Sister Nivedita University

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School:	*School of Engineering*
Department:	*Computer Science*
Program:	*B.Tech in CSE*
Academic Year:	*2023-2024*
Course Duration:	*4 Years*

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1. Program Educational Objectives (PEO)

i. PEO for B. Tech in CSE

PEO1:
Professional Excellence: Graduates of the B. Tech program in Computer Science and Engineering will demonstrate proficiency in applying fundamental principles, problem-solving skills, and innovative approaches to address real-world challenges in the field of computing. They will exhibit a commitment to lifelong learning and professional development, staying abreast of emerging technologies and evolving industry trends.

PEO2:
Leadership and Collaboration: Graduates will possess effective communication, teamwork, and leadership skills essential for interdisciplinary collaboration and successful project management. They will demonstrate the ability to work collaboratively in diverse teams, adapt to dynamic work environments, and lead initiatives that contribute to the advancement of technology and society.

PEO3:
Ethical and Social Responsibility: Graduates will uphold high ethical standards, integrity, and social responsibility in their professional practices. They will demonstrate awareness of the societal impact of technology and contribute to the ethical and sustainable development of computing solutions. They will engage in community service, promote inclusivity, and consider the broader ethical implications of their work on individuals, organizations, and society at large.

PEO4:
Global Perspective and Societal Impact: Graduates will recognize the global context of computing and its impact on society, economy, and environment. They will engage in lifelong learning to address societal challenges and contribute to sustainable development through the application of computing technologies in areas such as healthcare, education, Cybersecurity, environmental conservation, and social justice.

2. PEO-Departmental Mission Mapping

i. PEO-Mission map for B. Tech in CSE

	Mission 1	Mission 2	Mission 3	Mission 4
PEO1	3	2	1	2
PEO2	2	2	1	2
PEO3	1	1	3	2
PEO4	1	1	2	3

Highly Correlated: 3
Moderately Correlated: 2
Slightly Correlated: 1
Not Correlated: 0

3. PEO-PO Mapping

i. PEO-PO map for B. Tech in CSE

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
PEO1	2	3	2	2	2	0	0	0	0	0	0	1
PEO2	2	1	1	2	1	1	0	2	3	2	2	1
PEO3	0	2	0	0	0	2	2	2	1	2	2	1
PEO4	0	0	0	0	0	3	2	0	0	0	0	1

Highly Correlated: 3
Moderately Correlated: 2
Slightly Correlated: 1
Not Correlated: 0

4. List of Courses

First Year

SEMESTER-I

Sl No	Course Title	Code	Type	Credit	Type		
					L	T	P
1	**Discrete Mathematics**		MC	3	3	0	0
2	**Fundamentals of Computer Science & Problem Solving**		MC	4	4	0	0
3	**Digital Electronics**		MC	3	3	0	0
4	**Probability and Statistics**		NM	4	4	0	0
5	**Soft-Skill Development-I**		NV	1	1	0	0
6	**Anyone (Sports/Yoga/NCC/NSS) EAA-I**		NV	1	0	0	2
7	**Communicative English-I**		AEC	2	2	0	0
8	**Environmental Science-I**		VAC	2	2	0	0
9	**Fundamentals of Computer Science & Problem-Solving Lab**		MC	1	0	0	2
10	**Digital Electronics Lab**		MC	1	0	0	2
Total Credit				**22 Credit**			

SEMESTER-II

Sl No	Course Title	Code	Type	Credit	Type		
					L	T	P
1	**Linear Algebra**		MC	3	3	0	0
2	**Programming and data Structures**		MC	4	4	0	0
3	**Computer Organization**		MC	3	3	0	0
4	**Signal and Systems**		MC	3	3	0	0
5	**Soft-Skill Development-II**		NV	1	1	0	0
6	**MDC1: Selected by candidate from Other Discipline**		MDC	4	4	0	0
7	**Communicative English-II**		AEC	2	2	0	0
8	**Environmental Science-II**		VAC	2	2	0	0
9	**Programming and Data Structures Lab**		MC	1	0	0	2
10	**Computer Organization Lab**		MC	1	0	0	2
11	**Signals and Systems Lab**		MC	1	0	0	2
Total Credit				**25 Credit**			

Second Year

SEMESTER-III

Sl No	Course Title	Code	Type	Credit	Type		
					L	T	P
1	**Algorithm-I**		MC	3	3	0	0
2	**Computer Architecture**		MC	3	3	0	0
3	**Formal Language and Automata Theory**		MC	4	4	0	0
4	**Object Oriented Programming through C++**		MC	1	1	0	0
5	**Anyone (Sports/Yoga/NCC/NSS) EAA-II**		NV	1	0	0	2
6	**Soft-Skill Development-III**		NV	1	1	0	0
7	**MDC2: Selected by candidate from Other Discipline**		MDC	3	3	0	0
8	**SEC1: Entrepreneurship Skill Development**		SEC	3	3	0	0
9	**Foreign language-I**		AEC	2	2	0	0
10	**Algorithm-I Lab**		MC	1	0	0	2
11	**Computer Architecture Lab**		MC	1	0	0	2
12	**Object Oriented Programming Lab**		MC	2	0	0	4
Total Credit				**25 Credit**			

SEMESTER-IV

Sl No	Course Title	Code		Credit	Type		
					L	T	P
1	**Operating System**		MC	4	4	0	0
2	**Database Management System**		MC	4	4	0	0
3	**Artificial intelligence**		MC	4	4	0	0
4	**Algorithm II/ Compiler Design/ Optimization Techniques** / Computer Graphics		ME	3	3	0	0
5	**Soft-Skill Development-IV**		NV	1	1	0	0
6	**MDC3: Selected by candidate from Other Discipline**		MDC	2	2	0	0
7	**Foreign language-II**		AEC	2	2	0	0
8	**Human Values and Ethics**		VAC	2	2	0	0
9	**Operating Systems Lab**		MC	1	0	0	2
10	**Database Management System Lab**		MC	1	0	0	2
11	**Artificial Intelligence Lab**		MC	1	0	0	2
Total Credit				**25 Credit**			

THIRD Year

SEMESTER-V

Sl No	Course Title	Code		Credit	Type			
					L	T	P	S
1	**Computer Networks**		MC	4	4	0	0	0
2	**Software Engineering**		MC	4	4	0	0	0
3	**Digital Image Processing/Machine Learning**		ME	3	3	0	0	0
4	**NM Elective-I**		NM	4	4	0	0	0
5	**Soft-Skill Development-V**		NV	1	1	0	0	0
6	Mentored Seminar-I		NV	2	0	0	0	2
7	**SEC2: Current Programming Techniques**		SEC	3	3	0	0	0
8	**Computer Networks Lab**		MC	1	0	0	2	0
9	**Software Engineering Lab**		MC	1	0	0	2	0
10	**Digital Image Processing Lab /Machine Learning Lab**		ME	1	0	0	2	0
Total Credit				**24 Credit**				

