**University of Asia Pacific (UAP)**

**Department of Computer Science and Engineering (CSE)**

**Course Outline: CSE 101**

**Program:** Computer Science and Engineering (CSE)

**Course Title:** Introduction to Computer Science & Programming Methodology

**Course Code:** CSE 101

**Semester: Spring 2020**

**Level:** 1st Semester (Section A & B)

**Credit Hour:** 3.0

**Name & Designation of Teacher: Sakib Hasan, Lecturer**

**Office/Room: 701,** 7th Floor, teacher’s compound

**Class Hours: [SECTION:- A] Sat: 11am-12.20pm; Wed: 3.30-4.50pm;**

**[SECTION:- B] Sun: 2-3.20pm; Mon: 9.30-10.50am;**

**Consultation Hours: Thursday: 12.30-3.20pm;**

**Tuesday: 11.00am-1.45pm;**

**E-mail:** sakib.hasan@uap-bd.edu

**Mobile:** +8801701034193

**Rationale:** Required course in the CSE program. This knowledge is very important to build up the knowledge of computer and programming.

**Pre-requisite:** None

**Course Synopsis:**

Binary, Decimal, Octal, Hexadecimal number system and their conversion. Introduction to structured programming, **Flowchart:** what is flowchart, expressions of flowchart, importance of flow chart. **Pseudo code:** pseudo code and expression of pseudo code. **Algorithm:** Algorithm writing, relationship among algorithm, pseudo code and flow chart, code to flowchart and vice versa conversion. Introduction to C program, Skeleton of C program, **Compiler:** overview of compiler, importance and functionality, output standard library function as printf(), input standard library function as scanf(), **Data types and Variable:** different data types, variable types and their sizes, conversion among them, **scope:** global variable, local variable, static variable, auto variable . **Operators:** Types of operator in C, functionality of operators, increment – decrement operators, precedence of operators. Header files, library files, object files and their importance. **Conditional Operators:** if-else structure, switch-case structure, selection structure, statement and expression. **Control Flow:** for loop structure, while loop structure, do-while structure, sum of the series, co-ordinate geometry, design pattern using loop. **Debugging**: debug a sample program using compiler. **Function:** argument and parameter of a function, return types, inline declaration, forward declaration of a function. **Macro:** types of macro, sample macro program, macro as preprocessor, difference between macro and function, advantages and disadvantages of macro. **Bitwise operator:** introduction to bitwise operators, their functionality and truth table of basic and, or, xor, nor algebraic functions**. Arrays:** introduction to array, declaration and definition of an array, types of array, multidimensional array, size calculation of different types of array, scanning array, programs using array, matrix multiplication using array, insertion, deletion, replacement, search from an array, advantages of array over variable.

**Course Objectives:** The objectives of this course are to:

1. **Introduce** the vast fields of computer sciences to the students.
2. **Provide** knowledge about computer science ethics and norms.
3. **Describe** the current influence of computer science and their applications on this rapidly developing world.
4. **Introduce** the students with the base of computer science i.e. Programming Methodology.

**Course Outcomes (CO) and their mapping with Program outcomes (PO) and Teaching-Learning Assessment methods:**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **CO**  **No.** | **CO Statements:**  Upon successful completion of the course, students should be able to: | **Corresponding**  **POs**  **(Appendix-1)** | **Bloom’s taxonomy domain/level**  **(Appendix-2)** | **Delivery methods and activities** | **Assessment**  **Tools** |
| CO1 | **Describe** the fundamentals of computer organization, number system, Boolean logic, and advanced buzz topics of computer science | 1 | Remember | Lecture, Classwork, Assignments | Quiz, Written exam |
| CO2 | **Understand** the necessity of computer algorithms, algorithm flowcharts and programming languages for problem solving | 1 | Understand | Lecture, Designing Flowcharts | Quiz, Written exam |
| CO3 | **Apply** the basic concepts of C Programming Language | 1 | Apply | Lecture, Q&A | Assignment, Written exam, Quiz |
| CO4 | **Develop** simple programs using the fundamental concepts of C programming. | 2 | Apply | Problem Solving, Practice sessions | Online Contest, Assignment, Written exam, Quiz |

**Weighting COs with Assessment methods:**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Assessment Type** | **% weight** | **CO1** | **CO2** | **CO3** | **CO4** |
| Final Examination: | **50%** | 10 | 10 | 10 | 20 |
| Mid Semester Examination: | **20%** | 10 | 10 |  |  |
| Continuous Evaluation:  Class performance, Short Quizzes, Problem Solving Sessions, Oral Exams | **30%** | 10 | 10 |  | 10 |
| **Total** | **100%** | 30 | 30 | 10 | 30 |

