Program Outcomes (POs)

Program Specific Outcomes (PSO)

Course Outcomes (COs)

&

CO PO-PSO Articulation Matrices

Department of Computer Science & Engineering

BRCM

College of Engineering & Technology

Program Outcomes (PO) as defined by NBA

Engineering Graduates will be able to:

1. **Engineering knowledge**: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
2. **Problem analysis**: Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
3. **Design/development of solutions**: Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.
4. **Conduct investigations of complex problems**: Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.
5. **Modern tool usage**: Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.
6. **The engineer and society**: Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.
7. **Environment and sustainability**: Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.

8. **Ethics**: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
9. **Individual and team work**: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
10. **Communication**: Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.
11. **Project management and finance**: Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.
12. **Life-long learning**: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

Program Specific Outcomes (PSO)

At the end of the program, the student

PSO1: Should be able to apply the Concepts of Mathematics, Algorithms, Data Structures, Programming Languages, Databases, Multimedia, Operating Systems, Computer Networks, Computer Architecture, Big Data Analysis, Artificial Intelligence and Machine Learning to solve computation tasks and develop applications of varying complexity.

PSO2: Should be able to understand and make a contribution in the areas of Computer Science & Engineering through the design & planning of Software based real-world applications and also demonstrate professional ethics & concern for social well-being.

B.Tech. CSE 3rd Semester

Course: Database Management Systems
Course Code: PCC-CSE-201G

CO (Course Outcomes)		RBT*- Revised Bloom's Taxonomy
CO1	To **Describe** the concepts of DBMS Architecture and database objects and their Applications.	L2 (Understand)
CO2	To **Summarize** transaction processing, concurrency control and database recovery protocols in databases.	L2 (Understand)
CO3	To **Apply** Relational algebra operation & Structured Query Language (SQL) for database manipulation.	L3 (Apply)
CO4	To **Apply** normalization algorithms using database design theory for different applications.	L3 (Apply)
CO5	To **Design** Relational database systems for different applications to interact with databases.	L6 (Create)

CO PO-PSO Articulation Matrices

Course Outcomes (COs)	(POs)												PSOs	
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**
CO1	3	2										1	2	1
CO2	2	3	2									1	3	2
CO3	2	2	3	2								1	2	1
CO4	2	2		2								1	2	2
CO5	1	2	3	2								1	1	1

Course: Data Structures & Algorithms
Course Code: PCC-CSE-203G

CO (Course Outcomes)		RBT*- Revised Bloom's Taxonomy
CO1	To **Explain** the basic concepts such as Abstract Data Types, Linear and Non-Linear Data structures.	L1 (Remember)
CO2	To **Describe** insertion, deletion and traversing operations on Data Structures.	L2 (Understand)
CO3	To **Solve** problems using Algorithms such as the sorting, searching and hashing.	L3 (Apply)
CO4	To **Solve** Problems using Data Structures such as Lists, Graphs, Queues.	L3 (Apply)
CO5	To **Design** programs using a variety of data structures such as stacks, queues, hash tables, binary trees, search trees, heaps, graphs, and B-trees.	L6 (Create)

CO PO-PSO Articulation Matrices

Course Outcomes (COs)	(POs)												PSOs	
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**
CO1	3											1	3	3
CO2	2	3										1	3	2
CO3	2	2	3									1	3	2
CO4	2		3									1	3	2
CO5	2	2	3	1								1	3	2

Course: Digital Electronics
Course Code: ESC-CSE-205G

CO (Course Outcomes)		RBT*- Revised Bloom's Taxonomy
CO1	To **Recall** the basics of Digital Electronics	L1 (Remember)
CO2	To **Summarize** the minimization techniques of Digital Circuits.	L2 (Understand)
CO3	To **Apply** the working mechanism and design guidelines of different combinational, and sequential circuits.	L3 (Apply)
CO4	To **Analyze** different types of Digital Electronic circuits using various Matrices and mathematical methods.	L4 (Analyze)
CO5	To **Design** different types of Digital Circuits.	L6 (Create)

CO PO-PSO Articulation Matrices

Course Outcomes (COs)	(POs)												PSOs	
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**
CO1	3	2										1	2	2
CO2	3	2										1	3	2
CO3	2	2	3									1	2	2
CO4	2	2	3									1	2	2
CO5	2	2	3									1	1	1

Course: Python Programming
Course Code: PCC-CSE-207G

CO (Course Outcomes)		RBT*- Revised Bloom's Taxonomy
CO1	To **Define** the basic concepts of Python programming.	L1 (Remember)
CO2	To **Explain** the string manipulation and text files of Python programming.	L2 (Understand)
CO3	To **Apply** various Lists, Dictionaries and Functions used in Python language.	L3 (Apply)
CO4	To **Analyze** Object-Oriented aspects in Python programming such as inheritance, polymorphism etc.	L3 (Apply)
CO5	To **Design** and plan software solutions to problems using an object-oriented strategy.	L6 (Create)

CO PO-PSO Articulation Matrices

Course Outcomes (COs)	(POs)												PSOs	
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**
CO1	3	2										1	3	3
CO2	2	3										1	2	2
CO3	2	2	3									1	2	2
CO4	2	2	3	2								1	2	1
CO5	2		3									1	1	1

Course: Math-III (Multivariable Calculus, Differential Equations)
Course Code: BSC-MATH-203G

CO (Course Outcomes)		RBT*- Revised Bloom's Taxonomy
CO1	To **Recall** The mathematical tools needed in evaluating multiple integrals and their usage.	L1 (Remember)
CO2	To **Understand** the effective mathematical tools for the solutions of differential equations that model physical processes.	L2 (Understand)
CO3	To **Apply** the tools of differentiation and integration of functions that are used in various techniques dealing engineering problems.	L3 (Apply)
CO4	To **Analyze** how to deal with functions of several variables that are essential in most branches of engineering.	L4 (Analyze)
CO5	To **Evaluate/solve** the mathematical problems related to multivariable differentiation and integration.	L5 (Evaluate)

CO PO-PSO Articulation Matrices

Course Outcomes (COs)	(POs)												PSOs	
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**
CO1	3	2										1	3	3
CO2	3	2										1	3	3
CO3	2	3										1	3	3
CO4	2	3										1	2	3
CO5	2	3										1	3	2

Course: Economics for Engineers
Course Code: HSMC-01G

CO (Course Outcomes)		RBT*- Revised Bloom's Taxonomy
CO1	To **Describe** the Basics of Economic Theories terminology, Cost concepts and Pricing Policies Used in Engineering Economics.	L1 (Remember)
CO2	To **Summarize** the measures of national income, the functions of banks and concepts of globalization.	L2 (Understand)
CO3	To **Discuss** how supply and demand change when a product's price changes.	L2 (Understand)
CO4	To **Use** the Concept of Demand to explain the Outcomes of markets for individuals firms and society.	L4 (Analyze)
CO5	To **Analyze** how a change in price and income affects the behaviour of buyers and sellers.	L4 (Analyze)

