Course Outcomes (CO) - Department of Computer Science Engineering (Data Science)

Course Outcomes are narrower statements that describe what students are expected to know, and be able to do at the end of each course/subject. While the POs define the departmental outcomes, the COs are more oriented towards the subjects and are mostly defined by the faculties consulting higher authorities. The COs are more like statements that relate to the skills, knowledge, and behavior the students acquire as they go through a specific course within a program. They collectively contribute to the program outcomes. They are to be mapped to the POs, and not necessarily to a single one.

Course Outcomes from Semester 3 onwards are mentioned below

II Year/III Semester

Subject Name: Advanced Engineering Mathematics **Subject Code: 3CD1-01**

SUBJECT Course Outcomes	
CO1	Compute the discrete and continuous random variables, probability distributions, expectations, moments, MGF, mean and variances.
CO2	Define and explain the different statistical distributions like Binomial, Poisson, Normal, Uniform, Exponential Distribution and to compute the method of least squares, correlation and regression
CO3	To apply the theory of optimization methods to develop and for solving various types of optimization problems.
CO4	To make aware of the linear programming problem by solving techniques theoretically as well as applications of Linear Programming problem.
CO5	To study the numerical interpolations for equal and unequal intervals, numerical differentiation, integration and solving ordinary differential equations by numerical methods.

Subject Name: Digital Electronics **Subject Code: 3CD4-02**

SUBJECT Course Outcomes	
CO1	Have a thorough understanding of the fundamental concepts and techniques used in digital electronics
CO2	To understand and examine the structure of various number systems and its application in digital design.
CO3	The ability to understand, analyze and design various combinational and sequential circuits.
CO4	Ability to identify basic requirements for a design application and propose a cost-effective solution.
CO5	The ability to identify and prevent various hazards and timing problems in a digital design.

Subject Name: Data Structures & Algorithms **Subject Code: 3CD4-03**

SUBJECT Course Outcomes	
CO1	Understanding the fundamental analysis and time complexity for a given problem.
CO2	Articulate linear & non data structures and legal operations permitted on them.
CO3	Applying a suitable algorithm for searching and sorting.
CO4	Understanding graph algorithms, operations, and applications and the importance of hashing.
CO5	Application of appropriate data structures to find solutions to practical problems.

Subject Name: Object Oriented Programming **Subject Code: 3CD4-04**

SUBJECT Course Outcomes	
CO1	Understand the requirement and benefits of object-oriented programming languages.
CO2	Understand basic concepts & structure of object-oriented programming language using C++.
CO3	Understand the memory management in object-oriented paradigm.
CO4	Understand and implement polymorphism using different ways such as function and operator overloading.
CO5	Learn and implement exception handling mechanism for robust software development in C++.

Subject Name: Software Engineering **Subject Code: 3CD4-05**

SUBJECT Course Outcomes	
CO1	Identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics.
CO2	Apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors.
CO3	Communicate effectively with a range of audiences.

Subject Name: Introduction to Data Science **Subject Code: 3CD4-06**

SUBJECT Course Outcomes	
CO1	Know the Essential concepts of Artificial Intelligence and its real time use.
CO2	Solve basic AI based problems.
CO3	Select appropriately from a range of techniques when implementing AI systems.

Subject Name: Data Structures & Algorithms Lab **Subject Code: 3CD4-21**

SUBJECT Course Outcomes	
CO1	Be able to design and analyze the time and space efficiency of the data structure.
CO2	Understand the concept of static & Dynamic memory management.
CO3	Be capable to identity the appropriate data structure for given problem.
CO4	Have practical knowledge on the applications of data structures.

Subject Name: Object Oriented Programming using C++ Lab **Subject Code: 3CD4-22**

SUBJECT Course Outcomes	
CO1	Hands on practice of basic C++ syntax
CO2	Hands on practice of class, object and abstraction
CO3	Hands on practice of inheritance using class hierarchy
CO4	Hands on practice of function and operator overloading, Templates
CO5	Hands on practice of exception handling mechanism for robust software development in C++

Subject Name: Linux and Shell Programming Lab **Subject Code: 3CD4-23**

SUBJECT Course Outcomes	
CO1	To experiment with various basic commands, redirection and input/output of UNIX based operating systems
CO2	To develop shell scripts for various built-in commands of UNIX
CO3	To experiment with fundamental concepts of programming like loops, conditions, operators etc specific to Shell Programming
CO4	To develop shell scripts to perform tasks varying from simple to complex level

