



Effective from Academic Batch:2026-27

Faculty:	Technology and Engineering
Department:	Computer Science and Engineering
Programme:	Bachelor of Engineering
Semester, Year:	FS BE-I
Course Code:	
Course Title:	Design Thinking
Course Type:	HSMC

Prerequisite :

The prerequisite for this course is primarily a foundation in critical thinking and analytical skills for problem breakdown. Students are expected to have a keen interest in collaborative problem-solving and a willingness to adopt an empathy-driven, human-centric mindset for observation and research.

Course Objectives:

Students should be able to :

1. Problem Identification & Framing : conduct user research (empathy, observation) and frame complex, ambiguous ("wicked") problems into clear, actionable problem statements using root cause analysis
2. Apply a minimum of three distinct creative thinking strategies (e.g., Brainstorming, SCAMPER, Lateral Thinking) to generate multiple alternative, innovative solutions to a framed problem.
3. Design and construct low-fidelity prototypes (e.g., paper, soft prototypes) and integrate human factors analysis and user-centric principles into the engineering product design process.
4. Implement iterative testing methods, evaluate the feasibility and user experience (UX) of a prototype using feedback, and justify the final design refinement decisions.
5. Synthesize all Design Thinking stages to execute a full design challenge, demonstrating innovation, creativity, and the creation of tangible value relevant to local, national, or global needs.

Teaching & Examination Scheme:

Contact hours per week			Course Credits	Examination Marks				
Lecture	Tutorial	Practical		Theory		Practical		Total
				IA	UA	IA	UA	
-	-	02	01	-	-	-	50	50

Course Contents :

Unit No.	Topic / Unit	Contact Hours	Weightage
1	Introduction to Design Thinking and Innovation Innovation and its significance in engineering Design Thinking mindset and creative thinking strategies Customer-centric design and real-world examples Stages of the Design Thinking process	5	5%
2	Empathize and Define the Problem Research, observation, and empathy , Individual differences and perspective taking ,Problem framing and root cause analysis ,Wicked problems and their impact	5	20%
3	Ideation and Creative Problem Solving Brainstorming, Lateral Thinking, SCAMPER, Synectics	5	25%



	Mapping customer experience and stakeholder needs Converting insights into actionable ideas. Come out with several alternate creative innovative solutions to the problem		
4	Prototyping and Product Design Paper prototypes, soft prototyping, human factors analysis. Engineering product design using Design Thinking principles Testing and refinement of prototypes	5	20%
5	Test, Feedback, and Re-Design Iterative testing and feedback methods User experience, ergonomics, and feasibility evaluation ,Final concept testing and refinement	5	15%
6	Design Challenge and Application Selection of problem/project for design challenge Application of all Design Thinking phases Innovation, creativity, and value creation in engineering design	5	15%

Reference Books :

1.	E. Balaguruswamy, <i>Developing Thinking Skills (The Way to Success)</i> , Khanna Publishing.
2.	Tim Brown, <i>Change by Design: How Design Thinking Transforms Organizations and Inspires Innovation</i> , Harvard Business Review.
3.	Nigel Cross, <i>Design Thinking</i> , Bloomsbury.
4.	R.T. Krishnan & V. Dabholkar, <i>8 Steps to Innovation</i> , Collins Publishing.
5.	Design Thinking Process & Methods 5th Edition Robert Curedale, Design Community College Inc., 2019.
6.	Design Thinking for Strategic Innovation: What They Can't Teach You at Business or Design School - Idris Mootee, John Wiley & Sons, Inc

Online Resources :

1.	https://www.aim.gov.in/pdf/Introduction_to_Design_Thinking.pdf
2.	https://www.sessionlab.com/library/design-thinking
3	https://www.ideo.com/pages/design-thinking-resources
4.	https://online.hbs.edu/blog/post/what-is-design-thinking
5.	https://www.humanrestorationproject.org/resources/design-thinking-pbl-process

Sr. No.	Course Outcomes :
	After learning the course the students should be able to:
CO 1	Propose innovative engineering product designs using appropriate frameworks and techniques.
CO 2	Identify and frame complex problems using Design Thinking methods.
CO 3	Analyze user experiences and emotions to improve product design.



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CO 4	Apply creative thinking strategies to generate alternative solutions.
CO 5	Build, test, and refine prototypes based on iterative feedback.
CO 6	Appreciate individual differences and incorporate user-centric perspectives in engineering design.



