COURSE OUTCOMES (COs)

Course Outcomes (COs) describe what students can able to do after completion of the course.

Program : B.Tech-Computer Science and Engineering	Academic Year : 2021-22	Semester : I & II

S.No	Year/ Sem	Course Code	Course Name	Course Outcomes (After completion of the course student can able to :)
1	II/I	CS301ES	Analog and Digital Electronics	**CO1:** Acquire knowledge of electrical characteristics of ideal and practical diodes under forward and reverse bias to analyze and design diode application circuits such as rectifiers.
				CO2: Utilize operational principles of bipolar to derive appropriate small-signal models and use them for the analysis of basic circuits.
				CO3: Understand the basic concept of number systems, Boolean algebra principles.
				CO4: Understand minimization techniques for Boolean algebra.
				CO5: Analyze Combination logic circuit such as multiplexers, adders, decoders.
				CO6: Understand about synchronous and asynchronous sequential logic circuits.
2	II/I	CS302PC	Data Structures	**CO1:** Choose appropriate data structures to represent data items.
				CO2: Analyze the time and space complexities of algorithms.
				CO3: Design programs using a variety of data structures such as stacks, queues, hash tables, binary trees, search trees, heaps, graphs and B-trees.
				CO4: Analyze and implement various kinds of searching and sorting methods.
				CO5: Describe how arrays, linked structures, stacks, queues, trees, and graphs are represented in memory.
				CO6: Design programs using c language.

3	II/I	MA303BS	Computer Oriented Statistical Methods	**CO1:** Describe the conditional probability and state the Baye's theorem and solve its applications.
				CO2: Solve the problems on random variables and compare the difference between probability distributions.
				CO3: Construct the area of normal curve and distinguish binominal, gamma and exponential distributions.
				CO4: Formulate the sampling distribution of means and sampling distribution of variances.
				CO5: Classify the methods of estimations and errors of estimations.
				CO6: Identify the test of hypothesis for single mean , proportion and difference between the means , proportions and learn the concept of Markov process and different types of states.
4	II/I	CS304PC	Computer Organization and Architecture	**CO1:** Describe basics of computer organization and register transfer languages and micro operations such as arithmetic, logic, shift micro operations.
				CO2: Explain about computer instructions, computer registers and instruction cycle and interrupt cycle.
				CO3: Describe the design of control unit with address sequencing and microprogramming concept and CPU with instruction formats, addressing modes and types of instructions such as data transfer, manipulation and program control.
				CO4: Describe various data representations and explain how arithmetic operations are performed by computer.
				CO5: Illustrate the concepts of Input-Output Organization and Memory Organization.
				CO6: Describe the parallel processing and multiprocessors concept.
5	II/I	CS305PC	Object Oriented Programming using C++	**CO1:** Develop application for a range of problem using object oriented programming concepts.
				CO2: Construct programs on various methodology using class and object.
				CO3: Illustrate the different forms of inheritance.
				CO4: Construct and develop programs with reusability using polymorphism and virtual function.
				CO5: Develop programs for file handling.
				CO6: Identify and can handle exceptions in programming.

6	II/I	CS306ES	Analog and Digital Electronics Lab	CO1: Know the characteristics of various components.
				CO2: Understand the utilization of components.
				CO3: Design and analyze small signal amplifier circuits.
				CO4: Postulates of Boolean algebra and to minimize combinational functions.
				CO5: Design and analyze combinational and sequential circuits.
				CO6: Known about the logic families and realization of logic gates.
7	II/I	CS307PC	Data Structures Lab	CO1: Summarize different categories of data Structures.
				CO2: Analyze the performance of an algorithm.
				CO3: Develop C programs for computing control statements.
				CO4: Understand C programs for computing arrays, functions, pointers, strings.
				CO5: Understand stacks, queues and linked lists.
				CO6: Ability to Implement searching and sorting algorithms.
8	II/I	CS308PC	IT Workshop Lab	CO1: Identify the parts of CPU and able to learn knowledge for computer assembling and disassembling.
				CO2: Resolve the Software installation.
				CO3: Ability to solve the trouble shooting problems.
				CO4: Apply the techniques and netiquettes while using internet.
				CO5: Model a web page by using HTML
				CO6: Apply the tools for preparation of PPT, Documentation and budget sheet etc.
9	II/I	CS309PC	C++ Programming Lab	CO1: Identify and able to develop applications for a range of problems on operators such as scope resolution and new delete memory allocation.
				CO2: Write basic concepts on initializing and displaying contents of class member and structure of class.
				CO3: Develop basic programs on inheritance.
				CO4: Identify and able to do programs to use pointer for both base and derived classes and call the member function by using Virtual keyword.
				CO5: Develop basic programs on console i/o operations.
				CO6: Develop programs on arrays and inline functions.

