

B.C.A. (Honours) & B.C.A. (Honours with Research)
(Semester - 1 and Semester - 2)
Saurashtra University
To be effective from June – 2023

BCA SEM 1						
Sr. No.	Type of Course	Course Title	Credit	CCE	SEE	Total
1	MAJOR	CS-01: Problem Solving Methodologies and Programming In C	4	50	50	100
2	MAJOR	CS-02: Networking & Internet Environment	4	50	50	100
3	MINOR	CS-03: Computer Fundamentals and Emerging Technologies	4	50	50	100
4	MDC	CS-04: Practical Based on Problem Solving Methodologies and Programming In C and Networking & Internet Environment	4	50	50	100
5	AEC	CS-05: Critical Thinking and Problem Solving	2	25	25	50
6	SEC	CS-06: Mathematical and Statistical Foundation of Computer Science	2	25	25	50
7	IKS	CS-07: Mathematics in Ancient India: Exploring the Rich Heritage of Vedic Mathematics	2	25	25	50
			22	300	250	550

BCA SEM 2						
Sr. No.	Type of Course	Course Title	Credit	CCE	SEE	Total
1	MAJOR	CS-08: Data Structure Using C Language	4	50	50	100
2	MAJOR	CS-09: Web Programming	4	50	50	100
3	MINOR	CS-10: SAD, Software Quality Assurance & Testing	4	50	50	100
4	MDC	CS-11: Practical Based on Data Structure Using C Language and Web Programming	4	50	50	100
5	AEC	CS-12: Modern Indian Language	2	25	25	50
6	SEC	CS-13: Computer Organization & Architecture	2	25	25	50
7	VAC	CS-14: Environmental Science: Understanding the Earth's Ecosystems and Sustainability	2	25	25	50
			22	300	250	550

CCE = Continuous and Comprehensive Evaluation, SEE = Semester End Evaluation

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B.C.A. (Semester – 1)

Sr. No.	Type of Course	Course Title	Credit
1	MAJOR	CS-01: Problem Solving Methodologies and Programming In C	4
2	MAJOR	CS-02: Networking & Internet Environment	4
3	MINOR	CS-03: Computer Fundamentals and Emerging Technologies	4
4	MDC	CS-04: Practical Based on Problem Solving Methodologies and Programming In C and Networking & Internet Environment	4
5	AEC	CS-05: Critical Thinking and Problem Solving	2
6	SEC	CS-06: Mathematical and Statistical Foundation of Computer Science	2
7	IKS	CS-07: Mathematics in Ancient India: Exploring the Rich Heritage of Vedic Mathematics	2
Total Credits of Semester 1			22

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CS-01: PROBLEM SOLVING METHODOLOGIS AND PROGRAMMING IN C		
Objectives: <ul style="list-style-type: none"> • To develop basic programming skill and logic, concept of memory management and file handling. • To be able to understand preprogramming techniques • To become familiar with programming concepts • To become familiar with different problem-solving methodologies 		
Prerequisites: <ul style="list-style-type: none"> • Basic Computer Skills and Command-line knowledge 		
Unit No.	Topic	Detail
1	Introduction of C Language	<ul style="list-style-type: none"> • Introduction of Computer Languages • Introduction of Programming Concept • Introduction of C Language (History & Overview) • Difference between traditional and modern c. • C character set • C tokens <ul style="list-style-type: none"> ▪ Keywords ▪ Constants ▪ Strings ▪ Identifiers and variables ▪ Operators (all 8 operators) • Hierarchy of operators • Type casting • Data types in c • PRE-PROCESSORS IN C
	Introduction of Logic Development Tools	<ul style="list-style-type: none"> • Introduction of Logic. • Necessary Instructions for Developing Logic • Basics of Flow Chart • Dry-run and its Use. • Other Logic development techniques
2	Control Structures	<ul style="list-style-type: none"> • Selective control structure <ul style="list-style-type: none"> ▪ If statements ▪ Switch statement • Conditional ternary operator • Iterative (looping) control statements <ul style="list-style-type: none"> ▪ For loop ▪ Do...while loop ▪ While loop • Nesting of loops

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		<ul style="list-style-type: none"> • Jumping statements <ul style="list-style-type: none"> ▪ Break, Continue and Goto statements
3	Functions (Inbuilt and User Defined)	<ul style="list-style-type: none"> • Types of library functions <ul style="list-style-type: none"> ▪ String Function: strcpy, strncpy, strcat, strncat, strchr, strrchr, strcmp, strncmp, strstr, strspn, strcspn, strlen, strpbrk, strstr, strtok ▪ Mathematical Functions: acos, asin, atan, ceil, cos, div, exp, fabs, floor, fmod, log, modf, pow, sin, sqrt ▪ I/O Formatting Functions: printf, scanf, getc, getchar, gets, putc, putchar, puts, ungetc ▪ Miscellaneous Functions: delay, clrscr, clearer, errno, isalnum, isalpha, isdigit, islower, isspace, isupper, isxdigit, toupper, tolower ▪ Standard Library functions: abs , atof , atol , exit , free, labs , rand , strtoul , srand ▪ Memory Allocation Functions: malloc , realloc , calloc • Types of user defined functions • Function call by value • Function call by reference • Recursion • Storage classes • Passing and returning values
	Array	<ul style="list-style-type: none"> • Types of arrays <ul style="list-style-type: none"> ▪ Single dimensional array ▪ Two dimensional array ▪ Multi-dimensional array ▪ String arrays • Use of Arrays in Programming • Arrays and Matrices
4	Pointers	<ul style="list-style-type: none"> • Introduction of Pointers • Use of pointers in Dynamic Programming • Pointer to Variables • Pointer to Array • Pointer within Array • Array of Pointer • Pointer To Structure • Pointers within structure • Pointer to Pointer • Dangling Pointer Problem
5	User Defined Data Type – Structure, Union & enum	<ul style="list-style-type: none"> • What is structure • Initializations and declarations • Memory allocation functions • Pointers with structures • Array with structures

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		<ul style="list-style-type: none">• User defined function with structures• Nested structures• Introduction to union• Difference between Structure & Union• Enumerated Type
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Seminar - 5 Lectures
Expert Talk - 5 Lectures
Test - 5 Lectures

Total Lectures 60 + 15 = 75

Reference Books:

1. Programming in C, by Pradip Dey & Manas Ghosh, Publisher – Oxford
2. C: The Complete Reference, by Herbert Schildt, Publisher – Tata McGraw Hill.
3. Programming in ANSI C Author : E. Balaguruswami.
4. Schaum's Outline of Programming with C, By: Byron Gottfried, Publisher Shaum Series
5. Programming with ANSI and Turbo C, by Ashok N Kamthane, Publisher – Pearson Education
6. Let Us C Author : Yashwant Kanetkar.
7. Working with C Author: Yashwant Kanitkar.

