Course Outline / Plan

Southeast University

School of Science & Engineering/CSE Department

Spring, 2017

Program: B.Sc. in CSE

Course Title: Data Structure Course code: CSE1033 Section: 1, 2, 3

Faculty Name: Rajon Bardhan Faculty Code: RB Designation: Lecturer

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| --- | --- | --- | --- | --- | --- | --- | --- |
| Days | 8:30–9:50 | 10:00–11.20 | 11.30–12.50 | 1.00–2.20 | 2.30–3.50 | 4.00–5.20 | 5.30-6.50 |
| Saturday |  | Counseling Hour | Counseling Hour |  |  |  |  |
| Sunday |  | CSE1033.2 [Lab5] | CSE1011.2 [Lab2] | Counseling Hour | CSE1034.1 [Lab3] |  |  |
| Monday |  | CSE1033.1 [Lab5] | CSE1033.3 [Lab5] | CSE1034.2 [Lab2] |  |  |  |
| Tuesday |  | CSE1033.2 [Lab5] | CSE1011.2 [Lab2] | Counseling Hour |  |  |  |
| Wednesday |  | CSE1033.1 [Lab5] | CSE1033.3 [Lab5] | Counseling Hour | CSE01012.2 [Lab2] |  |  |
| Thursday |  | Counseling Hour | Counseling Hour |  |  |  |  |

1. **Course objectives:**

The aim of this course is to give the students a feel for algorithms and data structures as a central part of computer science. Students will understand that algorithm and data structures used for some problem are much more important than knowing the exact code for it in some programming language. Students will be able to use and design linked data structures, but appreciate why it is good programming style to hide the details of a data structure within an abstract data type. Again they will learn inheritance mechanism of object-oriented languages by which they can write generalized code expressing an algorithm or data structure in a way that may be used in a variety of real-world situations.

1. **Learning outcomes:**

The aim of this course is to help students to choose data structures and algorithm again what design methods impacts the performance of programs will have upon the choices. Choosing the appropriate data structure and algorithm design method for a specified application. Write programs using object-oriented design principles. Solve problems using data structures such as linear lists, stacks, queues, hash tables, binary trees, heaps, tournament trees, binary search trees, and graphs and writing programs for these solutions.

1. **Course contents(in brief):**

Classes and objects, arrays, stacks, queues, linked lists, recursion, binary search trees, binary heap, hash tables, graph implementation.

1. **Text and Reference Book:**

1. Data Structures by Edward M. Reingold &Wilfred J. Hansen

2. Teach Yourself C++ by Herbert Schildt

3. C/C++ Programmer's Reference by Herbert Schildt

4. Introduction to Algorithms (3rd Edition, 2010) by Thomas H. Cormen, Charles E. Leiserson, Ronald L. Rivest and Clifford Stein

5. Schaum’s Data Structure (latest edition)

1. **Teaching methodology:**
2. I divided assignment marks into
3. Class Test = 20
4. Home Assignment = 5
5. Two class tests will be taken.
6. No make-up class test will be taken. Assignments must submit within time.
7. **Tentative Plan of course:**

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| Lecture no | Brief course content & chapter no | Time period |
| Week 1  Lecture 1 | Introduction &Why Learn Data Structure? | 80 minutes |
| Week 1  Lecture 2 | Array | 80 minutes |
| Week 2  Lecture 3 | Bubble Sort , Linear Search, Binary Search | 80 minutes |
| Week 2  Lecture 4 | Object Oriented Programming( Abstraction, Encapsulation, Inheritance) – 1 | 80 minutes |
| Week 3  Lecture 5 | Object Oriented Programming(Abstraction, Encapsulation, Inheritance) – 2 | 80 minutes |
| Week 3  Lecture 6 | Stack, Queue, Circular queue | 80 minutes |
| Week 4  Lecture 7 | Postfix, Prefix, Parenthesis balance | 80 minutes |
| Week 4  Lecture 8 | Application of Queue & Circular queue | 80 minutes |
| Week 5  Lecture 9 | Pointers | 80 minutes |
| Week 5  Lecture 10 | Linked List | 80 minutes |
|  | **Midterm Exam** |  |
| Week 6  Lecture 11 | Singly Linked List – 1 | 80 minutes |
| Week 6  Lecture 12 | Singly Linked List – 2 | 80 minutes |
| Week 7  Lecture 13 | Double Linked List | 80 minutes |
| Week 7  Lecture 14 | Circular Linked List | 80 minutes |
| Week 8  Lecture 15 | Recursion | 80 minutes |
| Week 8  Lecture 16 | Applications of recursion ( Merge sort, Binary search ) | 80 minutes |
| Week 9  Lecture 17 | Binary Search Tree, Binary Heap | 80 minutes |
| Week 9  Lecture 18 | Applications of Binary Heap ( Priority queue, Heap sort) | 80 minutes |
| Week 10  Lecture 19 | Introduction to Graphs | 80 minutes |
| Week 10  Lecture 20 | Graph implementations ( Adjacency list, Adjacency matrix) | 80 minutes |
| Week 11  Lecture 21 | Breadth First Search | 80 minutes |
| Week 11  Lecture 22 | Applications of BFS (Maze search, Shortest path) | 80 minutes |
| Week 12  Lecture 23 | Depth First Search | 80 minutes |
| Week 12  Lecture 24 | Applications of DFS (Topological sorting) | 80 minutes |
|  | **Final Exam** |  |

1. **Course performance evaluation basis and Exam Format:**

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| --- | --- |
| **Performance Evaluation Basis, Midterm Exam & Final exam mark distribution\*** | |
| Attendance | 5% |
| Assignment | 25% |
| Midterm Exam | 30% |
| Final Exam | 40% |
| **Total** | **100%** |

1. **Grading Policy**

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| --- | --- | --- | --- | --- | --- |
| New Grading Policy (Applicable for students admitted after Summer 2007) | | | | | |
| Range | Grade point | Letter Grade | Range | Grade point | Letter Grade |
| 80-100 | 4.00 | A+ | 55-59 | 2.75 | B- |
| 75-79 | 3.75 | A | 50-54 | 2.50 | C+ |
| 70-74 | 3.5 | A- | 45-49 | 2.25 | C |
| 65-69 | 3.25 | B+ | 40-44 | 2.00 | D |
| 60-64 | 3.00 | B | < 40 | 0.00 | F |

1. **Instructor’s special note/ instructions:**
2. 75% attendance is required for attending midterm & final exam.
3. Must Keep I.D. card with you.
4. Integrity is very important in all my courses. Students with lack of integrity will be penalized.