SEMESTER-VI

Sl No	Course Title	Code		Credit	Type			
					L	T	P	S
1	**Introduction to Data Science**		MC	4	4	0	0	0
2	**Cryptography & Network Security/Artificial Neural Networks**		ME	4	4	0	0	0
3	**Cloud Computing/Soft Computing**		ME	4	4	0	0	0
4	**NM Elective-II**		NM	4	4	0	0	0
5	**Soft-Skill Development-VI**		NV	1	1	0	0	0
6	Mentored Seminar-II		NV	2	0	0	0	2
7	**SEC3: Logical Ability**		SEC	3	3	0	0	0
8	**Introduction to Data Science Lab**		MC	1	0	0	2	0
Total Credit				**23 Credit**				

FOURTH Year

SEMESTER-VII

Sl No	Course Title	Code		Credit	Type			
					L	T	P	S
1	**Deep Learning/Mobile Computing**		ME	4	4	0	0	0
2	**NM Elective III**		NM	4	4	0	0	0
1	Project-I / Fundamentals of Blockchain and Applications/Data Warehousing & Data Mining		Project	4	0	0	0	4
2	Summer Internship		INT	4	0	0	0	4
Total Credit				**16 Credit**				

SEMESTER-VIII

Sl No	Course Title	Code		Credit	Type			
					L	T	P	S
1	**NM Elective-IV**		NM	4	4	0	0	0
2	Project-II / Distributed Systems/Introduction to Cognitive Science		Project	4	0	0	0	4
3	Project-II / Natural Language Processing/Introduction to Augmented Reality & Virtual Reality		Project	4	0	0	0	4
Total Credit				**12 Credit**				

5. COs and CO-PO Mapping

5.1 Discrete Mathematics

List of COs

CO1	Understand the fundamentals of Propositional Logic.
CO2	Identify truth tables and logical operators to analyze problems.
CO3	Understand the fundamental theorems of Group theory.
CO4	Understand the fundamental concepts in graph theory
CO5	Apply the knowledge of Boolean algebra in switching circuits.
CO6	Use Max-flow Min-cut theorem, Ford and Fulkerson algorithm to design complex engineering problems.

CO-PO mapping

	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**
CO1	3	2	0	0	0	0	0	0	0	0	0	1
CO2	3	2	0	0	0	0	0	0	0	0	0	0
CO3	2	1	0	0	0	0	0	0	0	0	0	0
CO4	2	1	0	0	0	0	0	0	0	0	0	1
CO5	2	1	0	0	0	0	0	0	0	0	0	0
CO6	3	2	0	0	0	0	0	0	0	0	0	1

Highly Correlated: 3
Moderately Correlated: 2
Slightly Correlated: 1
Not Correlated: 0

*GO BACK TO **SEMESTER-I***

5.2 Fundamentals of Computer Science & Problem Solving

List of COs

CO1	To be able to develop an algorithm for solving a problem.
CO2	To be able to explain the utility of operators in C.
CO3	To be able to make use of control statements for solving the related problems.
CO4	To be able to utilize the concept of user defined functions for breaking a problem into sub problems
CO5	To be able to solve different problems using pointers and arrays.
CO6	To be able to make use of structures for constructing a complex data type which is more meaningful and relevant?

CO-PO mapping

	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**
CO1	3	3	3	0	0	0	0	0	0	0	0	1
CO2	3	3	3	0	0	0	0	0	0	0	0	1
CO3	3	3	3	0	0	0	0	0	0	0	0	1
CO4	3	3	3	0	0	0	0	0	0	0	0	1
CO5	3	3	3	0	0	0	0	0	0	0	0	1
CO6	3	3	3	0	0	0	0	0	0	0	0	1

Highly Correlated: 3
Moderately Correlated: 2
Slightly Correlated: 1
Not Correlated: 0

*GO BACK TO **SEMESTER-I***

5.3 Digital Electronics

List of COs

CO1	Explaining the number systems and Boolean function simplification methods
CO2	Design and simulation of combinational logic circuits
CO3	Design and simulation of sequential logic circuits
CO4	Construct combinational circuits using memory and PLDs
CO5	Demonstrate the working principles of ADC and DACs
CO6	Discuss about the logic families

CO-PO mapping

	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**
CO1	3	3	3	3	3	0	0	0	0	0	0	3
CO2	3	3	3	3	3	2	0	0	2	2	0	3
CO3	3	3	3	3	3	2	0	0	2	2	0	3
CO4	3	3	3	3	3	2	0	0	2	2	0	3
CO5	3	3	3	3	3	2	0	0	2	2	0	3
CO6	3	3	3	3	3	2	0	0	2	2	0	3

Highly Correlated: 3
Moderately Correlated: 2
Slightly Correlated: 1
Not Correlated: 0

*GO BACK TO **SEMESTER-I***

5.4 Probability and Statistics

List of COs

CO1	Build knowledge about basic statistical methods and representations of data
CO2	Explain the concept of frequency distributions and their graphical presentations.
CO3	Make use of the knowledge about the measures of central tendency, measures of absolute and relative dispersion, moments, measures of skewness and kurtosis, measures of moments.
CO4	Apply the concepts of scatter diagram, simple correlation, rank correlation, simple linear regression and curve fitting.
CO5	Apply the concepts of basic probability, concepts of conditional probability, Bayes' theorem and independent events, the fundamental knowledge of one dimensional discrete random variables and their related properties.
CO6	Build the fundamental knowledge of one dimensional continuous random variables and their related properties.