CO PO-PSO Articulation Matrices

Course Outcomes (COs)	(POs)												PSOs	
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**
CO1						3					2	1	1	2
CO2						2			3		2	1	1	2
CO3						3					3	1	1	2
CO4						3					2	1	3	2
CO5						3			2		2	1	3	1

Course: Database Management Systems LAB
Course Code: LC-CSE-209G

CO (Course Outcomes)		RBT*- Revised Bloom's Taxonomy
CO1	To **List** of various of SQL Command	L2 (Understand)
CO2	To **Demonstrate** SQL queries using SQL operators.	L2 (Understand)
CO3	To **Create** a database by using data definition, data manipulation and control languages.	L6 (Create)
CO4	To **Create** a Database application and retrieve the values with the help of queries using SQL.	L6 (Create)
CO5	To **Create** views, cursor and triggers.	L6 (Create)

CO PO-PSO Articulation Matrices

Course Outcomes (COs)	(POs)												PSOs	
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**
CO1	3	2										1	2	1
CO2	2	3	2		2							1	3	2
CO3	2	2	3	2	2							1	2	1
CO4	2	2		2	2							1	2	2
CO5	2	2	3	2	2							1	1	1

Course: Digital Electronics LAB
Course Code: LC-ESC-211G

CO (Course Outcomes)		RBT*- Revised Bloom's Taxonomy
CO1	To Recall the basic knowledge about measuring instrument and kit.	L1 (Remember)
CO2	To Explain the asynchronous, synchronous digital circuit and Flip-Flop conversion. Also basic knowledge about TTL and Flip- Flop Gates.	L2 (Understand)
CO3	To Analyze the function using k-maps and operation of shift register	L4 (Analyze)
CO4	To Verify the operation of Multiplexer, Demultiplxer & counter.	L6 (Create)
CO5	To Design counter and seven segment display unit.	L6 (Create)

CO PO-PSO Articulation Matrices

Course Outcomes (COs)	(POs)												PSOs	
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**
CO1	3	2										1	2	1
CO2	2	3	2		2							1	3	2
CO3	2	2	3	2	2							1	2	1
CO4	2	2		2	2							1	2	2
CO5	2	2	3	2	2							1	1	1

Course: Data Structures & Algorithms LAB Using C
Course Code: LC-CSE-213G

CO (Course Outcomes)		RBT*- Revised Bloom's Taxonomy
CO1	To **Choose** appropriate data structure while designing the applications..	L2 (Understand)
CO2	To **Solve** the problems of various data structures such as stack, queue and tree.	L2 (Understand)
CO3	To **Analyze** the complexity of the algorithms.	L4 (Analyze)
CO4	To **Implement** various searching and sorting techniques.	L6 (Create)
CO5	To **Implement** linear and non-linear data structures using linked list	L6 (Create)

CO PO-PSO Articulation Matrices

Course Outcomes (COs)	(POs)												PSOs	
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**
CO1	3											1	2	3
CO2	2	3			2							1	2	2
CO3	2	2	3		2							1	2	2
CO4	2		3		2							1	3	2
CO5	2	2	3	1	2							1	3	2

Course: Python Programming LAB
Course Code: LC-CSE-215G

CO (Course Outcomes)		RBT*- Revised Bloom's Taxonomy
CO1	To **Recall** the basic concepts of Python Programming.	L1 (Remember)
CO2	To **Describe** the core data structures like lists, dictionaries, tuples and sets in Python to store, process and sort the data.	L2 (Understand)
CO3	To **Apply** the external modules and import specific methods from the package	L3 (Apply)
CO4	To **Demonstrate** proficiency in handling Strings and File Systems	L3 (Apply)
CO5	To **Design** a dynamic application through Python Programming.	L6 (Create)

CO PO-PSO Articulation Matrices

Course Outcomes (COs)	(POs)												PSOs	
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**
CO1	3	2										1	2	3
CO2	2	3			2							1	2	2
CO3	2	2	3		2							1	2	2
CO4	2	2	3	2	2							1	2	1
CO5	2		3		2							1	1	1

B.Tech. CSE 4th Semester

Course: Discrete Mathematics
Course Code: PCC-CSE-202G

CO (Course Outcomes)		RBT*- Revised Bloom's Taxonomy
CO1	To **Recall** the Concepts, design and implementation of Discrete mathematics	L1 (Remember)
CO2	To **Perform** the operations associated with sets, relations, functions and discrete structures.	L2 (Understand)
CO3	To **Apply** mathematical logic to solve problems.	L3 (Apply)
CO4	To **Apply** the properties of Boolean algebra to simplify or convert a Boolean expression	L3 (Apply)
CO5	To **Solve** real world problems using graphs and trees.	L4 (Analyze)

CO PO-PSO Articulation Matrices

Course Outcomes (COs)	(POs)												PSOs	
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**
CO1	3	2	2									1	2	2
CO2	2	3	2									1	1	1
CO3	3	2										1	2	1
CO4	3	2										1	2	2
CO5	2	2	3									1	2	2

Course: Computer Organization & Architecture
Course Code: PCC-CSE-204G

CO (Course Outcomes)		RBT*- Revised Bloom's Taxonomy
CO1	To **Describe** the basics of Computer Organization and Architecture and functionality of central processing unit.	L1 (Remember)
CO2	To **Explain** the basics of Data representation, components, and fixed point representation.	L2 (Understand)
CO3	To **Analyze** different modes of data transfer, classify interconnection structures and distinguish CPU vs. ALU architectures & computations.	L4 (Analyze)
CO4	To **Classify** cache memory Matrices techniques and examine register transfer between processor, memory & I/O.	L4 (Analyze)
CO5	To **Compare** Hardwired & CISC style processors of parallel processing, pipelining and inter-processor communication.	L5 (Evaluate)

CO PO-PSO Articulation Matrices

Course Outcomes (COs)	(POs)												PSOs	
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**
CO1	3	2	2									1	2	2
CO2	2	3	2									1	3	2
CO3	2	2	3									1	2	2
CO4	2	2	3									1	2	1
CO5	1	2	3	1								1	1	1

Course: Operating System
Course Code: PCC-CSE-206G

CO (Course Outcomes)		RBT*- Revised Bloom's Taxonomy
CO1	To **Recall** the basic knowledge about the Operating System and Process.	L1 (Remember)
CO2	To **Describe** the conceptS of memory management including virtual memory.	L2 (Understand)
CO3	To **Apply** the concept of the different scheduling algorithms used for process management in operating system.	L3 (Apply)
CO4	To **Analyze** the issues related to file system interface and implementation, disk management.	L4 (Analyze)
CO5	To **Compare** various types of operating systems including Unix.	L5 (Evaluate)

CO PO-PSO Articulation Matrices

Course Outcomes (COs)	(POs)												PSOs	
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**
CO1	3	2										1	1	1
CO2	2	3										1	1	2
CO3	2	3										1	1	2
CO4	2	3										1	2	2
CO5	1	3										1	1	1

