

Name of the Programme : B.Tech CS 2019-23 (Group A and B)
CO-PO mapping of the Courses

Semester	Course Code	Course Name	Course Outcome No	Course Outcome	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2			
					Engineering Knowledge	Problem analysis	Design/ development of solutions	Investigations of complex problems	Modern tool usage	The engineer and society	Environment and sustainability	Ethics	Individual and team work	Communication	Project management and finance	Life-long learning	Use of specialized software	Create socially relevant systems			
Group A																					
1	70122101	Engineering Mathematics - I (Common for Group A and B)	C01	Apply successive differentiation to find nth derivative, indeterminate forms and series expansion	3	1	-	-	-	-	-	-	3	-	-	2	-	-			
			C02	Apply the concepts of partial differentiations to solve problems on homogeneous functions.	3	2	-	-	-	-	-	-	-	3	-	-	2	-	-		
			C03	Evaluate integrals using reduction formulae and improper integral using DUIS rule and beta-	3	2	-	-	-	-	-	-	-	3	-	-	2	-	-		
			C04	Test the convergence of series of positive terms, by using appropriate tests and find Fourier	3	3	-	-	-	-	-	-	-	3	-	-	2	-	-		
			C05	Evaluate rank of a matrix, Eigen values and Eigen vectors. Find inverse using Cayley Hamilton	3	2	-	-	-	-	-	-	-	3	-	-	2	-	-		
1	70122102	Physics	C01	understand the central concepts and principles of quantum mechanics; the Schrödinger equation, understand and explain the origin of band theory and transport properties of materials.	2	2	1	-	-	-	-	1	-	-	1	-	2	2			
			C02	understand different types of materials, their bonding, properties and applications in engineering d	3	3	-	-	1	-	-	-	1	-	-	2	-	2	2		
			C03	learn the principle of lasing and working of various types of lasers and understand their application	2	2	2	-	1	1	-	-	1	-	-	1	-	1	-	2	
			C04	understand the phenomenon of superconductivity, properties of superconductors and their applicat	1	1	-	-	1	1	-	-	1	-	-	3	-	2	-	2	
			C05	Enhancing the problem analyzing aptitude by means of learning troubleshooting electrical circuits or	3	3	-	2	-	1	-	2	3	-	2	-	2	-	-	-	
1	70122103	Physics Lab	C01	Data analysis, interpretation and drawing inferences	3	2	-	-	-	-	1	3	-	2	-	2	-	-			
			C02	Promoting individual and team work skills	3	2	-	2	-	-	-	1	-	2	-	2	-	-	-		
			C03	Inculcating ethics while recording (true) observations	1	-	-	-	-	-	-	-	1	-	1	-	1	-	-	-	
			C04	Teaching project management by learning to make the best use of available resources	1	2	-	2	-	-	-	-	1	-	1	-	1	-	-	-	
			C05	Understand about sustainable technologies for resource conservation	3	1	1	-	-	2	3	1	1	-	-	2	1	1	1	1	
1	70122104	Environmental Science	C01	Identify sources, effects and remedial measures for different pollutions	1	-	-	-	-	1	1	-	1	-	-	1	2	-	-		
			C02	Identify and formalize a generalized water and wastewater treatment process	2	2	1	2	1	3	3	-	-	-	-	2	3	3	-	-	
			C03	Identify various sources of solid wastes, their effects and latest management technique	3	1	1	2	2	2	3	-	-	-	-	-	3	3	-	-	
			C04	Know about existing environmental laws and legislations and related case studies.	2	1	-	1	-	2	2	-	1	-	1	-	1	-	-	-	
			C05	Understand the importance of right brain directed thinking complementing left brain directed thinki	-	3	1	-	-	-	-	3	1	3	-	2	-	-	-	-	
1	70122105	Creative Thinking	C01	Infer and discover processes and methods of creative problem solving	2	3	2	-	1	-	1	3	3	-	2	-	-	-	-		
			C02	Enhance and correlate their creative and innovative thinking skills	1	3	2	2	-	-	1	3	2	-	-	-	-	-	-	-	