CO-PO mapping

	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**
CO1	3	3	2	1	0	0	0	0	0	0	0	1
CO2	3	3	2	2	0	0	0	0	0	0	0	1
CO3	3	3	2	1	0	0	0	0	0	0	0	1
CO4	3	3	2	0	0	0	0	0	0	0	0	1
CO5	3	3	2	2	0	0	0	0	0	0	0	1
CO6	3	3	2	2	0	0	0	0	0	0	0	1

Highly Correlated: 3
Moderately Correlated: 2
Slightly Correlated: 1
Not Correlated: 0

*GO BACK TO **SEMESTER-I***

5.5 Soft-Skill Development-I

-WAITING FOR RESPONSE FROM SUPPORTING DEPARTMENT

5.6 Anyone (Sports/Yoga/NCC/NSS) EAA-I

-WAITING FOR RESPONSE FROM SUPPORTING DEPARTMENT

5.7 Communicative English-I

-WAITING FOR RESPONSE FROM SUPPORTING DEPARTMENT

5.8 Environmental Science-I

-WAITING FOR RESPONSE FROM SUPPORTING DEPARTMENT

5.9 Fundamentals of Computer Science & Problem-Solving Lab

-PREPARATION IN PROCESS

5.10 Digital Electronics Lab

- PREPARATION IN PROCESS

*GO BACK TO **SEMESTER-I***

5.11 Linear Algebra

List of COs

CO1	Understand the fundamentals of matrix algebra.
CO2	Describe properties of linear systems using vectors and solve systems of linear equations and interpret their results.
CO3	Identify vector spaces and subspaces.
CO4	Identify Linear Transform.
CO5	Construct the matrix representation of a linear transform
CO6	Apply the knowledge of Eigenvalue, Eigenvector, Singular value decomposition and Principal component analysis to solve problems in Image Processing and Machine Learning.

CO-PO mapping

	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**
CO1	3	2	0	0	0	0	0	0	0	0	0	1
CO2	3	2	0	0	0	0	0	0	0	0	0	0
CO3	3	2	0	0	0	0	0	0	0	0	0	0
CO4	3	3	0	0	0	0	0	0	0	0	0	1
CO5	2	3	0	0	0	0	0	0	0	0	0	0
CO6	3	3	3	0	0	0	0	0	0	0	0	1

Highly Correlated: 3
Moderately Correlated: 2
Slightly Correlated: 1
Not Correlated: 0

*GO BACK TO **SEMESTER-II***

5.12 Programming and data Structures

List of COs

CO1	To be able to classify linear and non-linear data structure.
CO2	To be able to solve different problems using Arrays.
CO3	To be able to make use of linked list for various operations on polynomials, sparse matrix etc.
CO4	To be able to utilize the knowledge of Stack, Queues in solving real life problem.
CO5	To be able to apply the knowledge of several binary trees in problem solving.
CO6	To be able to identify of the most appropriate searching or sorting algorithm for enhancing the efficiency (i.e. reduce the run-time) or for better memory utilization.

CO-PO mapping

	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**
CO1	3	2	1	0	0	0	0	0	0	0	0	0
CO2	3	3	3	1	0	0	0	0	0	0	0	1
CO3	3	3	3	2	0	0	0	0	0	0	0	1
CO4	3	3	3	1	0	0	0	0	0	0	0	1
CO5	3	3	3	2	0	0	0	0	0	0	0	1
CO6	3	3	3	2	0	0	0	0	0	0	0	1

Highly Correlated: 3
Moderately Correlated: 2
Slightly Correlated: 1
Not Correlated: 0

*GO BACK TO **SEMESTER-II***

5.13 Computer Organization

List of COs

CO1	Understand the structure, function and characteristics of computer systems and understand the design of the various functional units and components of computers.
CO2	Design the arithmetic and Logic unit and understand the floating and fixed point number representation
CO3	Analyze the performance of ripple carry adder and carry look ahead adder and understand the multiplication and division algorithm
CO4	Identify the elements of control unit and design of control unit
CO5	Explain the function of each element of a memory hierarchy.
CO6	Understand the input output subsystem and analyze the role of interrupts in process state transition.

CO-PO mapping

	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**
CO1	3	2	2	1	0	0	0	0	0	0	0	1
CO2	0	3	2	2	0	0	0	0	0	0	0	0
CO3	2	3	1	1	0	0	0	0	0	0	0	1
CO4	2	3	3	0	3	0	0	0	0	0	0	2
CO5	1	1	3	3	1	0	0	0	0	0	0	1
CO6	2	1	1	2	0	0	0	0	0	0	0	1

Highly Correlated: 3
Moderately Correlated: 2
Slightly Correlated: 1
Not Correlated: 0

*GO BACK TO **SEMESTER-II***

5.14 Signal and Systems

List of COs

CO1	Describe the basic mathematical operations on signals and systems
CO2	Convert the Analog signal into discrete time signal using sampling theorem
CO3	Explain the properties of Fourier series and transformations
CO4	Discuss the properties of Laplace and Z transformation
CO5	Develop input output relationship for linear shift invariant system and understand the convolution operator for continuous and discrete time system.
CO6	Compute the response of the LTI system for random inputs

CO-PO mapping

	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**
CO1	3	2	2	2	0	0	0	0	0	0	0	3
CO2	3	0	0	3	2	0	0	0	0	0	0	3
CO3	2	3	3	3	2	0	0	0	0	0	0	2
CO4	0	2	1	2	0	0	0	0	0	0	0	0
CO5	2	2	2	2	1	0	0	0	0	0	0	3
CO6	3	0	0	3	2	0	0	0	0	0	0	3

Highly Correlated: 3
Moderately Correlated: 2
Slightly Correlated: 1
Not Correlated: 0

*GO BACK TO **SEMESTER-II***

5.15 Soft-Skill Development-II

-WAITING FOR RESPONSE FROM SUPPORTING DEPARTMENT

5.16 MDC1: Selected by candidate from Other Discipline

-WAITING FOR RESPONSE FROM SUPPORTING DEPARTMENT

5.17 Communicative English-II

-WAITING FOR RESPONSE FROM SUPPORTING DEPARTMENT

5.18 Environmental Science-II

-WAITING FOR RESPONSE FROM SUPPORTING DEPARTMENT

5.19 Programming and Data Structures Lab

-PREPARATION IN PROCESS

5.20 Computer Organization Lab

-PREPARATION IN PROCESS

5.21 Signals and Systems Lab

-PREPARATION IN PROCESS

*GO BACK TO **SEMESTER-II***

5.22 Algorithm-I

List of COs

CO1	To be able to utilize various asymptotic notations to compute the complexity of different algorithms.
CO2	To be able to choose the suitable standard algorithm design techniques such as divide & conquer, greedy, dynamic programming, backtracking in solving problems.
CO3	To be able to compare the complexity of various sorting algorithm.
CO4	To be able to make use of various graph algorithms for solving problems, i.e. finding shortest path, minimum spanning tree etc.
CO5	To be able to select the appropriate algorithm strategy for several optimization problems.
CO6	To be able to utilize various algorithm strategies like Branch & Bound, LCS for solving real life problems.

