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A.G.M RURALCOLLEGEOFENGINEERINGANDTECHNOLOGY, VARUR

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(APPROVED BY AICTE NEW DELHI, AFFILIATED TO VTU BELAGAUM AND RECOGNIZED BY STATE GOVT.)
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DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING
CO STATEMENT FOR THE SCHEME 2018 (BATCH 2018-2022)

SL.NO	SUB NAME	COs	CO Statement
		I SEM	
1	CALCULUS AND LINEAR ALGEBRA	18MAT11.1	Apply the knowledge of calculus to problems related to polar curves and its applications in determining the bentness of the curve
		18MAT11.2	Learn the lotion of partial differentiation to calculate rates of change of multivariate function and solve problems related to composite functions and jacobians
		18MAT11.3	Apply the concept of change of order of integration and variables to evaluate multiple integrates and their usage in computing the area and volumes
		18MAT11.4	Solve first order linear/nonlinear differential equations analytically using standard methods
		18MAT11.5	Make use of matrix theory for solving system of linear equations and compute Eigenvalues and Eigenvectors required for matrix diagonalization process
2	ENGINEERING PHYSICS	18PHY12.1	Learn and understand various types of oscillations and their implications. Recognize the significance of shock waves and its application in various fields
		18PHY12.2	To get acquainted with elastic properties of materials by understanding the definition of elasticity, stress, strain, modulus of rigidity, young's modulus , bulk modulus and elastic limits
		18PHY12.3	To realize the inter relation between time varying electric field and magnetic field, Properties of EM waves, Maxwell's Equation and their role in Optical fiber communication
		18PHY12.4	Gain Knowledge of the intricacies of matter and energy, which is essential to explore the role of subatomic particles in understanding the matter at macro, micro and Nano level using the principles of quantum mechanics and understand the physics of lasers, various types of lasers and to appreciate their role in modern technology.
		18PHY12.5	Learn the niceties of technologically important materials such as conductor, semiconductor and dielectrics, their potential properties in understanding there use in engineering applications
3	BASIC ELECTRICAL ENGINEERING	18ELE13.1	Students will be able to comphrehend the basic concept of AC and DC circuits

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		18ELE13.2	Explain the working principle of AC and DC circuits
		18ELE13.3	Explain the working principle of construction of Transformer
		18ELE13.4	Understand the basic concepts of wiring,earthing, Domestic protection device and electric shock
4	ELEMENTS OF CIVIL ENGINEERING AND MECHANICS	18CIV14.1	Mention the applications of various fields of Civil Engineering
		18CIV14.2	Compute the resultant of given force system subjected to various loads
		18CIV14.3	Comprehend the action of forces, moments and other loads on the system of rigid bodies and compute the reactive forces that develop as a result of external bodies
		18CIV14.4	Locate the centroid and compute the moment of Inertia of regular and buildup section
		18CIV14.5	Express the relationship between motion of bodies and analyze the bodies in motion
5	ENGINEERING GRAPHICS	18EGDL15.1	Prepare Engineering drawing as per BIS conventions mentioned in the relevant codes.
		18EGDL15.2	Produce computer generated drawings using CAED software
		18EGDL15.3	Use the knowledge of orthographic projections to represent engineering concepts and present the same in the form of drawings.
		18EGDL15.4	Develop isometric drawings of simple objects reading the orthographic projections of those objects.
		18EGDL15.5	Convert pictorial and isometric views of obejcts to orthographic views.
6	ENGINEERING PHYSICS LABORATORY	18PHYL16.1	To recognize the light by exploring its interactions with matter and in realizing its characteristic properties
		18PHYL16.2	Understanding the mechanical properties of the material by application of stress
		18PHYL16.3	Appreciating the significance of elementary electric circuits in the functioning of various electric/ electronic devices and gaining understanding of physics of the materials
		18PHYL16.4	Design and implementation of electronic circuits to gain better understanding of physics in semiconductor devices
		18PHYL16.5	Appreciating the role of quantum mechanics in