Effective from Academic Batch:2026-27

Faculty:	Technology and Engineering
Department:	Computer Science and Engineering
Programme:	Bachelor of Engineering
Semester, Year:	FS BE-I
Course Code:	
Course Title:	Digital Logic and Design
Course Type:	ESC

Prerequisite : Students should have a basic understanding of mathematics, binary arithmetic, and logical reasoning. Familiarity with computer number systems and elementary electronics will help in grasping concepts related to logic gates, combinational and sequential circuits.

Course Objectives:

Students should be able to :

1. Understand and apply various Numbering systems (binary, octal, decimal, and hexadecimal) and perform Binary arithmetic operations including signed number representation using sign-magnitude, 1's complement, and 2's complement methods.
2. Analyze and differentiate among various Binary codes such as weighted (8421 BCD) and non-weighted (Excess-3, Gray code), and apply Error detection and correction codes to ensure data integrity.
3. Design and simplify Boolean expressions using Boolean algebra laws, Karnaugh maps, and the Quine–McCluskey method for optimizing digital logic circuits.
4. Construct and implement Combinational logic circuits including adders, subtractors, comparators, multiplexers, demultiplexers, encoders, decoders, and code converters using standard ICs.
5. Design, analyze, and simulate Sequential logic circuits such as latches, flip-flops, shift registers, and counters (asynchronous and synchronous) with specified modes and configurations.

Teaching & Examination Scheme:

Contact hours per week			Course Credits	Examination Marks				
Lecture	Tutorial	Practical		Theory		Practical		Total
				IA	UA	IA	UA	
03	-	02	04	30	70	-	50	150

Theory Course Contents :

Unit No.	Topic / Unit	Contact Hours	Weightage
1	Numbering System and Binary Codes Numbering systems: Introduction, Decimal system, Binary system, representation of signed numbers (sign-magnitude, 1's complement, 2's complement), Binary arithmetic operations (addition, subtraction, multiplication, division), Octal system, and Hexadecimal system. Binary codes: Introduction and classification of codes, Weighted code –	08	10%

	8421 BCD, Non-weighted codes – Excess-3 and Gray code, and Error control codes – Error detecting codes and Error correcting codes.		
2	Logic Gates, Boolean Algebra and Minimization Logic gates: Basic gates – AND, OR, NOT, Universal gates – NAND and NOR, Exclusive gates – XOR and XNOR. Boolean algebra: Logic operations (AND, OR, NOT, NAND, NOR, XOR, XNOR), Laws of Boolean algebra, Reduction of Boolean expressions, Boolean functions and their representation in SOP and POS forms, and Karnaugh map representation. Minimization of switching functions: Karnaugh maps for two, three, four, and five variables, Don't care combinations, and Quine–McCluskey tabular method.	12	20%
3	Combinational Logic Circuits Combinational logic design: Adders and Subtractors (Half and Full), Binary parallel adder, 4-bit parallel subtractor, Comparator (IC 7485), Code converters including Binary to Gray, Gray to Binary, Binary to BCD, BCD to Excess-3, and BCD to Gray, Multiplexers (IC 74151, 74153, 74157), Demultiplexers and Decoders (IC 74138, 74139, 74154, 74155), and Encoders (IC 4532).	08	20%
4	Sequential logic elements Classification of sequential circuits, Latches and Flip-Flops (SR, JK, T, D), Excitation tables of all Flip-Flops, and asynchronous inputs. Introduction to Finite state model, State diagram, State table, State reduction, State assignment, Transition and output table.	08	20%
5	Shift Registers Shift registers: Buffer register, Data transmission in shift registers, Serial-In Serial-Out (IC 74165), Serial-In Parallel-Out (IC 74164), Parallel-In Serial-Out, Parallel-In Parallel-Out, and Bidirectional shift registers (IC 74194).	04	10%
6	Counters Counters: Asynchronous counters – Two-bit ripple up/down counters using negative or positive edge triggering, Design of Mode-6 and Mode-10 asynchronous counters, and effect of propagation delay in ripple counters. Synchronous counters – Design of synchronous counters, 3-bit up counter, 3-bit down counter, 3-bit up-down counter using JK Flip-Flops, Modulo-10 synchronous counter (UP/DOWN), and standard counter ICs – 7490, 7492, and 7493 (BCD and Binary counters).	05	20%

Practical Course Contents :			
Unit No.	Topic / Unit	Contact Hours	Weightage
1	Practicals based on Digital Logic and Design	30	100%

