to analyze and design parallel and distributed applications.
3	Express master skills to measure the performance of parallel and distributed algorithms
4	Develop and apply knowledge of parallel and distributed computing techniques and methodologies.
5	Know performance measures for parallel systems.
6	Classify taxonomies of parallel systems.

Course Outcomes:

At the end of course, students will attain an ability to:

1	Categories the principles and concept in analyzing and designing the parallel and distributed system.
2	Make about ways to parallelize problems.
3	Gain an appreciation on the challenges and opportunities faced by parallel and distributed systems.
4	Implement the middleware technologies that support distributed applications such as RPC, RMI and object based middleware.
5	Improve the performance and reliability of distributed and parallel programs.
6	Use the application of fundamental Computer Science methods and algorithms in the development of parallel applications.