MAHARAJA RANJIT SINGH PUNJAB TECHNICAL UNIVERSITY BATHINDA-151001 (PUNJAB), INDIA

(A State University Estb. by Govt. of Punjab vide Punjab Act No. 5 of 2015 and Approved u/s 2(f) & 12 (B) of UGC; Member AIU)

Department: **COMPUTER SCIENCE AND ENGINEERING**

Giani Zail Singh Campus College of Engineering & Technology, MRSPTU

Program: B Tech Computer Science and Engineering

COURSE ARTICULATION MATRIX (STUDY SCHEME: 2018)

Subject	S Code	Semester	Credit	Duration (Hrs)	L T P	COs	Statement	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
Data Structure &Algorithm	BCSES1-302	3	4	60	3 1 0	CO1	For a given algorithm student will be able to analyze the algorithms to determine the time and computation complexity and justify the correctness.	2	3	3		1				3			3	1		
						CO2	For a given Search problem (Linear Search and Binary Search) student will be able to implement it.	2	3	3		1				3			3	1		
						CO3	For a given problem of Stacks, Queues and linked list student will be able to implement it and analyze the same to determine the time and computation complexity.	2	2	3		1				3			2		1	

Course	Code				Mode	CO	Course Outcome	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
						CO4	Student will able to write an algorithm Selection Sort, Bubble Sort, Insertion Sort, Quick Sort, Merge Sort, Heap Sort and compare their performance in term of Space and Time complexity.	1	3	3		3				2			2		1	
Computer Peripherals & Interfaces	BCSES1-301	3	3	45	3 0 0	CO1	To be able to learn system resources, IDE & SCSI Interfaces.			3		2									3	
						CO2	To be able to learn different video Hardware.			3		1	2								1	
						CO3	To learn different, I/O Interfaces and Input/ Output Driver Software Aspects.			3		1									2	
						CO4	To be able to design and implement different peripheral devices.		2	3		1	2								1	
DIGITAL ELECTRONICS	BCSES1-303	3	4	60	3 1 0	CO1	Understand working of logic families and logic gates.	3				2							3	3	2	3
						CO2	Design and implement Combinational and Sequential logic circuits.	3		3		3							3	3	2	2
						CO3	Understand the process of Analog to Digital conversion and Digital to Analog conversion.	3	2			3		1			3		3	3	1	1
						CO4	Be able to use PLDs to implement the given logical problem.	2		3	3								3	3	2	2
DATA STRUCTURE & ALGORITHMS LABORATORY	BCSES1-304	3	2		0 0 4	CO1	To introduce the basic concepts of Data structure, basic data types, searching and sorting based on array data types.	1												2		
						CO2	To introduce the structured data types like Stacks and Queue and its basic operation's implementation	1												2		
						CO3	To introduces dynamic implementation of linked list				3	2								2	1	

Course Name	Course Code	1	2	3	L-T-P	CO	Course Outcome	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
						CO4	To introduce the concepts of Tree and graph and implementation of traversal algorithms.				3	2									2	
DIGITAL ELECTRONICS LABORATORY	BBCSES1-305	3	1		0 0 2	CO1	To Familiarization with Digital Trainer Kit and associated equipment.	3	3	1	1	3	1						3	3	2	3
						CO2	To Study and design of TTL gates	3	3	3	3	2						3	3	3	1	2
						CO3	To learn the formal procedures for the analysis and design of combinational circuits.	3	3	3	2	3						3	3	3	2	2
						CO4	To learn the formal procedures for the analysis and design of sequential circuits	3	3	3	2	3						3	3	3	2	2
IT WORKSHOP (SciLab / MATLAB) LABORATORY	BCSES1-306	3	2		0 0 4	CO1	Introduction to Sci Labs / MATLAB environment and types of Sci Labs / MATLAB files.	3	3	1	1	3	1						3	3	2	3
						CO2	To be able to write programs for Matrix manipulations.	3	3	3	3	2						3	3	3	1	2
						CO3	MATLAB code for computing factorial of a number	3	3	3	2	3						3	3	3	2	2
						CO4	To be able to write programs using functions and plotting results	3	3	3	2	3						3	3	3	2	2
DISCRETE MATHEMATICS	BMATH1-401	4	4	60	3 1 0	CO1	For a given logic sentence express it in terms of predicates, quantifiers, and Logical connectives	1													2	
						CO2	For a given a problem, derive the solution using deductive logic and prove the Solution based on logical inference	1													2	
						CO3	For a given a mathematical problem, classify its algebraic structure				3	2									2	1