Reference Books :	
1.	Digital Logic and Computer Design, M.Morris Mano
2.	Fundamentals of Digital Circuits by A. Anand Kumar (PHI Publication)



3.	Digital Design: Principles and Practices by John F. Wakerly
4.	Digital Fundamentals by Thomas L. Floyd
5.	Digital Electronics: Principles and Integrated Circuits by Anil K. Maini

Online Resources :

1.	Digital Systems: From Logic Gates to Processors (Coursera)
2.	Digital Electronics and Logic Design Tutorials (GeeksforGeeks)
3.	Combinational Logic Circuits (Electronics-Tutorials)

Sr. No.	Course Outcomes : After learning the course the students should be able to:
CO 1	Understanding various number systems, binary codes, and encoding schemes used in digital systems.
CO 2	Apply Boolean algebra, logic simplification techniques, and Karnaugh maps to minimize Boolean expressions.
CO 3	Design and implement combinational logic circuits, including adders, subtractors, multiplexers, decoders, and code converters.
CO 4	Analyze and design sequential circuits, including flip-flops, shift registers, and counters, considering timing and state diagrams.
CO 5	Design synchronous sequential circuits and evaluate their performance in practical applications.

1	1. Communication Skills a. Process, Models of Communication , types and forms b. Context in Communication c. 7 C's of Communication d. Non-verbal Communication e. Barriers to Communication 2. Organisational Communication a. Process, types and Flow of Communication b. Barriers to organisational communication c. Managerial communication: Relevance and barriers d. Technical Communication	2	20%	BT-1, BT-2	CO1	PSO1, PSO3, PSO12	EMP SD	G	PE
2	1. Listening Skills a. Process of Listening b. Types of Listening c. Importance of Active Listening	2	20%	BT-1 BT-2, BT-3	CO2	PSO1, PSO3, PSO12			

	d. Techniques of Effective Listening 2. Phonetics a. IPA: Symbols, Sounds and types b. Organs of Speech c. Transcription: Some Common English Words d. Accent and Dialects: Introduction to different Accent									
3	1. Reading Skills a. Skimming and Scanning: Usage and Relevance b. Intensive and Extensive Reading c. SQ4R Method d. Reading Comprehensions 2. Study Skills a. Note making: Methods and their relevance 3. Writing Skills a. Coherence and Cohesion b. Paragraph Writing: Types of Paragraphs c. Letter Writing: Business	4	20%	BT-2, BT-3	CO3	PSO3, PSO12				

	Letters and Applications d. E-mail Writing e. Report writing: Business Reports f. CV and Resume								
4	1. Meetings and Conferences: a. Difference between meetings and conferences b. Notice, Agenda, Minutes and Note of Dissent c. Memorandum and Circulars 2. Presentation Skills a. Preparing for Presentation: Audience Analysis, types of Data and methods of data collection b. Discussing the Significance of Audio-visual Aids c. Audience and Feedback in Presentation Skills d. Analyzing the Significance of Non-Verbal Communication	8	20%	BT-2 BT-3, BT-4	CO4	PSO3, PSO4, PSO9			

5	1. Grammar a. Content words and Function words b. Word Formation and Morphology: Affixation, Conversion, Compounding, Clipping, Acronym, Abbreviations and Blending c. Phrase, Clause and Sentence: Types of Sentences 2. Vocabulary a. Denotation and Connotation b. Synonyms and Antonyms, Idioms and Phrases c. One-word substitutes, Homonyms and Homophones, Jargons, Terminology, Colloquialism 3. Error Analysis: Identifying, Analysing and correcting Errors	4	20%	BT-2 BT-3, BT-4	CO5	PSO3, PSO9			
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Reference Books:	
1.	S. Kumar, P. Lata, “Communication Skills”, New Delhi, Oxford University Press, 2011
2.	Raman Sharma, “Technical Communications”, Oxford Publication, London, 2004
3	High School English Grammar & Composition by Wren & Martin
4.	Daniel Jones. The Pronunciation of English. Cambridge: Cambridge University Press, 1956. James Hartman& et al. Ed. English Pronouncing Dictionary. Cambridge: Cambridge University Press, 2006.
5.	A Textbook of English Phonetics, Balasubramanian T, Macmillan
6.	T R Kansakar, A Course in English Phonetics, Orient BlackSwan, 2015
7.	Eisenbach Iris, “English for Materials Science and Engineering”, Springer Fachmedien Wiesbaden GmbH 2011
Practical:	
The practical sessions shall be designed to reinforce and complement the concepts covered in the theory syllabus. Practical exercises will be conducted based on the topics outlined above.	