Subject Name: Digital Electronics Lab **Subject Code: 3CD4-24**

SUBJECT Course Outcomes	
CO1	Understand different Number systems, Codes, Logic Gates, Boolean laws & theorems
CO2	Simplify the Boolean functions to the minimum number of literals
CO3	Design & implement different types of combinational logic circuits using Logic gates
CO4	Design & implement different types of sequential logic circuits using Flip Flops
CO5	Design & implement different types of Counters, Registers, and Programmable Logic Devices

II Year/IV Semester

Subject Name: Discrete Mathematical Structure **Subject Code: 4CD1-01**

SUBJECT Course Outcomes	
CO1	Understand the language of logic
CO2	Understand the concept of sets, relation, function and counting principle
CO3	Understand different terminologies and theorem of Graph Theory
CO4	Understand Algebraic Structures.

Subject Name: Microprocessor and Interfaces **Subject code: 4CCD4-02**

SUBJECT Course Outcomes	
CO1	Basic understanding of 8085 microprocessor, timing diagram and memory mapping.
CO2	Understand ISA for 8085 and also How to design ISA for some other microprocessors.
CO3	Write basic program in assembly language and concept of other Programmable peripheral devices.
CO4	Interface I/O devices, interrupt controller and DMA.
CO4	Basic understanding of design ISA and further design their own processor.

Subject Name: Theory of Computation **Subject Code: 4CD4-03**

SUBJECT Course Outcomes	
CO1	Able to classify Language and Grammar in Type0, Type1, Type2 and Type3. Design the Grammar for given string or languages.
CO2	Able to design the FA, PDA and TM for given string and languages.
CO3	Able to convert PDA to CFG. Able to apply the pumping lemma for regular languages
CO4	Able to demonstrate that a grammar is ambiguous. Simplification of the CFG, representations of grammars in CNF and GNF.
CO5	Understanding the concepts of LBA, NP Complete and NP Hard.

Subject Name: Database Management System **Subject Code: 4CD4-04**

SUBJECT Course Outcomes	
CO1	Describe DBMS architecture, physical and logical database designs, database models, entity-relationship model.
CO2	Understand relational algebra, relational calculus importance and query writing
CO3	Apply Structured query language (SQL) for database definition, database manipulation, data control.
CO4	Understanding of normalization theory and apply it to normalize databases.
CO5	Understand various transaction processing, concurrency control mechanisms and database protection mechanisms.

Subject Name: Introduction to Python Programming **Subject Code: 4CD4-05**

SUBJECT Course Outcomes	
CO1	Know the Essential concepts of Python Programming and its real time use
CO2	Design algorithms and source code
CO3	Use of suitable data structure and logic for problem solving.

Subject Name: Introduction to Java Programming **Subject Code: 4CD4-06**

SUBJECT Course Outcomes	
CO1	Understand the features of Java such as operators, classes, objects, inheritance, packages and exception handling
CO2	Learn latest features of Java like garbage collection, Console class, Network interface, APIs
CO3	Acquire competence in Java through the use of multithreading, applets
CO4	Get exposure to advance concepts like socket and database connectivity

Subject Name: Database Management Systems Lab **Subject Code: 4CD4-21**

SUBJECT Course Outcomes	
CO1	Installation of Backend and front end
CO2	Writing DDL queries effectively
CO3	Writing advance DML queries in MySQL
CO4	Writing DCL queries, triggers and views
CO5	Developing a web-based or client server-based application

Subject Name: Microprocessor and Interfaces Lab **Subject Code: 4CD4-22**

SUBJECT Course Outcomes	
CO1	Ability to write assembly language program for data transfer and control instructions.
CO2	Ability to write assembly language program for Arithmetic calculation using register pair
CO3	Ability to Write assembly language program for interfacing with Programmable peripheral devices.
CO4	Assembly language programming for general purpose problems like traffic light controller, control the speed of step motor etc.
CO5	To make live projects using assembly language and interfacing with PPI and see outputs on CRO and other electronic devices.

Subject Name: Python Programming Lab **Subject Code: 4CD4-23**

SUBJECT Course Outcomes	
CO1	Demonstrate and understanding of programming language concepts
CO2	Identify and abstract the programming task involved for a given problem
CO3	Design and develop modular programming skills
CO4	Trace and debug a program.

Subject Name: Java Programming Lab **Subject Code: 4CD4-24**

SUBJECT Course Outcomes	
CO1	Implement the features of Java such as operators, classes, objects, inheritance, packages and exception handling
CO2	Design problems using latest features of Java like garbage collection, Console class, Network interface, APIs
CO3	Develop competence in Java through the use of multithreading, Applets etc
CO4	Apply advance concepts like socket and database connectivity, and develop project based on industry orientation