Course Outcome:

- ✓ Able to illustrate and explain basic concepts of programming
- ✓ Able to understand the concept of control statements.
- ✓ Able to translate the real-life situations in programming form and solve them using some fundamentals of Programming.
- ✓ Able to translate the real-life situations in programming form and solve them by storing data into files and analysed user defined data types and test and detect that it is optimized applications.

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CS-02: NETWORKING & INTERNET ENVIRONMENT		
<p>Objectives:</p> <ul style="list-style-type: none"> • To give brief idea about Computer Network and Internet Environment • To be able to design and develop static and/or interactive website using HTML5, CSS and Javascript. • To become familiar with different web elements. • To get intermediate knowledge of CSS3, Javascript and Bootstrap Framework <p>Prerequisites:</p> <ul style="list-style-type: none"> • Basic Knowledge of Computer Network and Web Surfing 		
Unit No.	Topic	Detail
1	Introduction to Computer Network and it's Applications	<ul style="list-style-type: none"> • Computer Network • Type of Computer Network • Different Terminologies used in Computer Network Internet, ISP (Internet Service Provider), Intranet, VSAT (very small aperture terminal), URL, Portal, Domain Name Server, World Wide Web (WWW), Search Engine, Remote Login, Telnet, Email, E-Commerce, E-Business, E-Governance, Mobile Commerce • Website Basics (WebPages; Hyper Text Transfer Protocol, File Transfer Protocol, Domain Names; URL; Protocol Address; Website[Static, Dynamic, Responsive etc], Web browser, Web Servers; Web Hosting
2	Basic of HTML & Advance HTML 5	<ul style="list-style-type: none"> • Fundamental of HTML • Basic Tag and Attribute • The Formatting Tags • The List Tags • Link Tag • inserting special characters, • adding images and Sound, • lists types of lists • Table in HTML • Frame in HTML • Forms • HTML 5 & Syntax <ul style="list-style-type: none"> ○ HTML5 Document Structure (section, article, aside, header, footer, nav,

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		<p>dialog, figure)</p> <ul style="list-style-type: none"> ○ Attributes of HTML 5 ○ Web Form (datetime, date, month, week, time, number, range, email, url) ○ Audio / Video - Canvas
3	Cascading Style Sheet & CSS 3	<ul style="list-style-type: none"> ● Introduction to CSS ● Types of Style Sheets ● Class & ID Selector ● CSS Pseudo ● CSS Font Properties ● CSS Text Properties ● CSS Background Properties ● CSS List Properties ● CSS Margin Properties ● CSS Comments ● CSS 3 <ul style="list-style-type: none"> ○ Border Property ○ Background & Gradient Property ○ Drop Shadow Property - 2D & 3D Transform Property ○ Transition Property ○ Box Sizing Property ○ Position Property ● Media Query ● CSS Flexbox Properties (display, flex-direction, flex-wrap, flex-flow, justify-content, align-items, align-content, gap row-gap, column-gap) ● CSS Advance Properties (Overflow, text-overflow, Cursor, Visibility, filter, backdrop-filter, object-fit) ● How to use Google Fonts & Custom Fonts (@font-face) ● BEM Naming Convention
4	Java Script	<ul style="list-style-type: none"> ● Introduction to JavaScript ● Variables ● JavaScript Operators ● Conditional Statements ● JavaScript Loops, Break and Continue Statements

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		<ul style="list-style-type: none"> • Dialog Boxes
		<ul style="list-style-type: none"> • JavaScript Arrays • JavaScript User Define Function • Built in Function: string, Maths, Array, Date • Events (onclick, ondblclick, onmouseover, onmouseout, onkeypress, onkeyup, onfocus, onblur, onload, onchange, onsubmit, onreset) • DOM & History Object • Form Validation & E-mail Validation
5	Bootstrap Framework	<ul style="list-style-type: none"> • Introduction to Bootstrap • Bootstrap Layout (Container, Row, Columns, Responsive classes, Offset Column, Reordering Columns) • Bootstrap Content (Typography, Tables, Images, Forms) • Bootstrap Components (Navbar, Navs and tabs, Dropdowns, Buttons, Button Groups, Breadcrumb, Pagination, Labels, Alerts, Progress Bars, Accordion, Card, Modal) Bootstrap Utilities (Colors, Background, Borders, Display, Overflow, Position, Spacing, Text, Vertical align)

Seminar – 5 Lectures
Expert Talk – 5 Lectures
Test – 5 Lectures

Total Lectures: 60 + 15 = 75

Reference Books:

1. HTML in 10 steps or less - Laurie Ann Ulrich, Robert G. Fuller
2. Internet: The Complete Reference –Young.
3. World Wide Web Design with Html -C Xavier.
4. Internet for Every One –Leon.
5. Practical Html 4.0 -Lee Philips.
6. MCSE Networking Essential Training Guides.
7. Benjamin Jakobus, Jason Marah, "Mastering BootStrap 4" 2nd Edition
8. Matt Lambert "Learning BootStrap 4", Packt Publishing

Course Outcome

- ✓ Able to understand Computer Network and Internet Environment
- ✓ Able to understand design and develop static and/or interactive website using HTML5, CSS and Javascript.
- ✓ Able to explore different web elements.
- ✓ Able to understand knowledge of CSS3, Javascript and Bootstrap Framework

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CS-03: COMPUTER FUNDAMENTALS AND EMERGING TECHNOLOGY

Objectives:

- Bridge the fundamental concepts of computers with the present level of knowledge of the students.
- Familiarize peripheral devices, internal and external parts of computer system.
- Understand Number System like binary, hexadecimal and octal number systems and their arithmetic.

Prerequisites:

- Basic Computer Literacy

Unit No.	Topics	Details
1	Introduction to Computers	<ul style="list-style-type: none"> • Basics of Computers <ul style="list-style-type: none"> ○ What is Computer? ○ Characteristics of Computer ○ Data Processing Cycle (Data → Process → information) • Classification of Computer by Data Processed <ul style="list-style-type: none"> ○ Analog, Digital and Hybrid Computers • Classification of Computer by Processing Capabilities <ul style="list-style-type: none"> ○ Micro, Mini, Mainframe and Super Computers • History and Generations of Computers <ul style="list-style-type: none"> ○ First to Fifth Generation Computers • Simple Model of Computer <ul style="list-style-type: none"> ○ Input Devices ○ CPU (Central Processing Unit) ○ Arithmetic & Logic Unit ○ Control Unit ○ Internal Memory • Output Devices • Secondary Storage Devices
	Internal/External parts used with Computer Cabinet	<ul style="list-style-type: none"> • Introduction to Mother board • Types of Processors. <ul style="list-style-type: none"> ○ Dual Core, Core 2 Duo, i2, i3, etc • Memory structure and Types of Memory <ul style="list-style-type: none"> ○ RAM (SRAM, DRAM, SO, DDR, etc.) ○ ROM (ROM, PROM, EPROM, EEPROM, etc.) • Slots: ISA Slots / PCI Slots / Memory Slots • Sockets • Cables: Serial Cable / Parallel Cable / USB Cable