CO-PO mapping

	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**
CO1	3	3	0	0	0	0	0	0	0	0	0	1
CO2	3	3	3	0	0	0	0	0	0	0	0	1
CO3	3	3	3	1	0	0	0	0	0	0	0	1
CO4	3	3	3	0	0	0	0	0	0	0	0	1
CO5	3	3	3	0	0	0	0	0	0	0	0	1
CO6	3	3	3	0	0	0	0	0	0	0	0	1

Highly Correlated: 3
Moderately Correlated: 2
Slightly Correlated: 1
Not Correlated: 0

*GO BACK TO **SEMESTER-III***

5.23 Computer Architecture

List of COs

CO1	Understand the concepts of pipelining and parallel processing.
CO2	Applying arithmetic and instruction pipeline and evaluating the problems of pipeline hazards.
CO3	Applying the interleaved memory organization concept and concurrent and simultaneous memory access and analysis the cache coherence problem.
CO4	Understand the principles of instruction-level parallelism and compare various processor architectures, including superscalar, super-pipelined, and VLIW, to enhance computational performance.
CO5	Analyzing different multiprocessor architectures, understand synchronization and memory consistency issues, and evaluate interconnection networks and cluster computing.
CO6	Understand the concepts of non-von Neumann architectures non von Neumann architectures such as data flow computers, reduction computer architectures, and systolic architectures, and their applications in parallel processing.

CO-PO mapping

	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**
CO1	3	2	1	2	0	0	0	0	0	0	0	0
CO2	3	2	1	2	0	1	0	0	0	0	0	1
CO3	2	0	2	2	0	0	0	0	0	0	0	1
CO4	3	1	2	1	0	0	0	0	0	0	0	1
CO5	2	0	0	2	0	0	0	0	0	0	0	0
CO6	2	0	2	2	0	1	0	0	0	0	0	1

Highly Correlated: 3
Moderately Correlated: 2
Slightly Correlated: 1
Not Correlated: 0

*GO BACK TO **SEMESTER-III***

5.24 Formal Language and Automata Theory

List of COs

CO1	To be able to Understand the fundamental concepts of Finite State Machines and Model
CO2	To be able to Understand the fundamental concepts of Formal Languages and Automata.
CO3	To be able to apply the pumping lemma, closure properties to problems.
CO4	To be able to Understand the fundamental concepts of Context free grammars.
CO5	To be able to Understand the fundamental concepts of Pushdown Automata.
CO6	To be able to Understand the fundamental concepts of Turing machine and Linear Bounded Automata.

CO-PO mapping

	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**
CO1	3	0	2	2	0	0	0	0	0	0	0	1
CO2	3	0	0	1	0	0	0	0	0	0	0	1
CO3	3	2	1	0	0	1	0	0	0	0	0	0
CO4	0	2	2	1	0	0	0	0	0	0	0	1
CO5	2	0	0	1	2	1	0	0	0	0	0	1
CO6	2	2	2	0	0	1	0	0	0	0	0	0

Highly Correlated: 3
Moderately Correlated: 2
Slightly Correlated: 1
Not Correlated: 0

*GO BACK TO **SEMESTER-III***

5.25 Object Oriented Programming through C++

List of COs

CO1	To be able to describe the procedural and object-oriented paradigm with concepts of streams, classes, functions, data, and objects.
CO2	To be able to apply dynamic memory management techniques using pointers, constructors, destructors, etc
CO3	To be able to apply the concept of classes and objects with an idea of scope resolution operator and various access specifies.
CO4	To be able to describe the concept of function overloading, operator overloading, virtual functions, and polymorphism.
CO5	To be able to apply inheritance with an insight into an early and late binding, usage of exception handling, generic programming
CO6	To be able to apply the knowledge C++ template in designing generic classes

Highly Correlated: 3
Moderately Correlated: 2
Slightly Correlated: 1
Not Correlated: 0

CO-PO mapping

	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**
CO1	3	1	3	0	0	0	0	0	0	0	0	0
CO2	2	1	3	0	0	0	0	0	0	0	0	0
CO3	3	0	1	2	0	0	0	0	0	0	0	0
CO4	3	2	0	1	1	0	0	0	0	0	0	2
CO5	3	2	2	2	0	0	0	0	0	0	0	2
CO6	3	0	3	3	2	0	0	0	0	0	0	3

Highly Correlated: 3
Moderately Correlated: 2
Slightly Correlated: 1
Not Correlated: 0

*GO BACK TO **SEMESTER-III***

5.26 Anyone (Sports/Yoga/NCC/NSS) EAA-II

-WAITING FOR RESPONSE FROM SUPPORTING DEPARTMENT

5.27 Soft-Skill Development-III

-WAITING FOR RESPONSE FROM SUPPORTING DEPARTMENT

5.28 MDC2: Selected by candidate from Other Discipline

-WAITING FOR RESPONSE FROM SUPPORTING DEPARTMENT

5.29 SEC1: Entrepreneurship Skill Development

-WAITING FOR RESPONSE FROM SUPPORTING DEPARTMENT

5.30 Foreign language-I

-WAITING FOR RESPONSE FROM SUPPORTING DEPARTMENT

5.31 Algorithm-I Lab

-PREPARATION IN PROCESS

5.32 Computer Architecture Lab

-PREPARATION IN PROCESS

5.33 Object Oriented Programming Lab

-PREPARATION IN PROCESS

*GO BACK TO **SEMESTER-III***

5.34 Operating System

List of COs

CO1	To be able to understand the design of an operating system and its types. I/O structures and storage structures
CO2	To be able to apply process scheduling algorithm in various batch process scheduling scenarios
CO3	To be able to solve process synchronization, and deadlock avoidance problems
CO4	To be able to compare different memory and I/O management approaches and use system calls for managing processes, memory and the file system
CO5	To be able to understand the structure and organization of the file system.
CO6	To be able to compare and use different Disk scheduling techniques.