			C03	Understand various disruptive innovations and techniques	2	3	2	2	2	-	1	-	3	2	-	-	-	-	-	-	
			C04	Analyze and apply various tools of creativity to some basic problem	2	3	2	-	-	-	-	3	2	-	-	-	-	-	-	-	-
			C05	Understand the basic concepts of C Programming for problem-solving.	2	2	2	2	2	1	-	-	-	-	-	2	2	2	2	2	
1	70122106	Programing in C	C01	Illustrate the C data types, syntax and constructs.	2	2	2	2	2	1	-	-	-	-	-	2	2	2	2		
			C02	Illustrate C for decision making, branching and looping statements.	2	2	2	2	2	1	-	-	-	-	-	2	2	2	2		
			C03	Understand the concept of Array and Strings to solve different problems.	2	2	2	2	2	1	-	-	-	-	-	2	2	2	2		
			C04	Apply the concepts of Function modules, its usage and memory allocation using Pointers.	2	2	2	2	2	1	-	-	-	-	-	2	2	2	2		
			C05	Understand the concepts of structures and unions: declaration, initialization and implementation.	2	2	2	2	2	1	-	1	1	1	1	2	2	2	2		
			C06	Understand the programming in IDE (Integrated Development Environment) and write, execute and debug	1	1	2	2	1	2	-	-	1	1	-	2	2	2	2	2	
1	70122107	Programing in C Lab	C01	Interpret the programming tasks logically and understand making the pseudo-code	2	1	2	2	1	2	-	-	1	1	-	2	2	2	2		
			C02	Design and implement basic programming solutions including statements, macros, control	2	2	2	2	1	2	-	-	1	1	-	2	2	2	2		
			C03	Understand and apply the concept of Array and Strings to solve problem statement.	2	2	2	2	2	2	-	-	1	1	-	2	2	2	2		
			C04	Understand the concepts of Function modules, its usage and memory allocation using Pointers	2	2	2	2	2	2	-	-	1	1	-	2	2	2	2		
			C05	Understand and apply the concepts of structures and unions: declaration, initialization and	2	2	2	2	2	2	-	-	1	1	-	2	2	2	2		
			C06	Relate fundamental concepts/laws of science and engineering	2	1	-	-	-	-	-	-	3	1	-	1	1	-	-	-	
1	70122108	Tinker Lab	C01	Practice pre-achieved skills on hardware and devices	1	-	-	-	-	-	-	1	1	-	1	1	-	-	-		
			C02	Take apart and reassemble and/or repairing of engineering gadgets	1	-	-	-	-	-	1	1	-	1	-	1	-	-	-		
			C03	Explore various aspects of tinkered devices/instruments	1	-	-	-	-	-	-	2	-	-	2	-	-	-	-	-	
			C04	Design and make models out of creativity using raw material	1	-	-	1	-	-	-	-	3	2	-	-	-	-	-	-	
			C05	Communicate/ express effectively in correspondence.	-	-	-	-	-	-	-	2	3	3	-	3	-	-	-	-	
1	70122109	Communication Skills	C01	Identify/ Recognize the barriers to effective communication in accordance with all types of	-	-	-	-	-	-	-	2	3	3	-	3	-	-			
			C02	Employ etiquettes and effective communication in written communication.	-	-	-	-	-	-	2	1	3	-	2	-	-	-	-		
			C03	Compose or create formal reports, memos, agenda, minutes and notices.	-	-	-	-	-	-	2	1	3	-	3	-	3	-	-	-	
			C04	Create and deliver effective presentations.	-	-	-	-	-	-	-	2	3	-	2	-	2	-	-	-	
			C05	Express ideas and concepts well through vocabulary building, aptitude tests, mind mapping and br	-	-	-	-	-	-	-	2	2	1	1	-	-	-	-	-	
1	70122110	Communication Skill Lab	C01	Demonstrate linguistic competence- through accuracy in grammar, pronunciation and vocabulary.	-	-	-	-	-	-	-	2	2	1	1	-	-	-			
			C02	Employ etiquettes in oral and written communication.	-	-	-	-	-	-	-	3	3	1	1	-	-	-	-		
			C03	Modify their listening skills.	-	-	-	-	-	-	-	2	2	1	1	-	-	-	-		
			C04	Sketch their articulation while participating in Group discussions, debate or job interviews.	-	-	-	-	-	-	-	2	2	1	1	-	-	-	-		
			C05	Group B																	
1	70122111	Chemistry	C01	understand different terms and numericals related to water treatment, and apply different	3	2	-	-	-	-	-	-	-	-	-	-	-	-	-		
