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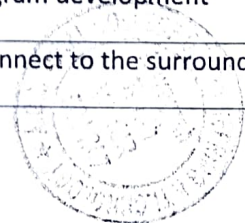
A.G.M RURAL COLLEGE OF ENGINEERING AND TECHNOLOGY, VARUR

Navagrah Teerth, NH-4 P. B. Road Opp, VRL Head Office, VARUR-581207, Hubballi, Dist. Dharwad, Karnataka
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DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING
CO STATEMENT FOR THE SCHEME 2022 (BATCH 2022-2026)

22	Data Structures and Applications	BCS304.1	Explain different data structures and their applications.
		BCS304.2	Apply Arrays, Stacks and Queue data structures to solve the given problems.
		BCS304.3	Use the concept of linked list in problem solving.
		BCS304.4	Develop solutions using trees and graphs to model the real-world problem..
		BCS304.5	Explain the advanced Data Structures concepts such as Hashing Techniques and Optimal Binary Search Trees.
20	Data Structures Lab	BCSL305.1	Analyze various linear and non-linear data
		BCSL305.2	Demonstrate the working nature of different types of data structures and their
		BCSL305.3	Use appropriate searching and sorting algorithms for the give scenario
		BCSL305.4	Apply the appropriate data structure for solving real world problems
21	Object Oriented Programming with JAVA	BCS306A.1	Demonstrate proficiency in writing simple programs involving branching and looping structures.
		BCS306A.2	Design a class involving data members and methods for the given scenario.
		BCS306A.3	Apply the concepts of inheritance and interfaces in solving real world problems
		BCS306A.4	Use the concept of packages and exception handling in solving complex problem
		BCS306A.5	Apply concepts of multithreading, auto boxing and enumerations in program development
22	Social Connect and	BSCK307.1	Communicate and connect to the surrounding.





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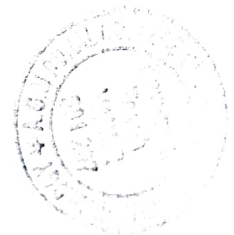
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	Responsibility	BSCK307.2	Create a responsible connection with the society.
		BSCK307.3	Involve in the community in general in which they work.
		BSCK307.4	Develop among themselves a sense of social & civic responsibility & utilize their knowledge in finding practical solutions to individual and community problems
		BSCK307.5	Notice the needs and problems of the community and involve them in problem –solving.
23	Data Visualization with Python	BCS358D.1	Demonstrate the use of IDLE or PyCharm IDE to create Python Applications
		BCS358D.2	Use Python programming constructs to develop programs for solving real-world problems
		BCS358D.3	Use Mat plot lib for drawing different Plots
		BCS358D.4	Use Plotly for drawing Time Series and Maps.
		BCS358D.5	Use Plotly for drawing Time Series and Maps.
24	PHYSICAL EDUCATION (SPORTS & ATHLETICS)	BPEK359.1	Understand the fundamental concepts and skills of Physical Education, Health, Nutrition and Fitness
		BPEK359.2	Familiarization of health-related Exercises, Sports for overall growth and development.
		BPEK359.3	Create a foundation for the professionals in Physical Education and Sports
		BPEK359.4	Participate in the competition at regional/state / national / international levels.





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		BPEK359.5	Create consciousness among the students on Health, Fitness and Wellness in developing and maintaining a healthy lifestyle.
V SEM			
25	Analysis & Design of Algorithms	BCS401.1	Apply asymptotic notational method to analyze the performance of the algorithms in terms of time complexity.
		BCS401.2	Demonstrate divide & conquer approaches and decrease & conquer approaches to solve computational problems.
		BCS401.3	Make use of transform & conquer and dynamic programming design approaches to solve the given real world or complex computational problems
		BCS401.4	Apply greedy and input enhancement methods to solve graph & string based computational problems.
		BCS401.5	Analyse various classes (P, NP and NP Complete) of problems.
		BCS401.6	Illustrate backtracking, branch & bound and approximation methods.
26	Microcontrollers	BCS402.1	Explain the ARM Architectural features and Instructions.
		BCS402.2	Develop programs using ARM instruction set for an ARM Microcontroller.
		BCS402.3	Explain C-Compiler Optimizations and portability issues in ARM Microcontroller.
		BCS402.4	Apply the concepts of Exceptions and Interrupt handling mechanisms in developing applications.
		BCS402.5	Demonstrate the role of Cache management and Firmware in Microcontrollers.





