CO Attainment of B. Tech. Computer Science & Engineering
(Session: Jan-June 2019 Semester)

Course Name		Course outcomes	Direct Attainment %	Indirect Attainment %	Total Attainment %	Target	Gap	Action Taken/Required
150401: Design and Analysis of Algorithm	CO1	Define the basic properties of algorithm.	94	82	**91.6**	60	-	Proper coverage & assignment of COs in the question paper is required. Arrangement of Extra classes
	CO2	Analyze the complexity of an algorithm.	56	81	**61**	60	-	
	CO3	Apply mathematical preliminaries to analyse and design stages of different types of algorithms.	49	57	**50.6**	60	9.4	
	CO4	Examine algorithms for a number of important computational problems.	33	66	**39.6**	60	20.4	
	CO5	Compare different design techniques to develop algorithms for various computational problems.	86	71	**83**	60	-	
	CO6	Build the general principles and good algorithm design techniques to develop efficient computer algorithms.	30	52	**34.4**	60	25.6	
150402: Database management system	CO1	Demonstrate the concepts of different type of database system.	97	52	**88**	60	-	Proper coverage & assignment of COs in the question paper is required. Arrangement of Remedial classes
	CO2	Apply Relational algebra concepts to design database system.	45	54	**46.8**	60	13.2	
	CO3	Make use of queries to design and access database system.	28	75	**37.4**	60	22.6	
	CO4	Analyze the evaluation of transaction processing and concurrency control.	30	73	**38.6**	60	21.4	
	CO5	Determine the optimize database for real world applications.	97	74	**92.4**	60	-	
	CO6	Design a database system for a real world application.	38	71	**44.6**	60	15.4	
150403: Operating system	CO1	Outline the basic concept of operating systems	24	62	**31.6**	60	28.4	Proper coverage & assignment of COs in the question paper is required. Arrangement of Extra classes
	CO2	Analyze the working of operating system	33	75	**41.4**	60	18.6	
	CO3	Examine the working of various scheduling/allocation approaches	46	74	**51.6**	60	8.4	
	CO4	Measure the performance of various scheduling/allocation approaches	51	71	**55**	60	5	
	CO5	Compare the various operating system problems/issues	15	81	**28.2**	60	31.8	
	CO6	Develop the Solution of various operating system problems/issues	15	51	**22.2**	60	37.8	
	CO1	Demonstrate the computer architecture for defining basic component and functional unit.	45	65	**49**	60	11	

Semester	Course	CO	Description						Remarks
Semester4	**150404: Computer System Organization**	CO2	Recall different number system and solve the basic arithmetic operations of signed and unsigned numbers.	25	71	**34.2**	60	25.8	Proper coverage & assignment of COs in the question paper is required. Arrangement of Remedial classes
		CO3	Develop the fundamental concept to understand the working of microprocessor.	28	58	**34**	60	26	
		CO4	Explain the basic concept of input output organization.	22	54	**28.4**	60	31.6	
		CO5	Compare various memory and mapping techniques.	18	45	**23.4**	60	36.6	
		CO6	Develop the skill of writing assembly language programming.	25	55	**31**	60	29	
	150401: Design and Analysis of Algorithm Lab	CO1	Label basic algorithms and different problem solving strategies.	72	64.1	**70.42**	60	-	-
		CO2	Demonstrate methods to solve non-conventional problems and expertise for analysing existing solutions.	92	62.39	**86.078**	60	-	
		CO3	Experiment with the algorithms as a precise mathematical concept.	84	60	**79.2**	60	-	
		CO4	Examine the design algorithms; establish their correctness, their efficiency and memory requirements.	88	66.66	**83.732**	60	-	
		CO5	Solve the problems using different algorithm solving paradigm.	72	61.53	**69.906**	60	-	
		CO6	Develop programming skills to practice well-known algorithms and design data structures to solve real-life problems.	88	58.97	**82.194**	60	-	
	150402: Database management system Lab	CO1	Construct database schema for a given problem domain.	75	85	**77**	60	-	-
		CO2	Apply integrity constraints on a database schema using a state-of-the-art RDBMS.	76	75	**75.8**	60	-	
		CO3	Apply SQL queries using DDL and DML to design and access database system.	71	75	**71.8**	60	-	
		CO4	Make use of operators and functions used in query.	85	76	**83.2**	60	-	
		CO5	Distinguish Tables and Views for database system.	64	84	**68**	60	-	
		C06	Develop a small project for real world scenario.	59	81	**63.4**	60	-	
	...ming Lab	CO1	Demonstrate the fundamentals of computer programming	52	64	**54.4**	60	5.6	
		CO2	Read, understand and trace the execution of program	32	75	**40.6**	60	19.4	

