

NOC:Programming, Data Structures and Algorithms - Video course

COURSE OUTLINE

This is a course on programming, data structures and algorithms. The learner is assumed to have no prior experience of programming, but is expected to be at the level of a second year undergraduate college student in science or engineering. The course will run over ten weeks with about 2-3 hours of lectures per week.

At the end of each week, the learner is expected to write some programs and submit them for grading. These programming problems are classified as easy, moderate or difficult. The easy problems, typically, are repeats from the lecture. The moderate and difficult ones will require increasing levels of initiative from the learner.

In addition, at the end of each week the learner is expected to answer a set of objective-type assessment questions.

COURSE DETAIL

List of Topics

- Introduction to Computers and Programming
- Writing your first program
- Variables and operators and expressions
- Variable declarations, more operators, precedence
- Input, Output Statements
- Conditionals
- Loops
- Arrays and Multidimensional arrays
- Pointers
- Functions
- Running time of a program
- Computing time complexity
- Polynomial evaluation and multiplication
- Searching: Linear and Binary
- Finding minimum and maximum
- Sorting I: Insertion, Merge
- Sorting II: Counting, Radix
- Finding i-th smallest number



NP-TEL

NPTEL

<http://nptel.ac.in>

Computer Science and Engineering

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- Structures and User-defined data types
- Brief introduction to C++: Classes and objects
- Data Structures: Abstract Data Type
- Lists
- Stacks: Last In First Out
- Queues: First In First Out
- Trees
- Tree traversal
- Heaps
- Graphs and Representation
- Greedy algorithms
- Dynamic programming
- Matrix Chain Multiplication
- Dijkstra's Algorithm
- Strings
- Boyer-Moore String Matching Algorithm
- File I/O
- Modular Programming