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			exploring the electrical properties of the materials
7	BASIC ELECTRICAL ENGINEERING LABORATORY	18ELE17.1	Determine the current, power drawn and comparing the power factor of different lamps
		18ELE17.2	Determine impedance of an electrical circuit and power consumed in 3phase load
		18ELE17.3	Determine the earth resistance and understand the 2way and 3 way control of lamp
		18ELE17.4	Understand the basic functioning of domestic appliances of like fuse, MCB, UPS
II SEM			
8	ADVANCED CALCULUS AND NUMERICAL METHODS	18MAT21.1	Illustrate the applications of multivariate calculus to understand the solenoidal and irrotational vectors and also exhibit the interdependence of line surface and volume integrals
		18MAT21.2	Emonstrate the various physical model through higher order differential equations and solve such higher orderndefferential equations
		18MAT21.3	Construct a variety of partial differential equations and solve the linear differential equations
		18MAT21.4	Explain the applications of differential equations and solution of ordinary differential equations
		18MAT21.5	Apply the knowledge of numerical methods in the modeling of various physical and engineering phenomena
9	ENGINEERING CHEMISTRY	18CHE22.1	Use of free energy in equilibria,rationalize bulk properties and processes using the thermodynamic consideration, electrochemical energy systems
		18CHE22.2	Causes and effect of corrosion of metals and control of corrosions. Modification of surface properties of metals to develop resistance to corrosion wear, tear impact et… by electro plating and electroless plating
		18CHE22.3	Production and consumption of energy for industrialization of country and living standard of people. Electrochemical and concentration of cells. Classical modern batteris and fuel cells.Utilization of solar energy for different useful forms of energy
		18CHE22.4	Environmental pollution, waste management and water chemistry.
		18CHE22.5	Different techniques of instrumental methods of

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			analysis. Fundamental principles of Nan materials.
10	C-PROGRAMMING FOR PROBLEM SOLVING	18CPS23.1	Illustrate simple algorithms from the different domainssuch as mathematic, physics etc.
		18CPS23.2	Construct a programming solutions to the given problems using C
		18CPS23.3	Identify and Correct the syntax and logical errors in C programming
		18CPS23.4	Modularize the given problems using functions and structures
11	BASIC ELECTRONICS	18ELN24.1	Describe the operations of diodes,BJT,FET and Operational Amplifiers.
		18ELN24.2	Design and explain the constructions of rectfiers ,regulators,amplifiers and oscillators.
		18ELN24.3	Describe general operating principles of SCR and its applications
		18ELN24.4	Explain the working and design of Fixed volatage IC regulators using 7805 and astable oscillator using timer IC 555
		18ELN24.5	Explain different number system and their conversions and construct simple combinational and sequential logic circuits using Flip-Fliops.
		18ELN24.6	Describe the basic principles of operation of communication systemand mobile phones
12	ELEMENTS OF MECHANICAL ENGINEERING	18ME25.1	Identify different sources of energy and their conversion process
		18ME25.2	Explain the working principles of Hydraulic turbines, pumps, IC engines and refrigirators
		18ME25.3	Recognize various metal joining process and power transmission elements
		18ME25.4	Understand the properties of common engineering materials and their applications in engineering industry
		18ME25.5	Discuss the working of conventional machine tools, machining process and accessories.
		18ME25.6	Describe the advanced manufacturing systems
13	ENGINEERING CHEMISTRY LABORATORY	18CHEL26.1	Handling different types of instruments for analysis of materials using small quantities of materials involved in quick and accurate results
		18CHEL26.2	Carrying out different types of titrations for estimation