Course: Object Oriented Programming
Course Code: PCC-CSE-208G

CO (Course Outcomes)		RBT*- Revised Bloom's Taxonomy
CO1	To **Recall** the basic concept of OOPs and C++ language features.	L1 (Remember)
CO2	To **Demonstrate** the use of constructors, destructors and also the behaviour of inheritance and its implementation.	L2 (Understand)
CO3	To **Apply** the concept of Function overloading, operator overloading, Inheritance, virtual functions and polymorphism.	L3 (Apply)
CO4	To **Analyze** runtime Polymorphism and Generic Programming	L4 (Analyze)
CO5	To **Evaluate** Exception handling.	L5 (Evaluate)

CO PO-PSO Articulation Matrices

Course Outcomes (COs)	(POs)												PSOs	
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**
CO1	3	2	2									1	3	3
CO2	2	3	2									1	2	2
CO3	3	2	2									1	2	2
CO4	3	2	2									1	1	2
CO5	2	3	2									1	1	1

Course: Organizational Behaviour
Course Code: HSMC-02G

CO (Course Outcomes)		RBT*- Revised Bloom's Taxonomy
CO1	To be Able to resolve the conflicts within an organization.	L1 (Remember)
CO2	To **Learn** how effectively and efficiently a manager manages their employees.	L2 (Understand)
CO3	To **Understand** students their own behaviour, attitudes and ethical views.	L2 (Understand)
CO4	To **Analyze** how to improve the functional behaviour within an organization.	L4 (Analyze)
CO5	To **Develop** the communication and administrative skills.	L4 (Analyze)

CO PO-PSO Articulation Matrices

Course Outcomes (COs)	(POs)												PSOs	
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**
CO1								2	3	1		2	1	2
CO2								2	3	1		2	1	2
CO3								3	2	1		2	1	2
CO4								2	3	1		2	2	2
CO5								2	3	3		2	3	3

Course: Environmental Sciences
Course Code: MC-106G

CO (Course Outcomes)		RBT*- Revised Bloom's Taxonomy
CO1	To **Understand** the core concepts and methods from ecological and physical sciences and their application in environmental problem-solving.	L2 (Understand)
CO2	To **Discuss** Living Organisms, and various issues related to Environment.	L2 (Understand)
CO3	To **Apply** the environment friendly techniques for healthy environment.	L3 (Apply)
CO4	T**o Analyze** problems associated with environmental degradation including pollution related issues.	L4 (Analyze)
CO5	T**o Assess** the contribution of human behaviour in environmental degradation.	L4 (Analyze)

CO PO-PSO Articulation Matrices

Course Outcomes (COs)	(POs)												PSOs	
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**
CO1	3					2	2	2				2	1	1
CO2						3	2	2				2	1	2
CO3						3	2	2				2	1	2
CO4						3	2	2				2	1	2
CO5						3	2	2				2	1	1

Course: Web Technologies
Course Code: PCC-CSE-210G

CO (Course Outcomes)		RBT*- Revised Bloom's Taxonomy
CO1	To **Recall** the basic concept of internet & protocols of internet.	L1 (Remember)
CO2	To **Understand** HTML,CSS,XML & PHP for website preparation.	L2 (Understand)
CO3	To **Implement** AJAX with PHP for database connectivity.	L3 (Apply)
CO4	To **Analyze** different tools & Web development languages for Attractive Website.	L4 (Analyze)
CO5	To **Design** web pages using HTML, XML and DHTML.	L6 (Create)

CO PO-PSO Articulation Matrices

Course Outcomes (COs)	(POs)												PSOs	
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**
CO1	3	2										1	2	2
CO2	2	3										1	3	2
CO3	2	3	2									1	2	2
CO4	2	3	2									1	3	2
CO5	2	2	3									1	3	3

Course: Operating System LAB
Course Code: LC-CSE-212G

CO (Course Outcomes)		RBT*- Revised Bloom's Taxonomy
CO1	To **Discuss** UNIX File System & Commands for working in UNIX environment.	L2 (Understand)
CO2	To **Apply** the basic concepts of Shell Programming and control structures	L3 (Apply)
CO3	To **Analyze** LINUX kernel, shell, basic commands, pipe and filter commands.	L4 (Analyze)
CO4	To **Analyze** CPU Scheduling Algorithms. (FCFS, RR, SJF, Priority, Multilevel Queuing)	L4 (Analyze)
CO5	To **Evaluate** simulating FIFO, LRU, and OPTIMAL page replacement algorithm.	L5 (Evaluate)

CO PO-PSO Articulation Matrices

Course Outcomes (COs)	(POs)												PSOs	
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**
CO1	3	2										1	1	1
CO2	2	3			2							1	1	2
CO3	2	3		2	2							1	1	2
CO4	2	3		2	2							1	2	2
CO5	1	3			2							1	1	1

Course: Object Oriented Programming Using C++ LAB
Course Code: LC-CSE-214G

CO (Course Outcomes)		RBT*- Revised Bloom's Taxonomy
CO1	To **Explain** C++ compiler and translate basic C programs into C++ programs.	L2 (Understand)
CO2	To **Apply** inheritance and polymorphism features to implement code reusability.	L3 (Apply)
CO3	To **Analyze** Exception handling concepts to handle runtime errors.	L4 (Analyze)
CO4	To **Create** programs on classes, objects, constructors and make use of access specified in classes.	L6 (Create)
CO5	To **Create** programs using different operators, function overloading and operator overloading.	L6 (Create)

CO PO-PSO Articulation Matrices

Course Outcomes (COs)	(POs)												PSOs	
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**
CO1	3	2	2									1	3	1
CO2	2	3	2		2							1	1	1
CO3	3	2	2		2							1	2	2
CO4	3	2	2		2							1	3	3
CO5	2	3	2		2							1	3	3

Course: Web Technologies LAB
Course Code: LC-CSE-216G

CO (Course Outcomes)		RBT*- Revised Bloom's Taxonomy
CO1	To **Describe** different commands of HTML,CSS,XML & PHP for website preparation.	L2 (Understand)
CO2	To **Use** AJAX with PHP for database connectivity.	L3 (Apply)
CO3	To **Analyze** a web page and identify its elements and attributes.	L4 (Analyze)
CO4	To **Create** XML documents and Schemas.	L6 (Create)
CO5	To **Design** an Application with Back-end use PHP.	L6 (Create)

CO PO-PSO Articulation Matrices

Course Outcomes (COs)	(POs)												PSOs	
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**
CO1	3	2										1	2	3
CO2	2	3			2							1	3	2
CO3	2	3	2		2							1	3	3
CO4	2	3	2		2							1	3	3
CO5	2	2	3		2							1	3	3