Bloom’s Taxonomy Levels:

1. Remember 2. Understand 3. Application 4. Analysis 5. Evaluation 6. Creation

Programme Name: B.E (Computer Science and Engineering)

PSO 1: Learn Basics of Computer Science, Engineering and its applications.

PSO 2: Understanding and learning computer hardware and architecture.

PSO 3: Understanding and learning programming paradigms, software engineering methodologies and software development technologies.

PSO 4: Understanding various data storage, data analysis and data security technologies.

PSO 5: Learning fundamentals of digital communication, networking and network security.

PSO 6: Understanding basics and advanced concepts of GUI, computer graphics, image processing, Computer Vision

PSO 7: Learning concepts of Operating Systems and Systems programming.

PSO 8: Understanding Advanced concepts of Computer Science & Engineering like AI, ML, DS, Embedded Systems, Data Science

PSO 9: Hands On to application development through Industry project / Group Project / Internship

PSO 10: Exposure to soft skills

PSO 11: Exposure to skill development, entrepreneurship, employability

PSO 12: Learning Foundation Courses essential for understanding the basics of Computer Science, Engineering and its Applications.



Effective from Academic Batch:2026-27

Faculty:	Technology and Engineering
Department:	Computer Science and Engineering
Programme:	Bachelor of Engineering
Semester, Year:	FS BE-I
Course Code:	
Course Title:	ICT Workshop-I
Course Type:	ESC

Prerequisite : None

Course Objectives:

Students should be able to :

1. Develop foundational digital literacy and technical fluency to understand, operate, and evaluate computer systems and software effectively.
2. Cultivate professional and collaborative skills for efficient communication, documentation, and teamwork in academic and workplace environments.
3. Foster the ability to leverage emerging tools and technologies such as AI, cloud platforms, and data analysis to enhance productivity and informed decision-making.

Teaching & Examination Scheme:

Contact hours per week			Course Credits	Examination Marks (Passing / Maximum)				
Lecture	Tutorial	Practical		Theory		Practical		Total
				IA	UA	IA	UA	
-	-	02	01	-	-	-	50	50

Practical Course Contents :

Unit No.	Topic / Unit	Contact Hours	Weightage
1	To demonstrate the basic internal and external components of a computer system (motherboard, CPU, RAM, storage devices, input/output devices).	2	8%
2	To demonstrate and compare different computer hardware components including storage devices (HDD vs SSD), display units, graphics processors (integrated vs dedicated GPU), and peripheral devices using Raspberry Pi, and prepare a comparative analysis report.	2	8%
3	To install and configure a Linux operating system (e.g., Ubuntu) in a virtualized environment using VirtualBox, manage user accounts, install essential applications, and demonstrate basic system administration tasks.	2	8%
4	To practice and enhance typing skills using online platforms (like TypingClub) by performing timed exercises, with the goal of improving words-per-minute (WPM) speed and accuracy for professional and academic tasks.	2	8%
5	To create and organize a systematic folder structure, practice cloud-based file storage using Google Drive, and demonstrate version control by enabling version history and restoring previous file versions.	2	8%

6	To develop professional communication and collaboration skills by drafting and sending formal emails with proper formatting, attachments, and use of CC/BCC, and by creating and using a team collaboration platform (MS Teams/Slack) for effective file sharing and group interaction.	2	8%
7	To prepare a professional-quality mini project report using MS Word by applying proper formatting elements such as cover page, table of contents, headers/footers, page numbers, images, and citations with references.	2	9%
8	To create a professional presentation using MS PowerPoint by applying consistent design themes, transitions, embedded charts/images, and presenter notes on a selected technical topic.	2	9%
9	To explore and apply practical AI/ML tools for enhancing productivity and coding support by performing tasks such as text summarization using ChatGPT, AI-assisted note-making with Notion AI, code completion with GitHub Copilot/Kaggle notebooks, and automated presentation generation using platforms like gamma.app.	2	9%
10	To practice and master advanced search techniques using Google operators (e.g., site:, filetype:, intitle:) for efficient retrieval of books, datasets, and technical documentation, and to present the findings in a structured note.	2	9%
11	To develop a professional online presence for career growth by creating or updating a LinkedIn profile with academic and career details, and by writing and publishing a short blog post on platforms such as Medium or WordPress for peer sharing.	2	8%
12	To perform data entry, analysis, and visualization using MS Excel by entering a sample dataset, applying formulas (SUM, AVERAGE, IF), generating bar charts and pivot tables, and exporting the results to PDF.	2	8%

