# FIRST SEMESTER

**ERA UNIVERSITY**
**Department of Computer Science**
**Course Outline**
**Academic Year: 2026-27**

| | | | | |
|---|---|---|---|---|
| **Programme:** Bachelor of Computer Application | | **Year:** I | | **Semester:** I |
| **Course Name:** Programming using C Language | | **Course Code:** B030101T | | |
| **Core/Elective/ Co-curricular/ Vocational:** Core | | | | |
| **Credits: 4** | **Total No. of Lectures:** 60<br>**Lecture-Tutorial-Practical (in hours/week) L-T-P:** 4-0-0 | | | |
| **Evaluation Spread** | **Internal Continuous** | 25 | **End Term Exam** | 75 |
| **Course Objective** | 1. To introduce the basic concepts like variable, datatypes, operators of C language.<br>2. To learn decision making and looping statement along with arrays.<br>3. To learn functions, structure and union.<br>4. To learn advanced programming concepts of C language. | | | |
| **Course Outcome** | **CO1:** Understand the basic concepts of C programming language and able to identify the need and use of programming in real world.<br>**CO2:** Design and develop various programs using basic concepts of C programming.<br>**CO3**: Use functions, pointers and array using C language.<br>**CO4:** Design and develop programs utilizing advance C programming concepts like structure, union etc. | | | |
| **Pedagogy** | Demonstrations, Art Excursion, Interactive and activity based class sessions, skills-based activities | | | |
| **Internal Evaluation Mode** | Mid-term Examination: 10 Marks<br>Quiz/Test: 05Marks<br>Assignment: 05 Marks<br>Presentation: 05 Marks | | | |

| UNIT | Topic | No. of Lectures |
|---|---|---|
| I | **Overview of C Language:** Introduction, Salient features of C, Structure of C programs. **C Language Fundamentals:** Character set, C Tokens, Data type and sizes, Type Conversion Type definition, Execution and Compilation of C programs.<br>**Structure of C program: -** Compilation and execution. Various type of Input and Output function. Formatted input and Outputs function. | 7 |
| II | **Operators and Expressions:** Various type of operators used in C language. Types of expression, Precedence and associativity of expression. | 8 |
| III | **Control Statements:** if, if-else, Nested if else, else if ladder, Switch statement.<br>**Loops:** Introduction, for loop, while loop, do-while loop, Nesting of loops. Break, Continue. | 7 |
| IV | **Arrays:** Defining of Array, Types of Array, and Declaration, initialization of Linear and Multidimensional arrays. | 8 |

| | | |
|---|---|---|
| **V** | **Functions:** Built-in and user-defined function, Types of user defined function, Function prototype declaration, Function call, and function definition, Recursive functions. | 8 |
| **VI** | **Pointers:** Introduction, Pointer operators (&, *)<br>**Parameter passing:** Call by value, Call by reference,<br>**Dynamic Memory Allocation:** calloc () and malloc () functions.<br>**Pre-processor directives in C** | 7 |
| **VII** | **Structure and Union:** Defining structure and union, Declaration and initialization of structure and union variables, Differences between structure and union.<br>**Storage Classes:** Static, Automatic, Register, Extern. | 7 |
| **VIII** | **File Handling:** Types of File, open (), fprintf (), fscanf (), file reading, writing and append mode, seekg (), seekp () functions. fputc(), fgetc(), fputs(), fgets(), fputw(), fgetw() | 8 |

**Suggested Readings:**


1. Yashwant Kanitkar, "Let us C", BPB.
2. Gottfried, "Programming in C", Schaum's Series, Tata McGraw Hill.
3. Programming in ANSI C, Balaguruswamy, Tata McGraw-Hill, 4th Edition, 2008.
4. Kernigham, Ritchie, "The C Programming Language", PHI, 1977, India, New Delhi.
5. Pointers in C, Yashwant Kanetkar, BPB Publication, 3rd Edition, 2003.