B.Tech. CSE 5th Semester

Course: Microprocessor
Course Code: ESC-CSE-301G

CO (Course Outcomes)		RBT*- Revised Bloom's Taxonomy's
CO1	To **Recall** the basic knowledge of microprocessor and interfacing devices.	L1 (Remember)
CO2	To **Understand** the construction, principle of operation and pin configuration and architecture of microprocessor (8085,8086 processor) and peripheral devices.	L2 (Understand)
CO3	To **Experiment** the programming by the understanding of instruction sets of microprocessor.	L3 (Apply)
CO4	To Analyze the interfacing of devices like 8255,8259,8237,8254.	L4 (Analyze)
CO5	To **Create** the programming of 8085 and 8086 microprocessor and interfacing the devices	L6 (Create)

CO PO-PSO Articulation Matrices

Course Outcomes (COs)	(POs)												PSOs	
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**
CO1	3	2										1	1	2
CO2	2	3										1	1	2
CO3	2	2	3									1	1	2
CO4	2	2	3									1	1	2
CO5	2	2	3									1	1	1

Course: Computer Networks
Course Code: PCC-CSE-303G

CO (Course Outcomes)		RBT*- Revised Bloom's Taxonomy's
CO1	To **Explain** Basic Computer Network Terms and Principles.	L1 (Remember)
CO2	To **Summarize** different protocols used at Application Layer i.e .FTP, DNS, HTTP, DNS, SNMP, SMTP.	L2 (Understand)
CO3	To **Examine** the functions of different layers in OSI and TCP/IP model.	L4 (Analyze)
CO4	To **Analyze** the different types of Network Topologies and Protocols.	L4 (Analyze)
CO5	To **Compare** different Network Layer Protocols and Routing Algorithms.	L4 (Analyze)

CO PO-PSO Articulation Matrices

Course Outcomes (COs)	(POs)												PSOs	
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**
CO1	3											1	2	3
CO2	2	3	2									1	1	2
CO3	3	2	2									1	2	2
CO4	2	2		3								1	3	3
CO5	2	3	2									1	3	1

Course: Formal Languages & Automata
Course Code: PCC-CSE-305G

CO (Course Outcomes)		RBT*- Revised Bloom's Taxonomy's
CO1	To Understand designing of various kinds of Finite State Machines.	L2 (Understand)
CO2	To Analyze various types of grammars i.e. Context Free Grammars.	L4 (Analyze)
CO3	To Describe the basic concepts of computability using Turing Machines and Undecidability.	L2 (Understand)
CO4	To Examine the Regular Expressions and Properties of Regular languages.	L4 (Analyze)
CO5	To Conceptualize about parsing of grammars, finding out ambiguities and removing ambiguities from grammars.	L5 (Evaluate)

CO PO-PSO Articulation Matrices

Course Outcomes (COs)	(POs)												PSOs	
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**
CO1	3	2	2									1	1	1
CO2	2	3	2									1	1	2
CO3	2	2	3	2								1	1	1
CO4	2	3										1	2	2
CO5	2	2		2								1	3	2

Course: Design & Analysis of Algorithms
Course Code: PCC-CSE-307G

CO (Course Outcomes)		RBT*- Revised Bloom's Taxonomy
CO1	To **Recall** the concept of algorithm designs a non-linear data structures.	L1 (Remember)
CO2	To **Describe** NP Hard and NP Complete Problems.	L2 (Understand)
CO3	To **Apply** Divide and Conquer, Greedy and Dynamic Programming algorithmic methods.	L3 (Apply)
CO4	To **Apply** efficient algorithms based on Backtracking and Branch & Bound approach in solving real time problems.	L3 (Apply)
CO5	To **Analyze** the asymptotic performance of algorithms.	L4 (Analyze)

CO PO-PSO Articulation Matrices

Course Outcomes (COs)	(POs)												PSOs	
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**
CO1	3	2	2									1	3	3
CO2	2	3	2	2								1	2	2
CO3	2	2	3	2								1	2	2
CO4	2	2	3	2								1	2	2
CO5	2	2		3								1	3	2

Course: Programming in Java
Course Code: PCC-CSE-309G

CO (Course Outcomes)		RBT*- Revised Bloom's Taxonomy
CO1	To **Describe** the basics of object-oriented programming using JAVA.	L2 (Understand)
CO2	To **Apply** the concept of classes, Java, JDK Components and develop Simple Java Programs.	L3 (Apply)
CO3	To **Analyze** Multi-threading Programming and Interfaces.	L4 (Analyze)
CO4	To **Develop** Simple Java Programs using Inheritance and Exception.	L6 (Create)
CO5	To **Develop** GUI applications using Applet classes, Swing components and Event handling programs.	L6 (Create)

CO PO-PSO Articulation Matrices

Course Outcomes (COs)	(POs)												PSOs	
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**
CO1	3	2										1	3	3
CO2	2	3	2									1	3	2
CO3	2	2	3									1	3	2
CO4	2	2	3									1	3	2
CO5	2	2	2	3								1	3	2

Course: Software Engineering (Elective-I)
Course Code: PEC-CSE-311G

CO (Course Outcomes)		RBT*- Revised Bloom's Taxonomy
CO1	To **Understand** the Basics Terms of Software Engineering.	L2 (Understand)
CO2	To **Discuss** Various Software Testing Techniques, Software Quality Assurance activities, ISO standards and Software configuration management.	L2 (Understand)
CO3	To **Apply** the software engineering lifecycle by demonstrating competence in requirement analysis, planning, analysis, design, construction, testing and deployment.	L3 (Apply)
CO4	To **Analyze** and lay down software requirements through a productive association with various stakeholders of the software project.	L4 (Analyze)
CO5	To **Analyze** and plan software solutions to problems using an object-oriented strategy.	L4 (Analyze)

CO PO-PSO Articulation Matrices

Course Outcomes (COs)	(POs)												PSOs	
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**
CO1	3	2										1	3	2
CO2	2	3	2									1	2	3
CO3	2	2	3	2								1	3	2
CO4	2	2	3	2								1	2	2
CO5	2	2	2									1	2	3

Course: Microprocessor Lab
Course Code: LC-ESC-321G

CO (Course Outcomes)		RBT*- Revised Bloom's Taxonomy
CO1	To **Understand** and **apply** the fundamentals of assembly level programming of microprocessors and microcontroller.	L3 (Apply)
CO2	To **Solve** basic binary math operations using the instructions of microprocessor 8085.	L3 (Apply)
CO3	To **Design**, code and debugs Assembly Language programs to implement simple programs.	L6 (Create)
CO4	To **Apply** programming knowledge using the capabilities of the stack, the program counter.	L3 (Apply)
CO5	To **Troubleshoot** interactions between software and hardware.	L6 (Create)

CO PO-PSO Articulation Matrices

Course Outcomes (COs)	(POs)												PSOs	
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**
CO1	3	2										1	1	2
CO2	2	3			2							1	1	2
CO3	2	2	3		2							1	1	2
CO4	2	2	3		2							1	1	2
CO5	2	2	3		2							1	1	1

