

Department of Computer Science and Engineering National Institute of Technology

Calicut - 673 601, Kerala, India

Tel:0495-2286801

Tentative Course Details - Monsoon Semester 2018 (July - November 2018)

Course:

Title : CS 2002D PROGRAM DESIGN

Class Rooms : ELHC 203/ ELHC 401

Class Timings : Mon: 9.00-10.00, Tue: 14.00-15.00, Wed: 10.15-11.15, Fri:11.15-12.15

Instructors:

Faculty : Subhasree M. & Subashini R

Telephone : 0495-22868(10)/(20). Email : {subha,suba}@nitc.ac.in

Prerequisites: ZZ1004D Computer Programming

Course Outcomes:

Students will be able to

- CO1:Design and analyse simple iterative and recursive algorithms.
- CO2:Design algorithms for sorting and searching and analyze them using mathematical tools, like formulation and solving of recurrences, asymptotic analysis
- CO3: Define simple data structures: arrays, linked lists and trees
- CO4: Analyze the correctness of algorithms

Course Objective:

This course is intended to equip the students to design correct and efficient algorithms for the computing problems. It also intends to provide an introduction to simple data structures, the concept of algorithms and their role in computing. The student is expected to be able to understand and analyze simple algorithms, and assess the suitability of data structures for different computing tasks, on completing the course.

Course Contents:

Module 1: (13 Hours)

Review of Programming Constructs- Conditional and Iterative constructs, Data types, Control Structures, Functions, Parameter passing- calling conventions, Recursion, Asymptotic notation for complexity analysis.

Module 2 : (13 Hours)

Searching - Linear and Binary, Sorting- Insertion and Selection sorting, Divide and conquer, Quick sort, Merge Sort, Heap Sort, External Sorting.

Module 3 : (13 Hours)

Pointers and dynamic memory allocation, Abstract Data Types, Lists, Stacks, Queues, Trees, Search Trees and traversal algorithms, Heaps and Priority queues.

Module 4 : (13 Hours)

Memory Management, Garbage collection algorithms, Storage allocation for objects with mixed sizes, Buddy systems, Storage compaction.

References:

1. A.V. Aho, J. E. Hopcroft, and J. D. Ullman, *Data Structures and Algorithms*, Addison Wesley, 1983.
2. T. H. Cormen, C.E. Leiserson, R. L. Rivest and C Stein, *Introduction to Algorithms*, 3/e, MIT Press, 2009.
3. E. Horowitz, S. Sahni S, and D. Mehta, *Fundamentals of Data Structures in C++*, 2/e, Universities Press, 2008.
4. O. B. W. Kernighan and D. M. Ritchie. *The C Programming Language* (2/e), Prentice Hall, 1988.

Evaluation:

- Mid Term Test I : 25
- Mid Term Test II: 25
- Final Exam: 50

Grading Policies:

- Grading will be relative.
- Absence for exams without prior permission will be equivalent to zero marks in the exam.
- There will be no makeup exams except in case of genuine reasons. In the event of such exceptional cases, the student must discuss the matter with the instructors and must get a written permission from FA and HOD at least one day prior to the date of the exam.
- All issues regarding valuation of exams must be resolved within one week after the announcement of result.

Standard of Conduct:

- Each student is expected to adhere to high standards of ethical conduct, especially those related to cheating and plagiarism.
- Any submitted work MUST BE on individual effort.
- Any academic dishonesty will result in zero marks in the corresponding exam and will be reported to the department council for record keeping and for permission to assign F grade in the course.
- Late comers to the class will be marked absent.
- Use of mobile phones is strictly prohibited during class hours.
- Any academic dishonesty will be reported to the department council for permission to assign F grade in the course.