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		<ul style="list-style-type: none"> • Ports: USB / Serial / Parellel / PS2 / HDMI • Power Devices: UPS • Graphic Cards, Network card, Sound Card
2	Input Devices	<ul style="list-style-type: none"> • Introduction • Types of Input Devices <ul style="list-style-type: none"> ○ Keyboard / Mouse / Trackball / Glide - Pad / Game Devices Joystick, etc.) / Light Pen / Touch Screen / Digitizers and Graphic Tablet / Mic (Sound Input) / Camera (Photo and Video Input) / POS (Point of Sale) Terminal (Scanners, etc) ○ MIDI(Musical Instrument Digital Interface) Keyboard, ○ Wireless Devices (Keyboard, Mouse, etc) • Types of Scanners <ul style="list-style-type: none"> ○ OCR, OMR, MICR, OBR
	Data Storage	<ul style="list-style-type: none"> • Introduction • Types of Magnetic Storage Devices <ul style="list-style-type: none"> ○ Floppy Disk / Hard Disk (SATA, SSD) / Magnetic Tape / Magnetic Disks • Storage Mechanism of Magnetic Storage Devices <ul style="list-style-type: none"> ○ Tracks / Sectors / Clusters / Cylinders • Reading / Writing Data to and from Storage Devices • Seek Time / Rotational Delay - Latency / Access • Time /Response Time • Other Storage Devices <ul style="list-style-type: none"> ○ USB - Pen Drive / CD / DVD / Blu-Rav Disk etc. ○ Flash Memory, Cloud Storage(Like Google Drive, OneDrive etc.)
3	Output Devices	<ul style="list-style-type: none"> • Types of Output Devices • CRT Display Units • Monitor • Non CRT display Units • LCD / LED / Plasma Displays • Types of Printers Impact and Non Impact Printers • Plotters • Other Devices <ul style="list-style-type: none"> ○ Fascimile(FAX) ○ OLED (Organic LED) ○ Headphone ○ SGD (Speech Generating Device)

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		<ul style="list-style-type: none"> ○ COM (Computer Output Microfilm) ○ Google Glass
	Numbering System and Codes	<ul style="list-style-type: none"> • Introduction to Binary Codes / <ul style="list-style-type: none"> ○ Nibble / Bit / Byte / Carry Bit / Parity Bit / Sign Bit ○ KB / MB / GB / TB / HB (etc) • Types of Numbering System <ul style="list-style-type: none"> ○ Binary / Octal/Decimal / Hex-Decimal • Conversion <ul style="list-style-type: none"> ○ Binary to Octal, Decimal and Hexa-Decimal ○ Decimal to Binary, Octal and Hexa-Decimal ○ Octal to Binary, Decimal and Hexa-Decimal ○ Hexa-Decimal to Binary, Octal and Decimal • Binary Arithmetic <ul style="list-style-type: none"> ○ Addition ○ Subtraction (1's Compliment and 2's Compliment) ○ Division ○ Multiplication ○ Types of Codes: ASCII/BCD / EBCDIC / Unicode • Parity Check: <ul style="list-style-type: none"> ○ Event Parity System / Odd Parity System
4	Languages, Operating Systems and Software Packages	<ul style="list-style-type: none"> • Introduction • Translator (Assembler / Compiler / Interpreter) • Types of Languages <ul style="list-style-type: none"> ○ Machine Level Language ○ Assembly Level Language ○ High Level Language (3GL, 4GL, 5GL, etc.) • Types of Operating Systems <ul style="list-style-type: none"> ○ Batch Operating System ○ Multi Processing Operating System ○ Time Sharing Operating System ○ Online and Real Time Operating System • Uses and applications of Software Packages <ul style="list-style-type: none"> ○ Word Processing Packages ○ Spread Sheet Packages ○ Graphical Packages ○ Database Packages I ○ Presentation Packages ○ Animation / Video / Sound Packages

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	<p align="center">Emerging Technologies and Virus</p>	<ul style="list-style-type: none"> • Different Communication methods <ul style="list-style-type: none"> ○ GIS / GPS / CDMA / GSM • Communication Devices <ul style="list-style-type: none"> ○ Cell Phones / Modem / Infrared / Bluetooth / WiFi/LiFi/SLM(Spatial Light Modulator) • Virus <ul style="list-style-type: none"> ○ Introduction to Virus and related terms ○ Origin and History ○ Types of Virus ○ Problems and Protection from Virus • Cloud Computing <ul style="list-style-type: none"> ○ What is Cloud Computing? ○ Characteristic & Service Models(IaaS, Paas, Saas) ○ Architecture ○ Security & Privacy
<p align="center">5</p>	<p align="center">Important Terms and Acronyms</p>	<ul style="list-style-type: none"> • ATM • Backup / Restore • Hard Copy / Soft Copy • Bus / Data Bus • Buffer and types / Spooling • Cursor / Pointer / Icon • E-Mail I Attachment • CLil GUI • Compiler and its types • Drive I Directory (Folder) / File / Path • Menu / Popup Menu / Toolbar • Shutdown / Reboot / Restart • Syntax / Wild Card Characters • Optical Fiber (Fiber Optic) . • Net meeting • Printing Speed (CPS, CPM, LPM, DPI, PPM) • Peripherals

Seminar - 5 Lectures
Expert Talk - 5 Lectures
Test - 5 Lectures

Total Lectures 60 + 15 = 75

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Reference Books:

1. Computer Fundamentals – By P.K.Sinha.
2. Fundamental of IT for BCA – By S.Jaiswal.
3. Engineering Physics – By V.K.Gaur.
4. Teach Yourself Assembler – By Goodwin.