Course: Computer Networks Lab
Course Code: LC-CSE-323G

CO (Course Outcomes)		RBT*- Revised Bloom's Taxonomy's
CO1	To **Demonstrate** the function(s) of each layers of the OSI model and TCP/IP.	L3 (Apply)
CO2	To **Describe** the different types of network topologies and protocols.	L2 (Understand)
CO3	To **Analyze** the various routing algorithms.	L4 (Analyze)
CO4	To **Construct** simple network by using any modern Open Source Network Simulation Tool.	L6 (Create)
CO5	To **Design** and implement a peer to peer file sharing application utilizing application layer protocols such as HTTP, DNS, and SMTP and transportation layer protocol.	L6 (Create)

CO PO-PSO Articulation Matrices

Course Outcomes (COs)	(POs)												PSOs	
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**
CO1	3											1	2	3
CO2	2	3	2		2							1	1	2
CO3	3	2	2		2							1	2	2
CO4	2	2		3	2							1	3	3
CO5	2	3	2		2							1	3	1

Course: Design & Analysis of Algorithms Using C++
Course Code: LC-CSE-325G

CO (Course Outcomes)		RBT*- Revised Bloom's Taxonomy
CO1	To **Apply** the Divide and Conquer method to solve various problems.	L3 (Apply)
CO2	To **Apply** the Backtracking method to solve problems various problems.	L3 (Apply)
CO3	To **Compare** different Sorting and Searching algorithms which provide the same solution.	L4 (Analyze)
CO4	To **Create** the programs to solve problems using algorithm design techniques	L6 (Create)
CO5	To **Create** programs to solve problems using Greedy and Dynamic programming techniques.	L6 (Create)

CO PO-PSO Articulation Matrices

Course Outcomes (COs)	(POs)												PSOs	
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**
CO1	3	2	2									1	3	3
CO2	2	3	2	2	2							1	2	2
CO3	2	2	3	2	2							1	2	2
CO4	2	2	3	2	2							1	2	2
CO5	2	2		3	2							1	3	2

Course: Programming in Java Lab
Course Code: LC-CSE-327G

CO (Course Outcomes)		RBT*- Revised Bloom's Taxonomy
CO1	To **Identify** of the structure and model of the Java programming language.	L2 (Understand)
CO2	To **Identify** classes, objects, members of a class and relationships among them needed for a specific problem.	L2 (Understand)
CO3	To **Demonstrate** the concepts of polymorphism and inheritance.	L3 (Apply)
CO4	To **Design** Java programs to implement error handling techniques using exception handling.	L6 (Create)
CO5	To **Design** Java application programs using OOP principles and proper program structuring.	L6 (Create)

CO PO-PSO Articulation Matrices

Course Outcomes (COs)	(POs)												PSOs	
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**
CO1	3	2										1	2	3
CO2	2	3	2		2							1	2	2
CO3	2	2	3		2							1	3	2
CO4	2	2	3		2							1	3	2
CO5	2	2	2	3	2							1	3	2

B.Tech. CSE 6th Semester

Course: Compiler Design
Course Code: PCC-CSE-302G

CO (Course Outcomes)		RBT*- Revised Bloom's Taxonomy
CO1	To **Recall** the concepts, design and implementation of language processors i.e. compilers.	L1 (Remember)
CO2	To **Illustrate** the various aspects like grammars, languages and phases of compilers etc.	L2 (Understand)
CO3	To **Applying** concept of First and follow of non-terminals and the ambiguity of Grammar.	L3 (Apply)
CO4	To **Analyze** the syntax directed translations with syntax trees.	L4 (Analyze)
CO5	To **Evaluate** the Code Optimization and Code Generation.	L5 (Evaluate)

CO PO-PSO Articulation Matrices

Course Outcomes (COs)	(POs)												PSOs	
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**
CO1	3	2										1	2	3
CO2	2	3	2									1	2	2
CO3	2	2	3	2								1	1	2
CO4	2	2	3	2								1	2	3
CO5	2	2	2	3								1	3	2

Course: Artificial Intelligence
Course Code: PCC-CSE-304G

CO (Course Outcomes)		RBT*- Revised Bloom's Taxonomy
CO1	To **Describe** the concept of Artificial Intelligence.	L2 (Understand)
CO2	To **Solve** the basic AI based problem solving, inference perception, knowledge representation and learning.	L3 (Apply)
CO3	To **Break down** real-world problems as state space problems, optimization problems or constraint satisfaction problems.	L4 (Analyze)
CO4	To **Analyze** AI techniques to real-world problems to develop intelligent systems.	L4 (Analyze)
CO5	To **Design** an expert system by using appropriate tools and techniques for implementing the intelligent system.	L6 (Create)

CO PO-PSO Articulation Matrices

Course Outcomes (COs)	(POs)												PSOs	
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**
CO1	3	2										1	3	2
CO2	2	2	3									1	2	2
CO3	2	3	2									1	2	2
CO4	2	2	2	3								1	1	2
CO5	2	2	2	3								1	2	1

Course: Advanced Java
Course Code: PCC-CSE-306G

CO (Course Outcomes)		RBT*- Revised Bloom's Taxonomy
CO1	To **Describe** the role of Servlet & JSP for Web designing.	L2 (Understand)
CO2	To **Demonstrate** the role of Spring & Struts.	L3 (Apply)
CO3	To **Differentiate** between Hibernate & Spring.	L4 (Analyze)
CO4	To **Analyze** Design Pattern of J2EE & Android.	L4 (Analyze)
CO5	To **Create** Mail API for understanding of mail system.	L6 (Create)

CO PO-PSO Articulation Matrices

Course Outcomes (COs)	(POs)												PSOs	
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**
CO1	3	2										1	3	3
CO2	2	3	2									1	3	2
CO3	2	2	3	2								1	3	2
CO4	2	2	3	2								1	3	2
CO5	2	2	2	2								1	3	2

Course: Mobile and Wireless Communication
Course Code: ESC-CSE-308G

CO (Course Outcomes)		RBT*- Revised Bloom's Taxonomy
CO1	To **Describe** the key concepts of cellular communication and Satellite Systems.	L2 (Understand)
CO2	To **Demonstrate** the standards like GSM, Bluetooth, 802.11, WAP etc.	L3 (Apply)
CO3	To **Differentiate** various multiple-access techniques for mobile communications like FDMA, TDMA, and CDMA.	L4 (Analyze)
CO4	To **Analyze** various routing algorithms and applications of Mobile Ad-Hoc Networks.	L4 (Analyze)
CO5	To **Assess** Mobile IP Standard with packet delivery concept.	L5 (Evaluate)

CO PO-PSO Articulation Matrices

Course Outcomes (COs)	(POs)												PSOs	
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**
CO1	3	2										1	2	3
CO2	2	3	2									1	1	2
CO3	2	2	3									1	2	2
CO4	2	2	2	2								1	3	3
CO5	3	2	2	3								1	3	1