CO-PO mapping

	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**
CO1	3	2	2	0	0	0	0	0	0	0	0	1
CO2	3	3	3	1	0	0	0	0	0	0	0	2
CO3	3	2	3	2	0	0	0	0	0	0	0	2
CO4	3	3	2	3	0	0	0	0	0	0	0	2
CO5	3	2	1	2	0	0	0	0	0	0	0	1
CO6	3	2	1	2	0	0	0	0	0	0	0	2

Highly Correlated: 3
Moderately Correlated: 2
Slightly Correlated: 1
Not Correlated: 0

*GO BACK TO **SEMESTER-IV***

5.35 Database Management System

List of COs

CO1	To be able to discuss basic concepts, data models, types of users and appreciate the applications of database systems
CO2	To be able to understand the logical design of the database including E-R models and the concept of generalization, specialization and aggregation
CO3	To be able to apply with a relational database system and Normalization
CO4	To be able to explain the basic concepts of relational database design, relational algebra and SQL
CO5	To be able to analyze relational database and formulate SQL queries on data.
CO6	To be able to describe transaction processing and concurrency control concepts

CO-PO mapping

	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**
CO1	3	2	2	1	1	0	0	0	0	0	0	1
CO2	3	0	2	0	0	1	0	0	0	0	0	2
CO3	2	2	0	2	1	0	0	0	0	0	0	1
CO4	0	0	2	1	0	1	0	0	0	0	0	0
CO5	2	2	0	0	1	0	0	0	0	0	0	0
CO6	0	2	2	1	0	0	0	0	0	0	0	2

Highly Correlated: 3
Moderately Correlated: 2
Slightly Correlated: 1
Not Correlated: 0

*GO BACK TO **SEMESTER-IV***

5.36 Artificial intelligence

List of COs

CO1	To be able to understand the informed and uninformed problem types and apply search strategies to solve them
CO2	To be able to apply difficult real life problems in a state space representation so as to solve them using AI techniques like searching and game playing
CO3	To be able to design and evaluate intelligent expert models for perception and prediction from intelligent environment
CO4	To be able to Identify valid solutions for problems involving uncertain inputs or outcomes by using decision making techniques
CO5	CO5: To be able to demonstrate and enrich knowledge to select and apply AI tools to synthesize information and develop models within constraints of application area
CO6	To be able to describe transaction processing and concurrency control concepts

CO-PO mapping

	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**
CO1	3	2	2	0	0	0	0	0	0	0	0	1
CO2	1	2	2	2	0	0	0	0	0	0	0	0
CO3	0	0	0	2	2	2	0	0	0	0	0	2
CO4	1	3	2	1	0	0	0	0	0	0	0	1
CO5	1	2	0	2	1	0	0	0	0	0	0	1
CO6	0	2	2	2	2	0	0	0	0	0	0	1

Highly Correlated: 3
Moderately Correlated: 2
Slightly Correlated: 1
Not Correlated: 0

*GO BACK TO **SEMESTER-IV***

5.37 Algorithm II

List of COs

CO1	To be able to apply the Amortized analysis to find the complexity/performance of different algorithms
CO2	To be able to understand the concept of linear time sorting
CO3	To be able to understand verity of approximation algorithms, such as Vertex cover problem, travelling salesman problem, set covering problem, randomization and linear programming, subset sum problem
CO4	To be able to understand the concept of Computational Geometry
CO5	To be able to analyse advanced issues related to design and analysis techniques of algorithms and their relation to NP-complete problems
CO6	To be able to apply the most suitable algorithm for any given task

CO-PO mapping

	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**
CO1	3	0	0	0	0	0	0	0	0	0	0	0
CO2	1	1	1	0	0	0	0	0	0	0	0	0
CO3	3	3	3	0	0	0	0	0	0	0	0	0
CO4	2	2	0	0	0	0	0	0	0	0	0	0
CO5	2	2	0	2	2	0	0	0	0	0	0	0
CO6	3	3	0	3	0	0	0	0	0	0	0	0

Highly Correlated: 3
Moderately Correlated: 2
Slightly Correlated: 1
Not Correlated: 0

*GO BACK TO **SEMESTER-IV***

5.38 Compiler Design

List of COs

CO1	To identify different phases and passes of the compiler and also able to use the compiler tools.
CO2	To able to analyze and compare different types of compiler tools to meet the requirements of the realistic constraints of compilers
CO3	To understand the parser and its types i.e. Top-Down and Bottom-up parsers and construction of LL, SLR, CLR, and LALR parsing table and evaluate the issues
CO4	To Construct the compiler using syntax-directed translation method and get knowledge about the synthesized and inherited attributes
CO5	To collect knowledge about run time data structure like symbol table organization and different techniques used in that
CO6	To understand the target machine's run time environment, its instruction set for code generation and techniques used for code optimization

CO-PO mapping

	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**
CO1	1	1	0	0	0	0	0	0	0	0	0	0
CO2	2	2	0	2	1	0	0	0	0	0	0	0
CO3	2	3	0	1	1	0	0	0	0	0	0	0
CO4	2	2	0	1	0	0	0	0	0	0	0	0
CO5	1	1	0	1	0	0	0	0	0	0	0	0
CO6	0	0	0	1	0	0	0	0	0	0	0	1

Highly Correlated: 3
Moderately Correlated: 2
Slightly Correlated: 1
Not Correlated: 0

*GO BACK TO **SEMESTER-IV***

5.39 Optimization Techniques

List of COs

CO1	Understand the concept of Operations Research and the basic concepts linear algebra.
CO2	Formulate Mathematical Model of various optimization problems and solve linear programming problems using appropriate techniques.
CO3	Determine optimal strategy for Transportation and Assignment problems
CO4	Determine the critical path, project time and its variance using the project scheduling techniques – Gantt chart, PERT & CPM
CO5	Understand the concept of inventory costs, Basics of inventory policy and fixed order-quantity models like EOQ, POQ
CO6	Understand the concept of queuing theory and identify the queuing models like M/M/1 and M/M/m

CO-PO mapping

	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**
CO1	3	0	0	0	0	0	0	0	0	0	0	1
CO2	3	3	0	0	0	0	0	0	0	0	0	1
CO3	3	3	0	0	0	0	0	0	0	0	0	0
CO4	3	0	0	0	0	0	0	0	0	0	0	0
CO5	3	0	0	0	0	0	0	0	0	0	0	1
CO6	2	3	0	0	0	0	0	0	0	0	0	1

Highly Correlated: 3
Moderately Correlated: 2
Slightly Correlated: 1
Not Correlated: 0

*GO BACK TO **SEMESTER-IV***

5.40 Soft-Skill Development-IV

-WAITING FOR RESPONSE FROM SUPPORTING DEPARTMENT

5.41 MDC3: Selected by candidate from Other Discipline

-WAITING FOR RESPONSE FROM SUPPORTING DEPARTMENT

5.42 Foreign language-II

-WAITING FOR RESPONSE FROM SUPPORTING DEPARTMENT

5.43 Human Values and Ethics

-WAITING FOR RESPONSE FROM SUPPORTING DEPARTMENT

5.44 Operating Systems Lab

-WAITING FOR RESPONSE FROM SUPPORTING DEPARTMENT

5.45 Database Management System Lab

-PREPARATION IN PROCESS

5.46 Artificial Intelligence Lab

-PREPARATION IN PROCESS

*GO BACK TO **SEMESTER-IV***

5.47 Computer Networks

List of COs

CO1	To be able to understand data communication components, representation of data, physical topologies and protocols.
CO2	To be able to understand Analog and Digital transmission, multiplexing and working of transmission media.
CO3	To be able to solve problems related to error correction/detection and protocols of media access control layer.
CO4	To be able to solve IP subnetting problems and routing problems.
CO5	To analyze basic operations of transport layer and congestion control mechanisms.
CO6	To be able to understand about various application layer functionalities.