Course	Code					CO	CO Statement	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
						CO4	Evaluate Boolean functions and simplify expressions using the properties of Boolean Algebra				3	2									2	
COMPUTER ORGANIZATION & ARCHITECTURE	BECES1-502	5	3	45	3 0 0	CO1	Draw the functional block diagram of a single bus architecture of a computer and describe the function of the instruction execution cycle, RTL interpretation of instructions, addressing modes, instruction set.	3	3	1	1	3	1						3	3	2	3
						CO2	Write assembly language program for specified microprocessor for computing 16-bit multiplication, division and I/O device interface (ADC, Control circuit, serial port communication).	3	3	3	3	2					3		3	3	1	2
						CO3	Write a flowchart for Concurrent access to memory and cache coherency in Parallel Processors and describe the process.	3	3	3	2	3					3		3	3	3	2
						CO4	To learn the formal procedures for the analysis and design of sequential circuits	3	3	3	2	3					3		3	3	3	2
OPERATING SYSTEMS	BCSES1-402	4	4	60	3 1 0	CO1	Create processes and threads.	1				1									1	2
						CO2	Develop algorithms for process scheduling for a given specification of CPU utilization, Throughput, Turnaround Time, Waiting Time, Response Time	1	3			1									1	3
						CO3	For a given specification of memory organization develop the techniques for optimally allocating memory to processes by increasing memory utilization and for improving the access time.	2	3			1		1							2	2

Course	Code	Credits	Hours	L-T-P	CO	Course Outcome	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
					CO4	4Design and implement file management system and for a given I/O devices and OS (specify) develop the I/O management functions in OS as part of a uniform device abstraction by performing operations for synchronization between CPU and I/O controllers.	**3**	**2**			**1**		**2**					**1**	**3**	
OBJECT ORIENTED PROGRAMMING	BCSES1-403	4 / 4 / 60	3 1 0		CO1	To introduce the basic concepts of object-oriented programming language and its representation	1											1		
					CO2	To allocate dynamic memory, access private members of class and the behavior of inheritance and its implementation			3										3	
					CO3	To introduce polymorphism, interface design and overloading of operator				2								2		
					CO4	To handle backup system using file, general purpose template and handling of raised exception during programming	1													1
OPERATING SYSTEMS LABORATORY	BCSES1-404	4 / 1	0 0 2 1		CO1	To be able to install various operating systems	1				1							1	2	
					CO2	To learn commands for files and directories.	1	3			1							1	3	
					CO3	To learn about background processes and commands to print something.	2	3			1		1					2	2	
					CO4	To be able to learn shell programming.	3	2			1		2					1	3	
PROGRAMMING USING	BCSES1-	4 / 2	0 0 4 2		CO1	To learn the concept of classes and objects.	1											1		

Course	Code				LTP	CO	Course Outcomes															
						CO2	To be able to implement constructors and destructors.								3							3	
						CO3	To implement initializer list and operator overloading									2					2	
						CO4	To learn type casting and inheritance.	1															1
DATABASE MANAGEMENT SYSTEM	BECES1-502	5	3	45	3 0 0	CO1	To be able to learn different DBMS languages and data models.		2												3	
						CO3	For a given specification construct the SQL queries for Open source and Commercial DBMS -MYSQL, ORACLE, and DB2.			2				3							3	2
						CO4	For a given transaction-processing system, determine the transaction atomicity, consistency, isolation, and durability.		2													2
						CO4	Implement database security		2													2
Formal languages and Automata	BECES1-503	5	3	45	3 0 0	CO1	Design finite automata to accept a set of strings of a language.	3	3	3	2	×	×	×	×	1	×	×	2	×	1	×
						CO3	Design context free grammars to generate strings of context free language.	3	3	3	2	×	×	×	×	×	×	1	2	×	1	×
						CO4	Design Turing machine for accepting context sensitive languages.	3	3	3	2	×	×	×	×	×	×	1	2	×	1	×
						CO4	To learn Rice's theorem.	1	×	×	×	×	×	×	×	×	×	×	2	×	×	1
Design & Analysis of Algorithms	BECES1-504	5	4	60	3 1 0	CO1	For a given algorithms analyze worst-case running times of algorithms based on asymptotic analysis and justify the correctness of algorithms. .		2												1	