Course Outcome:

- ✓ Able to explore the fundamental concepts of computers
- ✓ Able to Understand peripheral devices, internal and external parts of computer system.
- ✓ Able to Understand Number System like binary, hexadecimal and octal number systems and their arithmetic.
- ✓ Able to recognize the emerging technologies
- ✓ Able to differentiate the types of virus

Additional Topics (Not to be asked in examination):

Student should be aware of followings

- To Format Hard Disk
- Installation of OS, multi-OS and other packages
- Use of DOS commands
- Operating of Accounting Software

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CS-04 Practical based on CS-01 and CS-02	
<p>CCE- Continuous and comprehensive Evaluation as follow</p> <ul style="list-style-type: none"> • The continuous Comprehensive Evaluation (CCE) for each subject will be conducted by the teacher of that subject. The teacher will decide how the evaluation will be done. Usually CCE includes things like class participation, case studies and presentation, assignments, tutorials, small test (announced or surprised), quizzes and attendance or a mix of these. • Students must submit their work for internal evaluation on time to time. • Another part of CCE is the mid-term exam, which is compulsory for all students. This exam will be conducted internally by the college. 	50 Marks
<p>SEE – Semester End Examination as per the following</p> <ul style="list-style-type: none"> • Practical Exam is conducted by college using approved examiners (3 Hours duration) • Students must prepare a practical notebook/book for the final practical examination. (The practical book serves as a record of all practical work, observations, procedures and results performed during the semester in lab. It is essential for evaluation during the final practical examination) 	50 Marks

CS-04: Practical Based on Problem Solving Methodologies and Programming In C and Networking & Internet Environment	Total Marks - 100	
Topics	CCE	SEE
Problem Solving Methodologies and Programming in C	25	25
Networking and Internet Environment	25	25

Additional Topics to be taught during the semester – 1 (Not to be asked in examination):
Case studies of DBMS

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CS-05: CRITICAL THINKING AND PROBLEM SOLVING		
<p>Objective:</p> <ul style="list-style-type: none"> • Identify and define problems clearly and accurately • To use logic, reasoning and analytical tools to evaluate information • To recognize the value of ongoing learning and reflection in problem-solving, and continuously work to improve skills and approaches. • To generate creative and innovative solutions to complex problems, and evaluate potential outcomes and consequences. <p>Prerequisites:</p> <ul style="list-style-type: none"> • A willingness to engage in self-evaluation. 		
Unit No.	Topic	Details
1	Personality Development	<ul style="list-style-type: none"> • Self-awareness Conducting self-assessment exercises, personality tests. • Emotional Intelligence Practicing emotional regulation and social skills • Motivation Setting personal and academic goals and developing strategies to achieve them.
2	Introduction to Critical Thinking and Problem Solving	<ul style="list-style-type: none"> • Definition of critical thinking and problem solving • Importance of critical thinking and problem solving in personal and professional life • Approaches to critical thinking and problem solving • Techniques of problem solving
3	Time Management and Goal Setting	<ul style="list-style-type: none"> • Importance of time management • Techniques for managing time effectively • Goal setting and its importance • SMART goal setting • Prioritizing tasks

Course Outcome:

- Develop a deep understanding of critical thinking concepts.
- Develop the ability to identify and analyze problems critically, using logic and reasoning to evaluate different solutions and arrive at an effective decision.
- Enhance the ability to collaborate and communicate effectively with others, and work together to solve complex problems.

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- Develop a creative mindset and an ability to think outside the box, and generate innovative solutions to complex problems.
- Develop the ability to learn from failure, and use these experiences to grow and improve problem-solving skills.

Reference Books:

- "Thinking, Fast and Slow" by Daniel Kahneman
- "Critical Thinking: An Introduction to Analytical Reading and Reasoning" by Larry Wright
- "The Art of Thinking Clearly" by Rolf Dobelli
- "Critical Thinking: A User's Manual" by Debra Jackson and Paul Newberry

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CS-06: MATHEMATICAL AND STATISTICAL FOUNDATION OF COMPUTER SCIENCE

Objectives:

- To create awareness of about basic Mathematics and Statistics
- To develop Reasoning ability, Logical ability and Arithmetic ability
- To develop a positive attitude towards learning Mathematics & statistics
- To perform mathematical & statistical operations and manipulations with confidence, speed and accuracy.

Prerequisites:

- Basic knowledge of Mathematics and Statistics

Unit No.	Topic	Details
1	Determinants	<ul style="list-style-type: none"> • Introduction • 2×2, 3×3 order determinant • Cramer's method for solving linear equation (Two and Three Variables) • Properties of Determinants • Examples
	Matrices	<ul style="list-style-type: none"> • Introduction • Different types of matrix(square matrix, column matrix, row matrix, Diagonal matrix, Unit matrix, null matrix) • Transpose of matrix • Addition, subtraction & multiplication of two matrices • Adjoint of a square matrix • Inverse of matrix
2	Measures of Central Tendency & Dispersion	<ul style="list-style-type: none"> • Mean (ungroup data, group data) • Median (ungroup data, group data) • Mode (ungroup data, group data) • Range • Quartiles • Standard Deviation • Typical examples
3	Arithmetic & Geometric progression	<ul style="list-style-type: none"> • Sequence • Series • Arithmetic progression (Definition & Nth term, sum of n terms) • Geometric progression (Definition & Nth term, sum of n terms) • Harmonic Progression • Relation Between AM GM HM (Two Numbers) • Typical examples

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Student Seminar – 5 Lectures

Expert Talk – 5 Lectures

Student Test – 5 Lectures

Total Lectures 30 + 15 = 45

Course Outcome:

- Able to Understand basics of Mathematics and Statistics
- Able to Develop reasoning ability, logical ability and arithmetic ability
- Able to Develop a positive attitude towards learning Mathematics & statistics
- Able to Perform mathematical & statistical operations and manipulations with accuracy.

Reference Books:

1. Business Mathematics By Sancheti & Kapoor Sultan & Chand
2. Statistical Method By Gupta Sultan & Chand
3. Discrete Mathematical Structures with Applications to Computer Science By J.P. Tremblay & R. Manohar TMH
4. Business Mathematics : V.K. Kapoor
5. Business Mathematics : Dr Kachot
6. Fundamentals of Statistics : S. C. Gupta

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CS-07: Mathematics in Ancient India: Exploring the Rich Heritage of Vedic Mathematics		
<p>Objectives:</p> <ul style="list-style-type: none"> • Helps students understand the contributions made by ancient civilizations to the field of mathematics. • Ancient mathematics helps to establish connections between past and present mathematical ideas. • Exploring Mathematical concepts. <p>Prerequisites:</p> <ul style="list-style-type: none"> • Eagerness to know rich heritage of Indian Mathematics. 		
Unit No.	Topic	Details
1	Biographies of Ancient Indian Mathematicians	<ul style="list-style-type: none"> • A brief introduction to the lives and information on the works of the following mathematicians: Aryabhata, Varahmihira, Brahmagupta, Bhaskara I & II
2	Biographies of Remarkable Indian Mathematicians	<ul style="list-style-type: none"> • A brief introduction to the lives and information on the works of the following mathematicians: Shrinivasa Ramanujan, C. R. Rao, P. C. Mahalanobis, D. R. Kaprekar, Satyendranath Bose, Shakuntala Devi
3	Vedic Mathematics and Mathematics	<ul style="list-style-type: none"> • Overview of Vedic Mathematics and its historical background. • Introduction to the 16 Sutras and 13 Upa-Sutras used in Vedic Mathematics. • Use of Vedic Mathematics • Importance of Vedic Mathematics

Course Outcome:

- Student will know the Mathematical advancements of Ancient India.
- Student will gain a deeper understanding of the historical development of mathematics in ancient civilizations.
- Enhance their problem-solving skills and discovering the connections between ancient mathematical ideas and modern mathematical concepts.