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			of concerned in materials using comparatively more quantity of materials involved for good results
14	C-PROGRAMMING LABORATORY	18CPL27.1	Write algorithms ,flowcharts and program for simple problems
		18CPL27.2	Correct the syntax and logical errors to execute program
		18CPL27.3	Write iterative and wherever possible recursive programs
		18CPL27.4	Demonstrate use of functions, arrays, strings, strictures and pointers in problem solving.
III SEM			
15	TRANSFORM CALCULUS, FOURIER SERIES AND NUMERICAL TECHNIQUES	18MAT31.1	Use Laplace transform and inverse Laplace transform in solving differential/ integral equation arising in network analysis, control systems and other fields of engineering.
		18MAT31.2	Demonstrate Fourier series to study the behavior of periodic functions and their applications in system communications, digital signal processing and field theory.
		18MAT31.3	Make use of Fourier transform and Z-transform to illustrate discrete/continuous function arising in wave and heat propagation, signals and systems.
		18MAT31.4	Solve first and second order ordinary differential equations arising in engineering problems using single step and multistep numerical methods.
		18MAT31.5	Determine the extremals of functional using calculus of variations and solve problems arising in dynamics of rigid bodies and vibrational analysis
16	DATA STRUCTURES AND APPLICATIONS	18CS32.1	Use different types of data structures, operations and algorithms
		18CS32.2	Apply searching and sorting operations on files
		18CS32.3	Use stack, Queue, Lists, Trees and Graphs in problem solving
		18CS32.4	Implement all data structures in a high-level language for problem solving.
17	ANALOG AND DIGITAL ELECTRONICS	18CS33.1	Design and analyze application of analog circuits using photo devices, timer IC, power supply and regulator IC and op-amp
		18CS33.2	Explain the basic principles of A/D and D/A conversion circuits and develop the same
		18CS33.3	Simplify digital circuits using Karnaugh Map , and

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				Quine-McClusky Methods
			18CS33.4	Explain Gates and flip flops and make us in designing different data processing circuits, registers and counters and compare the types.
			18CS33.5	Develop simple HDL programs
18	COMPUTER ORGANIZATION		18CS34.1	Explain the basic organization of a computer system
			18CS34.2	Demonstrate functioning of different sub systems, such as processor, Input/output,and memory
			18CS34.3	Illustrate hardwired control and micro programmed control, pipelining, embedded and other computing systems.
			18CS34.4	Design and analyse simple arithmetic and logical units
19	SOFTWARE ENGINEERING		18CS35.1	Design a software system, component, or process to meet desired needs within realistic constraints.
			18CS35.2	Assess professional and ethical responsibility
			18CS35.3	Function on multi-disciplinary teams
			18CS35.4	Use the techniques, skills, and modern engineering tools necessary for engineering practice
			18CS35.5	Analyze, design, implement, verify, validate, implement, apply, and maintain software systems or parts of software systems
20	DISCRETE MATHEMATICAL STRUCTURES		18CS36.1	Use propositional and predicate logic in knowledge representation and truth verification.
			18CS36.2	Demonstrate the application of discrete structures in different fields of computer science.
			18CS36.3	Solve problems using recurrence relations and generating functions.
			18CS36.4	Application of different mathematical proofs techniques in proving theorems in the courses.
			18CS36.5	Compare graphs, trees and their applications
21	ANALOG AND DIGITAL ELECTRONICS LABORATORY		18CSL37.1	Use appropriate design equations / methods to design the given circuit.
			18CSL37.2	Examine and verify the design of both analog and digital circuits using simulators
			18CSL37.3	Make us of electronic components, ICs, instruments and tools for design and testing of circuits for the given the appropriate inputs.
			18CSL37.4	Compile a laboratory journal which includes; aim, tool/instruments/software/components used, design equations used and designs, schematics, program listing,