Course	Code					CO	Description	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
						CO2	Describe the greedy paradigm and explain when an algorithmic design situation calls for it.			1	2										2	
						CO3	Describe the different graph and tree traversal algorithms.	1													1	
						CO4	Describe the computability of problem using Cook's theorem.					1										1
DATABASE MANAGEMENT SYSTEM LABORATORY	BECES1-505	5	2		0 0 4	CO1	To understand basic DDL, DML, DCL commands	2				1									2	
						CO2	To understand the SQL queries using SQL operators					3									2	
						CO3	To understand the concept of relational algebra, date and group functions	1				2									2	
						CO4	To implement checkpoints.					3								2		
COMPILER DESIGN	BCSES1-501	5	4	60	3 1 0	CO1	For a given grammar specification, develop the lexical analyzer	2	3	3		1			3		3	1				
						CO2	For a given parser specification design top-down and bottom-up parsers.	2	3	3		1			3		3	1				
						CO3	Use syntax directed translation schemes to develop intermediate code.	2	2	3		1			3		2		1			
						CO4	Learn algorithms to generate code for a target machine	1	3	3		3			2		2		1			
DESIGN &ANALYSIS OF ALGORITHMS LABORATORY	BECES1-506	5	1		0 0 2	CO1	To perform different operations on integers.		2											1		
						CO2	To sort number of elements of an array using different sorting techniques.			1	2										2	
						CO3	To implement dynamic programming for various problems.	1													1	

Course	Code					CO	Course Outcome																
						CO4	To compute convex hull.								1								1
COMPUTER GRAPHICS	BCSED1-511	5	3	45	300	CO1	Able to learn about the basics of graphics, its applications, uses and Knowledge to draw different shapes in graphics on computer.	3	×	×	×	×	×	×	×	×	×	×	2	1	×	×
						CO2	Ability to apply different 2-D and 3-D transformations on an object.	3	2	3	×	×	×	×	×	×	×	×	2	×	1	×
						CO3	Learn clipping operations and various object filling techniques, different projections techniques. Various hidden surface removal	2	2	1	×	×	×	×	×	×	×	×	1	1	×	×
						CO4	Knowledge of Rendering techniques, Fractals and different colour models.	2	×	×	2	2	×	×	×	×	×	×	2	×	1	×
GRAPH THEORY	BCSED1-512	5	3	45	300	CO1	To have knowledge of the basic concepts of graph	3	3	2	1	1	×	×	×	×	1	×	×	1	×	×
						CO2	To have a knowledge of classes of graphs and its properties.	3	3	2	×	×	×	×	×	×	×	×	1	1	×	×
						CO3	To have knowledge of graph algorithms.	2	3	1	1	×	×	×	×	×	×	×	×	1	×	×
						CO4	Be exposed to constrained and unconstrained optimization techniques	1	×	1	×	×	×	×	×	×	×	×	1	×	×	1
WEB TECHNOLOGIES	BCSED1-513	5	3	45	300	CO1	To understand the HTML and Style Sheets	3		3		3					2		3	3	3	3
						CO2	To have knowledge of client-side scripting using JSP	3	3				3		2	2	3		3	3	3	2
						CO3	To understand the basics and object-oriented concepts of PHP.	3	3		2	1						1	3	3	3	2
						CO4	To access database using PHP programming.	3	1	2	2	2	1		2	2	2	2	3	3	3	3
JAVA PROGRA	BCSED1-	5	3	45	300	CO1	To learn the basics of Java and to understand the implementation of Classes and Inheritance with	2												1	1	