| UNITS | MAPPED CO |
|---|---|
| **I** | **CO1** |
| **II** | **CO1** |
| **III** | **CO1, CO2** |
| **IV** | **CO2,CO3** |
| **V** | **CO2,CO3** |
| **VI** | **CO2,CO3** |
| **VII** | **CO2,CO3** |
| **VIII** | **CO3, CO4** |

**MAPPED CO's WITH PO's & PSO's**

| **Mapped CO's with PO's and PSO's** | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **CO** | **PO1** | **PO2** | **PO3** | **PO4** | **PO5** | **PO6** | **PO7** | **PO8** | **PSO1** | **PSO2** | **PSO3** | **PSO4** |
| **CO1** | ✓ | ✓ | ✓ | ✓ | | | | | ✓ | ✓ | | |
| **CO2** | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | |
| **CO3** | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| **CO4** | ✓ | ✓ | ✓ | ✓ | | ✓ | ✓ | | ✓ | ✓ | ✓ | ✓ |

**Course created by:**
**Signature:**

**Approved by:**

**Signature:**

**ERA UNIVERSITY**
**Department of Computer Science**
**Course Outline**
**Academic Year: 2026-27**

| | | | | |
|---|---|---|---|---|
| **Programme:** Bachelor of Computer Application | | **Year:** I | | **Semester:** I |
| **Course Name:** Programming using C Language LAB | | **Course Code:** B030105P | | |
| **Co-curricular/Vocational/Core/Elective: Core** | | | | |
| **Credits:** 02 | **Total No. of Lectures:** 60<br>**Lecture-Tutorial-Practical (in hours/week) L-T-P**: 0-0-4 | | | |
| **Evaluation Spread** | **Internal Continuous** | 25 | **End Term Exam** | 75 |
| **Course Objective** | 1. To introduce the basic concepts like variable, datatypes, operators of C language.<br>2. To learn decision making and looping statement along with arrays.<br>3. To learn functions, structure and union.<br>4. To learn advanced programming concepts of C language. | | | |
| **Course Outcome** | **CO1:** Create programs to exhibit basic data types, variables, and arithmetic operations using the C language.<br>**CO2:** Design and develop various programs using decision-making statements and different types of loops available in the C language.<br>**CO3:** Demonstrate the concept of functions, pointers, and array using C programs.<br>**CO4:** Implement advanced C programming concepts like structure, union, etc. | | | |
| **Pedagogy** | Demonstrations, Art Excursion, Interactive and activity based class sessions, skills-based activities | | | |
| **Internal Evaluation Mode** | **Mid-term Practical Examination**: 10 Marks<br>**Viva Voce** 05 Marks<br>**Practical File** 05 Marks<br>**Attendance** 05 Marks | | | |

| **UNIT** | **Topic** | **No. of Lectures** |
|---|---|---|
| **I** | 1. Write a C program to perform addition, subtraction, multiplication and division of two numbers.<br>2. Write a C program that accepts two item's weight and number of purchases (floating point values) and calculates their average value.<br>3. Write a C program that accepts the principle, rate of interest, and time and calculates simple interest.<br>4. Write a C program to compute the perimeter and area of a circle with a given radius. | 7 |
| **II** | 1. Write a C program to print the corresponding Fahrenheit to Celsius and Celsius to Fahrenheit.<br>2. Write C program to find largest of three integers.<br>3. Write C program to find factorial of an integer.<br>4. Write C program to check whether the given string is palindrome or not. | 8 |

