Computer Science and Design

Vision

To envision a diverse, stimulating, continually improving academic and research environment to fulfill the needs of the society and to mould students as socially responsible and competent professionals in the field of computer science and engineering.

Mission

- To provide a strong theoretical and practical background across the computer science and engineering discipline with an emphasis on software development.
- To impart modern technologies with industrial, academic, and research collaboration.
- To inculcate professional behavior, strong ethical values, leadership abilities and impart the skills necessary to continue education for professional growth.

Program Educational Objectives (PEOs)

PEO1: Apply the ideologies of computer science, system design, science and basic engineering to solve real world problem.

PEO2: Act as a good team member applying design thinking and other problem solving approaches and practice entrepreneurship.

PEO3:Possess professional and ethical attitude, effective communication skills, team working skills, multi-disciplinary approach, and an ability to relate engineering issues to broader social context.

Program Outcomes

Engineering Graduates will be able to:

PO1. Engineering knowledge: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.

PO2. Problem analysis: Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.

PO3. Design/development of solutions: Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.

PO4. Conduct investigations of complex problems: Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.

PO5. Modern tool usage: Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.

PO6. The engineer and society: Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.

PO7. Environment and sustainability: Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.

PO8. Ethics: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.

PO9. Individual and team work: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.

PO10. Communication: Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.

PO11. Project management and finance: Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a

member and leader in a team, to manage projects and in multidisciplinary environments.

PO12. Life-long learning: Recognize the need for and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

Program Specific Outcomes (PSOs)

PSO1: Excel in emerging computer languages and design methodologies for innovative career paths as an entrepreneur and pursue higher studies.

PSO2: Ability to design and develop useful software in various domains and provide technology driven solutions to real world problems.

PSO3: Able to acquire practical competency with emerging technologies,programming languages and open source platforms

R20 B.Tech. Course Outcomes

Course Outcomes for First Year First Semester Course		
Course Title & Code	**CO**	**Statement**
ENGLISH & B20 HS 1101	CO1	Identify the context, topic and pieces of specific information by understanding and responding to the social or transactional dialogues spoken by native speakers of English
	CO2	Apply suitable strategies for skimming and scanning to get the main idea of a text and locate specific information.
	CO3	Build confidence and adapt themselves to the social and public discourses, discussions and presentations.
	CO4	Apply the principles of writing to paragraphs, arguments, essays and formal/informal communication.
	CO5	Construct sentences using proper grammatical structures and correct word forms..
MATHEMATICS – I & B20 BS 1101	CO1	Solve a given system of linear algebraic equations
	CO2	Determine Eigen values and Eigen vectors of a system represented by a matrix
	CO3	Solve ordinary differential equations of first order and first degree

	CO4	Apply the knowledge in simple applications such as Newton's law of cooling, orthogonal trajectories and simple electrical circuits
	CO5	Solve linear ordinary differential equations of second order and higher order..
	CO6	Determine Laplace transform, inverse Laplace transform and solve linear ODE
BIOLOGY FOR ENGINEERS (B20 BS 1110)	CO1	Correlate biological observations that lead to major discoveries and importance.
	CO2	Understand various kingdoms of the living world based on cell types and body organizations.
	CO3	Appreciate the essential materials of life i.e, biomolecules
	CO4	Analyze the basic biological processes related to energy currency of life
	CO5	Acquire knowledge about chromosomes and genetic material.
PROGRAMMING FOR PROBLEM SOLVING USING C & B20 CS 1101	CO1	Apply Precedence and Associativity rules to evaluate Expressions
	CO2	Make use of Decision Making and Looping statements to solve various problems in C
	CO3	Illustrate the importance of Arrays and Strings and to apply various operations on them
	CO4	Solve various problems by making use of Structure and Union concepts
	CO5	Design and implement programs to analyze the different pointer applications
	CO6	Develop programs using Functions and Pointers..
DIGITAL LOGIC & DESIGN & B20 CD 1101	CO1	Demonstrate different number systems, binary addition and subtraction, 2's complement representation and operations with this representation.
	CO2	Understand the different switching algebra theorems and apply them for logic functions.
	CO3	Define the Karnaugh map for a few variables and make use for an algorithmic reduction of logic functions.
	CO4	Understand various logic gates starting from simple ordinary gates to complex programmable logic devices &arrays and design different combinational logic circuits.
	CO5	Design various sequential circuits starting from flip-flop to registers and counters.
PROGRAMMING FOR PROBLEM SOLVING USING C LAB & B20 CS 1103	CO1	Write, Trace and Debug the programs and correct syntax and logical errors.
	CO2	Solve various Problems by making use of Arrays, Strings, Structures, Unions and Pointers
	CO3	Solve a complex problem by decomposing into several modules by using Functions
	CO4	Apply various File I/O operations