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10	II/I	*MC309	Gender Sensitization Lab	CO1: Develop sensibility with regard to issues of gender in contemporary India.	
				CO2: Provide a critical perspective on the socialization of men and women.	
				CO3: Determine information about some key biological aspects of genders.	
				CO4: Debate on the politics and economics of work.	
				CO5: Reflect critically on gender violence.	
				CO6: Expose more egalitarian interactions between men and women.	
11	II/II	CS401PC	Discrete Mathematics	CO1: Understand and construct precise mathematical proofs.	
				CO2: Use logic and set theory to formulate precise statements.	
				CO3: Analyze and solve counting problems on finite and discrete structures.	
				CO4: Describe and manipulate sequences.	
				CO5: Apply graph theory in solving computing problems.	
12	II/II	SM402MS	Business Economics & Financial Analysis	CO1: The students will understand various forms of Business and the impact of economic variables on the business.	
				CO2: Understand the significance of elasticity of demand and its forecasting, law of demand and its exceptions and supply analysis.	
				CO3: Understand production analysis function with different variables and cost analysis functions.	
				CO4: To adopt the principles of accounting to record, classify and summarize various transactions in books of accounts for preparation of final accounts.	
				CO5: Understand the Ratio analysis to give an idea about financial forecasting, financial planning, controlling and decision making.	
				CO6: Understand the implementation of different structures of markets covering how price-output is determined under different market structures.	
13	II/II	CS403PC	Operating Systems	CO1: Describe operating system goals and functions.	
				CO2: Get the knowledge of process, various CPU scheduling algorithms and synchronization.	
				CO3: Analyze the methods for handling deadlocks.	
				CO4: Understand the memory management and several page replacement algorithms.	
				CO5: Classify the storage management and file system implementation.	
				CO6: Express the various system protection methods.	

14	II/II	CS404PC	Database Management Systems	**CO1:** Identify and understand the underlying concepts of database techniques and query a database using DML/DDL commands and able to design entity relationship diagrams.
				CO2: Explain the concepts of relational data model, entity-relationship model and relational database design.
				CO3: Apply relational algebra and calculus, understands the use of sql and learns sql syntax.
				CO4: Develop and improve database design by normalization.
				CO5: Define transaction and understand its properties. Learns techniques for controlling the consequences of concurrent data access.
				CO6: Describe basic database storage structures and access techniques: file and page organisations, index methods including B tree and Hashing.
15	II/II	CS405PC	Java Programming	**CO1:** Analyze Object Oriented Programming Concepts.
				CO2: Develop the Abstract Classes and know the importance of the Inheritance, Encapsulation and Polymorphism.
				CO3: Implementing interfaces and creating packages and create files and directories using g Java I/O Streams.
				CO4: Get the importance of Exception handling and knowledge of multithreading and java collection classes concepts.
				CO5: Design web applications by using applets and swings.
				CO6: Recognize event handling concepts in java.
16	II/II	CS406PC	Operating Systems Lab	**CO1:** Develop programs on CPU scheduling algorithms.
				CO2: Construct the programs on file organisation and file allocation techniques.
				CO3: Solve deadlock avoidance and deadlock prevention using Bankers' algorithm.
				CO4: Classify and construct programs on memory management techniques.
				CO5: Develop application programs using system calls.
				CO6: Describe inter processes communication between the processes using semaphores and named pipes.
				CO1: Identify and understand the underlying relational data model, entity-relationship model and relational database design.

17	II/II	CS407PC	Database Management Systems Lab	**CO2:** Develop and improve database design by normalization.
				CO3: Identify and understand the underlying concepts of database techniques and query a database using DML/DDL commands.
				CO4: Identify and understands the use of sql and learns sql syntax of set difference operators and joins.
				CO5: Write basic database query using Aggregate operators.
				CO6: Write basic database on Triggers and procedures.
18	II/II	CS408PC	Java Programming Lab	**CO1:** Construct the programs for Abstract classes, Inheritance and Interface.
				CO2: Write the program for Multithreading and Files operations.
				CO3: Prepare the programs for applets.
				CO4: Develop the basic applications by using Swing components.
				CO5: Construct the programs for collection Framework.
				CO6: Recognize the concept of Event Listeners and implements the Event components.
19	II/II	*MC409	Constitution of India	**CO1:** Understand meaning, features, characteristics of constitution law and constitutionalism.
				CO2: Describe fundamental rights, fundamental duties and its legal status.
				CO3: Describe The constitution powers and status of the President of India.
				CO4: Understand Emergency Provisions: National Emergency, President Rule, And Financial Emergency.
				CO5: Understand Fundamental Right to Equality, Fundamental Right to certain Freedom under Article 19.
				CO6: Describe the Scope of the Right to Life and Personal Liberty under Article 21.
20	III/I	CS501PC	Formal Languages & Automata Theory	**CO1:** Understand the basic properties of formal languages and grammars.
				CO2: Differentiate regular, context-free and recursively enumerable languages.
				CO3: Make grammars to produce strings from a specific language.
				CO4: Acquire concepts relating to the theory of computation and computational models including decidability and intractability.