Reference Books :

1.	Fundamentals of Computers by V. Rajaraman & Neeharika Adabala, PHI Learning, (6th Edition, 2014)
2.	Computer Fundamentals by Ananya Saha & R.G. Saha, Himalaya Publishing House, (2016)
3.	Mastering MS Office – Computer Skill Development: Be Future Ready by Vikas Khatri, V&S Publishers, (2017)

Online Resources :

1.	https://www.khanacademy.org/computing/computer-science
2.	https://grow.google/intl/en_in/?utm_source=redirect&utm_medium=redirect&utm_term=ggw&utm_content=a pac&utm_campaign=redirect
3.	https://www.typingclub.com



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Sr. No.	Course Outcomes : After learning the course the students should be able to:
CO 1	Demonstrate understanding of hardware fundamentals operating systems and peripheral devices
CO 2	Apply file organisation backup versioning and effective usage of office productivity tools
CO 3	Communicate and collaborate using email services, team softwares and digital footprint management
CO 4	Utilize AI ML tools and search engines for efficient information retrieval and problem solving
CO 5	Develop touch typing skills and create professional documents presentations and spreadsheets



Effective from Academic Batch:2026-27

Faculty:	Technology and Engineering
Department:	Computer Science and Engineering
Programme:	Bachelor of Engineering
Semester, Year:	FS BE-I
Course Code:	
Course Title:	Programming for Problem Solving
Course Group:	ESC

Prerequisite : None

Course Objectives:

Students should be able to :

1. Develop a foundational understanding of computer systems and the C programming environment.
2. Build logical thinking and problem-solving abilities through algorithm design, flowcharting, and structured programming.
3. Apply control structures, functions, and modular programming techniques to create efficient and reusable code.
4. Strengthen data handling and memory management skills using arrays, strings, pointers, and dynamic allocation.
5. Cultivate the ability to design and implement complete C programs involving file handling and advanced features for real-world problem solving.

Teaching & Examination Scheme:

Contact hours per week			Course Credits	Examination Marks				
Lecture	Tutorial	Practical		Theory		Practical		Total
				IA	UA	IA	UA	
03	-	02	04	30	70	-	50	150

Theory Course Contents :

Unit No.	Topic / Unit	Contact Hours	Weightage
1	Fundamentals of Computers and C Language Introduction to Computers, History, Generations of Computers, Programming Concepts (Algorithm, Flowchart, Pseudocode), C Basics (Structure, Compilation, Tokens, Data types, Operators), Storage Classes	5	10%
2	Control Structures Decision making (if, if-else, switch), Looping (while, do-while, for), Nested loops, Jump statements (break, continue, goto)	4	15%
3	Functions and Program Structure Function declaration, definition, calling, Recursion, Storage classes, Preprocessor directives	4	15%
4	Arrays and Strings 1D and 2D Arrays, Sorting and Searching, Strings (operations and library functions)	4	15%
5	Pointers and Dynamic Memory Allocation Pointers basics and arithmetic, Call by reference, Dynamic memory (malloc, calloc, realloc, free)	3	15%

6	Structures, Unions, and Enumerations Structures (declaration, array of structures, nested), Unions, Enumerations, typedef	4	15%
7	File Handling File operations (open, close, read, write), File handling functions (fscanf, fprintf, fread, fwrite), Error handling	1	10%
8	Advanced Topics Command line arguments, Bitwise operators, Libraries (stdio, math, string, ctype), Introduction to Computer Graphics in C	2	5%

Practical Course Contents :			
Unit No.	Topic / Unit	Contact Hours	Weightage
1	Practicals based on Programming for Problem Solving	30	100%

Reference Books :	
1.	The C Programming Language – Brian W. Kernighan, Dennis M. Ritchie
2.	Programming in ANSI C – E. Balagurusamy
3.	C: The Complete Reference – Herbert Schildt

Online Resources :	
1.	https://www.w3schools.com/c/
2.	https://www.codecademy.com/learn/paths/c
3.	https://www.programiz.com/c-programming/online-compiler/

Sr. No.	Course Outcomes : After learning the course the students should be able to:
CO 1	Understand the fundamental concepts of computers and apply basic C programming constructs including data types, operators, and control structures to develop simple programs.
CO 2	Design and implement modular programs using functions, recursion, and preprocessor directives to enhance code reusability and structure.
CO 3	Apply arrays, strings, and pointer concepts effectively to manipulate data and perform efficient memory management.
CO 4	Develop structured programs utilizing structures, unions, and enumerations for organizing and processing complex data.
CO 5	Demonstrate file handling and advanced C features such as command-line arguments, bitwise operations, and standard libraries to build comprehensive and efficient applications.