COMMUNICATION SKILLS LAB & B20 HS 1102	CO1	Apply their linguistic competence in all LSRW skills to professional and personal settings.
	CO2	Apply communication skills learnt through various language learning activities to their advancement in academics and competitive examinations.
	CO3	Draft job application letters, E-Mail messages and other writing discourses.
	CO4	Adopt professional etiquette consistent with formal settings.
	CO5	Improve fluency and clarity in both spoken and written English.
FREE & OPEN SOURCE SOFTWARE (FOSS) LAB & B20 CD 1102	CO1	
	CO2	Configure, evaluate and select hardware platforms for the implementation and execution of computer applications, services and systems
	CO3	Make use of tools for converting pdf to word and vice versa.
	CO4	Develop presentation, documents and small applications using productivity tools such as word processor, presentation tools, spreadsheets, HTML, LaTex.

Course Outcomes for First Year Second Semester Course		
Course Title & Code	CO	Statement
MATHEMATICS-II & B20 BS 1201	CO1	Determine Fourier series and half range series of functions
	CO2	Determine Fourier transforms of non-periodic functions and also use them to evaluate integrals
	CO3	Compute partial derivatives, total derivative and Jacobians
	CO4	Find maxima/minima of functions of two variables and evaluate some real definite integrals
	CO5	Form partial differential equations and solve Lagrange linear equation. Solve linear higher order homogeneous and non-homogeneous PDEs
	CO6	Find theoretical solution of one-dimensional wave equation and one-dimensional heat equation
APPLIED PHYSICS &	CO1	Interpret the behavior of light radiation in interference and diffraction Phenomena and their applications.
	CO2	Explain the classification and properties of dielectric and magnetic materials suitable for engineering applications.
	CO3	Understand the basics of modern optical technologies like lasers and optical fibers and their utility in various fields

B20 BS 1202	CO4	Explain the important aspects of semiconductors and electrical conductivity in them
	CO5	Understand the basics of technology of Ultrasonics in various fields and demonstrate the synthesis and applications of nanomaterials.
PYTHON PROGRAMMING & B20 CD 1201	CO1	Develop essential programming skills in computer programming concepts like data types , containers
	CO2	Apply the basics of programming, conditional execution, loops in the Python language
	CO3	Apply Lists , Dictionaries and modular programming techniques to solve problems.
	CO4	Employ files to write python programs.
	CO5	Use Exceptions and GUI to write python programs.
DESIGN DRAWING AND VISUALIZATION & B20 ME 1205	CO1	Identify basic building blocks of a computer.
	CO2	Design of computer functional blocks.
	CO3	Identify Regular operation of a computer
	CO4	Identify the parameters that enhance system performance.
DATA STRUCTURES & B20 CS 1203	CO1	Demonstrate the concept of recursion, the way arrays, records, linked structures, stacks, queues, trees, and graphs are represented in memory
	CO2	Implement stacks, linked lists, queues and trees and apply them to solve different Computer Science problems and Engineering problems.
	CO3	Compare alternative implementations of data structures with respect to performance
	CO4	Apply the principal algorithms for sorting and searching to the given data and analyze the computational efficiency
	CO5	Make use of Graphs to solve real life applications.
DESIGN THINKING AND INNOVATION LAB & B20 CD 1202	CO1	Design a solution to a real world problem
	CO2	Apply design thinking approach for product innovation
	CO3	Design and create a business model for an idea
APPLIED PHYSICS LAB & B20 BS 1207	CO1	Get hands on experience in setting up experiments and using the instruments / equipment individually
	CO2	Get introduced to using new / advanced technologies and understand their significance.

DATA STRUCTURES LAB **&** **B20 CS 1206**	CO1	Student will be able to write programs to implement stacks and queues.
	CO2	Ability to implement various searching and sorting techniques.
	CO3	Ability to implement programs using trees and graphs.
PROFESSIONAL ETHICS AND **HUMAN VALUES** **&** **B20 MC 1202**	CO1	Identify and analyze an ethical issue in the subject matter under investigation or in a relevant field. Demonstrate knowledge of ethical values in non-classroom activities, such as service learning, internships and field work.
	CO2	Identify the multiple ethical interests at stake in a real-world situation or practice and Articulate what makes a particular course of action ethically defensible.
	CO3	Assess their own ethical values and the social context of problems.
	CO4	Identify ethical concerns in research and intellectual contexts, including academic integrity, use and citation of sources, the objective presentation of data, and the treatment of human subjects
	CO5	Integrate, synthesize, and apply knowledge of ethical dilemmas and resolutions in academic settings, including focused and interdisciplinary research
NATIONAL SERVICE SCHEME(NSS) **&** **B20MC1203**	CO1	understand general orientation about community service, voluntarism role and responsibility of NSS volunteer.
	CO2	Analyze about the community he live in.
	CO3	Asses the life in adopted villages.
	CO4	Identify the importance of national days and attain participation in it.