CO-PO mapping

	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**
CO1	2	2	1	2	0	0	0	0	0	0	0	1
CO2	3	3	2	3	0	0	0	0	0	0	0	1
CO3	3	3	2	2	2	0	0	0	0	0	0	0
CO4	2	3	3	3	2	2	0	0	0	0	0	0
CO5	3	2	1	2	2	2	0	0	0	0	0	0
CO6	2	2	1	1	2	0	0	0	0	0	0	1

Highly Correlated: 3
Moderately Correlated: 2
Slightly Correlated: 1
Not Correlated: 0

*GO BACK TO **SEMESTER-V***

5.48 Software Engineering

List of COs

CO1	Ability to apply software engineering principles and techniques and understand the SDLC, SRS.
CO2	Ability to develop, maintain and evaluate software design.
CO3	Analyze the coding standard and justify the code with different testing techniques.
CO4	Apply the knowledge of system design for testing software in various environment
CO5	Estimate the scheduling and budgeting for maintaining the project management, and Illustrate the quality control and maintenance of software.
CO6	To be able to analyze the interaction among various model in a software design using Class diagram, interaction diagram: collaboration diagram, sequence diagram, state chart diagram, activity diagram, and implementation diagram.

CO-PO mapping

	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**
CO1	0	2	0	1	0	0	0	0	0	1	0	0
CO2	2	2	3	0	0	0	0	0	0	0	0	0
CO3	3	2	3	0	0	2	0	0	0	0	0	0
CO4	0	2	0	0	0	0	0	0	1	1	0	0
CO5	1	2	0	1	0	0	0	0	2	0	0	1
CO6	0	1	3	0	3	0	0	0	0	1	0	1

Highly Correlated: 3
Moderately Correlated: 2
Slightly Correlated: 1
Not Correlated: 0

*GO BACK TO **SEMESTER-V***

5.49 Digital Image Processing

List of COs

CO1	To be able to understand basic fundamental concepts of image processing.
CO2	To be able to implement various image enhancement techniques.
CO3	To be able to apply different segmentation techniques based on the input image property.
CO4	To be able to apply various morphological operations on various image.
CO5	To be able to compare among image registration operations.
CO6	To be able to establish new image processing techniques for preserving images.

CO-PO mapping

	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**
CO1	3	3	2	0	2	2	0	0	0	0	0	1
CO2	3	0	2	0	0	0	0	0	0	0	0	0
CO3	0	3	0	2	0	0	0	0	0	0	0	1
CO4	3	2	0	0	1	2	0	0	0	0	0	0
CO5	2	0	2	0	0	2	0	0	0	0	0	0
CO6	2	3	2	2	0	2	0	0	0	0	0	2

Highly Correlated: 3
Moderately Correlated: 2
Slightly Correlated: 1
Not Correlated: 0

*GO BACK TO **SEMESTER-V***

5.50 Machine Learning

List of COs

CO1	To be able to discuss the basics of learning problems with hypothesis
CO2	To be able to understand the features of machine learning to deal with real world problems
CO3	To be able to differentiate the machine learning algorithms as supervised learning and unsupervised learning
CO4	To be able to design and analyze various classification and clustering algorithms
CO5	To be able to develop and tune the machine learning models with datasets
CO6	To be able to evaluate the models for optimization engineering problems

CO-PO mapping

	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**
CO1	3	3	2	1	0	0	0	0	0	0	0	1
CO2	3	2	0	2	1	0	0	0	0	0	0	2
CO3	2	2	3	2	2	0	0	0	0	0	0	2
CO4	1	2	3	3	2	0	0	0	0	0	0	3
CO5	2	2	3	3	3	0	0	0	0	0	0	3
CO6	0	2	3	3	2	0	0	0	0	0	0	0

Highly Correlated: 3
Moderately Correlated: 2
Slightly Correlated: 1
Not Correlated: 0

*GO BACK TO **SEMESTER-V***

5.51 NM Elective-I

-WAITING FOR RESPONSE FROM SUPPORTING DEPARTMENT

5.52 Soft-Skill Development-V

-WAITING FOR RESPONSE FROM SUPPORTING DEPARTMENT

5.53 SEC2: Current Programming Techniques

-WAITING FOR RESPONSE FROM SUPPORTING DEPARTMENT

5.54 Computer Networks Lab

-PREPARATION IN PROCESS

5.55 Software Engineering Lab

-PREPARATION IN PROCESS

5.56 Digital Image Processing Lab /Machine Learning Lab

-PREPARATION IN PROCESS

*GO BACK TO **SEMESTER-V***

5.57 Introduction to Data Science

List of COs

CO1	Students should gain a solid understanding of the fundamental concepts and principles of Data Science, including data collection, cleaning, exploration, visualization, statistical analysis, machine learning, and data-driven decision-making.
CO2	Students should develop proficiency in programming languages commonly used in Data Science, such as Python or R. They should be able to write code to manipulate data, perform statistical analysis, and build machine learning models.
CO3	Students should acquire skills to effectively manipulate and analyze large and complex datasets. This includes skills in data pre-processing, feature engineering, data transformation, and data visualization.
CO4	Students should learn various statistical analysis techniques and modeling approaches used in Data Science. This includes understanding of descriptive statistics, inferential statistics, hypothesis testing, regression analysis, time series analysis, and other statistical modeling techniques.
CO5	Students should become familiar with a range of machine learning algorithms and techniques, such as linear regression, logistic regression, decision trees, random forests, support vector machines, clustering, and neural networks. They should understand the principles behind these algorithms and know how to apply them to real-world problems.
CO6	Students should develop skills in visualizing and communicating data insights effectively. This includes creating meaningful visualizations, interpreting and presenting results, and effectively communicating findings to both technical and non-technical audiences.