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			procedure followed, relevant theory, results as graphs and tables, interpreting and concluding the findings.
22	DATA STRUCTURES LABORATORY	18ECSL38.1	Analyze and Compare various linear and non-linear data structures
		18ECSL38.2	Code, debug and demonstrate the working nature of different types of data structures and their applications
		18ECSL38.3	Implement, analyze and evaluate the searching and sorting algorithms
		18ECSL38.4	Choose the appropriate data structure for solving real world problems
IV SEM			
23	ENGINEERING MATHEMATICS-IV	18MAT41.1	Use the concepts of analytic function and complex potentials to solve the problems arising in electromagnetic field theory.
		18MAT41.2	Utilize conformal transformation and complex integral arising in aero foil theory, fluid flow visualization and image processing.
		18MAT41.3	Apply discrete and continuous probability distributions in analyzing the probability models arising in engineering field.
		18MAT41.4	Make use of the correlation and regression analysis to fit a suitable mathematical model for the statistical data.
		18MAT41.5	Construct joint probability distributions and demonstrate the validity of testing the hypothesis.
24	DESIGN AND ANALYSIS OF ALGORITHMS	18CS42.1	Describe computational solution to well known problems like searching, sorting etc
		18CS42.2	Estimate the computational complexity of different algorithms.
		18CS42.3	Devise an algorithm using appropriate design strategies for problem solving.
25	OPERATING SYSTEMS	18CS43.1	Demonstrate need for OS and different types of OS
		18CS43.2	Apply suitable techniques for management of different resources
		18CS43.3	Use processor, memory, storage and file system commands
		18CS43.4	Realize the different concepts of OS in platform of usage through case studies
26	MICROCONTROLLER AND EMBEDDED SYSTEMS	18CS44.1	Describe the architectural features and instructions of ARM microcontroller
		18CS44.2	Apply the knowledge gained for Programming ARM for different applications.
		18CS44.3	Interface external devices and I/O with ARM

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			microcontroller.
		18CS44.4	Interpret the basic hardware components and their selection method based on the characteristics and attributes of an embedded system.
		18CS44.5	Develop the hardware /software co-design and firmware design approaches
		18CS44.6	Demonstrate the need of real time operating system for embedded system applications
27	OBJECT ORIENTED CONCEPTS	18CS45.1	Explain the object-oriented concepts and JAVA.
		18CS45.2	Develop computer programs to solve real world problems in Java.
		18CS45.3	Develop simple GUI interfaces for a computer program to interact with users, and to understand the event-based GUI handling principles using swings.
28	DATA COMMUNICATION	18CS46.1	Explain the various components of data communication
		18CS46.2	Explain the fundamentals of digital communication and switching
		18CS46.3	Compare and contrast data link layer protocols
		18CS46.4	Summarize IEEE 802.xx standards
29	DESIGN AND ANALYSIS OF ALGORITHMS LABORATORY	18CSL47.1	Design algorithms using appropriate design techniques (brute-force, greedy, dynamic programming, etc.)
		18CSL47.2	Implement a variety of algorithms such assorting, graph related, combinatorial, etc., in a high level language.
		18CSL47.3	Analyze and compare the performance of algorithms using language features.
		18CSL47.4	Apply and implement learned algorithm design techniques and data structuresto solve real-world problems.
30	MICROCONTROLLER AND EMBEDDED SYSTEMS LABORATORY	18CSL48.1	Develop and test program using ARM7TDMI/LPC2148
		18CSL48.2	Conduct the following experiments on an ARM7TDMI/LPC2148 evaluation board using evaluation version of Embedded 'C' & Keil Uvision-4 tool/compiler.
	ADDITIONAL MATHEMATICS – II	18MATDIP41.1	CO1: Solve systems of linear equations using matrix algebra..
		18MATDIP4.2	CO2: Apply the knowledge of numerical methods in modelling and solving engineering problems
		18MATDIP4.3	CO3: Make use of analytical methods to solve higher order differential equations.
		18MATDIP4.4	CO4: Classify partial differential equations and solve them by exact methods.
		18MATDIP4.5	CO5: Apply elementary probability theory and solve related problems.