| | | |
|---|---|---|
| **III** | 1. Write a C program that accepts three integers and finds the maximum of three.<br>2. Write C program to find whether the given integer is: A prime number.<br>3. Write a program in C to check if a given number is even or odd.<br>4. Write a C program to demonstrate the use of while and do while loop.<br>5. Write a C program to demonstrate for loop.<br>6. Write a C program to demonstrate the loop control statement continue and break. | 7 |
| **IV** | 1. Write C program to find sum and average of n integers using linear array.<br>2. Write a program in C to store elements in an array and print them.<br>3. Write a program in C to find the maximum and minimum elements in an array.<br>4. Write a program in C to copy the elements of one array into another array.<br>5. Write a program in C to print all unique elements in an array.<br>6. Write a program in C to separate odd and even integers into separate arrays.<br>7. Write a program in C to sort the elements of the array in descending order. | 8 |
| **V** | 1. Write a program in C to find the square of any number using the function.<br>2. Write a program in C to swap two numbers using a function.<br>3. Write a program in C to check if a given number is even or odd using the function.<br>4. Write a program in C to check whether a number is a prime number or not using the function.<br>5. Write a program in C to get the largest element of an array using the function.<br>6. Write C program to find factorial of n by recursion using user defined functions. | 8 |
| **VI** | 1. Write a program in C to show the basic declaration of a pointer.<br>2. Write a program in C to demonstrate how to handle pointers in a program.<br>3. Write a program in C to demonstrate the use of the &(address of) and *(value at address) operators.<br>4. Write a program in C to add numbers using call by reference.<br>5. Write a program in C to store n elements in an array and print the elements using a pointer.<br>6. Write a program in C to demonstrate the difference between call by value and call by reference. | 7 |
| **VII** | 1. Create a structure called "Student" with members name, age, and total marks. Write a C program to input data for two students, display their information, and find the average of total marks.<br>2. Create a structure named "Employee" to store employee details such as employee ID, name, and salary. Write a program to input data for three employees, find the highest salary employee, and display their information.<br>3. Design a structure named "Car" to store details like car ID, model, and rental rate per day. Write a C program to input data for three | 7 |

| | | |
|---|---|---|
| | cars, calculate the total rental cost for a specified number of days, and display the results. | |
| **VIII** | 1. Write a program in C to append multiple lines to the end of a text file.<br>2. Write a program in C to copy a file to another name.<br>3. Write a program in C to read from a file into a variable and write a variable's contents into a file.<br>4. Write a program in C to create and store information in a text file.<br>5. Write a program in C to read an existing file. | 8 |

**Suggested Readings:**


1. Yashwant Kanitkar, "Let us C", BPB.
2. Gottfried, "Programming in C", Schaum's Series, Tata McGraw Hill.
3. Programming in ANSI C, Balaguruswamy, Tata McGraw-Hill, 4th Edition, 2008.
4. Kernigham, Ritchie, "The C Programming Language", PHI, 1977, India, New Delhi.
5. Pointers in C, Yashwant Kanetkar, BPB Publication, 3rd Edition, 2003.
6. https://www.geeksforgeeks.org/c-programming-language/
7. https://onlinecourses.nptel.ac.in/noc22_cs40/preview


| UNITS | MAPPED CO |
|---|---|
| I | CO1 |
| II | CO1 |
| III | CO1, CO2 |
| IV | CO2,CO3 |
| V | CO2,CO3 |
| VI | CO2,CO3 |
| VII | CO2,CO3 |
| VIII | CO3, CO4 |

## MAPPED CO's WITH PO's & PSO's

**Mapped CO's with PO's and PSO's**

| CO | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PSO1 | PSO2 | PSO3 | PSO4 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CO1 | ✓ | ✓ | ✓ | ✓ | | | | | ✓ | ✓ | | |
| CO2 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | |

**Course created by:**
**Signature:**

**Approved by:**

**Signature:**

**ERA UNIVERSITY**
**Department of Computer Science**
**Course Outline**
**Academic Year: 2025-26**

| | | | | |
|---|---|---|---|---|
| **Programme:** Bachelor of Computer Application | | **Year:** I | | **Semester:** I |
| **Course Name:** Computer Fundamentals | | **Course Code:** B030102T | | |
| **Co-curricular/Vocational/Core/Elective: Core** | | | | |
| **Credits:** 4 | **Total No. of Lectures:** 60<br>**Lecture-Tutorial-Practical (in hours/week) L-T-P:** 4-0-0 | | | |
| **Evaluation Spread** | **Internal Continuous** | 25 | **End Term Exam** | 75 |
| **Course Objective** | 1. To learn basics of Computer fundamentals, memory and number systems.<br>2. To understand the input and output devices of Computers.<br>3. To know software, programming languages and operating system.<br>4. To get familiar with Office Tools–MS-Word, MS-Excel and MS- Power Point etc. | | | |
| **Course Outcome** | **CO1** Understand basics of Computer fundamentals, Networks, Internet and operating system.<br>**CO2** Understand the working of various input and output components.<br>**CO3** Describe software, programming language and OS.<br>**CO4** Understand and apply office automation tools. | | | |
| **Pedagogy** | Demonstrations, Art Excursion, Interactive and activity based class sessions, skills-based activities | | | |
| **Internal Evaluation Mode** | Mid-term Examination: 10 Marks<br>Quiz/Test: 05Marks<br>Assignment: 05 Marks<br>Presentation: 05 Marks | | | |