Annexure A

	The Maharaja Sayajirao University of Baroda Faculty Technology and Engineering Department of Textile Engineering					Academic Year		2024-25	
B.E. (ALL BRANCHES) : Regular Programme									
Year	I	Core / Elective / Foundation FTE XXXX: Universal Human Values – I				Hours per week (L-T-P) & Credit 02-00-00, No Credit			
Semester	I	Year of Introduction: 2024 Year of Syllabus Revision: --				Maximum Marks / Grade 00			
Mode of Transaction		Lectures (Online)							
Course Outcome (CO) CO1: Understand and analyse the essentials of human values and skills, self-exploration, happiness and prosperity. CO2: Evaluate coexistence of the “I” with the body. CO3: Identify and evaluate the role of harmony in family, society and universal order. CO4: Understand and associate the holistic perception of harmony at all levels of existence. CO5: Develop appropriate technologies and management patterns to create harmony in professional and personal lives.									
Unit No.	Topic/Unit	Cont act Hou rs	Weightage (%)	BT Leve l	CO	PSO	Elements of Employability (Emp)/ Entrepreneurshi p (Ent)/ Skill Development (SD)	Relevance to Local (L)/ National (N)/ Regional(R)/Glob al (G) developmental needs	Relation to Gender (G), Environment and Sustainabilit y (ES), Human Values (HV) and

Annexure A

									Professional Ethics (PE)
1	Introduction to UHV, Aspirations and Concerns, Self-management, Health	6	40%		CO1 , CO2	-----	Emp, Ent, SD	L, N, R, G	G, ES, HV, PE
2	Relationships	4	27%		CO2 , CO3				
3	Society, Natural Environment, Self-evaluation	5	33%		CO4 , CO5				
Reference Books:									
1.	A foundation course in Human Values and Professional Ethics by R R Gaur, R. Ashthana and G P Bagaria, 2 nd Edition (2019).								
2.	Universal Human Values and Professional Ethics by Dr. Saroj Kumar, Prof. Sheenu Nayyer, Thakur Publication Pvt Ltd, (2020)								
3.	Online Universal Human Values material of AICTE.								

Bloom's Taxonomy Levels:

1. Remember 2. Understand 3. Application 4. Analysis 5. Evaluation 6. Creation

Program Name: Bachelor of Civil Engineering

Programme Specific Outcome (PSO)

PSO1 Demonstrate knowledge and understanding of principles of Civil Engineering by using tools and methodologies to provide application-oriented solutions.

PSO2 Analyze and design civil engineering structures and systems which are cost effective, socially acceptable, and sustainable.

Syllabus of Courses

5	S. Somvanshi and R. Dhupper, <i>Fundamentals of Environmental Studies</i> : S. K. Kataria and Sons, Reprint 2019.
6	Benny Joseph, “Environmental Studies”, 3rd Addition, McGraw Hill Education (India), Pvt. Ltd., 2018.



Effective from Academic Batch:2026-27

Faculty:	Technology and Engineering
Department:	Computer Science and Engineering
Programme:	Bachelor of Engineering
Semester, Year:	SS BE-I
Course Code:	
Course Title:	Health and Wellness Awareness
Course Type:	Mandatory Course

Prerequisite : None

Course Objectives:

Students should be able to :

1. Realize the importance and be aware of health and fitness in their life.
2. Know about the Indian Knowledge System of Yoga
3. Develop respect towards nation and Indian Army by participation in NCC
4. Play various sports and develop team spirit with a strong character via sports.