Reference Books:

- The History of Ancient Indian Mathematics. The World Press Private Ltd. Calcutta. Digitized Book (2009) - Srinivasiengar, C. N. (1988).
- "Vedic Mathematics" by Swami Bharati Krishna Tirtha

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BCA-1
CS-01: Problem solving methodologies and programming in C
Minimum following exercise should be performed by the students during the semester
1. Write a C program to display “Hello, World!” on the screen.
2. Write a C program to display your name, age, and city using printf().
3. Write a C program to Print Your Name in Center of the screen
4. Write a C program to Print Your Name in Four corners of the screen
5. Write a C program to declare a variable and assign value and display that variable.
6. Write a C program to get integer value and display it
7. Write a C program to perform addition, subtraction, multiplication, and division of two integers.
8. Write a C program to find the square and cube of a number.
9. Write a C program to get 5 numbers from user, display sum and average.
10. Write a C program to input two numbers and swap them using a third variable.
11. Write a C program to input two numbers and swap them without using a third variable.
12. Write a C program to calculate simple interest. ($SI = P * R * T / 100$)
13. Write a program to calculate compound interest.
14. Write a C program to convert temperature from Celsius to Fahrenheit.
15. Write a C program to Input meters and convert it into centimeters
16. Write a C program to Input feet’s and convert it into inches.
17. Write a C program to convert inches to centimeters
18. Write a C program to input distance in kilometers and convert it into meters, centimeters, and millimeters.
19. Write a C program to calculate the area of a circle. ($Area = \pi * r * r$)
20. Write a C program to calculate the volume of a cylinder. ($Volume = \pi * r^2 * h$)
21. Write a C program to input length and width of a rectangle and calculate area and perimeter.
22. Write a program to calculate area and perimeter of triangle.
23. Write a program to input seconds and convert into HH:MM:SS format.
24. Write a program to convert days into years, weeks
25. Write a C program to print the ASCII value of a character entered by the user.
26. Write a C program to perform type casting from float to int and vice versa.
27. Write a C program to use the sizeof operator to display memory size of basic data types.
28. Write a C program to calculate the gross salary of an employee (HRA = 20%, DA = 40% TAX=3% of basic salary).
29. Write a C program to calculate 5% discount amount and final amount for a product purchase by customer.
30. Write a C program to define a constant value using #define and calculate the area of a

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circle.
31. Write a C program to input a product price and quantity, then calculate the total cost and 5% tax. Display payable amount.
32. Write a C program to input three item prices and calculate the total shopping bill including a fixed 5% GST.
33. Write a c program to input working days and per day salary. Calculate basic salary and 10% bonus on it. Display net salary
Condition programs
1. Write a program to check whether a number is positive, negative, or zero.
2. Write a C program to check whether a number is even or odd using if-else.
3. Write a C program to find the larger of two numbers using if-else.
4. Write a C program to find the largest among three numbers using else-if.
5. Write a C Program to find the middle value out of three values
6. Write a C program to check whether a year is a leap year or not.
7. Write a program to check number is 2 digit or not.
8. Write a program to display absolute value of given number
9. Write a program to convert negative number to positive and positive to negative.
10. Write a program to input age and check if person is child, teenager, adult, or senior.
11. Write a program to check if a number is divisible by 5 and 11.
12. Write a program to find the eligibility of a person to vote based on age.
13. Write a C program to implement a simple calculator using switch-case.
14. Use switch-case to display day of the week (1-7 input).
15. Use switch-case to display month name (1-12 input).
16. Switch-case to calculate area of different shapes (circle, rectangle, triangle) based on user's choice.
17. Write a program to calculate the total, percentage, result and grade of a student based on marks of 5 subjects (using if-else ladder).
18. Write a program to calculate the discount on a product: If the price of the product is more than ₹1000, apply a 10% discount; otherwise, apply a 5% discount. Display the final price after discount.
19. Write a program to calculate income tax based on income slabs:
a. Income up to ₹2,50,000: No tax
b. Income from ₹2,50,001 to ₹5,00,000: 5% tax on the amount above ₹2,50,000
c. Income from ₹5,00,001 to ₹10,00,000: 20% tax on the amount above ₹5,00,000
d. Income above ₹10,00,000: 30% tax on the amount above ₹10,00,000 Calculate and display the total tax.
20. Write a program to calculate the salary of an employee: Basic salary is given. Add 20% house rent allowance (HRA) and 10% dearness allowance (DA). Deduct 12% provident fund (PF). Calculate and display net salary.
21. Write a program to calculate electricity bill based on units consumed:
a. First 100 units: ₹1.50 per unit

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b. Next 100 units: ₹2.50 per unit
c. Beyond 200 units: ₹3.50 per unit Calculate and display the total bill amount.
22. Write a program to calculate total price after discount and GST: Apply 8% discount if purchase amount exceeds ₹5000. Add 18% GST on the discounted amount. Display the final amount.
23. Write a menu driven program which has options as follow:
i. Print Ascii of entered character
ii. Print table of entered number
iii. Print Odd or even
24. Write a program that reads a student's score (an integer between 0 and 100) and determine the corresponding letter grade based on the following scale:
a. A: 90-100
b. B: 80-89
c. C: 70-79
d. D: 60-69
e. F: 0-59
The program should then print the letter grade
25. Create a program that reads the age of a person and classify them into one of the following age groups:
a. Child (0-12 years)
b. Teenager (13-19 years)
c. Adult (20-64 years)
d. Senior (65 years and older)
Print the age group category
26. Create a program that reads the weight (in kilograms) and height (in meters) of a person and to categorize their Body Mass Index (BMI) as follows:
a. Underweight: $BMI < 18.5$
b. Normal weight: $18.5 \leq BMI < 24.9$
c. Overweight: $25 \leq BMI < 29.9$
d. Obese: $BMI \geq 30$
Print the corresponding category. (Consider $BMI = \frac{WEIGHT}{HEIGHT}$)
27. Design a program that reads a person's income and credit score to determine their eligibility for a loan. Use if and else if statements with the following criteria:
a. $Income \geq 50,000$ and $CreditScore \geq 700$: Eligible for loan
b. $Income \geq 30,000$ and $CreditScore \geq 650$: Conditional eligibility
c. Otherwise: Not eligible Print the eligibility status.
Character programs
1. Write a program to find the ASCII value of a given character.
2. Write a program to check whether a character is a vowel or a consonant.
3. Check if two characters are equal or not.
4. Write a program to determine if a character is uppercase or lowercase.
5. Write a program to check whether a character is an alphabet, digit, or special