			C02	understand the basic concept in polymer chemistry and describe types, mechanism and	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
			C03	apply the concepts related to various spectroscopic analysis techniques	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
			C04	describe different thermodynamic concepts and solve basic problems in electrochemistry	3	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
			C05	understand the basic concepts related to Green chemistry, environmental chemistry and non-	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
1	70122112	Chemistry Lab	C01	describe the concepts related to fuel chemistry, solve numerical problems and understand the	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
			C02	examine water samples for different parameters through experimentation	3	3	2	2	-	1	-	-	2	-	-	-	-	-	-	-	
			C03	understand the preparation of condensation polymers and finding molecular weight of polymer	3	2	-	-	-	-	-	-	1	-	-	-	-	-	-	-	
			C04	understand basic experimentation related to adsorption and chromatography	3	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	
			C05	apply basic concepts in spectroscopic analysis	3	1	-	-	-	-	-	-	1	-	-	3	-	-	-	-	

			CO5	write effectively the results of experimentation and develop team working skills	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
1	70122113	Basic Electrical and Electronics Engineering	CO1	Apply the knowledge of relevant laws and principles and familiarize with different theorems and analytical	3	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
			CO2	Develop a clear understanding and acquire the knowledge of basic principles, working and applications of	3	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
			CO3	Understand basics of semiconductor physics, diode, Zener Diode and BJTs, their different configurations and	3	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
			CO4	Develop a clear understanding of digital circuits like half adder, full adder and logic gate	3	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
1	70122114	Basic Electrical and Electronics Engineering Lab	CO1	Understand the need of various safety precautions to be undertaken while working with electrical	2	1	-	-	3	-	-	-	3	1	-	1	-	-	-	1	
			CO2	Apply the knowledge of relevant laws and principles and familiarize with different theorems and analytical	3	3	-	-	3	-	-	-	3	1	-	1	-	-	-	1	
			CO3	Develop a clear understanding of the characteristics of basic semiconductor devices like, pn junction diode,	3	3	-	-	3	-	-	-	3	1	-	1	-	-	-	1	
			CO4	Use and understand different controls of equipment's like CRO and DMM.	2	2	-	-	3	-	-	-	3	1	-	1	-	-	-	1	
1	70122115	Programming and Problem solving	CO1	Understand and develop Computational Thinking concepts	2	1	1	1	1	-	-	-	-	-	-	-	-	-	-	-	
			CO2	Understand the programming in IDE (Integrated Development Environment) and write, execute and debug	1	1	2	1	2	-	-	-	3	-	-	-	-	-	-	-	
			CO3	Understand basic Python Programming, functions, patterns, algorithmic constructs etc.	1	1	2	1	2	-	-	-	3	-	-	-	-	-	-	-	
			CO4	Understand and apply object oriented programming concepts	1	2	2	1	2	-	-	-	3	-	-	-	-	-	-	-	
1	70122116	Programming and Problem Solving Lab	CO1	Understand and develop Computational Thinking concepts	2	2	2	2	2	-	-	-	-	-	-	2	2	2	2	2	
			CO2	Express a problem-solving strategy to breakdown a complex problem into a series of simpler tasks	2	3	3	2	2	-	-	-	-	-	-	2	2	2	2	2	