				CO5: Understand Importance of enumerable languages.
				CO6: Analyze Automata Theory.
21	III/I	CS502PC	Software Engineering	CO1: Analyze various data base techniques for data warehouse and able to perform OLAP Operations.
				CO2: Ability to perform the Pre-processing of data and apply mining techniques on data.
				CO3: Understand frequent set and apply association Rule on Data Set.
				CO4: Evaluate the data mining ask like Classification, Regression Clustering on large data set.
				CO5: Ability to solve real world Problems in business and scientific information using data mining.
				CO6: Ability to understand clustering Concepts in the real world and apply Various clustering techniques.
22	III/I	CS503PC	Computer Networks	CO1: Gain the knowledge of the basic computer network technology.
				CO2: Gain the knowledge of the functions of each layer in the OSI and TCP/IP reference model.
				CO3: Obtain the skills of subnetting and routing mechanisms.
				CO4: Familiarity with the essential protocols of computer networks, and how they can be applied in network design and implementation.
				CO5: Analyze Application Layer.
				CO6: Analyze transport Layer.
23	III/I	CS504PC	Web Technologies	CO1: Construct the web applications using HTML language.
				CO2: Explain server side scripting with PHP language.
				CO3: Identify well formed/valid XML documents.
				CO4: Develop server side applications using servlets.
				CO5: Get the knowledge on Java Server Pages.
				CO6: Evaluate the validation of forms using Java Script and Explain AJAX.
24	III/I	CS515PE	Principles of Programming languages (Professional Elective-I)	CO1: Explain the basic concepts of Principles of Programming Languages.
				CO2: Understand Names, Variables, Binding, Data Types, Control Structures in Programming Languages.
				CO3: Analyze the fundamentals of sub-programs and Implementation of Sub Programs.
				CO4: Explain the concept of Abstract Data Types.
				CO5: Understand Concurrency, Java Threads, Exception Handling, Event Handling concepts in Java and C##.

				CO6: Differentiate Functional Programming Languages, Logic Programming Languages, Scripting Language.
25	III/I	CS524PE	Distributed Database (Professional Elective –II)	**CO1**: Understand the Architecture of distributed DBMS Architecture.
				CO2: Describe Query processing and decomposition in distributed databases.
				CO3: Explain Properties of transaction, Types of transaction.
				CO4: Analyze deadlock management
				CO5: Understand reliability and measures concepts in distributed databases.
				CO6:Describe distributed object database management system.
26	III/I	CS505PC	Software Engineering Lab	**CO1:** Understand the software engineering methodologies involved in the phases for project development.
				CO2: Gain knowledge about open source tools used for implementing software engineering methods.
				CO3: Exercise developing product-start-ups implementing software engineering methods.
				CO4: Study the problem and identify the project scope, Objectives and Infrastructure.
				CO5: Identify the modules of the project and differentiate the functional and non-functional requirements.
				CO6: Create prototypes for the projects.
27	III/I	CS506PC	Computer Networks & Web Technologies Lab	**CO1:** Implement data link layer farming methods.
				CO2: Analyze error detection and error correction codes.
				CO3: Implement and analyze routing and congestion issues in network design.
				CO4: Implement Encoding and Decoding techniques used in presentation layer.
				CO5: To be able to work with different network tools.
28	III/I	EN508HS	Advanced Communication Skills Lab	**CO1:** Speak effectively.
				CO2: Express and communicate fluently and appropriately in social professional contexts.
				CO3: Develop the comprehensive ability through English language enables the students in understanding and assimilating other engineering subjects.
				CO4: The awareness of English lab enriches their communication and soft skills contributing to their overall development and success.
				CO5: Draft various letters and reports for all official