Course	CO	Course Outcome						Remarks
150405: Program	CO3	Develop Conditional and Iterative Statements	72	71	**71.8**	60	-	-
	CO4	Design the program using functions	32	68	**39.2**	60	20.8	
	CO5	Implement the programs using Derived and User defined data types	64	64	**64**	60	-	
	C06	Design program for a given problem using computer programming	44	71	**49.4**	60	10.6	
BCSL602: Mobile computing	CO1	Define basic concepts and principles in mobile computing systems.	41	75	**47.8**	60	12.2	Arrangement of Remedial Classes
	CO2	Explain various protocol and markup languages of wireless communication system.	25	74	**34.8**	60	25.2	
	CO3	Identify vision, services and its quality of third generation mobile communication.	24	72	**33.6**	60	26.4	
	CO4	Analyze the different architecture, technologies inter-networking challenges and solutions in fixed and mobile versions of mobile networks.	26	55	**31.8**	60	28.2	
	CO5	Compare the characteristics of different multiple access techniques of mobile communication systems.	26	53	**31.4**	60	28.6	
	CO6	Elaborate different infrastructure to face the challenges and solutions in wireless mobile network.	44	65	**48.2**	60	11.8	
BCSL603: Software Project Management	CO1	Choose and initiation of individual projects and portfolios of projects in the enterprise	66	58	**64.4**	60	-	Proper coverage & assignment of COs in the question paper is required.
	CO2	Explain and Recognize the Conduction of project planning activities.	82	62	**78**	60	-	
	CO3	Apply estimating and risk management techniques to projects.	28	75	**37.4**	60	22.6	
	CO4	Analyze effective project execution and control techniques that result in successful projects.	86	57	**80.2**	60	-	
	CO5	Justify the adaptive project management practices to meet the needs of stakeholders from multiple sectors of the economy.	60	68	**61.6**	60	-	
	CO6	Develop a business plan for a start-up software business to be presented to a venture capitalist.	42	56	**44.8**	60	15.2	
esign	CO1	Outline the major concept areas of language translation and compiler design and acquire the knowledge of modern compiler & its features.	75	46	**69.2**	60	-	
	CO2	Identify the similarities and differences among various parsing techniques and grammar transformation techniques.	69	50	**65.2**	60	-	

Semester	Course	CO	Description							Arrangement
Semester6	**BCSL604: Compiler D**	CO3	Apply the knowledge of lex tool & yacc tool to develop a scanner & parser and apply ideas and techniques discussed to various software designs.	54	46	**52.4**	60	7.6		Arrangement of Extra Classes
		CO4	Implement various parsing, conversion, optimization and code generation algorithms for the design of a compiler	46	46	**46**	60	14		
		CO5	Develop program to solve complex problems in compiler and learn the new code optimization techniques to improve the performance of a program in terms of speed & space	74	46	**68.4**	60	-		
		CO6	Analyze the problems and limitations of modern compiler and learn & use the new tools and technologies used for designing a compiler.	76	50	**70.8**	60	-		
	BCSL605: Network and web security	CO1	Define Security and its requirement at different levels & in different cases.	65	74	**66.8**	60	-		Arrangement of Remedial Classes
		CO2	What are security principles and how they can be achieved.	41	76	**48**	60	12		
		CO3	Outline the characteristics and working of infected/ malicious system or person.	27	68	**35.2**	60	24.8		
		CO4	Analyze the different attacks and perform security algorithm/ solution accordingly.	34	62	**39.6**	60	20.4		
		CO5	Explain the mechanisms/ techniques for various attacks against security or more specifically principles of security.	29	53	**33.8**	60	26.2		
		CO6	Justify the role of Government and thirty party in security.	58	64	**59.2**	60	0.8		
	BCSL610: Cloud computing	CO1	List various strengths and limitations of cloud computing.	87	76.67	**84.93**	60	-		-
		CO2	Explain the architecture, infrastructure and delivery models of cloud computing	46	78.33	**52.47**	60	7.534		
		CO3	Apply suitable virtualization concepts.	74	72.5	**73.70**	60	-		
		CO4	Analyse various programming models and approaches for cloud computing.	59	73.33	**61.87**	60	-		
		CO5	Elaborate various security mechanisms for cloud computing environment.	58	72.5	**60.90**	60	-		
		CO6	Predict various practical applications of cloud computing.	41	71.67	**47.13**	60	12.87		
	Software Project agement Lab	CO1	Define various software application domains and remember different process model used in software development.	48	84	**55.2**	60	4.8		-
		CO2	Explain needs for software specifications also they can classify different types of software requirements and their gathering techniques.	56	71	**59**	60	1		
		CO3	Analyze the role of SDLC in Software Project Development and its importance.	52	68	**55.2**	60	4.8		