CO-PO mapping

	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**
CO1	1	2	3	0	0	0	0	0	0	0	1	2
CO2	2	2	2	3	0	0	0	0	0	0	3	2
CO3	2	2	3	0	0	0	0	0	0	0	3	2
CO4	1	2	3	3	0	0	0	0	0	0	2	2
CO5	1	2	2	1	0	0	0	0	0	0	1	2
CO6	2	2	2	3	0	0	0	0	0	0	2	2

Highly Correlated: 3
Moderately Correlated: 2
Slightly Correlated: 1
Not Correlated: 0

*GO BACK TO **SEMESTER-V***

5.58 Cryptography & Network Security

List of COs

CO1	To understand the fundamental of attacks and the need of security
CO2	To be able to secure a message over insecure channel by various means.
CO3	Have a strong understanding of different cryptographic algorithms and techniques and be able to use them
CO4	To learn about how to maintain the Confidentiality, Integrity and Availability of a data.
CO5	To understand various protocols for network security to protect against the threats in the networks.
CO6	To apply methods for authentication, access control, intrusion detection and prevention. Identify and mitigate software security vulnerabilities in existing systems

CO-PO mapping

	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**
CO1	2	3	1	0	0	0	0	0	0	0	2	3
CO2	1	3	2	0	0	0	0	0	0	0	0	3
CO3	3	3	3	2	0	0	0	0	0	0	2	3
CO4	1	3	2	0	0	0	0	0	0	0	0	3
CO5	3	3	3	2	0	0	0	0	0	0	2	3
CO6	2	3	3	3	0	0	0	0	0	0	0	3

Highly Correlated: 3
Moderately Correlated: 2
Slightly Correlated: 1
Not Correlated: 0

*GO BACK TO **SEMESTER-V***

5.59 Artificial Neural Networks

List of COs

CO1	Understand the principles of Neural Networks.
CO2	Identify different types of models of artificial neural networks (ANN).
CO3	Analyse the feedback and feed-forward neural networks.
CO4	Develop neural network models.
CO5	Compare different applications of artificial neural networks.
CO6	Design and develop applications using neural networks.

CO-PO mapping

	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**
CO1	2	0	0	0	0	0	0	0	0	0	0	2
CO2	2	2	0	0	0	0	0	0	0	0	0	2
CO3	2	0	0	0	0	0	0	0	0	0	0	0
CO4	3	3	0	3	0	0	0	0	0	0	2	0
CO5	2	3	0	0	0	0	0	2	0	0	2	0
CO6	0	3	2	0	0	0	0	0	0	0	2	0

Highly Correlated: 3
Moderately Correlated: 2
Slightly Correlated: 1
Not Correlated: 0

*GO BACK TO **SEMESTER-V***

5.60 Cloud Computing

List of COs

CO1	To be able to articulate the business model concepts, architecture and infrastructure of cloud computing, including cloud service models and deployment models.
CO2	To be able to apply and design suitable Virtualization concept, Cloud Resource Management and design scheduling algorithms.
CO3	To be able to explore some important cloud computing driven commercial systems such as Google Apps, Microsoft Azure and Amazon Web Services and other businesses cloud applications.
CO4	To be able to analyse the core issues of cloud computing such as security, privacy, interoperability, and its impact on cloud application.
CO5	To be able to analyze the flow of service oriented architecture and protocol stack.
CO6	To be able to evaluate different cloud applications in different platforms.

CO-PO mapping

	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**
CO1	1	2	1	1	0	0	0	0	0	0	2	3
CO2	2	3	3	3	0	0	0	0	0	0	0	2
CO3	2	3	3	3	0	0	0	0	0	0	2	2
CO4	3	2	2	2	0	0	0	0	0	0	0	3
CO5	3	2	2	2	0	0	0	0	0	0	2	2
CO6	2	3	3	3	0	0	0	0	0	0	0	1

Highly Correlated: 3
Moderately Correlated: 2
Slightly Correlated: 1
Not Correlated: 0

*GO BACK TO **SEMESTER-V***

5.61 Soft Computing

List of COs

CO1	To Understand intelligent systems leveraging the paradigm of soft computing techniques.
CO2	To get the knowledge solutions by various soft computing approaches for finding the optimal solutions.
CO3	To Recognize the feasibility of applying a soft computing methodology for a particular problem
CO4	To Design the methodology to solve optimization problems using fuzzy logic, genetic algorithms and neural networks.
CO5	To Design hybrid system to revise the principles of soft computing in various applications.
CO6	To analyse the applications of Soft Computing Systems.

CO-PO mapping

	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**
CO1	3	2	2	0	0	0	0	0	0	0	0	3
CO2	3	3	3	2	1	0	0	0	0	0	3	3
CO3	3	3	3	2	2	0	0	0	0	0	2	2
CO4	2	3	3	3	1	0	0	0	0	0	2	1
CO5	3	3	3	2	2	0	0	0	0	0	3	1
CO6	2	3	3	3	2	0	0	0	0	0	3	1

Highly Correlated: 3
Moderately Correlated: 2
Slightly Correlated: 1
Not Correlated: 0

*GO BACK TO **SEMESTER-V***

5.62 NM Elective-II

-WAITING FOR RESPONSE FROM SUPPORTING DEPARTMENT

5.63 Soft-Skill Development-VI

-WAITING FOR RESPONSE FROM SUPPORTING DEPARTMENT

5.64 SEC3: Logical Ability

-WAITING FOR RESPONSE FROM SUPPORTING DEPARTMENT

5.65 Introduction to Data Science Lab

-PREPARATION IN PROCESS

*GO BACK TO **SEMESTER-V***

5.66 Internet of Things

List of COs

CO1	To be able to understand the various concepts, terminologies, and architecture of IoT systems.
CO2	To be able to use sensors and actuators for design and architecture of IoT.
CO3	To be able to understand and apply various protocols for design of IoT systems.
CO4	To be able to apply various techniques of web applications and analytics in IoT.
CO5	To be able to analyze various applications of IoT.
CO6	To be able to develop different APIs to connect IoT related technologies.