			CO3	Describe python programs that appropriately utilize built-in functions and control flow statements	2	2	2	2	2	-	-	-	-	-	-	2	2	2	2	2	
			CO4	Use functions for structuring Python programs.	2	2	2	2	2	-	-	-	-	-	-	2	2	2	2	2	
			CO5	Represent compound data using Python lists, tuples, dictionaries	2	2	2	2	2	-	-	-	-	-	-	2	2	2	2	2	
			CO6	Understand and apply object oriented programming concepts.	2	2	2	2	2	-	-	-	-	-	-	2	2	2	2	2	
1	70122117	Critical Thinking	CO1	Make better decisions based on logical thinking,	-	3	1	2	-	-	-	-	1	-	-	2	-	-	-	-	
			CO2	Identify and evaluate facts in an argument,	-	3	1	2	-	-	-	-	1	-	-	2	-	-	-	-	
			CO3	Derive truth , ambiguity, vagueness and fallacy in arguments	-	2	1	1	-	-	-	-	-	-	-	2	-	-	-	-	
			CO4	Design questions to reach conclusions.	-	1	1	1	-	-	-	-	-	-	-	1	-	-	-	-	
			CO5																		
1	70122118	Engineering Graphics	CO1	Understand and draw projections of points (OD) located in four quadrants	3																
			CO2	Visualize, plan and draw projections of lines (1D) and planes (2D) (inclined to both planes of projection)	3	1															
			CO3	Visualize and draw projections of regular solids (3D) (inclined to both planes of projection) and sections of regular	3	2															
			CO4	Visualize and communicate 3D regular/irregular shapes as 2D engineering drawings and vice versa using	3	1															
			CO5																		
1	70122119	Software Tools	CO1	Create formula with absolute and relative cell references using MS-Excel tool	3	3	2	2	2	-	-	-	-	-	-	1	-	-	-	-	
			CO2	Understand the functioning of various MS-Excel command	3	3	3	2	-	-	-	-	-	-	-	1	-	-	-	-	
			CO3	Demonstrate the ability to use PowerPoint and its application	3	3	2	1	-	-	-	-	3	2	-	1	-	-	-	-	
			CO4	Analyze the data by using statistical functions using MS-Excel tool	3	3	3	2	2	-	-	-	-	-	-	1	-	-	-	-	
			CO5	Create microsoft outlook profiles to configure it with an email account.	3	3	2	1	3	-	-	-	-	-	-	1	-	-	-	-	
				Group A																	
2	70122201	Engineering Mathematics -II (Common for Group A and B)	CO1	Evaluate multiple integral in different coordinate system.	3	2	-	-	-	-	-	-	3	-	-	2	-	-	-	-	
			CO2	Apply multiple integral to find area, volume and centre of mass and gravity.	3	2	1	-	-	-	-	-	3	-	-	2	-	-	-	-	
			CO3	Identify and solve linear differential equations using suitable method and apply for solving problems from	3	3	-	-	-	-	-	-	3	-	-	2	-	-	-	-	
			CO4	Evaluate gradient, divergence, curl, directional derivatives and apply Green's theorem, Gauss divergence theorem	3	2	-	-	-	-	-	-	3	-	-	2	-	-	-	-	
			CO5	Evaluate Laplace transform of various function and solve linear differential equation	3	2	1	-	-	-	-	-	3	-	-	2	-	-	-	-	
2	70122111	Chemistry	CO1	Understand different terms and numericals related to water treatment, and apply different techniques for the	3	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
			CO2	Understand the basic concept in polymer chemistry and describe types, mechanism and properties of polymers and	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
			CO3	Apply the concepts related to various spectroscopic analysis techniques	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
			CO4	Describe different thermodynamic concepts and solve basic problems in electrochemistry	3	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
			CO5	Understand the basic concepts related to Green chemistry, environmental chemistry and non-conventional energy	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