| **UNIT** | **Topic** | **No. of Lectures** |
|---|---|---|
| **I** | **Introduction to Computer:** Definition, Block Diagram of Computer, Characteristics of Computer, Classification of Computers, History of Computers, Generation of Computers, Applications of computer. | 7 |
| **II** | **Processor:** Introduction, types, specification, Intel, Pentium, AMD**.**<br>**Memory:** Concept, Memory Units, RAM, ROM, Cache, Register. Secondary Memory.<br>**Motherboard**: Introduction, component, types, BIOS, CMOS.<br>**Number System:** Binary, Decimal, Octal, Hexadecimal, Base Conversion, Binary Arithmetic. | 8 |
| **III** | **Input devices:** Keyboard, Mouse, Scanners, Bar-Code Reader, Light Pen, and Touch Screen. **Output Devices**: Monitors, Printers, Plotter, Sound Card and Speakers. | 7 |
| **IV** | **Software Concepts:** Definition, System Software, Application Software, Utility Software.<br>**Operating System:** Definition, Functions, Textual v/s GUI Interface, Introduction to DOS, MS Windows and UNIX Operating System. | 8 |
| **V** | **Word Processing Software:** Editing features, formatting features, saving, printing, page setup, spell-checking, mail-merge, Header, footer, page numbering, Working with tables, Inserting images, shapes, WordArt | 8 |

| | | |
|---|---|---|
| **VI** | **Spreadsheet Software:** Workbook, worksheets, editing features, formatting features, creating formulas, formulas, sorting, filtering, functions, Charts & Graphs. Cell referencing (relative, absolute), Sorting and filtering data. | 7 |
| **VII** | **Presentation Graphics Software:** Templates, views, creating, editing & formatting slides, slides with graphs, animation, using special features, presenting slide shows. | 7 |
| **VIII** | **Emerging Technologies:** Artificial Intelligence (AI) and Machine Learning (ML), Agentic AI, Explainable AI, Generative AI, Quantum computing, Block chain, Internet of Things (IoT), Virtual Reality, Robotics, Cloud Computing, Cyber security and threats. Edge Computing, Human-Computer Interaction (HCI) | 8 |

**Suggested Readings:**


1. V. Rajaraman, "Fundamentals of Computers", PHI
2. Peter Norton's, "Introduction to Computers", TMH
3. D.S. Yadav, "Foundation of Information Technology", New Age International.
4. Computer Today, Suresh Basandra, Galgotia Publication, 1stedition, 2010.
5. T. M., Ramachandran, "Principles and Techniques of Programming", Galgotia Publications.


| UNITS | MAPPED CO |
|---|---|
| **I** | **CO1** |
| **II** | **CO1** |
| **III** | **CO1, CO2** |
| **IV** | **CO2,CO3** |
| **V** | **CO2,CO3** |
| **VI** | **CO2,CO3** |
| **VII** | **CO2,CO3** |
| **VIII** | **CO3, CO4** |

**MAPPED CO's WITH PO's & PSO's**

| **Mapped CO's with PO's and PSO's** | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **CO** | **PO1** | **PO2** | **PO3** | **PO4** | **PO5** | **PO6** | **PO7** | **PO 8** | **PSO 1** | **PSO2** | **PSO3** | **PSO 4** |
| **CO1** | ✓ | ✓ | ✓ | ✓ | | | | | ✓ | ✓ | | |
| **CO2** | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | |
| **CO3** | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| **CO4** | ✓ | ✓ | ✓ | ✓ | | ✓ | ✓ | | ✓ | ✓ | ✓ | ✓ |