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character.
6. Write a program to count number of uppercase, lowercase, digits, and special characters in a string.
7. Write a program to convert an uppercase character to lowercase and lower case to upper case
Loop programs
1. Write a C program to print numbers from 1 to N using for loop.
2. Write a program to print even numbers from 1 to N.
3. Write a program to print odd numbers from 1 to N.
4. Print numbers from N to 1 in reverse
5. Print the series: 1 4 9 16 25 ... N terms (squares of natural numbers)
6. Print the series: 1 8 27 64 125 ... N terms (cubes of natural numbers)
7. Print 100 81 64...n
8. Print 1 2 6 24 120.....n
9. Print the series: 1 2 6 24 120 ... N terms (factorials)
10. Print the series: 2 5 10 17 26 37 ... N terms ($n^2 + 1$)
11. Print the series: 1 2 4 7 11 16 22 ... N terms (difference increases by 1)
12. Print the series: 1, -2, 3, -4, 5, ... N terms (alternating signs)
13. Print the series: 1 - 2 + 3 - 4 + 5 - ... ± N
14. Print the series: 1 - 2 + 3 - 4 + 5 - ... ± N = ?
15. Print the series: 1 + 1/2 + 1/3 + ... + 1/N (harmonic series)
16. Print the series: 1 - 1/2 + 1/3 - 1/4 + ... ± 1/N
17. Print the series: 2, 4, 8, 16, 32, ... (2ⁿ)
18. Print the series: 0, 3, 8, 15, 24, 35, ... (n² - 1)
19. Print the series: 1×2, 2×3, 3×4, ..., N×(N+1)
20. Print the series: 10 1 9 2 8 3 7 4 6 5
21. Print the series: 1² + 2² + 3² + ... + N²
22. Print the series: 1³ + 2³ + 3³ + ... + N³
23. Print the series: 1 + 10 + 100 + 1000 + ... N terms
24. Print A a B b C c D d Z z
25. Write a program to calculate sum of even and odd numbers up to N.
26. Calculate and print sum of series of numbers which are divisible by 3
27. Write a C program to find the sum of first N natural numbers using loop.
28. Write a C program to find the factorial of a number using loop.
29. Write a C program to display the multiplication table of a number entered by the user.
30. Write a C program to check whether a number is prime or not.
31. Write a program to print the Fibonacci series up to N terms using a loop.

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32. Write a C program to count the number of digits in an integer.
33. Write a C program to reverse a given integer number.
34. Write a C program to find the sum of digits of a given number.
35. Write a C program to check whether a number is an Armstrong number.
36. Write a C program to check whether a number is a palindrome
Perform Followings with the use of for loop, while loop, dowhile loop and goto statement.

#####	1 1 1 1 1	1 2 3 4 5	5 4 3 2 1
#####	2 2 2 2 2	1 2 3 4 5	5 4 3 2 1
#####	3 3 3 3 3	1 2 3 4 5	5 4 3 2 1
#####	4 4 4 4 4	1 2 3 4 5	5 4 3 2 1
#####	5 5 5 5 5	1 2 3 4 5	5 4 3 2 1
11111	1111#	#\$\$\$	55555
#####	111##	#\$\$\$	44444
11111	11###	#\$\$\$	\$\$\$\$\$
#####	1####	#\$\$\$	22222
11111	#####	#\$\$\$	11111
1	1	5	5
12	22	54	44
123	333	543	333
1234	4444	5432	2222
12345	55555	54321	11111
1	1	11111	12345
2 3	00	2222	2345
4 5 6	1111	333	345
7 8 9 10	00000	44	45
11 12 13 14 15	11111	5	5
10101	5	12345	55555
1010	54	1234	4444
101	543	123	333
10	5432	12	22
1	54321	1	1
*	* * * * *	1	123454321
**	* * * *	121	1234321
***	* * *	12321	12321
****	**	1234321	121
*****	*	123454321	1

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A BB CCC DDDD EEEE	A BC DEF GHI JKLM	ABCDE ABCD ABC AB A	&&&&& ##### &&&&& ##### &&&&&
* *** **** ***** ***** *****	***** ***** ***** *** *	1 232 34543 4567654 567898765	* * * * * * * ****
***** * * * * * * *****	1 2 2 3 3 3 2 2 1	* _ * _ * _ * _ * _ * _ * _ * * _ * _ * * _ * _ *	1 1 1 1 2 1 1 3 3 1 1 4 6 4 1
1 1 2 1 2 3 1 2 3 4 1 2 3 4 5	1 0 1 1 0 1 0 1 0 1 0 1 0 1 0	2 4 6 8 10 12 14 16 18 20 22 24 26 28 30	1 2 3 4 5 1 2 3 4 1 2 3 1 2 1
1 00 111 0000 11111	55555 54444 54333 54322 54321	\ ' ' ~ ==== >>>>>	A 1 B 2 C3 D4E5 F 6G7H
1A2B3C4D5E 1A2B3C4D 1A2B3C 1A2B 1A	***** **** * *** * ** * * *	1 121 12321 1234321 123454321	* * ** ** *** ** **** ** *****
##### #\$\$\$# #\$\$\$# #\$\$\$# #####	AAAAA BBBBB 11111 CCCCC DDDDD	1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25	A B C D E F G H I J K L M N O P Q R S T U V W X Y Z
* *** ***** ***** ***** ***** ***** ***	1 121 12321 1234321 123454321 1234321 12321 121	* *	1 1 12 21 123 3 2 1 1234

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*	1	* *	43 21 12345 5 43 2 1
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One Dimensional Array
(1) Write program to get 10 numbers and display it
(2) Write program to display number with index
(3) Write program to sum of array.
(4) Write a program to display array in reverse order.
(5) Write a program to find out maximum number.
(6) Write a program to find minimum number from array.
(7) Write a program to sort array.
(8) Write a program to search number from array and display its position.
(9) Write a program to display sum of odd and even numbers
(10) Write a program to count odd and even number form the array
(11) Input 5 numbers and count how many of them are positive, negative and zeroes
Two dimensional Array
(1) Write a program to print sum of 3 X 3 matrix
(2) Write a program to print multiplication of 3 X 3 matrix
(3) Write a program for 3 X 3 matrix transpose
(4) Write a program to display sum row wise and column wise
(5) Write a program to get five names and display it in upper case.
String Handling
(1) Write a program to display each character in new line with ASCII value (i.e. Entered string: "Computer" o/p: C – 67, o – 111, m – 109, p – 112, u – 117, t – 116, e – 101, r – 114)
(2) Write a program to find character from the string
(3) Write a program to count vowels from the string
(4) Write a program to display string in reverse
(5) Write a program to display length of string.
(6) Write a program to Calculate length of a string without using strlen()
(7) Write a program that accepts STRING from keyboard and count the character is a CAPITAL letter, a SMALL letter, a DIGIT or a SPECIAL character.
(8) Write a program to print characters between two given characters (e.g., from 'A' to 'Z').
(9) Print uppercase and lowercase alphabets in alternating order (A a B b ...).
(10) Write a program that reads a string and print each word in new line.
(11) Write a program to compare two strings
(12) Write a program to check string is palindrome or not.
(13) Write a program to reverse a string using character indexing.
(14) Write a program to compare two strings without using strcmp().
(15) Input a name and print each character with toggle case.
UDF / function