Course: Advanced Database Management System (Elective-II)
Course Code: PEC-CSE-310G

CO (Course Outcomes)		RBT*- Revised Bloom's Taxonomy
CO1	To **Describe** Basic Components, Terms, Advantages and Disadvantages of DBMS.	L2 (Understand)
CO2	To **Illustrate** the Transactions issues and concurrency control.	L2 (Understand)
CO3	To **Demonstrate the** ER, EER, Network, Hierarchical and Relational data models.	L3 (Apply)
CO4	To **Analyze** Parallel and Distributed Databases and Query Processing and Optimization.	L4 (Analyze)
CO5	To **Compare** Object Oriented and Object Relational Databases.	L4 (Analyze)

CO PO-PSO Articulation Matrices

Course Outcomes (COs)	(POs)												PSOs	
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**
CO1	3	2										1	3	3
CO2	2	3	2									1	2	2
CO3	2	2	3	2								1	2	2
CO4	2	2	3	2								1	3	2
CO5	2	2	3	2								1	2	2

Course: Distributed System (Elective-III)
Course Code: PCC-CSE-316G

CO (Course Outcomes)		RBT*- Revised Bloom's Taxonomy
CO1	To **Recall** the Goals, Issues, hardware & software concepts of the Distributed system.	L1 (Remember)
CO2	To **Discuss** the Communication & Synchronization Algorithms in Distributed System.	L2 (Understand)
CO3	To **Apply** Scheduling & Processor Allocation Techniques for Load balancing.	L3 (Apply)
CO4	To **Analyze** the Design & functioning of Distributed file System & Shared Memory.	L4 (Analyze)
CO5	To **Examine** the security issues of Distributed System & Distributed Web-based System**.**	L4 (Analyze)

CO PO-PSO Articulation Matrices

Course Outcomes (COs)	(POs)												PSOs	
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**
CO1	3	2										1	3	3
CO2	3	2										1	3	2
CO3	2	3	2									1	3	2
CO4	2	3	3									1	3	2
CO5	2	3	2									1	3	2

Course: PROJECT-I
Course Code: PROJ-CSE-322G

CO (Course Outcomes)		RBT*- Revised Bloom's Taxonomy
CO1	To **Define** the problem identification, requirements and analyze the feasibility.	L2 (Understand)
CO2	To **Demonstrate** knowledge, skills of professional engineer and applying hypothesis on Problem.	L3 (Apply)
CO3	To **Design** and develop the solution for real-life engineering problems.	L6 (Create)
CO4	To **Evaluate** the developed system to solve real world problems.	L5 (Evaluate)
CO5	Ability to **use** formal & informal communication with team members and guide.	L3 (Apply)

CO PO-PSO Articulation Matrices

Course Outcomes (COs)	(POs)												PSOs	
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**
CO1	3	2	1						2	2	3	1	3	3
CO2	2	3	2	2					2	2		1	2	3
CO3	2	2	3	2					2	2	2	1	3	2
CO4	2	2	2	3					2	2	2	1	2	3
CO5	2	2	2						3	3		1	2	3

Course: Compiler Design Lab
Course Code: LC-CSE-324-G

CO (Course Outcomes)		RBT*- Revised Bloom's Taxonomy
CO1	To **Describe** the concept of Lex/ Yacc Compilers.	L2 (Understand)
CO2	To **Use** various aspects like grammar, languages, operators, left recursion using practical experiments.	L3 (Apply)
CO3	To **Analyze** whether Regular Expressions belong to Grammar or not.	L4 (Analyze)
CO4	To **Analyze** Lexical Analyzer for validating operators.	L4 (Analyze)
CO5	To **Evaluate** the implementation of Operator Precedence Parser.	L5 (Evaluate)

CO PO-PSO Articulation Matrices

Course Outcomes (COs)	(POs)												PSOs	
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**
CO1	3	2										1	2	3
CO2	2	3	2		2							1	2	2
CO3	2	2	3	2	2							1	1	2
CO4	2	2	3	2	2							1	2	3
CO5	2	2	2	3	2							1	3	2

Course: Artificial Intelligence Lab using Python
Course Code: LC-CSE-326G

CO (Course Outcomes)		RBT*- Revised Bloom's Taxonomy
CO1	To **Use** Control Structures and Operators to write basic Python programming.	L3 (Apply)
CO2	To **Analyze** object-oriented concepts in Python.	L4 (Analyze)
CO3	To **Evaluate** the AI models pre-processed through various feature engineering algorithms by Python Programming.	L5 (Evaluate)
CO4	To **Develop** the code for the recommender system using Natural Language processing.	L6 (Create)
CO5	To **Design** various reinforcement algorithms to solve real-time complex problems.	L6 (Create)

CO PO-PSO Articulation Matrices

Course Outcomes (COs)	(POs)												PSOs	
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**
CO1	3	2										1	3	2
CO2	2	2	3		2							1	2	2
CO3	2	3	2		2							1	2	2
CO4	2	2	2	3	2							1	1	2
CO5	2	2	2	3	2							1	2	1

Course: Advanced Java Lab
Course Code: LC-CSE-328-G

CO (Course Outcomes)		RBT*- Revised Bloom's Taxonomy
CO1	To **Explain** the basics of the Java.Net package	L2 (Understand)
CO2	To **Demonstrate** client-server interaction using Servlets.	L3 (Apply)
CO3	To **Analyze** applications to implement database interaction using JDBC.	L4 (Analyze)
CO4	To **Develop** Java Beans applications.	L6 (Create)
CO5	To **Create** server communication using TCP-IP and UDP.	L6 (Create)

CO PO-PSO Articulation Matrices

Course Outcomes (COs)	(POs)												PSOs	
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**
CO1	3	2										1	3	3
CO2	2	3	2		2							1	3	2
CO3	2	2	3	2	2							1	3	2
CO4	2	2	3	2	2							1	3	2
CO5	2	2	2	2	2							1	3	2

Course: Constitution of India
Course Code: MC-317-G

CO (Course Outcomes)		RBT*- Revised Bloom's Taxonomy
CO1	To **Understand** the basic features of Constitution of India	L2 (Understand)
CO2	To **Understand** about salient features of the Constitution of India.	L2 (Understand)
CO3	To **Understand** fundamental duties and federal structure of Constitution of India.	L2 (Understand)
CO4	To **Understand** about emergency provisions in Constitution of India.	L2 (Understand)
CO5	To **Understand** about fundamental rights under Constitution of India.	L2 (Understand)

CO PO-PSO Articulation Matrices

Course Outcomes (COs)	(POs)												PSOs	
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**
CO1						3		2				1	0	1
CO2						3		2				1	0	1
CO3						2		3				1	0	1
CO4						3		2				1	1	1
CO5						3		2				1	1	1