**Course created by:**
**Signature:**

**Approved by:**
**Signature:**

**ERA UNIVERSITY**
**Department of Computer Science**
**Course Outline**
**Academic Year: 2026-27**

| | | | | |
|---|---|---|---|---|
| **Programme:** Bachelor of Computer Application | | **Year:** I | | **Semester:** I |
| **Course Name:** Computer Fundamentals Lab | | **Course Code:** B030106P | | |
| **Co-curricular/Vocational/Core/Elective: Core** | | | | |
| **Credits:**02 | **Total No. of Lectures:** 60<br>**Lecture-Tutorial-Practical (in hours/week) L-T-P:** 0-0-4 | | | |
| **Evaluation Spread** | **Internal Continuous** | 25 | **End Term Exam** | 75 |
| **Course Objective** | 1. To identify basic components of the computer system.<br>2. Understanding the concept of input and output devices of Computers and recognize them.<br>3. To know the introductory concept of software, operating system and various DOS commands.<br>4. To learn Office automation tools like MS-Word, Excel and PowerPoint. | | | |
| **Course Outcome** | **CO1:** Explain the basics of Computer fundamentals, Networks, Internet and operating system.<br>**CO2:** Identify various hardware, software input/output components.<br>**CO3:** Demonstrate internal and external DOS commands.<br>**CO4:** Create basic documents, worksheets, presentations with their properties. | | | |
| **Pedagogy** | Interactive, discussion-based, student-centered, presentation. | | | |
| **Internal Evaluation Mode** | **Mid-term Practical Examination**: 10 Marks<br>**Viva Voce** 05 Marks<br>**Practical File** 05 Marks<br>**Attendance** 05 Marks | | | |
| | **Topic** | | | **No. of Lectures** |
| **I** | **1. Introduction to MS Word:**<br>a. Creating b. Formatting c. Table d. Drawing e. Printing<br>**2. Prepare a grocery list having four Columns (serial number, the name of theproduct, Quantity, price) for the month of April 2025:**<br>a. Font Specification for the title (Grocery list): 14 point Arial black boldand italic.<br>b. The heading of the Column should de use 12 point and bold.<br>c. The rest of the document should be in 10 points times new roman.<br>d. Leave the gap of 12 points after the title. | | | 7 |
| **II** | **1. Create a telephone directory:**<br>a. The Heading should be 16 point Ariel Font in bold.<br>b. The rest of the document should use 10 point font size.<br>c. Other heading should be use 10 point courier new font.<br>d. The footer should the page number as well as the date last updated.<br>**2. Create your resume.** | | | 8 |