			CO6	Describe the concepts related to fuel chemistry, solve numerical problems and understand the basic concepts in	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
2	70122112	Chemistry Lab	CO1	Examine water samples for different parameters through experimentation	3	3	2	2	-	1	-	-	2	-	-	-	-	-	-	-	
			CO2	Understand the preparation of condensation polymers and finding molecular weight of polymer	3	2	-	-	-	-	-	-	1	-	-	-	-	-	-	-	
			CO3	Understand basic experimentation related to adsorption and chromatography	3	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	
			CO4	Apply basic concepts in spectroscopic analysis	3	1	-	-	-	-	-	-	1	-	-	-	-	-	-	-	
			CO5	Write effectively the results of experimentation and develop team working skills	-	1	-	-	-	-	-	-	1	-	-	-	-	-	-	-	
2	70122113	Basic Electrical and Electronics Engineering	CO1	Develop a clear understanding and acquire the knowledge of basic principles, working and applications of DC	3	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
			CO2	Understand basics of semiconductor physics, diode, Zener Diode and BJTs, their different configurations and applica	3	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
			CO3	Develop a clear understanding of digital circuits like half adder, full adder and logic gate	3	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
			CO4	Understand the need of various safety precautions to be undertaken while working with electrical equipment and	2	1	-	-	3	-	-	-	3	1	-	1	-	-	-	1	
2	70122114	Basic Electrical and Electronics Engineering Lab	CO1	Apply the knowledge of relevant laws and principles and familiarize with different theorems and analytical	3	3	-	-	3	-	-	-	3	1	-	1	-	-	-	1	
			CO2	Develop a clear understanding of the characteristics of basic semiconductor devices like, pn junction diode, Zener	3	3	-	-	3	-	-	-	3	1	-	1	-	-	-	1	
			CO3	Use and understand different controls of equipment's like CRO and DMM.	2	2	-	-	3	-	-	-	3	1	-	1	-	-	-	1	
			CO4	Understand and develop Computational Thinking concepts	2	1	1	1	1	-	-	-	-	-	-	-	-	-	-	-	
2	70122115	Programming and Problem solving	CO1	Understand and develop Computational Thinking concepts	2	1	1	1	1	-	-	-	-	-	-	-	-	-	-	-	
			CO2	Understand the programming in IDE (Integrated Development Environment) and write, execute and debug simple	1	1	2	1	2	-	-	-	3	-	-	-	-	-	-	-	
			CO3	Understand basic Python Programming, functions, patterns, algorithmic constructs etc.	1	1	2	1	2	-	-	-	3	-	-	-	-	-	-	-	
			CO4	Understand and apply object oriented programming concepts	1	2	2	1	2	-	-	-	3	-	-	-	-	-	-	-	
			CO1	Understand and develop Computational Thinking concepts	2	2	2	2	2	-	-	-	-	-	-	2	2	2	2	2	
			CO2	Express a problem-solving strategy to breakdown a complex problem into a series of simpler tasks	2	3	3	2	2	-	-	-	-	-	-	2	2	2	2	2	
			CO3	Describe python programs that appropriately utilize built-in functions and control flow statements	2	2	2	2	2	-	-	-	-	-	-	2	2	2	2	2	
			CO4	Use functions for structuring Python programs.	2	2	2	2	2	-	-	-	-	-	-	2	2	2	2	2	
			CO5	Represent compound data using Python lists, tuples, dictionaries	2	2	2	2	2	-	-	-	-	-	-	2	2	2	2	2	
			CO6	Understand and apply object oriented programming concepts.	2	2	2	2	2	-	-	-	-	-	-	2	2	2	2	2	
2	70122117	Critical Thinking	CO1	Make better decisions based on logical thinking,	-	3	1	2	-	-	-	-	1	-	-	2	-	-	-	-	
			CO2	Identify and evaluate facts in an argument,	-	3	1	2	-	-	-	-	1	-	-	2	-	-	-	-	
			CO3	Derive truth , ambiguity, vagueness and fallacy in arguments	-	2	1	1	-	-	-	-	-	-	-	2	-	-	-	-	
			CO4	Design questions to reach conclusions.	-	1	1	1	-	-	-	-	-	-	-	1	-	-	-	-	