				purpose.
				CO6: Take part in social and professional communication.
29	III/I	*MC510	Intellectual Property Rights	**CO1:** Analyze different types of intellectual property.
				CO2: Express function of trademarks.
				CO3: Understand law of copy rights.
				CO4: Understand law of patents.
				CO5: Explain trade secrets.
				CO6: Understand the development of intellectual Prop.
30	III/II	CS601PC	Machine Learning	**CO1:** Understand perspectives and issues in machine learning and decision tree learning.
				CO2: Understand artificial neural network problem and evaluation hypotheses.
				CO3: Explain Baysean learning.
				CO4: Differentiate computational learning and instance based learning.
				CO5: Describe Genetic algorithms.
				CO6: Analyze different analytical learning approaches.
31	III/II	EC600OE	Fundamentals of IOT (Open Elective-I)	**CO1:** Understand the basics of Internet of Things.
				CO2: Differentiate between IoT and M2M.
				CO3: Analyze the introduction to Python Programming, Raspberry Pi.
				CO4: Implement IoT with Raspberry Pi.
				CO5: Describe SDN, Data Handling, Analytics.
				CO6: Explain Cloud Computing. Describe different case studies on Agriculture and Health Care.
32	III/II	CS602PC	Compiler Design	**CO1:** Describe structure of a compiler and basics of programming languages.
				CO2: Design Lexical analyzer generator by using regular expressions and finite automata.
				CO3: Design and implement LL and LR parsers and use YACC Tool for developing a parser.
				CO4: Explain the applications of SDT and different types of intermediate-code generation.
				CO5: Identify the storage organization used to support the run-time environment of a program and effectively generate machine codes.
				CO6: Apply the several algorithms for collecting and optimizing the information using data flow analysis.

33	III/II	CS603PC	Design and Analysis of Algorithms	**CO1:** Analyze the Performance of an Algorithm.
				CO2: Solve the problems using divide and conquer approach.
				CO3: Develop constraint satisfied solutions using backtracking.
				CO4: Evaluate feasible solutions using Greedy method.
				CO5: Developing solutions to problems using dynamic programming.
				CO6: Define np hard and no complete problems.
34	III/II	CS615PE	Software Testing Methodologies (Professional Elective – III)	**CO1:** Explain about purpose of testing.
				CO2: Analyze transaction flow testing.
				CO3: Describe Paths, Path products and Regular expressions.
				CO4: Understand logic based testing.
				CO5: Explain about state graphs.
				CO6: Explain about Graph Matrices and Application like JMeter.
35	III/II	CS604PC	Machine Learning Lab	**CO1:** Understand complexity of Machine Learning algorithms and their limitations.
				CO2: Understand modern notions in data analysis-oriented computing.
				CO3: Applying common Machine Learning algorithms in practice and implementing their own.
				CO4: Perform experiments in Machine Learning using real-world data.
36	III/II	CS605PC	Compiler Design Lab	**CO1:** Develop client-server application using web technologies.
				CO2: Introduce server-side programming with Java servlets and JSP.
				CO3: Understand the various phases in the design of a compiler.
				CO4: Understand the design of top-down and bottom-up parsers.
				CO5: Understand syntax directed translation schemes.
				CO6: Introduce lex and yacc tools.
37	III/II	CS625PE	Software Testing Methodologies (Professional Elective – III Lab)	**CO1:** Explain about purpose of testing.
				CO2: Analyze transaction flow testing.
				CO3: Describe Paths, Path products and Regular expressions.
				CO4: Understand logic based testing.
				CO5: Explain about state graphs.
				CO6: Explain about Graph Matrices and Application.

38	III/II	*MC609	Environmental Science	**CO1:** Get the information about ecosystem and also about its functions like Food chain, Ecological pyramids etc.,
				CO2: Get the knowledge about the different types of resources like land, water, mineral and energy and also about the effects of environment by the usage of these resources.
				CO3: Gain the knowledge about the ecosystem diversity, its values and also about the importance of the endemic species and different techniques involved in its conservation
				CO4: Gain the knowledge about the different types of pollutions and their control technologies, Waste water treatment, Bio medical waste management etc.,
				CO5: Get the complete information about EIA-Environmental Impact Assessment,
				CO6: Gain the knowledge about environmental policies and regulations.
39	IV/I	CS701PC	Cryptography & Network Security	**CO1:** Understand various attacks on the network and understanding the need for security.
				CO2: Apply various classical encryption techniques on messages and analyze various security services and mechanisms.
				CO3: Compare and contrast symmetric and asymmetric key cryptographic systems.
				CO4: Describe the cryptographic hash functions, message authentication codes and various key management and distribution techniques.
				CO5: Explain different protocols like SSL, TLS, HTTPS, SSH and various wireless network standards.
				CO6: Analyze how PGP and S/MIME is used to protect messages transmitted through E- Mail and explains IPSEC.
40	IV/I	CS702PC	Data Mining	**CO1:** Analyze various data base techniques for data warehouse and able to perform OLAP Operations.
				CO2: Ability to perform the Pre-processing of data and apply mining techniques on data.
				CO3: Understand frequent set and apply association Rule on Data Set.
				CO4: Evaluate the data mining ask like Classification, Regression Clustering on large data set.
				CO5: Ability to solve real world Problems in business and scientific information using data mining.
				CO6: Ability to understand clustering Concepts in the real world and apply Various clustering techniques.
41	IV/I	CS714PE	Cloud Computing (Professional Elective –IV)	**CO1**: Distinguish different computing paradigms.
				CO2: Explain the fundamentals of cloud computing.
				CO3: Understand the cloud computing architecture.
				CO4: Analyze process of migrating Application to cloud.