Teaching & Examination Scheme:

Contact hours per week			Course Credits	Examination Marks				
Lecture	Tutorial	Practical		Theory		Practical		Total
				IA	UA	IA	UA	
-	-	02	-	-	-	-	-	

Course Contents :

Unit No.	Topic / Unit	Contact Hours	Weightage
1	Student can opt for any one or more of the following health and fitness activities • Sports • Yoga • NSS • NCC	30	100%

Reference Books :

1.	Raja Yoga - Swami Vivekananda
2.	Light on Yoga - BKS Iyengar
3.	Light on Pranayama - BKS Iyengar

Online Resources :

1.	-
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Sr. No.	Course Outcomes : After learning the course the students should be able to:
CO 1	Develop and maintain physical fitness, stamina, and endurance (Sports/Yoga/NSS/NCC/etc.)
CO 2	Demonstrate teamwork, discipline, leadership qualities, patriotism and the spirit of sportsmanship
CO 3	Practice yoga and relaxation techniques for stress management, mental peace, and holistic well-being
CO 4	Understand the core human values.
CO 5	Adopt a lifelong approach towards fitness, healthy living, and a balanced lifestyle



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Faculty:	Technology and Engineering
Department:	Computer Science and Engineering
Programme:	Bachelor of Engineering
Semester, Year:	SS BE-I
Course Code:	
Course Title:	ICT Workshop-II
Course Type:	ESC
Prerequisite : Basic knowledge of computer operations and file systems , Familiarity with using a web browser, No prior programming or web development experience is required.	
Course Objectives: Upon completion, students will be able to build a basic website, manage a project using version control, and work effectively in a team using collaboration platforms.	

Teaching & Examination Scheme:

Contact hours per week			Course Credits	Examination Marks				
Lecture	Tutorial	Practical		Theory		Practical		Total
				IA	UA	IA	UA	
-	-	02	01	-	-	-	50	50

Practical Course Contents :

Unit No.	Topic / Unit	Contact Hours	Weightage
1	Introduction to Web Development & HTML Introduction to client-side and server-side web technologies. Basic HTML syntax, tags, and structure. Creating a static web page with headings, paragraphs, and lists. Working with hyperlinks and images. Working with tables and semantic HTML5 tags (e.g., <header>, <footer>, <nav>, <article>). Creating forms with various input types (text, radio, checkbox, etc.). Using form attributes like action and method.(Demo of reading the form data on server side)	5	30%
2	CSS Introduction to CSS syntax and the box model. Different ways to apply CSS: inline, internal, and external stylesheets. Using selectors (tag, class, ID) to style elements. Styling text, colors, and backgrounds. Understanding and using CSS properties like padding, margin, and border. Introduction to Flexbox, creating responsive layouts. Basic positioning (static, relative, absolute).	5	30%
3	Git & GitHub Introduction to version control and its importance. Installing and configuring Git. Basic Git commands Creating a GitHub Account and new repository Connecting & Synchronizing local and remote repository Cloning a repository Collaborating on a project	5	20%
4	Project Management Introduction to Project Management Tool Creating and Managing Projects Creating Issues (Epics, Story, Task) and Assigning to Team Members Using boards and task management for monitoring.	5	10%

5	Team Collaboration Introduction to effective team communication. set up channels/space for different project topics and use them for communication and documentation Integration with Project Management Tool	5	10%
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Reference Books :	
1.	HTML and CSS: Design and Build Websites by Jon Duckett
2.	Pro Git by Scott Chacon and Ben Straub
3.	Learning Web Design: A Beginner's Guide to HTML, CSS, JavaScript, and Web Graphics by Jennifer Robbins

Online Resources :	
1.	https://www.codecademy.com/projects/language/html-css
2.	https://www.theodinproject.com/
3.	https://learn.github.com/

Sr. No.	Course Outcomes : After learning the course the students should be able to:
CO 1	Develop and style a static website using fundamental HTML and CSS
CO 2	Apply version control principles using Git & centralized repository to track and manage code changes.
CO 3	Utilize project management tools to organize and track project tasks.
CO 4	Employ team collaboration tools for efficient communication and documentation.
CO 5	Integrate all learned concepts into a small team-based web project.



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Faculty:	Technology and Engineering
Department:	Computer Science and Engineering
Programme:	Bachelor of Engineering
Semester, Year:	SS BE-I
Course Code:	
Course Title:	Object Oriented Programming with C++
Course Type:	PCC

Prerequisite :

Students should have a basic understanding of C programming, including variables, data types, control structures, and functions. Prior experience with problem-solving and logical thinking will help in grasping object-oriented concepts in C++ effectively.