Course	Code	Cr1	Cr2	Hrs	L T P	CO	Course Outcome	C1	C2	C3	C4	C5	C6	C7	C8	C9	C10	C11	C12	C13	C14	C15
							respect to Java.															
						CO2	To describe the concept of handling of exceptions and multithreading.	2												2		
						CO3	To understand how to implement I/O, Applets and Graphics in Java		2	3											2	
						CO4	To comprehend the advanced topics of Java Programming	2		2										1		
DATABASE MANAGEMENT SYSTEM LABORATORY	BECES1-505	5	2	60	0 0 4	CO1	To understand basic DDL, DML, DCL commands	2					1								2	
						CO2	To understand the SQL queries using SQL operators						3								2	
						CO3	To understand the concept of relational algebra, date and group functions	1					2								2	
						CO4	To implement checkpoints.						3							2		
SOFTWARE ENGINEERING	BCSES1-601	6	3	45	3 0 0	CO1	To study how software engineering principles evolve and to analyse the various software models that can be followed to develop software.	2												1	1	
						CO2	To understand the software analysis and design step of software development	2												2		
						CO3	To study coding, testing and reliability of a software.		2	3											2	
						CO4	To highlight the various management activities and related terms of a software.	2		2										1		
COMPUTER NETWORKS	BCSES1-602	6	4	60	3 1 0	CO1	Explain the functions of the different layer of the OSI Protocol.	**3**					**2**		**2**			**1**		**1**	**1**	
						CO2	Draw the functional block diagram of wide-area networks (WANs), local area networks (LANs) and	**3**					**1**		**1**		**2**	**1**		**1**	**2**	**1**

Course	Code				L T P	CO	Course Outcome	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
							Wireless LANs (WLANs) describe the function of each block.															
						CO3	For a given problem related TCP/IP protocol developed the network programming.	3				2	2						1		1	2	1
						CO4	Configure DNS DDNS, TELNET, EMAIL, File Transfer Protocol (FTP), WWW, HTTP, SNMP, Bluetooth, Firewalls using open source available software and tools.	3				3	3						1		1	1	1
COMPUTER NETWORKS LABORATORY	BCSES1-603	6	1	45	0 0 2	CO1	To become familiarize with different networking components.	3		1						3					1		
						CO2	To learn the concept of data transmission using different cables.	3		1		3									1	2	
						CO3	To learn different topologies and implement file sharing	3		2		3											3
						CO4	To implement different networks.	3		1					3					1	2	1	
MACHINE LEARNING	BCSED1-612	6	3	45	3 0 0	CO1	To learn the concept of learning algorithm	2	×	1	2	2	×	×	×	×	×	×	2	1	×	×
						CO2	To learn representation of decision trees.	×	×	3	1	1	×	×	×	×	×	×	2	1	×	×
						CO3	To learn unsupervised learning.	×	×	1	2	1	×	×	×	×	×	×	2	1	×	×
						CO4	To learn about SVMs.	×	×	1	2	1	×	×	×	×	×	×	2	1	×	×
DISTRIBUTED SYSTEMS	BCSES1-603	6	3	45	3 0 0	CO1	To learn architecture of DDBS.	1	2											3		
						CO2	To learn different design strategies and query processing		2												2	

Subject	Code	L	T	Hrs	Marks	CO	Course Outcome	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
						CO3	To Optimize Distributed queries.					2									2	
						CO4	To learn reliability issues.						2							2		
SIGNALS AND SYSTEMS	BCSED1-614	6	3	45	300	CO1	Analyze the properties of signals & systems and representation in time and frequency domain.	3			1	3					3		3	3	1	1
						CO2	Classify systems based on their properties and determine the response of LSI system.	3	2		1	3		`			3		3	2		1
						CO3	Apply random signal theory and understand various types of noise.	3		1	3	1							3	1		1
						CO4	Understand the process of sampling and reconstruction.	3	3		2								3	2	1	2
DATA MINING	BCSED1-621	6	3	45	300	CO1	To introduce the basic concepts of Data Mining techniques.		2											2		
						CO2	To have knowledge of decision trees and algorithms used for it.		1			3									3	
						CO3	To learn the concept of search engines.		1			3								2		
						CO4	To understand web mining.		1											2		
CLOUD COMPUTING	BCSED1-622	6	3	45	300	CO1	To learn basic terms used in cloud computing and its benefits.	2	2	×	×	×	×	×	×	×	×	×	2	1	×	×
						CO2	To learn architecture of Hadoop	2	1	2	1	×	×	×	×	×	×	×	2	1	×	×
						CO3	To implement cloud security.	2	×	×	1	×	×	×	1	×	×	×	1	×	1	×
						CO4	To manage services provided by cloud.	2	1	×	×	×	×	×	×	×	1	×	1	×	×	1