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			V SEM
31	MANAGEMENT AND ENTREPRENEURSHIP FOR IT INDUSTRY	18CS51.1	Define management, organization, entrepreneur, planning, staffing, ERP and outline their importance in entrepreneurship
		18CS51.2	Utilize the resources available effectively through ERP
		18CSS51.3	Make use of IPRs and institutional support in entrepreneurship
32	COMPUTER NETWORKS AND SECURITY	18CS52.1	Explain principles of application layer protocols
		18CS52.2	Recognize transport layer services and infer UDP and TCP protocols
		18CS52.3	Classify routers, IP and Routing Algorithms in network layer
		18CS52.4	Understand the Wireless and Mobile Networks covering IEEE 802.11 Standard
		18CS52.5	. Describe Multimedia Networking and Network Management
33	DATABASE MANAGEMENT SYSTEM	18CS53.1	Identify, analyze and define database objects, enforce integrity constraints on a database using RDBMS.
		18CS53.2	Use Structured Query Language (SQL) for database manipulation
		18CS53.3	Design and build simple database systems
		18CS53.4	Develop application to interact with databases.
33	AUTOMATA THEORY AND COMPUTABILITY	18CS54.1	Acquire fundamental understanding of the core concepts in automata theory and Theory of Computation
		18CS54.2	Learn how to translate between different models of Computation (e.g., Deterministic and Non-deterministic and Software models)
		18CS54.3	Design Grammars and Automata (recognizers) for different language classes and become knowledgeable about restricted models of Computation (Regular, Context Free) and their relative powers
		18CS54.4	Develop skills in formal reasoning and reduction of a problem to a formal model, with an emphasis on semantic precision and conciseness.
		18CS54.5	Classify a problem with respect to different models of Computation.
34	APPLICATION DEVELOPMENT USING PYTHON	18CS55.1	Evaluate problems on electrostatic force, electric field due to point, linear, volume charges by applying conventional methods and charge in a volume.
		18CS55.2	. Identify the methods to create and manipulate lists, tuples and dictionaries
		18CS55.3	Discover the commonly used operations involving regular expressions and file system.
		18CS55.4	Interpret the concepts of Object-Oriented Programming

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			as used in Python.
		18CS55.5	Determine the need for scraping websites and working with CSV, JSON and other file formats.
35	UNIX PROGRAMMING	18CS56.1	Explain Unix Architecture, File system and use of Basic Commands
		18CS56.2	Illustrate Shell Programming and to write Shell Scripts
		18CS56.3	Categorize, compare and make use of Unix System Calls
		18CS56.4	Build an application/service over a Unix system.
36	COMPUTER NETWORK LABORATORY	18CSL57.1	Analyze and Compare various networking protocols.
		18CSL57.2	Demonstrate the working of different concepts of networking.
		18CSL57.3	Implement, analyze and evaluate networking protocols in NS2 / NS3 and JAVA programming language
37	DBMS LABORATORY WITH MINI PROJECT	18CSL58.1	Create, Update and query on the database.
		18CSL58.2	Demonstrate the working of different concepts of DBMS
		18CSL58.3	Implement, analyze and evaluate the project developed for an application.
338	ENVIRONMENTAL STUDIES	18CIV59.1	CO1: Understand the principles of ecology and environmental issues that apply to air, land, and water issues on a global scale,
		18CIV59.2	CO2: Develop critical thinking and/or observation skills, and apply them to the analysis of a problem or question related to the environment.
		18CIV59.3	CO3: Demonstrate ecology knowledge of a complex relationship between biotic and abiotic components
		18CIV59.4	CO4: Apply their ecological knowledge to illustrate and graph a problem and describe the realities that managers face when dealing with complex issues.
VI SEM			
39	SYSTEM SOFTWARE AND COMPILERS	18CS61.1	The question paper will have ten questions
		18CS61.2	Each full Question consisting of 20 marks
		18CS61.3	There will be 2 full questions (with a maximum of four sub questions) from each module.
		18CS61.4	Each full question will have sub questions covering all the topics under a module
		18CS61.5	The students will have to answer 5 full questions, selecting one full question from each module.
40	COMUTER GRAPHICS AND VISUALIZATION	18CS62.1	Design and implement algorithms for 2D graphics primitives and attributes.
		18CS62.2	Illustrate Geometric transformations on both 2D and 3D objects.
		18CS62.3	Apply concepts of clipping and visible surface detection in 2D and 3D viewing, and Illumination Models