<table>
<tr>
<td>III</td>
<td>
1. Introduction to MS Excel:<br>
a. Creating b. Formatting c. Table d. Formulas e. Printing Enter the following data in Excel sheet:<br><br>
<table>
<tr><th>State</th><th>Qtr1</th><th>Qtr2</th><th>Qtr3</th><th>Qtr4</th><th>Qtr. (Total Average)</th><th>Rate</th><th>Amount</th></tr>
<tr><td>Rajasthan</td><td>2017</td><td>2541</td><td>2351</td><td>3215</td><td></td><td>12</td><td></td></tr>
<tr><td>Delhi</td><td>2314</td><td>2589</td><td>6541</td><td>2014</td><td></td><td>14</td><td></td></tr>
<tr><td>U.P.</td><td>1234</td><td>5216</td><td>4521</td><td>2365</td><td></td><td>15</td><td></td></tr>
<tr><td>Haryana</td><td>8523</td><td>2654</td><td>1258</td><td>3269</td><td></td><td>16</td><td></td></tr>
<tr><td>Punjab</td><td>9521</td><td>2547</td><td>3568</td><td>2546</td><td></td><td>17</td><td></td></tr>
</table>
<br>
Apply Formatting as follows:<br>
a. Title in times new roman<br>
b. Font size 14<br>
c. Remaining text Ariel , font size 10<br>
d. State Names And Qtr. heading bold<br>
e. Number in 2 decimal places<br>
f. Qtr. heading in centre Alignment<br>
g. Apply border to whole data<br><br>
Calculate:<br>
a. Calculate average for each quarter.<br>
b. Calculate amount = Rate*Qtr. Total (Average)
</td>
<td>7</td>
</tr>
<tr>
<td>IV</td>
<td>
1. Create the following Worksheet:<br>
Roll No Name Marks Grade<br>
1001 Dhoni 84<br>
1002 Virat 58<br>
1003 Raina 66<br>
1004 Sachin 42<br>
1005 Rahul 99<br>
Calculate the grade of these students on the basis of following Guidelines if- Marks then grade:<br>
>= 80 A+<br>
>=60<80 A<br>
>=50<60 B<br>
<50 Fail<br>
2. Prepare the following worksheet:<br>
Sales Man ID Qtr. 1 Qtr. 2 Qtr. 3 Qtr. 4 TotalCommission<br>
S001 5010 2563 6985 7485<br>
S002 6254 4526 4521 4521<br>
S003 3452 5649 6352 6521<br>
S004 4582 2354 6532 2558<br>
S005 7895 2536 4596 6351<br>
Calculate the commission earned by the salesman on the basis of following conditions, If total sales commission:<br>
• <20000 0% of sales<br>
• >20000 and <25000 4% sales<br>
• >25000 and <30000 5.5% of sales<br>
• >30000 and <35000 8% of sales<br>
• <35000 11% sales<br>
• The Total sales are sum of sales of all the four quarters.
</td>
<td>8</td>
</tr>
<tr>
<td>V</td>
<td>
1. Introduction to MS Power Point:<br>
a. Creating b. Formatting c.Graphics d. Effects e. Printing
</td>
<td>8</td>
</tr>
</table>

| | | |
|---|---|---|
| | **2. Create a presentation on memory Hierarchy of a digital computer system.** | |
| **VI** | **1. Create a presentation on functionalities of Operating System.**<br>**2. Create a presentation on input/output devices of a digital computer system.** | 7 |
| **VII** | **1. Using Essential Accessories:**<br>a. Notepad<br>b. MS Paint<br>c. Calculator<br>**2. Create your resume in note pad.** | 7 |
| **VIII** | **1. Create natural scenery in MS Paint.**<br>**2. Use system calculator to convert the degree Celsius value into Fahrenheitvalue.** | 8 |

**Suggested Readings:**


1. V. Rajaraman, "Fundamentals of Computers", PHI
2. Peter Norton's, "Introduction to Computers", TMH
3. D.S. Yadav, "Foundation of Information Technology", New Age International.
4. Computer Today, Suresh Basandra, Galgotia Publication, 1stedition, 2010.
5. T. M., Ramachandran, "Principles and Techniques of Programming", Galgotia Publications.


| UNITS | MAPPED CO |
|---|---|
| **I** | **CO1** |
| **II** | **CO1** |
| **III** | **CO1, CO2** |
| **IV** | **CO2,CO3** |
| **V** | **CO2,CO3** |
| **VI** | **CO2,CO3** |
| **VII** | **CO2,CO3** |
| **VIII** | **CO3, CO4** |

**MAPPED CO's WITH PO's & PSO's**

| **Mapped CO's with PO's and PSO's** | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **CO** | **PO1** | **PO2** | **PO3** | **PO4** | **PO5** | **PO6** | **PO7** | **PO 8** | **PSO 1** | **PSO2** | **PSO3** | **PSO 4** |
| **CO1** | ✓ | ✓ | ✓ | ✓ | | | | | ✓ | ✓ | | |
| **CO2** | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | |
| **CO3** | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| **CO4** | ✓ | ✓ | ✓ | ✓ | | ✓ | ✓ | | ✓ | ✓ | ✓ | ✓ |