**Teaching-learning and Assessment Strategy:** Lectures, assignments, quizzes, exams

**Grading Policy:** As per the approved grading policy of UAP (Appendix-3)

**Course Content Outline and mapping with COs**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Weeks** | **Topics / Content** | **CO** | **Delivery methods** | **Materials** |
| 1 | Introduction to the University, Department and Program.   1. Introduction of Computer and Computer Science 2. Motivation of study of Computer Science and engineering 3. Basic Structure and Components of a Computer 4. Processor, CPU, Memory devices, I/O Devices | CO1 | Lecture, Multimedia | 1. Slides by teacher |
| 2 | 1. Performance Metric of Computer Components 2. SOFTWARE, HARDWARE, System software, Application software, Operating System (OS) 3. Basic Discussions on Security on Computer based systems and Internet | CO1 | Lecture, Multimedia | 1. Introduction to computers by Peter Norton 2. Power Point Slides |
| 3 | 1. Number Systems: Decimal, Binary, Others 2. Conversion between any two number systems | CO1 | Lecture, Multimedia | 1. PDF by teacher 2. Class notes |
| 4 | Boolean Logic, Boolean Operations, Logic Gates, Truth Tables | CO1 | Lecture | 1. PDF by teacher 2. Class notes |
| 5 | **CT#01,** Flowchart, Algorithms | CO2 | Written Exam;  Lecture, Multimedia | 1. Book- Kendall and Kendall 2. Ch-04 |
| 6 | 1. ALU, Performing Arithmetic Operations with Computer 2. Conversion of all Arithmetic Operations into Additions | CO2 | Lecture, Multimedia | 1. Intro to Computers(Book) 2. Slides |
| 7 | Details on Software: Application Software, System Software, Linkage of Software with Hardware: OS, BIOS, **CT#02** | CO1 | Lecture, Multimedia; Written Exam | 1. Intro to Computers(Book) 2. Slides |
| **MID SEMESTER EXAMINATION** | | | | |
| 8 | Hard Disk Partitions, File System; Computer Networks; | CO1 | Lecture | 1. Intro to Computers(Book) 2. Slides |
| 9 | Internet, Local Network, Network Topology, Data Transmission on Internet | CO1 | Lecture | 1. PDF |
| 10 | Artificial Intelligence, Internet of Things, Cloud Computing | CO1 | Lecture | 1. Slides 2. PDF |
| 11 | Programming Languages, Evolution, Low-Mid-High Level Languages, Program Compilation; Structured Programming Language: C Language; Smallest C program that compiles without error or warning; Skeleton of a C program, header file, library file, preprocess, body of the program C compiler; Steps of compiling a C program;;; **CT#03** | CO3 | Lecture; Written Exam | 1. Programing Books 2. Slides |
| 12 | Basic data types; Size and Limits of each datatype; Type conversion, data loss, solving the data loss problem; Operators, Operator precedence; Declaration and definition of a variable; Add, sub, div, multiplication, modulus operations and Integer division, floating modulus; scanf() & printf(); | CO3 | Lecture, Example Program | 1. Programing Books 2. Slides |
| 13 | Basic structure of if-else, switch-case conditions; Basic program using if-else, switch-case, Nested if-else and nested switch-case; Looping(if possible); | CO4 | Lecture, Problem Solve | 1. Programing Books 2. Slides |
| 14 | **CT#04,** Review Class | CO4 | Written Test; Consultation | Verbal Lecture |

**Required References: #** Introduction to Computers

- Peter Norton

# Teach Yourself C

- Herbet Schildt

**Recommended References:** # সবার জন্য কম্পিউটার প্রোগ্রামিং ল্যাংগুয়েজ : C

* মোঃ কামরুজ্জামান নিটন

# Programming with C

* Reema Thareja

**Grading System:** As per the approved grading scale of University of Asia Pacific (Appendix-2).

**Student’s responsibilities:** Students must come to the class prepared for the course material covered in the previous class (es).

They must submit their assignments on time.

No late or partial assignments will be acceptable. There will be no make-up quizzes.

**Special Instructions:**

* Minimum 70% attendance is required for a student to appear in the final exams
* Late presence Any student coming after 20 minutes will miss the attendance

|  |  |  |
| --- | --- | --- |
| **Prepared by:**  **\_\_\_\_Sakib Hasan\_\_\_** | **Checked by:**  **-----------------------------** | **Approved by: (Head of the Department)**  **-----------------------------** |

**Appendix-1:**

**Washington Accord Program Outcomes (PO) for engineering programs:**

|  |  |  |
| --- | --- | --- |
| **No.** | **PO** | **Differentiating Characteristic** |
| 1 | Engineering Knowledge | Breadth and depth of education and type of knowledge, both theoretical and practical |
| 2 | Problem Analysis | Complexity of analysis |
| 3 | Design/ development of solutions | Breadth and uniqueness of engineering problems i.e. the extent to which problems are original and to which solutions have previously been identified or codified |
| 4 | Investigation | Breadth and depth of investigation and experimentation |
| 5 | Modern Tool Usage | Level of understanding of the appropriateness of the tool |
| 6 | The Engineer and Society | Level of knowledge and responsibility |
| 7 | Environment and Sustainability | Type of solutions. |
| 8 | Ethics | Understanding and level of practice |
| 9 | Individual and Team work | Role in and diversity of team |
| 10 | Communication | Level of communication according to type of activities performed |
| 11 | Project Management and Finance | Level of management required for differing types of activity |
| 12 | Lifelong learning | Preparation for and depth of Continuing learning. |

**Appendix-2**