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		18CS62.4	Decide suitable hardware and software for developing graphics packages using OpenGL
41	WEB TECHNOLOGY AND ITS APPLICATIONS	18CS63.1	Adapt HTML and CSS syntax and semantics to build web pages.
		18CS63.2	Construct and visually format tables and forms using HTML and CSS
		18CS63.3	Develop Client-Side Scripts using JavaScript and Server-Side Scripts using PHP to generate and display the contents dynamically.
		18CS63.4	Appraise the principles of object oriented development using PHP
		18CS63.5	Inspect JavaScript frameworks like jQuery and Backbone which facilitates developer to focus on core features.
42	DATA MINING AND DATA WAREHOUSING	18CS641.1	Identify data mining problems and implement the data warehouse
		18CS641.2	Write association rules for a given data pattern
		18CS641.3	Choose between classification and clustering solution.
43	OBJECT ORIENTED MODELING AND DESIGN	18CS642.1	Describe the concepts of object-oriented and basic class modeling.
		18CS642.2	Draw class diagrams, sequence diagrams and interaction diagrams to solve problems.
		18CS642.3	Choose and apply a befitting design pattern for the given problem.
44	CLOUD COMPUTING AND ITS APPLICATIONS	18CS643.1	Explain cloud computing, virtualization and classify services of cloud computing
		18CS643.2	Illustrate architecture and programming in cloud
		18CS643.3	Describe the platforms for development of cloud applications and List the application of cloud.
45	ADVANCED JAVA AND J2EE	18CS644.1	Interpret the need for advanced Java concepts like enumerations and collections in developing modular and efficient programs
		18CS644.2	Build client-server applications and TCP/IP socket programs
		18CS644.3	Illustrate database access and details for managing information using the JDBC API
		18CS644.4	Describe how servlets fit into Java-based web application architecture
		18CS644.5	Develop reusable software components using Java Beans
46	SYSTEM MODELLING AND SIMULATION	18CS645.1	Explain the system concept and apply functional modeling method to model the activities of a static system
		18CS645.2	Describe the behavior of a dynamic system and create an analogous model for a dynamic system;

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		18CS645.3	Simulate the operation of a dynamic system and make improvement according to the simulation results.
47	MOBILE APPLICATION DEVELOPMENT	18CS651.1	Create, test and debug Android application by setting up Android development environment
		18CS651.2	Implement adaptive, responsive user interfaces that work across a wide range of devices.
		18CS651.3	Infer long running tasks and background work in Android applications
		18CS651.4	Demonstrate methods in storing, sharing and retrieving data in Android applications
		18CS651.5	Analyze performance of android applications and understand the role of permissions and security
		18CS651.6	Describe the steps involved in publishing Android application to share with the world
48	INTRODUCTION TO DATA SRUCTURES AND ALGORITHM	18CS652.1	Identify different data structures in C programming language
		18CS652.2	Appraise the use of data structures in problem solving
		18CS652.3	Implement data structures using C programming language.
49	PROGRAMMING IN JAVA	18CS653.1	Explain the object-oriented concepts and JAVA.
		18CS653.2	Develop computer programs to solve real world problems in Java. Develop simple GUI interfaces for a computer program to interact with users
VII SEM			
50	NTRODUCTION TO OPERATING SYSTEM	18CS654.1	Explain the fundamentals of operating system
		18CS654.2	Comprehend process management, memory management and storage management.
		18CS654.3	Familiar with various types of operating systems
51	SYSTEM SOFTWARE LABORATORY	18CSL66.1	Implement and demonstrate Lexer"s and Parser"s
		18CSL66.2	Evaluate different algorithms required for management, scheduling, allocation and communication used in operating system.
		18CSL66.3	Interpret testing and testability issues in VLSI Design
52	COMPUTER GRAPHICS LABORATORY WITH MINI PROJECT	18CSL67.1	Apply the concepts of computer graphics
		18CSL67.2	Implement computer graphics applications using OpenGL
		18CSL67.3	. Animate real world problems using OpenGL
53	MOBILE APPLICATION DEVELOPMENT	18CSMP68.1	Create, test and debug Android application by setting up Android development environment.
		18CSMP68.2	Implement adaptive, responsive user interfaces that work across a wide range of devices.
		18CSMP68.3	Infer long running tasks and background work in Android applications.