**Course created by:**
**Signature:**

**Approved by:**

**Signature:**

**ERA UNIVERSITY**
**Department of Computer Science**
**Course Outline**
**Academic Year: 2026-27**

| | | | | |
|---|---|---|---|---|
| **Programme:** Bachelor of Computer Application | | **Year:** I | | **Semester:** I |
| **Course Name:** Digital Circuit | | **Course Code:** B030103H | | |
| **Core/Elective/ Co-curricular/ Vocational:** Co-curricular | | | | |
| **Credits:** 2 | **Total No. of Lectures:** 30<br>**Lecture-Tutorial-Practical (in hours/week) L-T-P:** 2-0-0 | | | |
| **Evaluation Spread** | **Internal Continuous** | 25 | **End Term Exam** | 75 |
| **Course Objective** | 1. To understand the structure, function and characteristics of computer systems.<br>2. To understand the design of the various functional units and components of computers.<br>3. To identify the elements of modern instructions sets and their impact on processor design.<br>4. To explain the function of each element of a memory hierarchy. | | | |
| **Course Outcome** | **CO1:** Understand the basic logic gates and their applications.<br>**CO2:** Examine the structure of various number systems and its application in digital design.<br>**CO3:** Learn the organization of the peripheral devices, the interface between these devices to the system.<br>**CO4:** Design the architecture of a basic computer, its registers, bus system and the interaction flow among them. | | | |
| **Pedagogy** | Demonstrations, Art Excursion, Interactive and activity based class sessions, skills-based activities | | | |
| **Internal Evaluation Mode** | Mid-term Examination: 10 Marks<br>Quiz/Test: 05Marks<br>Assignment: 05 Marks<br>Presentation: 05 Marks | | | |

| UNIT | Topic | No. of Lectures |
|---|---|---|
| I | **Basic of Digital Electronics:** Introduction to logic gates. Primary Gates,Derived gate, Universal Gate, Logical expression. | 08 |
| II | **Canonical and standard forms,** Reducing the SOP/POS expression using Algebraic & K- map methods up to four variables, don't care conditions. | 07 |
| III | **Combinational Logic**: Combinational circuits, analysis and design procedures, binary adder- subtractor, introduction to decoders, encoders, multiplexers, de-multiplexers.<br>**Sequential logic:** Sequential circuits, flip flops-RS, D, JK, T, Master slave flip flop. | 07 |
| IV | **Registers and counter:** Register, serial, parallel register, shift registers, left shift, Right shift.<br>**Counters:** Asynchronous Counter/ripple counters, synchronous counter, and mod N counter, Up counter, down counter. | 08 |

**Suggested Readings:**


1. M. Mano, "Computer System Architecture", Pearson Education, New Jersey, 2017, 3rd Ed.
2. W. Stallings, "Computer Organization and Architecture Designing for Performance", Prentice Hall of India, 2015, Tenth Edition.
3. M. Mano, "Digital Design", Pearson Education, New Jersey, 2018, Sixth Edition.
4. https://www.javatpoint.com/digital-electronics
5. https://onlinecourses.swayam2.ac.in/cec21_cs16/preview


| UNITS | MAPPED CO |
|---|---|
| I | CO1 |
| II | CO1 |
| III | CO1, CO2 |
| IV | CO2,CO3 |

**MAPPED CO's WITH PO's & PSO's**

**Mapped CO's with PO's and PSO's**

| CO | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PSO1 | PSO2 | PSO3 | PSO4 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CO1 | ✓ | ✓ | ✓ | ✓ | | | | | ✓ | ✓ | | |
| CO2 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | |
| CO3 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| CO4 | ✓ | ✓ | ✓ | ✓ | | ✓ | ✓ | | ✓ | ✓ | ✓ | ✓ |

