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| | **Daffodil International University**<br>**Department of Computer Science and Engineering (CSE)**<br>**Course Outline** | |

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|---|---|---|---|---|
| **Course Code:** | CSE122 | | | |
| **Course Title:** | Programing and Problem Solving | | | |
| **Program:** | B.Sc. in CSE | | | |
| **Faculty:** | Faculty of Science and Information Technology (FSIT) | | | |
| **Semester:** | Spring | **Year:** | 2020 | |
| **Credit:** | 2 | **Contact Hour:** | 3.00 | |
| **Course Level:** | L1T2 | **Prerequisite:** | CSE112 | |
| **Course Category:** | Core Engineering | | | |
| **Instructor Name:** | Sheak Rashed Haider Noori | | | |
| **Designation:** | Associate Professor and Associate Head | | | |
| **Email:** | drnoori@daffodilvarsity.edu.bd | | | |
| **Office Address:** | CSE Office | | | |
| **Class Hours:** | **Section** | **Class Day** | **Class Hours** | **Classroom** |
| | | | | |
| | | | | |
| **Google Classroom Code:** | | | | |

## 1. Course Rationale

Regardless of the area of study, computer science is all about solving problems with computers. The problems that we want to solve can come from any real-world problem or perhaps even from the abstract world. Computer programming is at the heart of computer science. It is the implementation portion of software development, application development and software engineering efforts, transforming ideas and theories into actual, working solutions.

### 1.1.Course Objective

The primary purpose of this course is to teach students the basic of pure programming and problem solving. This course provides students with a comprehensive study of the C programming language. The course emphasizes problem-solving and empirical skills through the process of designing, implementing, and executing C programs.

### 1.2.Course Outcomes (CO's)

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| CO1 | Able to solve computing problems using programming concepts and learn the basic concept of ACM Problem solving techniques. |
| CO2 | Able to apply fundamental programming elements including: variable, use of data types and data structures, decision structures, loop structures, pointer, string, console, |

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| | file IO, and functions. |
| CO3 | Able to specify the problem requirements, analyze the problem, design the algorithm to solve the problem and implement with the help of programming language. |
| CO4 | Able to apply the knowledge of programing and problem solving in real file problem. |

## 2. Strategies and approaches to learning

### 2.1. Teaching and Learning Activities (TLA)

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| **TLA1** | Lectures twice a week using multimedia of different topics. |
| **TLA2** | Active discussion in class regarding efficient solving of the logical and mathematical problems. |
| **TLA3** | Group discussion and presentation regarding diverse problems and corresponding lectures. |
| **TLA4** | Evaluation of class performances to reach each student in a class for every topic. |

## 3. Course Schedule and Structure

### 3.1.Textbook

1. Programming in ANSI C- E Balagurusamy.
2. The C programming language. Prentice Hall, 1988, by Dennis Ritchie
3. Teach Yourself C : Herbert Shieldt

### 3.2.Reference Books

1. Programming in C by Stephen G. Kochan
2. Let Us C , 7/e by Yashavant Kanetkar.
3. Programming in ANSI C : Balaguru Samy
4. C: The Complete Reference : Herbert Shieldt
5. How to solve it using Computer: R.G. Dromey, Prentice Hall, 1985
6. C Programming- A Modern Approach, 2nd Edition, W W Norton, 2008
7. C: How to Program, 6/E Paul Deitel Harvey M. Deitel, Deitel & Associates, Inc