Course Objectives:

Students should be able to :

1. Demonstrate understanding of the evolution of C++ from C and explain the fundamental principles, structure, and benefits of Object-Oriented Programming (OOP).
2. Apply programming fundamentals such as tokens, data types, control structures, and functions—including function overloading, default arguments, and inline functions—to develop efficient C++ programs.
3. Design and implement programs using classes and objects by applying OOP concepts such as access specifiers, static members, friend functions, constructors, and destructors to achieve modular and reusable code.
4. Implement advanced OOP mechanisms such as operator overloading, inheritance, and polymorphism to create extensible and maintainable software solutions.
5. Utilize advanced C++ features including templates, exception handling, type conversions, and the Standard Template Library (STL) to enhance code flexibility, reliability, and performance.

Teaching & Examination Scheme:

Contact hours per week			Course Credits	Examination Marks				
Lecture	Tutorial	Practical		Theory		Practical		Total
				IA	UA	IA	UA	
03	00	02	04	30	70	-	50	150

Theory Course Contents :

Unit No.	Topic / Unit	Contact Hours	Weightage
1	Introduction to Object Oriented Programming and C++ Evolution from C to C++, Object-Oriented Programming paradigm, Basic concepts of Object-Oriented Programming, Benefits of OOP, Structure of a C++ program	2	5%
2	Revision of Programming Concepts Tokens, keywords, identifiers, variables, constants, Data Types, type casting expressions, Operator Precedence and associativity Control structures, I/O Statements, Reference Variable	2	5%
3	Functions Parameter passing by reference variable, returning reference, Function	4	15%

	overloading, Default Arguments, constant arguments, Constant function, Inline functions		
4	Classes and Objects Introduction to Class and Object, this pointer, Access specifier, Objects as function arguments, Array of objects, Static members, Friend functions and friend classes, Pointers to Object and pointer to Members, Local classes	8	20%
5	Constructors and Destructors Constructors, Default constructor, do-nothing constructor, Parameterized constructor, and copy constructor, Constructor Overloading, Dynamic Constructor, Destructors	4	15%
6	Operator Overloading Rules of Operator Overloading, overloading unary and binary operators using member function and friend function	6	15%
7	Inheritance Types of Inheritance, Constructor and Destructor in Inheritance, Role of Access Modifier in Inheritance, Virtual base classes	6	10%
8	Polymorphism Concept of polymorphism, Virtual functions and pure virtual functions, Abstract classes	4	10%
9	Advance Concepts Type Conversions, Basics of Exception Handling, Templates, Introduction to STL, Introduction to graphics	9	5%

Practical Course Contents :			
Unit No.	Topic / Unit	Contact Hours	Weightage
1	Practicals based on Object Oriented Programming with C++	30	100%

Reference Books :	
1.	Balagurusamy, E., Object Oriented Programming with C++, McGraw Hill Education, 6th Edition
2.	Lafore, R., Object-Oriented Programming in C++, Pearson Education, 4th Edition.
3.	Stroustrup, B., The C++ Programming Language, Addison-Wesley, 4th Edition.
4.	Schildt, H., C++: The Complete Reference, McGraw Hill Education, 4th Edition.
5.	Deitel, H.M. and Deitel, P.J., C++ How to Program, Pearson Education, 10th Edition.
6.	Kanetkar, Y.P., Let Us C++, BPB Publications

Online Resources :	
1.	C++ Programming Language - GeeksforGeeks
2.	C++ Tutorial
3.	C++ For C Programmers, Part A Coursera



Sr. No.	Course Outcomes : After learning the course the students should be able to:
CO 1	Understand the fundamental principles of Object-Oriented Programming and C++ syntax — including the evolution from C to C++, structure of a C++ program, and the core OOP concepts such as abstraction, encapsulation, inheritance, and polymorphism.
CO 2	Apply basic programming constructs and control structures in C++ — such as tokens, data types, operators, expressions, and I/O statements to develop modular and structured programs.
CO 3	Design and implement modular programs using functions, classes, and objects — including parameter passing, function overloading, constructors, destructors, access specifiers, and static/friend members.
CO 4	Demonstrate proficiency in advanced object-oriented features — such as operator overloading, inheritance, polymorphism, virtual functions, and abstract classes to create extensible and maintainable code.
CO 5	Implement advanced C++ programming techniques — including templates, exception handling, type conversions, and basic use of Standard Template Library (STL) and graphics for real-world problem solving.