B.Tech. CSE 7th Semester

Course: Neural Networks
Course Code: PCC-CSE-401G

CO (Course Outcomes)		RBT*- Revised Bloom's Taxonomy's
CO1	To **Understand** the concept of Biological neurons and Activation function.	L2 (Understand)
CO2	To **Describe** the concepts ANN architecture in single and multi-layer Network.	L2 (Understand)
CO3	To **Analyze** various types of Models: MCP Model and Perceptron Network .	L4 (Analyze)
CO4	To **Identify** the types of Learning and their Learning concepts.	L4 (Analyze)
CO5	To **Conceptualize** about different types of Associative Memory.	L5 (Evaluate)

CO PO-PSO Articulation Matrices

Course Outcomes (COs)	(POs)												PSOs	
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**
CO1	3	2										1	1	2
CO2	3	2	1									1	2	2
CO3	2	3	1									1	2	2
CO4	2	3	1									1	2	3
CO5	2	3	1									1	2	1

Course: Software Project Management (Professional Elective –IV)
Course Code: PEC-CSE-403G

CO (Course Outcomes)		RBT*- Revised Bloom's Taxonomy's
CO1	To **Recall** the fundamental principles of software project management.	L1 (Remember)
CO2	To **Understand** Estimation, Planning, And Tracking.	L2 (Understand)
CO3	To **Recognize** good knowledge of responsibilities of a project manager.	L2 (Understand)
CO4	To **Interpret** the importance of software quality and techniques to enhance software quality	L3 (Apply)
CO5	To **Compare** and differentiate organization structures and project structures.	L4 (Analyze)

CO PO-PSO Articulation Matrices

Course Outcomes (COs)	(POs)												PSOs	
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**
CO1	3											2	2	3
CO2	2	3										2	1	2
CO3	2	2							2			2	2	3
CO4	2	2									3	2	3	1
CO5	2	3									2	2	2	1

Course: Web Mining (Professional Elective –IV)
Course Code: PEC-CSE-405G

CO (Course Outcomes)		RBT*- Revised Bloom's Taxonomy
CO1	To **Recall** the basic concepts and techniques of Web Mining, Data Mining, and Web Mining Challenges.	L1 (Remember)
CO2	To **Discuss** the application of Swarn Intelligence Techniques in real-world problems.	L2 (Understand)
CO3	To **Illustrate** Information retrieval models and Web Content Mining.	L3 (Apply)
CO4	To **Classify** the concept of Computational Intelligence and Optimization algorithms.	L4 (Analyze)
CO5	To **Assess** the performance of different Swarn Intelligence Techniques.	L5 (Evaluate)

CO PO-PSO Articulation Matrices

Course Outcomes (COs)	(POs)												PSOs	
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**
CO1	3											1	2	2
CO2	2	2										1	2	2
CO3	2	2	2	1								1	2	2
CO4	2	2	1	3								1	2	2
CO5	2	1	2	2								1	1	1

Course: Advanced Computer Architecture (Professional Elective –V)
Course Code: PEC-CSE-417G

CO (Course Outcomes)		RBT*- Revised Bloom's Taxonomy
CO1	To **Discuss** the computational model and micro architectural design of Advance Computer Architecture.	L2 (Understand)
CO2	To **Describe** various parallel processing techniques, performance measures and code scheduling.	L2 (Understand)
CO3	To **Interpret** the role of VLIW Superscalar processor and branch handling techniques for performance improvement.	L3 (Apply)
CO4	To **Analyze** various MIMD architecture, various static and dynamic networks for realizing the efficient network.	L4 (Analyze)
CO5	To **Distinguish** advance processor technology, memory hierarchy and cache tolerance using directory based and snoopy class of protocols.	L4 (Analyze)

CO PO-PSO Articulation Matrices

Course Outcomes (COs)	(POs)												PSOs	
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**
CO1	3	2										1	1	2
CO2	3	2	2									1	1	3
CO3	3	2	2									1	1	2
CO4	2	3	2									1	1	3
CO5	3	2	2	2								1	1	1

Course: Network Security and Cryptography (Professional Elective –V)
Course Code: PEC-CSE-411G

CO (Course Outcomes)		RBT*- Revised Bloom's Taxonomy's
CO1	To **Understand** various attacks and need of Cryptography.	L2 (Understand)
CO2	To **Apply** various substitution and transposition ciphers for securing a message.	L3 (Apply)
CO3	To **Analyze** the need and functioning of various block ciphers.	L4 (Analyze)
CO4	To **Evaluate** how to maintain the Confidentiality, Integrity and Availability.	L5 (Evaluate)
CO5	To **Create** various public key algorithm for securing the message.	L6 (Create)

CO PO-PSO Articulation Matrices

Course Outcomes (COs)	(POs)												PSOs	
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**
CO1	3	2										1	1	2
CO2	2	2	1									1	1	1
CO3	3	2	2									1	1	2
CO4	2	2	2									1	1	1
CO5	2	2	2	2								1	1	1

Course: Fundamentals of Management (Open Elective –I)
Course Code: HSMC-08G

CO (Course Outcomes)		RBT*- Revised Bloom's Taxonomy
CO1	To **Describe** the Basics of Management and the role of Management in an organization.	L2 (Understand)
CO2	To **Explain** the Importance of Staffing and Training.	L2 (Understand)
CO3	To **Discuss** the concept of Material management and Inventory Control.	L2 (Understand)
CO4	To **Analyze** the components of Marketing and Advertising.	L4 (Analyze)
CO5	To **Assess** the Various sources of Finance and Capital Structure.	L5 (Evaluate)

CO PO-PSO Articulation Matrices

Course Outcomes (COs)	(POs)												PSOs	
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**
CO1											3	2	1	2
CO2									3	2	2	2	1	2
CO3											3	2	1	2
CO4											3	2	1	2
CO5											3	2	1	2

Course: NEURAL NETWORKS USING MATLAB

CO (Course Outcomes)		RBT*- Revised Bloom's Taxonomy's
CO1	To **Understand** basic neuron models and learning algorithms by using Matlab's neural network toolbox	L2 (Understand)
CO2	To **Describe** about different activation function (transfer function).	L2 (Understand)
CO3	To **Analyze** how weights & bias values affect the output of neuron.	L4 (Analyze)
CO4	To **Identify** how weights & bias values are able to represent a decision boundary in the feature space.	L4 (Analyze)
CO5	To **Conceptualize** about perceptron learning rule works for linearly separable problems.	L5 (Evaluate)

CO PO-PSO Articulation Matrices

Course Outcomes (COs)	(POs)												PSOs	
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**
CO1	3	2										1	1	2
CO2	3	2	1		2							1	2	2
CO3	2	3	1		2							1	2	2
CO4	2	3	1		2							1	2	3
CO5	2	3	1		2							1	2	1