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		18CSMP68.4	Demonstrate methods in storing, sharing and retrieving data in Android applications.
		18CSMP68.5	Infer the role of permissions and security for Android applications.
54	ARTIFICIAL INTELLIGENCE AND MACHINE LEARNING	18CS71.1	Appaise the theory of Artificial intelligence and Machine Learning.
		18CS71.2	Illustrate the working of AI and ML Algorithms.
		18CS71.3	Demonstrate the applications of AI and ML.
55	BIG DATA AND ANALYTICS	18CS72.1	Understand fundamentals of Big Data analytics.
		18CS72.2	Investigate Hadoop framework and Hadoop Distributed File system.
		18CS72.3	Investigate Hadoop framework and Hadoop Distributed File system.
		18CS72.4	Demonstrate the MapReduce programming model to process the big data along with Hadoop tools.
		18CS72.5	Use Machine Learning algorithms for real world big data.
		18CS72.6	Analyze web contents and Social Networks to provide analytics with relevant visualization tools.
56	SOFTWARE ARCHITECTURE AND DESIGN PATTERNS INTERNSHIP	18CS731.1	Design and implement codes with higher performance and lower complexity
		18CS731.2	Be aware of code qualities needed to keep code flexible
		18CS731.3	Experience core design principles and be able to assess the quality of a design with respect to these principles
		18CS731.4	Capable of applying these principles in the design of object oriented systems.
		18CS731.5	Demonstrate an understanding of a range of design patterns. Be capable of comprehending a design presented using this vocabulary.
57	HIGH PERFORMANCE COMPUTING	18CS732.1	Illustrate the key factors affecting performance of CSE applications
		18CS732.2	Illusrate mapping of applications to high-performance computing systems
		18CS732.3	Apply hardware/software co-design for achieving performance on real-world applications
58	ADVANCED COMPUTER ARCHITECTURES	18CS733.1	Explain the concepts of parallel computing and hardware technologies
		18CS733.2	Compare and contrast the parallel architectures

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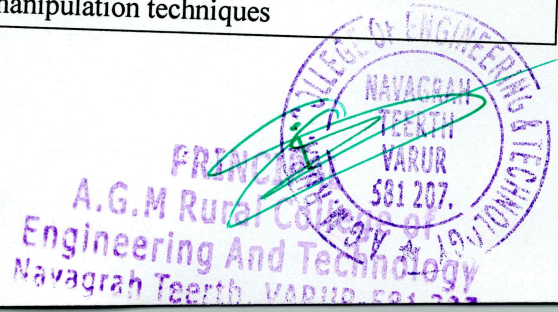Navagrah Teerth, VARUR-581 207

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		18CS733.3	Illustrate parallel programming concepts
59	USER INTERFACE DESIG	18CS734.1	Design the User Interface, design, menu creation, windows creation and connection between menus and windows
60	DIGITAL IMAGE PROCESSING	18CS741.1	Explain fundamentals of image processing
		18CS741.2	Compare transformation algorithms.
		18CS741.3	Contrast enhancement, segmentation and compression techniques
61	NETWORK MANAGEMENT	18CS742.1	Analyze the issues and challenges pertaining to management of emerging network technologies such as wired/wireless networks and high-speed internets.
		18CS742.2	Apply network management standards to manage practical networks
		18CS742.3	Formulate possible approaches for managing OSI network model.
		18CS742.4	Use on SNMP for managing the network .
		18CS742.5	Use RMON for monitoring the behavior of the network
		18CS742.6	Identify the various components of network and formulate the scheme for the managing them.
62	NATURAL LANGUAGE PROCESSING	18CS743.1	Analyze the natural language text.
		18CS743.2	Define the importance of natural language
		18CS743.3	Understand the concepts Text mining.
		18CS743.4	Illustrate information retrieval techniques.
63	CRYPTOGRAPHY	18CS744.1	Define cryptography and its principles
		18CS744.2	Explain Cryptography algorithms
		18CS744.3	Illustrate Public and Private key cryptography
		18CS744.4	Explain Key management, distribution and ceritification
		18CS744.	Explain authentication protocols
		18CS744.6	Tell about IPSec
64	ROBOTIC PROCESS AUTOMATION DESIGN & DEVELOPMENT	18CS745.1	To Understand the basic concepts of RPA
		18CS745.2	To Describevarious components and platforms of RPA
		18CS745.3	To Describe the different types of variables, control flow and data manipulation techniques