CO-PO mapping

	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**
CO1	3	2	2	1	0	0	0	0	0	0	0	2
CO2	0	3	2	2	0	0	0	0	0	1	0	0
CO3	2	3	1	1	0	1	1	0	0	0	0	1
CO4	2	3	3	0	3	0	0	1	0	0	0	2
CO5	1	1	3	3	1	0	0	0	0	0	1	1
CO6	2	1	1	2	0	0	0	0	0	0	0	1

Highly Correlated: 3
Moderately Correlated: 2
Slightly Correlated: 1
Not Correlated: 0

*GO BACK TO **SEMESTER-V***

5.67 Deep Learning/Mobile Computing

-WAITING FOR RESPONSE FROM SUPPORTING DEPARTMENT

5.68 NM Elective III

-WAITING FOR RESPONSE FROM SUPPORTING DEPARTMENT

5.69 NM Elective-IV

-WAITING FOR RESPONSE FROM SUPPORTING DEPARTMENT

*GO BACK TO **SEMESTER-V***

6. Course-PO Mapping

Subject	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	P10	P11	P12
Discrete Mathematics	3	2	0	0	0	0	0	0	0	0	0	1
Fundamentals of Computer Science & Problem Solving	3	3	3	0	0	0	0	0	0	0	0	1
Digital Electronics	3	3	3	3	3	2	0	0	2	2	0	3
Probability and Statistics	3	3	2	1	0	0	0	0	0	0	0	1
Soft-Skill Development-I	-	-	-	-	-	-	-	-	-	-	-	-
Anyone (Sports/Yoga/NCC/NSS) EAA-I	-	-	-	-	-	-	-	-	-	-	-	-
Communicative English-I	-	-	-	-	-	-	-	-	-	-	-	-
Environmental Science-I	-	-	-	-	-	-	-	-	-	-	-	-
Fundamentals of Computer Science & Problem-Solving Lab	-	-	-	-	-	-	-	-	-	-	-	-
Error! Reference s ource not found.	-	-	-	-	-	-	-	-	-	-	-	-
Linear Algebra	3	3	1	0	0	0	0	0	0	0	0	1
Programming and data Structures	3	3	3	2	0	0	0	0	0	0	0	1
Computer Organization	2	2	2	2	1	0	0	0	0	0	0	3
Signal and Systems	2	2	1	3	1	0	0	0	0	0	0	2
Soft-Skill Development-II	-	-	-	-	-	-	-	-	-	-	-	-
MDC1: Selected by candidate from Other Discipline	-	-	-	-	-	-	-	-	-	-	-	-
Communicative English-II	-	-	-	-	-	-	-	-	-	-	-	-
Environmental Science-II	-	-	-	-	-	-	-	-	-	-	-	-
Programming and Data Structures Lab	-	-	-	-	-	-	-	-	-	-	-	-
Computer Organization Lab	-	-	-	-	-	-	-	-	-	-	-	-
Signals and Systems Lab	-	-	-	-	-	-	-	-	-	-	-	-
Algorithm-I	3	3	3	0	0	0	0	0	0	0	0	1
Computer Architecture	3	1	1	2	0	0	0	0	0	0	0	1
Formal Language and Automata Theory	2	1	1	1	0	1	0	0	0	0	0	1
Object Oriented Programming through C++	3	1	2	1	1	0	0	0	0	0	0	1
Anyone (Sports/Yoga/NCC/NSS) EAA-II	-	-	-	-	-	-	-	-	-	-	-	-
Soft-Skill Development-III	-	-	-	-	-	-	-	-	-	-	-	-

MDC2: Selected by candidate from Other Discipline	-	-	-	-	-	-	-	-	-	-	-	-
SEC1: Entrepreneurship Skill Development	-	-	-	-	-	-	-	-	-	-	-	-
Foreign language-I	-	-	-	-	-	-	-	-	-	-	-	-
Algorithm-I Lab	-	-	-	-	-	-	-	-	-	-	-	-
Computer Architecture Lab	-	-	-	-	-	-	-	-	-	-	-	-
Object Oriented Programming Lab	-	-	-	-	-	-	-	-	-	-	-	-
Operating System	**3**	**2**	**2**	**2**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**2**
Database Management System	**2**	**1**	**1**	**1**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**1**
Artificial intelligence	**1**	**2**	**1**	**2**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**1**
Algorithm II	**2**	**2**	**1**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
Compiler Design	**1**	**2**	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
Optimization Techniques	**3**	**2**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**
Soft-Skill Development-IV	-	-	-	-	-	-	-	-	-	-	-	-
MDC3: Selected by candidate from Other Discipline	-	-	-	-	-	-	-	-	-	-	-	-
Foreign language-II	-	-	-	-	-	-	-	-	-	-	-	-
Human Values and Ethics	-	-	-	-	-	-	-	-	-	-	-	-
Operating Systems Lab	-	-	-	-	-	-	-	-	-	-	-	-
Database Management System Lab	-	-	-	-	-	-	-	-	-	-	-	-
Artificial Intelligence Lab	-	-	-	-	-	-	-	-	-	-	-	-
Computer Networks	**3**	**3**	**2**	**2**	**1**	**1**	**0**	**0**	**0**	**0**	**0**	**1**
Software Engineering	**1**	**2**	**2**	**0**	**1**	**0**	**0**	**0**	**1**	**1**	**0**	**0**
Digital Image Processing	**2**	**2**	**1**	**1**	**1**	**1**	**0**	**0**	**0**	**0**	**0**	**1**
Machine Learning	**2**	**2**	**2**	**2**	**2**	**0**	**0**	**0**	**0**	**0**	**0**	**2**
NM Elective-I	-	-	-	-	-	-	-	-	-	-	-	-
Soft-Skill Development-V	-	-	-	-	-	-	-	-	-	-	-	-
SEC2: Current Programming Techniques	-	-	-	-	-	-	-	-	-	-	-	-
Computer Networks Lab	-	-	-	-	-	-	-	-	-	-	-	-
Software Engineering Lab	-	-	-	-	-	-	-	-	-	-	-	-
Digital Image Processing Lab	-	-	-	-	-	-	-	-	-	-	-	-
Digital Image Processing Lab /Machine Learning Lab	-	-	-	-	-	-	-	-	-	-	-	-
Introduction to Data Science	**2**	**2**	**3**	**2**	**0**	**0**	**0**	**0**	**0**	**0**	**2**	**2**
Cryptography & Network Security	**2**	**3**	**2**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**3**

Artificial Neural Networks	**2**	**2**	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**1**
Cloud Computing	**2**	**3**	**2**	**2**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**2**
Soft Computing	**3**	**3**	**3**	**2**	**1**	**0**	**0**	**0**	**0**	**0**	**2**	**2**
NM Elective-II	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
Soft-Skill Development-VI	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
SEC3: Logical Ability	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
Introduction to Data Science Lab	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
Deep Learning/Mobile Computing	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
NM Elective III	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
NM Elective-IV	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**

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