Subject	Code					CO	Outcome																
PARALLEL PROCESSING	BCSED1-623	6	3	45	3 0 0	CO1	Design and analyze the parallel algorithms for real world problems and implement them on available parallel computer systems.	3	3	3	2		1					2		3	3	3	3
						CO2	To implement basic communication operations.	3		3								3		3	3	3	3
						CO3	To implement various threads.	3		3	2									3	3	2	2
						CO4	To learn different sorting algorithms.	3	3				3							3	3	3	3
EMBEDDED SYSTEMS	BCSED1-624	6	3	45	3 0 0	CO1	To learn specifications and analysis of embedded systems	3	×	2	×	1	×	×	×	×	×	×	×	1	1	×	×
						CO2	To estimate hardware and software costs.	×	×	1	×	×	×	×	×	×	×	1	×	×	×	1	×
						CO3	To learn arm programming instruction set.	2	×	×	1	×	×	×	×	×	×	×	×	×	1	×	×
						CO4	To learn IDE.	2	×	1	×	×	×	×	×	×	×	×	×	×	1	×	×
DISTRIBUTED OPERATING SYSTEMS	BCSED1-711	7	3	45	3 0 0	CO1	To learn architecture of distributed operating systems	2		1										1			
						CO2	To learn resource management.		2		2									1			
						CO3	To learn distributed OS implementation.			3		2											2
						CO4	To learn multiprocessor system.		2											1			
SOFT COMPUTIN	BCSED1-	7	3	45	3 0 0	CO1	Identify and describe soft computing techniques and their roles in building intelligent machines	2														1	

Subject	Code					CO	Course Outcome	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
						CO2	To have knowledge of neural networks I	1				1								1		
						CO3	To have knowledge of neural networks-II.	1				1								1		
						CO4	To learn the concepts of genetic algorithms.	1			1									1		
HUMAN COMPUTER INTERACTION	BCSED1-713	7	3	45	3 0 0	CO1	To have knowledge of task centered systems design	2				1						1		1		
						CO2	Understand the fundamental aspects of designing and evaluating interfaces			2	1		1							1	1	
						CO3	To understand different design principles			2	1		1							1		
						CO4	To learn different HCI design standards.			2	1									1		
Ad-hoc and SENSOR NETWORKS	BCSED1-714	7	3	45	3 0 0	CO1	To be able to learn wireless technologies.	2		3		1								2		
						CO2	To be able to learn different protocols for ad-hoc networks.	3		3		1								2	1	
						CO3	To learn different routing algorithms used for ad-hoc networks.	2		1		1								2	1	
						CO4	To learn how to synchronize network nodes.	2		1		1								2	1	
BIOINFORMATICS	BCSED1-721	7	3	45	3 0 0	CO1	To learn basic concepts of bioinformatics.		2											1	2	
						CO2	To learn different motif models.	1		2										1	2	
						CO3	To learn the concept of genomics.	1	2			3								1	2	

Course	Code	L	T	H		CO	Outcome	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
						CO4	To analyse DNA data.		2	2		1									1	
IMAGE PROCESSING	BCSED1-722	7	3	45	3 0 0	CO1	To give introduction of image processing.	1												3		
						CO2	To understand image enhancement.		2											3	1	
						CO3	To have knowledge of image Compression Redundancy models		3	2										2		
						CO4	To have knowledge of Image Segmentation.		2										1	2		
CRYPTOGRAPHY & NETWORK SECURITY	BCSED1-723	7	3	45	3 0 0	CO1	To understand security trends.	3									3			2	2	1
						CO2	To implement various cryptographic algorithms.	1			2	1				3				2	3	
						CO3	To implement public key cryptography.	1				1				3				2	3	
						CO4	To implement IP Security.	1			3	2	3						3	2	3	1
ARTIFICIAL INTELLIGENCE	BCSED1-724	7	3	45	3 0 0	CO1	Understand the concept of Artificial intelligence, problem solving and various types of search strategies.	2	2	1	×	×	×	×	×	2	2	1	3	1	×	×
						CO2	Understand the concept of Knowledge base, knowledge representation, AI languages & tools and various planning techniques.	1	2	1	1	1	×	×	×	1	2	1	2	1	×	×
						CO3	Identify uncertainty and understand fuzzy logic concept to handle uncertainty.	1	2	1	1	1	×	×	×	1	2	×	2	×	1	×
						CO4	Understand the COURSE of AI agents and various COURSE methods it also includes neural network and includes the communication of AI agents and	2	2	2	1	1	×	×	×	1	2	×	2	×	1	×