### 3.3.Course Plan/Lesson Plan

| Week | Lesson | Topic | Teaching and Learning Activities (TLAi) | Textbook & Video Reference | Related CO's |
|---|---|---|---|---|---|
| 1 | Les. 1 | a. Importance of Programing & Problem Solving<br>b. Sample program of C<br>c. Basic Structure of C program<br>d. Programming style<br>e. Executing a 'C' program | **TLA1** | E-Balagurusamy (Ch1) | None |
| | Les. 2 | a. Character set<br>b. C token<br>c. Keywords and Identifiers<br>d. Constants<br>e. Variables<br>f. Data Types<br>g. Declaration of variables<br>h. Assigning values to variables<br>i. Defining symbolic constant<br>j. Declaring a variable as constant | **TLA1** | E-Balagurusamy (Ch2) | CO1 |
| 2 | Les. 3 | a. Arithmetic operators<br>b. Relational operators<br>c. Logical operators<br>d. Inc. and Dec. operators<br>e. Conditional operators<br>f. Bitwise operators<br>g. Arithmetic Expressions<br>h. Evaluation of Expressions<br>i. Precedence of Arithmetic operators | **TLA1, TLA2** | E-Balagurusamy (Ch3) | CO1, CO2 |
| | Les. 4 | j. Reading a character<br>k. Writing a character<br>l. Formatted input<br>m. Formatted output | **CLASS TEST 1** (on last class of the week) **TLA4** | E-Balagurusamy (Ch4) | CO1, CO2 |

| Week | Lesson | Topic | Teaching and Learning Activities (TLAi) | Textbook & Video Reference | Related CO's |
|---|---|---|---|---|---|
| 3 | | **(Class Test – 1, Assignment – 1)** | | | |
| | Les. 5 | a. Conditional statements (e.g., if/else, switch case). | | E-Balagurusamy (Ch5) | CO1, CO2 |
| | Les. 6 | b. Nested conditional structures Standard/structures programming practices for decision structures. | **TLA1, TLA2** | E-Balagurusamy (Ch5) | CO1, CO2 |
| 4 | Les. 7 | a. Why should we use the loops?<br>b. Loop control variables, initialization, test, and<br>c. modifications (e.g., while loop, do-while, for loop) | **TLA1** | E-Balagurusamy (Ch6) | CO1, CO2 |
| | Les. 8 | d. Nested loop structures<br>e. Standard/structures programming practice for loop structures | **TLA1, TLA2** | E-Balagurusamy (Ch6) | CO1, CO2 |
| 5 | | **(Class Test – 2)** | | | |
| | Les. 9 | a. Use of Array<br>b. Advantage of using Array.<br>c. One-dimensional Array<br>d. Declaration of 1-D array<br>e. Initialization of 1-D array | **TLA1** | E-Balagurusamy (Ch7) | CO1, CO2 |
| | Les. 10 | f. Two Dimensional array<br>g. Initialization of 2-D array<br>h. Multi-dimensional array | **CLASS TEST 2 TLA4** | E-Balagurusamy (Ch7) | CO1, CO2 |
| 6 | Les. 11 | a. Pointer Expressions<br>b. Pointer Increments and scale factor<br>c. Pointers and array<br>d. Array of pointers | **TLA1, TLA2** | E-Balagurusamy (Ch11) | CO1, CO2 |

| Week | Lesson | Topic | Teaching and Learning Activities (TLAi) | Textbook & Video Reference | Related CO's |
|---|---|---|---|---|---|
| | | e. Pointer as Function Arguments<br>a. Functions Returning pointers<br>b. Pointers to Functions<br>c. Pointers and structures | | | |
| | Les. 12 | f. Pointer Expressions<br>g. Pointer Increments and scale factor<br>h. Pointers and array<br>i. Array of pointers<br>j. Pointer as Function Arguments<br>d. Functions Returning pointers<br>e. Pointers to Functions<br>f. Pointers and structures | **TLA1, TLA2** | E-Balagurusamy (Ch11) | CO1, CO2 |
| 7 | **(MID–TERM EXAM)** | | | | |
| 8 | Les. 13 | a. Introduction to function<br>b. Need for user-defined function<br>c. A multi-function program<br>d. Elements of user define function<br>e. Definition of function<br>f. Return values and their types<br>g. Function calls<br>h. Function Declaration<br>i. Category of function | **TLA1** | E-Balagurusamy (Ch9) | CO1, CO2,CO3 |
| | Les. 14 | a. No arguments and no return values<br>b. Arguments but no return values | **TLA1, TLA2** | E-Balagurusamy (Ch9) | CO1, CO2,CO3 |