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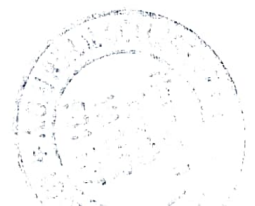
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27	Database Management Systems	BCS403.1	Describe the basic elements of a relational database management system
		BCS403.2	Design entity relationship for the given scenario.
		BCS403.3	Apply various Structured Query Language (SQL) statements for database manipulation.
		BCS403.4	Analyse various normalization forms for the given application
		BCS403.5	Develop database applications for the given real world problem
		BCS403.6	Understand the concepts related to NoSQL databases.
28	Analysis & Design of Algorithms Lab	BCSL404.1	Develop programs to solve computational problems using suitable algorithm design strategy.
		BCSL404.2	Compare algorithm design strategies by developing equivalent programs and observing running times for analysis (Empirical).
		BCSL404.3	3. Make use of suitable integrated development tools to develop programs
		BCSL404.4	Choose appropriate algorithm design techniques to develop solution to the computational and complex problems
		BCSL404.5	Demonstrate and present the development of program, its execution and running time(s) and record the results/inferences
29	A Discrete Mathematical Structures	BCS405A.1	Apply concepts of logical reasoning and mathematical proof techniques in proving theorems and statements
		BCS405A.2	Demonstrate the application of discrete structures in different fields of computer science





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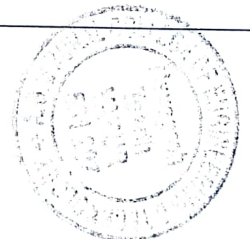
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		BCS405A.3	Apply the basic concepts of relations, functions and partially ordered sets for computer representations
		BCS405A.4	Solve problems involving recurrence relations and generating functions
		BCS405A.5	Illustrate the fundamental principles of Algebraic structures with the problems related to computer science & engineering.
30	UI/UX	BCS456C.1	Explain the user experience design requirements.
		BCS456C.2	Relate design thinking concepts and mental models to UX design.
		BCS456C.3	Illustrate UX design in line with design goals, metrics and targets.
		BCS456C.4	Demonstrate different prototyping in relation with software engineering.
31	Biology For Computer Engineers	BBOC407.1	Elucidate the basic biological concepts via relevant industrial applications and case studies
		BBOC407.2	Evaluate the principles of design and development, for exploring novel bioengineering projects
		BBOC407.3	Corroborate the concepts of biomimetics for specific requirements.
		BBOC407.4	Think critically towards exploring innovative biobased solutions for socially relevant problems
32	Universal human values course	BUHK408.1	They would become more responsible in life, and in handling problems with sustainable solutions, while keeping human relationships and human nature in mind.
		BUHK408.2	They would have better critical ability.





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		BUHK408.3	They would become more responsible in life, and in handling problems with sustainable solutions, while keeping human relationships and human nature in mind.
		BUHK408.4	It is hoped that they would be able to apply what they have learnt to their own self in different day-to-day settings in real life, at least a beginning would be made in this direction
33	PHYSICAL EDUCATION (SPORTS & ATHLETICS) – II	BPEK459.1	Understand the ethics and moral values in sports and athletics
		BPEK459.2	Perform in the selected sports or athletics of student's choice
		BPEK459.3	Understand the roles and responsibilities of organisation and administration of sports and games
V SEM			
34	Software Engineering & Project Management	BCS501.1	Differentiate process models to judge which process model has to be adopted for the given scenarios.
		BCS501.2	Derive both functional and nonfunctional requirements from the case study.
		BCS501.3	Analyze the importance of various software testing methods and agile methodology.
		BCS501.4	Illustrate the role of project planning and quality management in software development.
		BCS501.5	Identify appropriate techniques to enhance software quality
35	Computer Networks	BCS502.1	Explain the fundamentals of computer networks
		BCS502.2	Apply the concepts of computer networks to demonstrate the working of various layers and protocols in communication network