BCSP603: Man...	CO4	Compare among different testing strategies and tactics.	48	65	**51.4**	60	8.6	
	CO5	Create the design model from the requirements and demonstrate the use of software and user interface design principles.	16	69	**26.6**	60	33.4	
	CO6	Propose the project schedule as per cost and Risk impact factor.	52	75	**56.6**	60	3.4	
BCSP604: Compiler Design Lab	CO1	Generate the machine code by considering all the functionalities involved in different phases of the compilation process	80	75	**79**	60	-	-
	CO2	Demonstrate the knowledge of patterns, tokens & regular expressions in programming for solving a problem.	60	84	**64.8**	60	-	
	CO3	Operate different types of compiler tools to meet the requirements of the realistic constraints of compilers.	36	76	**44**	60	16	
	CO4	Design and Implement the parsing techniques including Bottom-up and Top-down parsing.	48	85	**55.4**	60	4.6	
	CO5	Develop program for implementing code optimization techniques and apply it to improve the performance of a program.	32	89	**43.4**	60	16.6	
	CO6	Build symbol table and intermediate code.	56	71	**59**	60	1	
BCSP605: Network and web security Lab	CO1	Describe the Installation, configuration, use and manage offensive/defensive security tools on a working network	84	84	**84**	60	-	-
	CO2	Evaluate best practices in security concepts to maintain confidentiality, integrity and availability of computer systems	60	71	**62.2**	60	-	
	CO3	Gain the experience in the use of intrusion detection and prevention systems and techniques.	48	68	**52**	60	8	
	CO4	Acquire the practical knowledge to secure computers and networks including the setup of policies and security assessment.	64	65	**64.2**	60	-	
	CO5	Demonstrate competence in detecting potential security vulnerabilities, and demonstrate ways of recovering from the effects of attacks	80	69	**77.8**	60	-	
	CO6	Compare and contrast symmetric and asymmetric encryption systems and their vulnerability to attack, and explain the characteristics of hybrid systems.	48	75	**53.4**	60	6.6	
BCSP 606: Minor Project	CO1	Able to formulate a real problem	96	82	**93.2**	60	-	-
	CO2	Express the technical ideas, strategies and methodologies	92	84	**90.4**	60	-	
	CO3	Utilize the new tools, algorithms, techniques to obtain solution of the project	100	76	**95.2**	60	-	
	CO4	Test and validate the develop the prototype/results	100	93	**98.6**	60	-	
	CO5	Write a project report	80	95	**83**	60	-	
	CO6	Present the oral demonstration	96	84	**93.6**	60	-	