				CO5: Distinguish cloud service models.
				CO6: Understand cloud service providers.
42	IV/I	CS722PE	Real time systems (Professional Elective –V)	**CO1**: Explain real-time concepts such as preemptive multitasking, task priorities, priority inversions, mutual exclusion, context switching, and synchronization, interrupt latency and response time, and semaphores.
				CO2: Describe how a real-time operating system kernel is implemented.
				CO3: Explain how the real-time operating system implements time management.
				CO4: Discuss how tasks can communicate using semaphores, mailboxes, and queues.
				CO5: Implement a real-time system on an embedded processor.
				CO6: Work with real time operating systems like RT Linux, Vx Works, MicroC /OSII, Tiny Os.
43	IV/I	MT701OE	Principles of Entrepreneurship (Open Elective – II)	**CO1**: Understand basics of Entrepreneurship.
				CO2: Explain financing and managing the new ventures.
				CO3: Understand schemes and functions of different corporations.
				CO4: Explain industrial final support from different corporations.
				CO5: Describe production and marking management.
				CO6: Discuss labour legislation, Provision of health.
44	IV/I	CS703PC	Cryptography & Network Security Lab	**CO1**: Understand various attacks on the network and understanding the need for security.
				CO2: Apply various classical encryption techniques on messages and analyze various security services and mechanisms.
				CO3: Compare and contrast symmetric and asymmetric key cryptographic systems.
				CO4: Describe the cryptographic hash functions, message authentication codes and various key management and distribution techniques.
				CO5: Explain different protocols like SSL, TLS, HTTPS, SSH and various wireless network standards.
				CO6: Analyze how PGP and S/MIME is used to protect messages transmitted through E- Mail and explains IPSEC.
45	IV/I	CS704PC	Industrial Oriented Mini Project	**CO1**: Apply fundamental concepts and methods of their engineering field.
				CO2: Use effectively oral, written and visual communication.

				CO3: Understand working with teams.
46	IV/I	CS705PC	Seminar	CO1: Understand advanced research methodologies in the field of computer science engineering.
				CO2: Demonstrate their understanding of discussions and spark further discussion.
				CO3: Identify understand and discuss current issues in the engineering field.
47	IV/I	CS706PC	Project Stage - I	CO1: Apply fundamental concepts and methods of their engineering field.
				CO2: Use effectively oral, written and visual communication.
				CO3: Understand working with teams.
48	IV/II	SM801MS	Organization al Behaviour	CO1: Define organization Behaviour.
				CO2: Explain cognitive processes.
				CO3: Differentiate communications in organizations.
				CO4: Understand types of conflict.
				CO5: Differentiate power-empowerment.
				CO6: Understand goal setting, Quality of life.
49	IV/II	CS812PE	Distributed Systems (Professional Elective – VI)	CO1: Characterize distributed systems.
				CO2: Describe OS layer and OS architecture.
				CO3: Explain peer to peer systems.
				CO4: Describe distributed mutual exclusion.
				CO5: Distinguish transactions and Concurrency.
				CO6: Explain the concept of replication in distributed systems.
50	IV/II	MT802OE	Total Quality Management (Open Elective – III)	CO1: Understand what is Total Quality Management
				CO2: Analyze the concept of customer focus and Satisfaction.
				CO3: Analyze TQM organization.
				CO4: Explain seven tools of TQM.
				CO5: Understand the cost of quality.
				CO6: Understand the ISO 9000 Standard.
51	IV/II	CS802PC	Project Stage - II	CO1: Learn to work as a team and to focus on getting a working project done within a stipulated period of time.
				CO2: Demonstrate the understanding of impact of engineering solutions on the society.
				CO3: Plan, analyze, design and implement the idea using different tools.

HOD/CSE

PRINCIPAL

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