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(1)	Write a C program to copy one string to another using strcpy().
(2)	Write a program to concatenate two strings using strcat().
(3)	Write a C program to Create a program to compare two strings using strcmp().
(4)	Write a C program to Use strlen() to find the length of a string.
(5)	Write a C program to Search for a character in a string using strchr() and strrchr().
(6)	Write a C program to Use strstr() to find a substring inside a string.
(7)	Write a C program to Tokenize a sentence using strtok() function.
(8)	Write a C program to Compare first n characters of strings using strncmp().
(9)	Write a C program to Copy first n characters of a string using strncpy().
(10)	Write a C program to Use strspn() and strespn() to analyze string segments.
(11)	Write a C program to Use strpbrk() to find the first occurrence of any character from a set.
(12)	Write a C program to calculate square root of a number using sqrt().
(13)	Write a C program to Use pow() to find power of a number.
(14)	Write a C program to Find the floor and ceiling value of a float using floor() and ceil().
(15)	Write a program to calculate sine, cosine, and tangent using sin(), cos(), atan().
(16)	Write a C program to Use fabs() to find the absolute value of a float number.
(17)	Write a C program to Generate exponential and logarithmic values using exp() and log().
(18)	Write a C program to Perform modulo operation on floats using fmod().
(19)	Write a C program to Check whether a character is digit, alphabet, etc. using isdigit(), isalpha(), etc.
(20)	Write a C program to Convert characters to upper and lower case using toupper() and tolower().
(21)	Write a C program to Convert string to float using atof().
(22)	Write a C program to Generate random numbers using rand() and srand().
(23)	Write a C program to Find absolute values using abs() and labs().
(24)	Write a C program to Use exit() function to terminate program.
(25)	Write a C program to Use strtoul() to convert string to unsigned long.
(26)	Write a C program to Free memory using free().
(27)	Write a C program to Allocate memory using malloc() and take input into array.
(28)	Write a C program to Use calloc() to allocate and initialize memory.
(29)	Write a C program to Use realloc() to resize memory block.
(30)	Write a C program to create a UDF to add two numbers.
(31)	Write a C program to create a UDF to calculate the square of a number.
(32)	Write a C program to create a UDF to calculate the cube of a number.
(33)	Write a C program to create a UDF to find the maximum of three numbers.
(34)	Write a C program to create a UDF to check whether a number is even or odd.
(35)	Write a C program to create a UDF to check whether a character is a vowel or consonant.
(36)	Write a C program to create a UDF to check whether a number is prime.
(37)	Write a C program to create a UDF to compare two strings.
(38)	Write a C program to create a UDF to find the maximum number in an array.
(39)	Write a C program to create a UDF to calculate area of circle, rectangle, and triangle using menu.
(40)	Write a C program to Demonstrate function call by value with a swap logic (values remain same).

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(41)	Implement call by reference using pointers to swap two numbers.
(42)	Write a recursive function to calculate factorial of a number.
(43)	Write a recursive function to print Fibonacci series.
Structure	
(1)	Define a structure for a student (name, ID, marks), initialize its members, and print them using the dot operator.
(2)	Create a structure for an employee and accept data for one employee. Fields: emp_id, name, salary.
(3)	Create a union for student and accept data for one student Fields: rno, name
(4)	Create a structure for an employee and accept data for one employee. Fields: emp_id, name, salary.
Create udf to display data of structure.	
(5)	Store and display details of 5 students using array of structures. Fields: rollno, name
(6)	Create a program to store product information for N products using array of structures. Fields: product_id, name, price, quantity.
(7)	Store and display detail of student and display using pointer <ul style="list-style-type: none"> • Fields: roll, name
(8)	Write a program to dynamically allocate memory for a structure using pointers. Structure: employee with emp_id, name
(9)	Write a program to Find Size of a Structure
(10)	Write a program for nested structure
(11)	Program to demonstrate how only one member of a union can store value at a time.
(12)	Program to determine the size of a union and show memory usage.
(13)	Define a constant using macro and calculate area of square
(14)	Write a macro to find maximum of two numbers
(15)	Write a macro to find minimum of two numbers
(16)	Use #if, #elif, #else, #endif with macros
Pointer	
(1)	Write a program to declare a pointer, initialize it with the address of a variable and print the variable's value using the pointer.
(2)	Write a program to display the value and address of a variable using pointer.
(3)	Write a program to display sum of two numbers of using pointer
(4)	Write a program to swap the value of a variable using pointer.
(5)	Write a program to get maximum number from two numbers using pointer
(6)	Write a program to demonstrate the concept of pointer to pointer.
(7)	Write a program to access array elements using pointer notation.
(8)	Write a program to perform pointer arithmetic (increment/decrement) on an array and print the elements using a pointer.
(9)	Write a program to calculate the sum of array elements using pointer.
(10)	Implement a function that swaps two numbers using pointers passed as arguments.
(11)	Write a program to access array elements using a pointer and print the array.
(12)	Create a program where a function accepts a pointer as an argument to modify a variable's value (e.g., increment a number).
(13)	Write a program to allocate memory dynamically for an array using malloc, input values, and print them, then free the memory.

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(14)	Implement a program to demonstrate the use of a pointer to a pointer to access and modify a variable's value.
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BCA-1	
CS-02: Networking & Internet Environment	
Minimum following exercise should be performed by the students during the semester	
1	Create a webpage profile.html using <html>, <head>, <title>, and <body>. Add your name, course, and college. Open it in a browser to view your personal homepage.
2	Build a digital resume using headings, paragraphs, line breaks, and formatting tags like , <i>, <u>, etc. Include sections like Objective, Education, Skills, and Contact Info.
3	Simulate a short news article with <h2>, <p>, , <mark>, and tags. Include title, author, and content formatted to enhance readability.
4	Create a grocery list page using for priority items, for random items, and <dl> for descriptions. Use nested lists where needed.
5	Build a webpage with internal links to sections (About, Projects) and external links to sites like GitHub. Add mailto: and target="_blank" for better navigation.
6	Create a pricing page using special characters like €, ©, ≤, ≥, ™ inside a paragraph or table.
7	Use to display a photo with alt, width, height. Use <audio> to embed a music file with controls and fallback text.
8	Design a table using <table>, <tr>, <th>, <td>. Include colspan, rowspan, and styling attributes. Add headings and rows for student data (Name, Subject, Marks).
9	Use <iframe> to create two sections: one showing a navigation menu (menu.html) and the other displaying content (content.html). Adjust width and height.
10	Create a form with fields: name, gender (radio), hobbies (checkbox), email, suggestions (textarea), and a submit button. Use appropriate input types and labels.
11	Design a layout using <header>, <nav>, <section>, <article>, <aside>, <footer>, <figure>. Add dummy content to mimic a news/blog layout.
12	Extend the previous form to use type="date", type="time", type="email", type="url", type="range", type="month", type="week", type="number" to collect more structured data.
13	Embed a video lecture using <video controls> and a music track using <audio controls>. Add autoplay and loop options for testing. Include fallback text.
14	Use <canvas> and JavaScript to draw a filled rectangle and a circle. Get context with getContext("2d"), then use fillRect() and arc() to draw shapes.
15	Create a homepage for a coffee shop using inline, internal, and external CSS. Compare results.
16	Design a portfolio page using inline styles (for one section), internal (for navigation), and external (for rest of the page).
17	Create a product grid with multiple product cards using class selector, and highlight