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36	Theory of Computation	BCS502.3	Analyze the principles of protocol layering in modern communication systems		
		BCS502.4	Demonstrate various Routing protocols and their services using tools such as Cisco packet tracer		
		BCS503.1	Apply the fundamentals of automata theory to write DFA, NFA, Epsilon-NFA and conversion between them.		
		BCS503.2	Prove the properties of regular languages using regular expressions.		
		BCS503.3	Design context-free grammars (CFGs) and pushdown automata (PDAs) for formal languages.		
		BCS503.4	Design Turing machines to solve the computational problems..		
		BCS503.5	Explain the concepts of decidability and undecidability.		
		37	Web Technology Lab	BCSL504.1	Design the experiment for the given problem using HTML, Javascript and CSS.
				BCSL504.2	Develop the solution for the given real-world problem using jQuery, Ajax and PHP.
				BCSL504.3	Analyze the results and produce substantial written documentation.
38	Artificial Intelligence	BCS515B.1	Explain the architecture and components of intelligent agents, including their interaction with the AI environment.		
		BCS515B.2	Apply problem-solving agents and various search strategies to solve a given problem		
		BCS515B.3	Illustrate logical reasoning and knowledge representation using propositional and first-order logic.		
		BCS515B.4	Demonstrate proficiency in representing knowledge and solving problems using first-order logic.		





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		BCS515B.5	Describe classical planning in the context of artificial intelligence, including its goals, constraints, and applications in problem-solving.
39	Mini Project	BCS586.1	Create, test and debug Android application by setting up Android development environment.
		BCS586 .2	Implement adaptive, responsive user interfaces that work across a wide range of devices.
		BCS586.3	Infer long running tasks and background work in Android applications.
		BCS586.4	Demonstrate methods in storing, sharing and retrieving data in Android applications
40	Research Methodology and IPR	BRMK557.1	To Understand the knowledge on basics of research and its types.
		BRMK557.2	To Learn the concept of Literature Review, Technical Reading, Attributions and Citations.
		BRMK557.3	To learn Ethics in Engineering Research..
		BRMK557.4	To Discuss the concepts of Intellectual Property Rights in engineering.
41	Environmental Studies and E-waste Management	BCS508.1	Acquire observation skills for solving problems related to the environment
		BCS508.2	Acquire observation skills for solving problems related to the environment.
		BCS508.3	Conduct survey to describe the realities of waste management system
42	Physical Education (PE) (Sports and Athletics)	BPEK559.1	Understand the fundamental concepts and skills of Physical Education, Health, Food, Nutrition and general fitness



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		BPEK559.2	Familiarization of health-related Exercises, Sports for overall growth and development
		BPEK559.3	Create a foundation for the professionals in Physical Education and
		BPEK559.4	Participate in the competition at regional/state / national / international levels.
		BPEK559.5	Understand and practice of specific games and athletic throwing events.
VI SEM			
43	Cloud Computing (Open Stack /Google)	BCS601.1	Describe various cloud computing platforms and service providers.
		BCS601.2	Illustrate the significance of various types of virtualization.
		BCS601.3	Identify the architecture, delivery models and industrial platforms for cloud computing based applications.
		BCS601.4	Analyze the role of security aspects in cloud computing.
		BCS601.5	Demonstrate cloud applications in various fields using suitable cloud platforms
44	Machine Learning	BCS602.1	Describe the machine learning techniques, their types and data analysis framework.
		BCS602.2	Apply mathematical concepts for feature engineering and perform dimensionality reduction to enhance model performance.
		BCS602.3	Develop similarity-based learning models and regression models for solving classification and prediction tasks
		BCS602.4	Build probabilistic learning models and design neural network models using perceptrons and multilayer architectures





