

Department of Computer Science and Engineering
Khulna University of Engineering & Technology
Khulna - 9203, Bangladesh

2nd year Course Plan

1. CSE 2101 (Object Oriented Programming)

Credit: 3.0

a) **Course Teacher:** Md. Kowsar Hossain and Abdul Aziz

b) **Learning Outcome:**

- ✓ Demonstrate an understanding of the model of object oriented programming: abstract data types, encapsulation, inheritance and polymorphism
- ✓ Demonstrate an ability to effectively use the fundamental features of an object oriented language like C++/Java: object classes and interfaces, exceptions and libraries of object collections
- ✓ Demonstrate an ability to identify how to take the statement of a business problem and from this determine suitable logic for solving the problem; then be able to proceed to code that logic as a program.
- ✓ Demonstrate an ability to test, document and prepare a professional looking package for each business project.

c) **Schedule:**

| SL | Topics |
|----|--|
| 1 | Philosophy of object oriented programming (OOP), Features of OOP, Advantages of OOP over structured programming. |
| 2 | Classes and objects |
| 3 | Classes and objects |
| 4 | Array of objects |
| 5 | Array of objects |
| 6 | Object references |
| 7 | Object references |
| 8 | Memory allocation of objects |
| 9 | Memory allocation of objects |
| 10 | Constructors |
| 11 | Constructors |
| 12 | Destructors and different types of constructors |
| 13 | Destructors and different types of constructors |
| 14 | Function overloading |

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| 15 | Function overloading |
| 16 | Operator overloading |
| 17 | Operator overloading |
| 18 | Type conversion of objects |
| 19 | Inheritance: Types of inheritance |
| 20 | Inheritance: Types of inheritance |
| 21 | Composition |
| 22 | Composition |
| 23 | Aggregation |
| 24 | Aggregation |
| 25 | Polymorphism: Abstract classes |
| 26 | Abstract classes |
| 27 | Virtual and pure virtual functions overriding |
| 28 | Virtual and pure virtual functions overriding |
| 29 | Interface |
| 30 | Interface |
| 31 | Runtime type identification (RTTI) |
| 32 | Runtime type identification (RTTI) |
| 33 | Exception handling |
| 34 | Exception handling |
| 35 | Template functions and classes |
| 36 | Template functions and classes |
| 37 | Generics |
| 38 | Namespace, Package |
| 39 | Standard template library |

2. CSE 2102 (Object Oriented Programming Laboratory)

Credit: 1.5

a) **Course Teacher:** Md. Kowsar Hossain and S. K. Imran Hossain

b) **Learning Outcome:**

- ✓ Demonstrate an understanding of the model of object oriented programming: abstract data types, encapsulation, inheritance and polymorphism
- ✓ Demonstrate an ability to effectively use the fundamental features of an object oriented language like C++/Java: object classes and interfaces, exceptions and libraries of object collections
- ✓ Demonstrate an ability to identify how to take the statement of a business problem and from this determine suitable logic for solving the problem; then be able to proceed to code that logic as a program.

- ✓ Demonstrate an ability to test, document and prepare a professional looking package for each business project.

c) Schedule:

| SL | Topics |
|-----------|--|
| 1 | Introduction to OOP using Python and C++; C++ language basics |
| 2 | Importance of Getter and Setter methods; Namespace; Constructors and Destructors |
| 3 | Operator Overloading |
| 4 | Dynamic Memory Allocation and Copy Constructor |
| 5 | Inheritance |
| 6 | Polymorphism |
| 7 | Exception Handling |
| 8 | Templates |
| 9 | Introduction to STL |
| 10 | Lambda Expressions |
| 11 | Lab Project: Designing an Object Oriented Model for a real life problem |
| 12 | Project Evaluation |
| 13 | Quiz |
| 14 | Lab test |

3. CSE 2105 (Data Structure and Algorithm)

Credit : 3.0

a) Course Teacher: Mohammad Insanur Rahman Shuvo and Md. Shamimur Rahman

b) Learning Outcome:

c) Schedule:

| SL. | Topics |
|------------|--------------------------------|
| 1 | Introduction to Data Structure |
| 2 | Introduction to Data Structure |
| 3 | Linked List |
| 4 | Linked List |
| 5 | Linked List |
| 6 | Array |
| 7 | Linked List |
| 8 | Tree |
| 9 | Array |
| 10 | Tree |

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|----|------------------------|
| 11 | Multiway-Tree |
| 12 | Abstract Data Type |
| 13 | Class Test-1 |
| 14 | External Memory: RAID. |
| 15 | Stack |
| 16 | Graphs |
| 17 | Graphs |
| 18 | Stack |
| 19 | Heaps |
| 20 | Fibonacci Heaps |
| 21 | Class Test-2 |
| 22 | Sorting |
| 23 | Recursion |
| 24 | Recursion |
| 25 | Searching |
| 26 | Queues |
| 27 | Queues |
| 28 | Hashing Techniques |
| 29 | Sorting |
| 30 | Sorting |
| 31 | Hashing Techniques |
| 32 | Sorting |
| 33 | Sorting |
| 34 | AVL and splay trees |
| 35 | Searching |
| 36 | Searching |
| 37 | Class test-3 |
| 38 | AVL and splay trees |
| 39 | Overview of the course |

4. CSE 2106 (Data Structure and Algorithm Laboratory)

Credit : 1.5

a) Course Teacher: Mohammad Insanur Rahman Shuvo and Md. Shamimur Rahman

b) Learning Outcome:

- ✓ Choose appropriate data structure as applied to specified problem definition.

- ✓ Handle operations like searching, insertion, deletion, traversing mechanism etc. on various data structures.
- ✓ Apply concepts learned in various domains like DBMS, compiler construction, problem solving, development etc.
- ✓ Use linear and non-linear data structures like stacks, queues, linked list, tree, graph etc.

c) Schedule:

| SL | Topics |
|----|--|
| 1 | Array Operation (insert/delete(first, last and middle position)) |
| 2 | Stack, queue implementation and their different operations |
| 3 | Linked List(singly and circular linked list creation, insert and delete) |
| 4 | Linked List(doubly and circular linked list creation, insert and delete) |
| 5 | Sorting Techniques implementation(bubble sort, insertion sort, selection sort) |
| 6 | Sorting Techniques implementation(Quick sort, merge sort) |
| 7 | Lab Test |
| 8 | BST creation, insertion, deletion |
| 9 | Binary Indexed tree |
| 10 | Segment Tree |
| 11 | Heap sort, min heap, max heap |
| 12 | BFS, DFS, Topological Sort |
| 13 | Lab Test+Presentation+quiz |

5. CSE 2113 (Computer Architecture)

Credit : 3.0

a) Course Teacher: Al-Mahmud and Md. Abdul Awal

b) Learning Outcome:

- ✓ Understand the organization of a computer system in terms of its main components.
- ✓ Understand learn the fundamentals of computer organization and its relevance to classical and modern problems of computer design.
- ✓ Understand input/output mechanisms.
- ✓ Understand the various parts of a system memory hierarchy.
- ✓ Explain the function of each element of a memory hierarchy.
- ✓ Identify where, when and how enhancements of computer performance can be accomplished project.

c) Schedule:

6. **EEE 2113 (Digital Electronics)** **Credit : 3.0**
To be uploaded soon.
7. **EEE 2114 (Digital Electronics Laboratory)** **Credit : 1.5**
To be uploaded soon.
8. **MATH 2107 (Fourier Analysis and Linear Algebra)** **Credit : 3.0**
To be uploaded soon.