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		18CS745.4	To Understand various control techniques and OCR in RPA
		18CS745.5	ToDescribevarioustypes andstrategies tohandle exceptions.
65	INTRODUCTION TO BIG DATA ANALYTICS	18CS751.1	Explain the importance of data and data analysis
		18CS751.2	Interpret the probabilistic models for data
		18CS751.3	Define hypothesis, uncertainty principle
		18CS751.4	Evaluate regression analysis
66	INTRODUCTION TO ARTIFICIAL INTELLIGENCE	18CS753.1	Identify the AI based problems
		18CS753.1	Apply techniques to solve the AI problems
		18CS753.1	Define learning and explain various learning techniques
		18CS753.1	Discuss on expert systems
67	INTRODUCTION TO DOT NET FRAMEWORK FOR APPLICATION DEVELOPMENT	18CS754.1	Build applications on Visual Studio .NET platform by understanding the syntax and semantics of C#
		18CS754.2	Demonstrate Object Oriented Programming concepts in C# programming language
		18CS754.3	Design custom interfaces for applications and leverage the available built-in interfaces in building complex applications
		18CS754.4	Illustrate the use of generics and collections in C# Compose queries to query in-memory data and define own operator behaviour
68	ARTIFICIAL INTELLIGENCE AND MACHINE LEARNING LABORATORY	18CSL76.1	Implement and demonstrate AI and ML algorithms.
		18CSL76.2	Evaluate different algorithms.
VIII SEM			
69	INTERNET OF THINGS	18CS81.1	Interpret the impact and challenges posed by IoT networks leading to new architectural models
		18CS81.2	Compare and contrast the deployment of smart objects and the technologies to connect them to network.
		18CS81.3	Appraise the role of IoT protocols for efficient network communication
		18CS81.4	Elaborate the need for Data Analytics and Security in IoT
		18CS81.5	Illustrate different sensor technologies for sensing real world entities and identify the applications of IoT in

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			Industry.
70	MOBILE COMPUTING	18CS82.1	Explain state of art techniques in wireless communication.
		18CS82.2	Discover CDMA, GSM. Mobile IP, WImax
		18CS82.3	Demonstrate program for CLDC, MIDP let model and security concerns
71	NOSQL DATABASE	18CS823.1	Define, compare and use the four types of NoSQL Databases (Document-oriented, KeyValue Pairs, Column-oriented and Graph).
		18CS823.2	Demonstrate an understanding of the detailed architecture, define objects, load data, query data \and performance tune Column-oriented NoSQL databases
		18CS823.3	Explain the detailed architecture, define objects, load data, query data and performance tune Document-oriented NoSQL databases.
72	PROJCT WORK PHASE-II	18CSP83.1	Design and Implementation of system to measure the system optimally
		18CSP83.2	Analyzing the outcomes of experiment in hardware/software through comparison
		18CSP83.3	Imbibing Professional Ethics in Report Writing in systematic manner and adopting to quality presentation
73	TECHNICAL SEMINAR	18ECS84.1	Read , Understand and realize the technical reports from reputed international journals.
		18ECS84.2	Prepare the essential contents from the report and express the knowledge through presentation
		18ECS84.3	Imbibe the professional ethics while preparing the report and presentation.
74	Internship	CO-1	To understand the theory concepts and implement those in Industry environment

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