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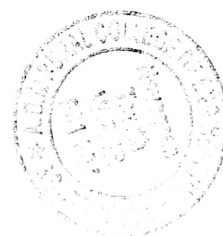
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		BCS602.5	Utilize clustering algorithms to identify patterns in data and implement reinforcement learning techniques
45	Block chain Technology	BCS613A.1	Explain the Blockchain terminologies with its applications. design
		BCS613A.2	Illustrate the working principles of Blockchain and the Smart Contract Lifecycle
		BCS613A.3	Demonstrate the principles and methodologies used in Bitcoin.
		BCS613A.4	Develop Ethereum Network, Wallets, Nodes, Smart contract and DApps.
		BCS613A.5	Make use of Hyper ledger in Block chain Based Application Architecture.
46	Digital System Design using Verilog	BEC654A.1	Understand the Verilog HDL design flow
		BEC654A.2	Describe the basic concepts of Verilog HDL programming.
		BEC654A.3	Design of digital electronics circuits using dataflow, behavioral, gate-level, and structural modelling
		BEC654A.4	Design complex digital circuits using advanced Verilog concepts
47	Project Phase I	BCS685.1	Design and implementation of system to measure the performance parameters, optimally
		BCS685.2	Analyzing the outcomes of the experiment in software/hardware through comparison
		BCS685.3	Imbibing professional ethics in report writing in a systematic manner and adopting to quality presentation
48	Machine Learning lab	BCSL606.1	Illustrate the principles of multivariate data and apply dimensionality reduction techniques.





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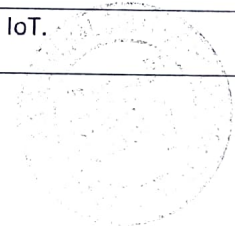
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		BCSL606.2	Demonstrate similarity-based learning methods and perform regression analysis.
		BCSL606.3	Develop decision trees for classification and regression problems, and Bayesian models for probabilistic learning
		BCSL606.4	Implement the clustering algorithms to share computing resources.
49	Devops	BCSL657D.1	Demonstrate different actions performed through Version control tools like Git.
		BCSL657D.2	Perform Continuous Integration and Continuous Testing and Continuous Deployment using Jenkins by building and automating test cases using Maven & Gradle.
		BCSL657D.3	Experiment with configuration management using Ansible.
		BCSL657D.4	Demonstrate Cloud-based DevOps tools using Azure DevOps
50	PHYSICAL EDUCATION (SPORTS & ATHLETICS) – II	BPEK659.1	Understand the Postural deformities and Stress management in sports and athletics
		BPEK659.2	Participate in the competition at regional/state / national / international levels
		BPEK659.3	Understand and practice of specific games and athletic Jumping events
		BPEK659.4	Understand and practice of Aerobics.
VII SEM			
51	Internet of Things	BCS701.1	Explain the evolution of IoT, IoT networking components and addressing strategies in IoT.
		BCS701.2	Analyze various sensing devices and actuator types.
		BCS701.3	Demonstrate the processing in IoT.





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		BCS701.4	Apply different connectivity technologies.
		BCS701.5	Elaborate the need for Data Analytics and Security in IoT
52	Parallel Computing	BCS702.1	Explain the need for parallel
		BCS702.2	Demonstrate parallelism in MIMD system.
		BCS702.3	Apply MPI library to parallelize the code to solve the given problem
		BCS702.4	Apply Open MP pragma and directives to parallelize the code to solve the given problem
		BCS702.5	Design a CUDA program for the given problem
53	Cryptography & Network Security	BCS703.1	Explain the basic concepts of Cryptography and Security aspects
		BCS703.2	Apply different Cryptographic Algorithms for different applications
		BCS703.3	Analyze different methods for authentication and access control.
		BCS703.4	Describe key management, key distribution and Certificates
		BCS703.5	Explain about Electronic mail and IP Security
54	Big Data Analytics	BCS714D.1	Identify and list various Big Data concepts, tools and applications.
		BCS714D.2	Develop programs using HADOOP framework
		BCS714D.3	Use Hadoop Cluster to deploy Map Reduce jobs, PIG,HIVE and Spark programs.
		BCS714D.4	Analyze the given data set and identify deep insights from the data set
55	E-waste	BEC755A.1	Understand the environmental impacts of e-waste



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	Management	BEC755A.2	Distinguish the role of various national and internal act and laws applicable for e-waste management and handling
		BEC755A.3	Analyse the e-waste handling methods & restrictions
		BEC755A.4	Analyze the e-waste recycling techniques
56	Major Project Phase-II	BCS786.1	Design and implementation of system to measure the performance parameters, optimally
		BCS786.2	Analyzing the outcomes of the experiment in software/hardware through comparison
		BCS786.3	Imbibing professional ethics in report writing in a systematic manner and adopting to quality presentation


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