**Course created by:**
**Signature:**

**Approved by:**

**Signature:**

**ERA UNIVERSITY**
**Department of Computer Science**
**Course Outline**
**Academic Year: 2026-27**

| | | | | |
|---|---|---|---|---|
| **Programme:** Bachelor of Computer Application | | **Year:** I | | **Semester:** I |
| **Course Name:** Fundamental of Design in Multimedia | | **Course Code:** B030104I | | |
| **Co-curricular/Vocational/Core/Elective:** Vocational | | | | |
| **Credits:** 3 | **Total No. of Lectures: 75** (prorated for 15 theory + 60 practical hours)<br>**Lecture-Tutorial-Practical (in hours/week) L-T-P: 1:0:4** | | | |
| **Evaluation Spread** | **Internal Continuous** | - | **End Term Exam** | **Theory- 40 Marks**<br>**Practical- 60 Mark** |
| **Course Objective** | The course "Fundamentals of Design in Multimedia" course aims to equip students with a deep understanding of multimedia design. It focuses on enhancing students' multimedia content creation skills, highlighting the importance of design in communication and problem-solving in computer science. The course also promotes exploration of the latest multimedia technologies. | | | |
| **Course Outcome** | **CO1:** Understand Multimedia Design Principles: Students will gain a comprehensive understanding of the principles and techniques used in multimedia design.<br>**CO2:** Develop Multimedia Content: Students will acquire the skills necessary to create effective and engaging multimedia content.<br>**CO3:** Apply Design in Problem-Solving: Students will learn to apply design principles in problem-solving and communication within the field of computer science.<br>**CO4:** Explore Multimedia Technologies: Students will be encouraged to explore and apply the latest multimedia technologies in various domains. | | | |
| **Pedagogy** | Demonstrations, Art Excursion, Interactive and activity based class sessions, skills-based activities | | | |
| **Internal Evaluation Mode** | NA | | | |

| UNIT | Topic | No. of Lectures |
|---|---|---|
| I | **Introduction to Design:**<br>• Components and Types of graphic design<br>• Composition | 10 |
| II | **Raster software:** Introduction to Adobe Photoshop<br>• History and evolution<br>• Interface and workspace | 8 |
| III | **Digital Imaging and Editing:**<br>• Image Editing Techniques<br>• Matte painting<br>• Digital painting<br>• Photo retouching<br>• 3D text and objects | 20 |
| IV | **Visual Arts and Design**<br>• **Elements of design:** Balance, Emphasis, Proportion, Rhythm, Unity, and Variety | 4 |

| | | |
|---|---|---|
| | • **Principals of design:** Line, Shape, Color, Texture, Space, and Value | |
| **V** | **Multimedia system in Fundamentals of Advertising:**<br>• Role of Multimedia: Enhancing engagement and interactivity<br>• Advertisement campaigns | 8 |
| **VI** | **Concept of Colour Theory**<br>• Properties of colour<br>• Colour wheel | 7 |
| **VII** | **Designs for Print and Web Media:**<br>• Differences and similarities<br>• Resolution and Color Modes | 4 |
| **VIII** | **Portfolio creation and critique :**<br>• Purpose and types of portfolios<br>• Documentation process of creating portfolio | 14 |

**Suggested Readings:**

1. https://www.youtube.com/watch?v=L1CK9bE3H_s
2. Adobe Photoshop workspace basics
3. 7 Elements of Design: Everything You Should Know | Renderforest
4. Elements of Design: Understanding the 7 Elements of Design (founderjar.com)
5. The basic principles of design—and how to apply them (paperform.co)

| UNITS | MAPPED CO |
|---|---|
| **I** | **CO1** |
| **II** | **CO1** |
| **III** | **CO1, CO2** |
| **IV** | **CO2,CO3** |
| **V** | **CO2,CO3** |
| **VI** | **CO2,CO3** |
| **VII** | **CO2,CO3** |
| **VIII** | **CO3, CO4** |

**MAPPED CO's WITH PO's & PSO's**

| **Mapped CO's with PO's and PSO's** | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **CO** | **PO1** | **PO 2** | **PO3** | **PO4** | **PO5** | **PO6** | **PO7** | **PO 8** | **PSO 1** | **PSO2** | **PSO3** | **PSO 4** |
| **CO1** | ✓ | ✓ | ✓ | ✓ | | | | | ✓ | ✓ | | |
| **CO2** | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | |
| **CO3** | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| **CO4** | ✓ | ✓ | ✓ | ✓ | | ✓ | ✓ | | ✓ | ✓ | ✓ | ✓ |

**Course created by: Ms. Hershika Verma**
**Department of Liberal Education**
**Signature:**

**Approved by:**
**Signature:**