Course: PROJECT-II
Course Code: PROJ-CSE-423G

CO (Course Outcomes)		RBT*- Revised Bloom's Taxonomy
CO1	To **Define** the problem identification, requirements and analyze the feasibility.	L2 (Understand)
CO2	To **Demonstrate** knowledge, skills of professional engineer and applying hypothesis on Problem.	L3 (Apply)
CO3	To **Design** and develop the solution for real-life engineering problems.	L6 (Create)
CO4	To **Evaluate** the developed system to solve real world problems.	L5 (Evaluate)
CO5	Ability to **use** formal & informal communication with team members and guide.	L3 (Apply)

CO PO-PSO Articulation Matrices

Course Outcomes (COs)	(POs)												PSOs	
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**
CO1	3	2	1						2	2	3	1	3	3
CO2	2	3	2	2					2	2		1	2	3
CO3	2	2	3	2					2	2	2	1	3	2
CO4	2	2	2	3					2	2	2	1	2	3
CO5	2	2	2						3	3		1	2	3

B.Tech. CSE 8th Semester

Course: Machine Learning
Course Code: PCC-CSE-402G

CO (Course Outcomes)		RBT*- Revised Bloom's Taxonomy
CO1	To **Describe** the basic concept and the importance of Machine Learning.	L2 (Understand)
CO2	To **Explain** the Machine Learning Models and features of machine learning to apply to real world problems.	L2 (Understand)
CO3	To **Apply** the concept of Machine Learning algorithms as supervised learning and unsupervised learning	L3 (Apply)
CO4	To **Analyze** the Regression, Classification and Clustering Techniques of Machine learning.	L4 (Analyze)
CO5	To **Evaluate** various machine learning algorithms through statistical learning techniques.	L5 (Evaluate)

CO PO-PSO Articulation Matrices

Course Outcomes (COs)	(POs)												PSOs	
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**
CO1	3	2										2	3	2
CO2	3	2										2	2	1
CO3	2	2	3									2	3	2
CO4	2	2	3									2	3	3
CO5	2	2	3	1								2	2	1

Course: Big Data Analytics
Course Code: PCC-CSE-404G

CO (Course Outcomes)		RBT*- Revised Bloom's Taxonomy
CO1	To **Describe** the need for Big Data challenges, applications and their Business Implications.	L2 (Understand)
CO2	To **Demonstrate** the conceptual, logical, and physical Big Data Model.	L3 (Apply)
CO3	To **Analyze** the Big Data framework like Hadoop, and NOSQL to efficiently store and process Big Data to generate analytics.	L4 (Analyze)
CO4	To **Classify** the Workflow system for Big Data like Swift, Taverna, Kepler.	L4 (Analyze)
CO5	To **Develop** all-purpose big data pipeline architecture.	L6 (Create)

CO PO-PSO Articulation Matrices

Course Outcomes (COs)	(POs)												PSOs	
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**
CO1	3											1	2	2
CO2	2	3										1	2	3
CO3	2	2	3	1								1	3	2
CO4	2	2	1	3								1	2	2
CO5	2	1	2	3								1	1	1

Course: Wireless Adhoc and Sensor Network (Open Elective-II)
Course Code: OEC-ECE-430G

CO (Course Outcomes)		RBT*- Revised Bloom's Taxonomy
CO1	To **Describe** the concepts, architectures, and applications of Wireless Ad Hoc and Sensor Networks.	L2 (Understand)
CO2	To **Describe** the MANETs and WSNs for industry and research point of views.	L2 (Understand)
CO3	To **Classify** the various Sensor Network Platforms, tools and applications.	L4 (Analyze)
CO4	To **Evaluate** the QoS related performance measurements of Wireless Ad Hoc and Sensor networks.	L5 (Evaluate)
CO5	To **Design** routing protocols for ad hoc systems.	L6 (Create)

CO PO-PSO Articulation Matrices

Course Outcomes (COs)	(POs)												PSOs	
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**
CO1	3	1	1	1	1							1	3	3
CO2	3	2	2	1	3							1	3	3
CO3	3	1	3	2	2							1	3	3
CO4	3	1	3	1	2							1	2	2
CO5	3	1	2	1	3							1	2	2

Course: Big Data Analytics Lab
Course Code: LC-CSE-410G

CO (Course Outcomes)		RBT*- Revised Bloom's Taxonomy
CO1	To **Describe** the key issues in Big Data Management and experiment with the Hadoop framework.	L2 (Understand)
CO2	To **Explain** the structure and unstructured data by using NoSQL commands.	L2 (Understand)
CO3	To **Apply** scientific computing algorithms for finding similar items and clustering.	L3 (Apply)
CO4	To **Test** fundamental enabling techniques and scalable algorithms for data stream mining.	L5 (Evaluate)
CO5	To **Develop** problem solving and critical thinking skills in fundamental enable techniques like Hadoop & MapReduce.	L6 (Create)

CO PO-PSO Articulation Matrices

Course Outcomes (COs)	(POs)												PSOs	
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**
CO1	3											1	2	2
CO2	2	3			2							1	2	3
CO3	2	2	3	1	2							1	3	2
CO4	2	2	1	3	2							1	2	2
CO5	2	1	2	3	2							1	1	1

Course: Machine Learning with Python Lab
Course Code: LC-CSE-412G

CO (Course Outcomes)		RBT*- Revised Bloom's Taxonomy
CO1	To **Describe** the implementation procedures for the Machine Learning algorithms.	L2 (Understand)
CO2	To **Apply** appropriate data sets to the Machine Learning algorithms.	L3 (Apply)
CO3	To **Use** Machine Learning algorithms to solve real-world problems.	L3 (Apply)
CO4	To **Outline** predictions using machine learning algorithms.	L4 (Analyze)
CO5	To **Design** Java/Python programs for various Machine Learning algorithms.	L6 (Create)

CO PO-PSO Articulation Matrices

Course Outcomes (COs)	(POs)												PSOs	
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**
CO1	3	2		2								1	3	3
CO2	3	3	2									1	3	2
CO3	3	2	3	2								1	3	2
CO4	3		3	2								1	3	2
CO5	3	2		3								1	3	2

Course: PROJECT-III
Course Code: PROJ-CSE-422G

CO (Course Outcomes)		RBT*- Revised Bloom's Taxonomy
CO1	To **Define** the problem identification, requirements and analyze the feasibility.	L2 (Understand)
CO2	To **Demonstrate** knowledge, skills of professional engineer and applying hypothesis on Problem.	L3 (Apply)
CO3	To **Design** and develop the solution for real-life engineering problems.	L6 (Create)
CO4	To **Evaluate** the developed system to solve real world problems.	L6 (Evaluate)
CO5	Ability to **use** formal & informal communication with team members and guide.	L3 (Apply)

CO PO-PSO Articulation Matrices

Course Outcomes (COs)	(POs)												PSOs	
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**
CO1	3	2	1						2	2	3	1	3	3
CO2	2	3	2	2					2	2		1	2	3
CO3	2	2	3	2					2	2	2	1	3	2
CO4	2	2	2	3					2	2	2	1	2	3
CO5	2	2	2						3	3		1	2	3