| Week | Lesson | Topic | Teaching and Learning Activities (TLAi) | Textbook & Video Reference | Related CO's |
|---|---|---|---|---|---|
| | | c. Arguments with return values<br>d. No Arguments but return a values<br>e. Functions that return multiple values<br>f. Nesting of functions<br>g. Recursion<br>h. Passing arrays to functions<br>i. Passing strings to functions<br>j. The scope, visibility and lifetime of variables | | | |
| 9 | Les. 15 | i. Introduction to String<br>j. Declaring and Initializing string variable<br>k. Reading string from terminal | **TLA1, TLA2** | E-Balagurusamy (Ch8) | CO1, CO2 |
| | Les. 16 | l. Arithmetic operations and characters<br>m. Putting strings together<br>n. Comparison of two strings<br>o. String handling functions | **TLA3** | E-Balagurusamy (Ch8) | CO1, CO2 |
| 10 | Les. 17 | a. Introduction to structure<br>b. Defining a structure<br>c. Declaring structure variables<br>d. Accessing structure members<br>e. Structure initialization | **TLA1** | E-Balagurusamy (Ch10) | CO1, CO2 |
| | Les. 18 | f. Copying and Comparing structure | **PRESENTATION TLA3** | E-Balagurusamy | CO1, |

| Week | Lesson | Topic | Teaching and Learning Activities (TLAi) | Textbook & Video Reference | Related CO's |
|---|---|---|---|---|---|
| | | variables<br>g. Operations on individual members<br>h. Arrays of structures<br>i. Structure and function | | (Ch10) | CO2, CO4 |
| 11 | | **(Class Test-3, Assignment – 2)** | | | |
| | Les. 19 | a. Create, read, write and update files<br>b. Copying a File<br>c. Character Input vs. Line Input | **TLA4** | E-Balagurusamy (Ch12) | CO1, CO2 |
| | Les. 20 | d. Dynamic Memory Allocation<br>e. Allocating a block of Memory: Malloc<br>f. Releasing the used space: Free | **TLA1, TLA2** | E-Balagurusamy (Ch13) | CO1, CO2 |
| 12 | Les. 21 | g. Preprocessor – why?<br>h. #include: how to make use of a header file<br>i. #define: simple and parameterized macros<br>j. #undef directive<br>k. predefined preprocessor symbols<br>l. macrooperators: # and ##<br>m. conditional compilation: #if and #ifdef directives | **TLA1** | E-Balagurusamy (Ch14) | CO1, CO2 |
| | Les. 22 | Review and Exercises | **TLA1, TLA2** | | CO1, CO2 |
| **(FINAL EXAM)** | | | | | |

## 4. Assessment Methods

### 4.1. Grading System

| Numerical Grade | Letter Grade | Grade Point |
|---|---|---|
| 80-100 | A+ | 4.00 |
| 75-79 | A | 3.75 |
| 70-74 | A- | 3.50 |
| 65-69 | B+ | 3.25 |
| 60-64 | B | 3.00 |
| 55-59 | B- | 2.75 |
| 50-54 | C+ | 2.50 |
| 45-49 | C | 2.25 |
| 40-44 | D | 2.00 |
| Less than 40 | F | 0.00 |

## 5. Additional Support for Students

- Student Portal: http://studentportal.diu.edu.bd/
- Academic Guidelines https://daffodilvarsity.edu.bd/article/academic-guidelines
- Rules and Regulations of DIU https://daffodilvarsity.edu.bd/article/rules-and-regulation
- Career Development Center: https://cdc.daffodilvarsity.edu.bd/
- For general queries: http://daffodilvarsity.edu.bd/