Course	Code	L	T	P	C	CO	Course Outcome	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
INTERNET OF THINGS	BCSED1-812	8	3	45	3 0 0	CO1	To Understand the Architectural Overview of IoT	3		2										2	1	
						CO2	To Understand Raspberry.			3				2	3					3	2	
						CO3	To Understand the various IoT Protocols (Datalink, Network).					3	2		1		2			3	3	1
						CO4	To understand sensor applications.						3				2			3	2	2
ADVANCED DATABASE MANAGEMENT SYSTEMS	BCSED1-813	8	3	45	3 0 0	CO1	To be able to use different database analyse techniques.		2			2								3		
						CO2	To learn about query compiler	1	2			1								3	2	
						CO3	To learn different distributed database models.	1												1	2	
						CO4	To learn emerging models and techniques in databases.					2								2	2	
SOFTWARE PROJECT MANAGEMENT	BCSED1-814	8	3	45	3 0 0	CO1	Apply the basics of Software Project Management to manage and deliver qualified product and plan the activities within time schedules with CPM and PERT Analysis.	3	2													1
						CO2	For managing the quality of product and managing the risk involved					1		1								1
						CO3	Managing team and measuring and tracking the planning									2		2				1
						CO4	To learn Configuration management and project monitoring and control										1	1	1			

natural language processing.

Course	Code	L	T	H	Marks	CO	Course Outcome	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
MOBILE APPLICATION DEVELPOMENT	BCSED1-611	6	3	45	3 0 0	CO1	To learn application models of mobile application frameworks.		2													1
						CO2	To learn Mobile OS architectures.								1							1
						CO3	To be database access in different mobile OS.											2		2		1
						CO4	To learn testing methodologies for mobile applications.													1	1	1
ENTERPRISE RESOURCE PLANNING	BCSED1-811	8	3	45	3 0 0	CO1	To understand the concepts of ERP and its related technologies.	3														1
						CO2	To understand the implementation of ERP in an organization.								1							1
						CO3	To have a deep understanding of different business modules of an organization.							2				2				1
						CO4	To have a basic understanding of applications of ERP and various ERP software"s						1							1		1
Introduction to Concerned Branch of Engineering	BCOBE0-101	1	0	24	2 0 0	CO1	To be able to learn the basic terminologies- computer, science, and engineering.	3	3		1	3	1							3	3	3
						CO2	To understand different branches of Computer Science.	3		3		2									1	
						CO3	To learn different parts of computer.	3	3	3	2						3				2	2
						CO4	To learn different types of softwares.	3			2	3					3			3	3	2
Programming for Problem Solving	BCSCE0-101	2	3	41	3 0 0	CO1	To learn the basic terms related to programming and understand arithmetic expressions.				1		1							3	3	3
						CO2	To understand the concept of arrays.	3		3		2									1	

Course	Code	L	T	Hrs	P	CO	Course Outcome	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
						CO3	To implement functions and recursion.		3		2						3				2	
						CO4	To learn structure, pointers and file handling.	3			2										3	
Programming for Problem Solving Laboratory	BCSCE0-102	2	2	45	3 0 0	CO1	To learn the basic terms related to programming and understand arithmetic expressions.				1		1							3	3		3
						CO2	To understand the concept of arrays.	3		3		2										1	
						CO3	To implement functions and recursion.		3		2						3				2	
						CO4	To learn structure, pointers and file handling.	3			2										3	