Semester	Course	CO	CO Description						Remarks
Semester8	**BCSL801: Image Processing**	CO1	Explain different modalities and current techniques in image acquisition.	73	81	**74.6**	60	-	Arrangement of Extra classes
		CO2	Classify spatial and fequency domain techniques in image processing.	75	85	**77**	60	-	
		CO3	Apply image processing techniques to enhance visual images.	38	74	**45.2**	60	14.8	
		CO4	Analyze the constraints in image processing when dealing with real problems	57	65	**58.6**	60	1.4	
		CO5	Evaluate various enhancement, restoration and retrieval techniques of image processing	33	62	**38.8**	60	21.2	
		CO6	Design a system using mathematical models and principle of digital image processing for real world problems	18	43	**23**	60	37	
	BCSL802: Data warehouse and data Mining	CO1	Illustrate various tools of Data Mining and their techniques to solve the real time problems	28	67	**35.8**	60	24.2	Proper coverage & assignment of COs in the question paper is required. Arrangement of Extra classes
		CO2	Apply data preprocessing and data quality for construction of data warehouse	27	56	**32.8**	60	27.2	
		CO3	Identify various data bases and modeling of data warehouse and comparing various methods for storing & retrieving data from different data sources/repository.	47	64	**50.4**	60	9.6	
		CO4	Develop various classification algorithms for data using data mining.	26	59	**32.6**	60	27.4	
		CO5	Make use of data mining methods for identification of association for transactional databases.	52	59	**53.4**	60	6.6	
		CO6	Analyse data mining for knowledge discovery & prediction	10	60	**20**	60	40	
	BCSL803: Neural Network and Fuzzy systems	CO1	Relate the models of brain and ANN with mathematical models.	42	62	**46**	60	14	Proper coverage & assignment of COs in the question paper is required.
		CO2	Illustrate various algorithms of ANN.	79	74	**78**	60	-	
		CO3	Apply neural and fuzzy techniques for solving simple/complex, constrained/ unconstrained models.	13	55	**21.4**	60	38.6	
		CO4	Analyse the performance of various types of neural network.	20	64	**28.8**	60	31.2	
		CO5	Explain the concepts of fuzzy systems and its various types.	79	78	**78.8**	60	-	
		CO6	Formulate a strategy to solve real world problems by combining the concepts of ANN and fuzzy systems.	14	54	**22**	60	38	
	04: Internet of nd Applications	CO1	Explain internet of things, evolution of IoT, applications of IoT	68	65	**67.4**	60	-	Proper coverage & assignment of COs in the question paper is required.
		CO2	classify IoT architecture, IoT service life cycle and application of device/cloud collaboration	38	75	**45.4**	60	14.6	
		CO3	Apply the concept of IoT in real world scenario	37	74	**44.4**	60	15.6	
		CO4	Analyse security and privacy in the IoT	21	81	**33**	60	27	

Course	CO	Description						Arrangement of Extra classes
BCSL8 Things a	CO5	choose appropriate framework for distributed data analysis for IoT and anomaly detection	37	61	**41.8**	60	18.2	Arrangement of Extra classes
	CO6	develop small low cost embedded systems	20	58	**27.6**	60	32.4	
BCSP802: Data warehouse and data Mining Lab	CO1	Demonstrate the utility of data mining using tools or simulator	64	75	**66.2**	60	-	-
	CO2	Apply data mining algorithms for finding useful information from large amount of data set.	65	72	**66.4**	60	-	
	CO3	Solve real world problems through data mining algorithms	64	84	**68**	60	-	
	CO4	Analyze the pattern using data mining tools	70	76	**71.2**	60	-	
	CO5	Classify algorithms on the basis of various measurement.	69	83	**71.8**	60	-	
	CO6	Determine hypotheses based on the analysis of the results obtained and test them	85	69	**81.8**	60	-	
BCSP801: Image Processing Lab	CO1	Develop an algorithm for performing the various algebraic operations using image processing tools	68	81	**70.6**	60	-	-
	CO2	Distinguish spatial and frequency domain techniques used in image processing visually	40	85	**49**	60	11	
	CO3	Formulate a program for enhancing image using image processing techniques	44	74	**50**	60	10	
	CO4	Demonstrate the constraints in image processing when dealing with real problems	44	65	**48.2**	60	11.8	
	CO5	compare various enhancement, restoration and retrieval techniques of image processing	48	62	**50.8**	60	9.2	
	CO6	Design a system using mathematical models and principle of digital image processing for real world problems	32	43	**34.2**	60	25.8	
BCSL805: Major Project	CO1	Able to formulate a real problem	96	75	**91.8**	60	-	-
	CO2	Express the technical ideas, strategies and methodologies	92	67	**87**	60	-	
	CO3	Utilize the new tools, algorithms, techniques to obtain solution of the project	85	68	**81.6**	60	-	
	CO4	Test and validate the develop the prototype/results	86	62	**81.2**	60	-	
	CO5	Write a project report	80	57	**75.4**	60	-	
	CO6	Present the oral demonstration	96	74	**91.6**	60	-	