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	one card using ID selector.
18	Build a blog list where links change on hover, first paragraph is styled uniquely, and alternate rows use :nth-child().
19	Create a typography demo page showcasing various font properties like size, weight, style, variant, and line height.
20	Design a news article layout with styled headings and paragraphs using alignment, spacing, and text-transform.
21	Build a travel website hero section with background image, repeat, position, size, and attachment settings.
22	Create a vertical sidebar navigation menu styled with different list-style types and custom images.
23	Design a multi-box layout and use different margins to explore element spacing and margin collapsing.
24	Add meaningful comments to a CSS file from a previous project explaining styling logic for each block.
25	Build a pricing table and apply various borders, styles, and border-radius to visually separate pricing plans.
26	Create a modern login page with linear and radial gradient backgrounds. Use background-blend-mode.
27	Create product cards with box-shadow, text-shadow, and transform effects like rotate, scale, and 3D tilt.
28	Create animated buttons that change size and color smoothly on hover using CSS transitions.
29	Build two similar boxes and use content-box and border-box to compare padding and layout behavior.
30	Create a modal popup or tooltip using position: absolute, relative, and fixed.
31	Design a responsive webpage with three breakpoints for desktop, tablet, and mobile. Change layout and visibility accordingly.
32	Build a responsive navigation bar and dashboard layout using all major flex properties including gap, justify-content, and align-items.
33	Design an interactive image gallery using overflow, text-overflow, filter, visibility, cursor, object-fit, and backdrop-filter.
34	Design a personal blog using Google Fonts for headings and custom fonts via @font-face for paragraphs.
35	Refactor an old project using BEM structure, e.g., .card_image--rounded, .button_icon--large. Apply consistent naming throughout.
36	Create a personal portfolio webpage that uses JavaScript to display a welcome message with your name and the current time.
37	Build a simple budget calculator where the user inputs income and expenses, and JavaScript variables store the values and display remaining balance.
38	Create a price calculator for an online shop that applies discounts, taxes, and calculates the final amount using arithmetic, logical, and assignment operators.
39	Design a student grading system where user inputs marks, and JavaScript displays grades based on conditions (A, B, C, Fail etc.).
40	Create a multiplication table generator where the user inputs a number and a loop displays its table. Use break to stop at a condition (e.g., stop at 50) and continue to skip a certain value.
41	Develop a feedback form that uses alert, confirm, and prompt to collect and confirm user data before submission.

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42	Build a to-do list manager using arrays: add tasks, remove tasks, and show all tasks dynamically on the web page.
43	Write a program where clicking a button calculates and displays BMI (Body Mass Index) using a user-defined function.
44	Create a mini dashboard showing: current date/time (Date), capitalized user name (String), random daily quote (Array + Math.random()), and an age calculator (Math.floor).
45	Create a responsive card: <code>Change background color onmouseoverZoom in image ondblclickShow keycode onkeypressAuto-capitalize name field onblurDisplay message onloadReset form onreset</code> and more.
46	Build a navigation system: Use DOM to dynamically change content on link click. Add buttons for Back and Forward using <code>history.back()</code> and <code>history.forward()</code> .
47	Create a registration form that validates required fields, email format, password match, and phone number using JavaScript before allowing submission.
48	Create a personal portfolio webpage using Bootstrap CDN. Include your photo, bio, education, and social media links.
49	Design a responsive product listing page for an e-commerce store showing 6 products in a grid. Use containers, rows, columns, offset and reordering to make it look good on mobile, tablet, and desktop views.
50	Create a blog post layout using headings, paragraphs, blockquotes, and text utilities. Include at least one motivational quote styled distinctively.
51	Build an attendance record table for students with striped rows, hover effects, and responsive design. Add a heading and caption.
52	Display a gallery of 4–6 images with rounded corners, thumbnails, and responsive classes. Add captions below each image.
53	Create a student admission form using Bootstrap form classes. Include inputs for name, email, gender (radio), skills (checkbox), course (dropdown), and submit button.
54	Design a responsive navbar for a college website with logo, navigation links (Home, Courses, Contact), and a search bar on the right.
55	Create a tabbed section to show semester-wise syllabus. Each tab shows syllabus for one semester using lists or cards.
56	Add a dropdown menu under the “Courses” section in the navbar to list BCA, BBA, BSc. Show a different layout for each on selection.
57	Design a control panel with grouped buttons like “Add Student”, “Edit Record”, “Delete Record” using button groups and contextual colors.
58	Add breadcrumb navigation to a student dashboard that shows: Home > Dashboard > Profile. Make it responsive.
59	Create a paginated list of registered users or student records showing 5 entries per page. Use Bootstrap pagination.
60	Add success, warning, and error alerts to a registration form for different submission states. Use badges to show notifications or counts.
61	Simulate a course completion status bar for 5 different courses. Each course should have a labeled progress bar showing completion percentage.
62	Create an FAQ section with accordion where each panel opens to show answer when clicked. Use Bootstrap collapse/accordion component.
63	Build a staff directory using Bootstrap cards. Each card should display staff photo, name, designation, and contact details.
64	Add a "Contact Us" modal popup on a college website. Trigger it from a “Get in

B.C.A. (Honours) & B.C.A. (Honours with Research)
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	Touch” button. Include name, email, message, and close buttons.
65	Create a section with 4 colored info boxes (e.g., Notices, Events, Exams, News) using background and text color utilities.
66	Style a set of cards with different border styles and use display utilities to toggle visibility of a “More Info” section.
67	Create a fixed top notification bar and a scrollable list of items within a card using overflow and position utilities.
68	Add margin and padding to various sections of a webpage to ensure proper layout and spacing between elements. Use spacing classes only.
69	Design a testimonial section where user images and text are vertically aligned. Use text utilities to center and format content properly.