

# Continuous Evaluation

## Computer Science Engineering Syllabus

## What is Continuous Evaluation?

A set of knowledge based assessments that cover technical aspects of student's job readiness.

A **Summative Assessment** which is devised as per engineering semester frame work to examine student's knowledge level in **industry relevant** courses across major engineering branches which included **Civil, Mechanical, Electrical, Electronics, and Computer Science Engineering.**

### Assessment Framework for Continuous Evaluation – Computer Science Engineering



<b>First/Second Semester</b>	<ul style="list-style-type: none"><li>• Basics of Computer Programming</li></ul>
<b>Third/Fourth Semester</b>	<ul style="list-style-type: none"><li>• Computer Architecture</li><li>• Digital Circuits &amp; Electronics</li><li>• Computer Networks</li><li>• Data Structures</li><li>• Operating Systems</li></ul>
<b>Fifth Semester</b>	<ul style="list-style-type: none"><li>• Database Management</li></ul>
<b>Sixth Semester</b>	<ul style="list-style-type: none"><li>• Design and Analysis of Algorithms</li></ul>

## Detailed Syllabus for Continuous Evaluation – Computer Science Engineering



**Basics of Computer Programming:** Introduction, C programming basics, Arrays and strings, Functions and pointers, Structures and unions, Loop based items, Decision-making, Introduction to computers – basic operations, RAM, ROM)

**Computer Architecture:** Computer Organization and architecture – functional units, basic operational concepts, basic processing unit, pipelining, memory systems, I/O organization, instruction set architecture

**Digital Circuits & Electronics:** Number systems and Boolean algebra, implementation of combinational logic design, design of synchronous sequential circuits, asynchronous sequential logic, hardware description logic, logic gates, k-maps

**Computer Networks:** Overview of data communication and networking, reference models, physical layer and media, data link layer, network layer, transport layer, application layer, security, IP addressing

**Data Structures:** Introduction, arrays, linked lists, stacks, queue, Trees - binary trees, AVL tree, minimum cost spanning trees - Prim's and Kruskal's algorithm, graphs, graph traversal - depth first search and breadth first search, shortest path algorithm - Warshall algorithm and Dijkstra algorithm, searching, sorting algorithms, heap, search trees: binary search trees(BST), insertion and deletion in BST, complexity of search algorithm, AVL trees, introduction to m-way search trees, B trees & B+ trees. Hashing - hash function

**Operating Systems:** Introduction, concurrent processes, process synchronization process scheduling, mutual exclusion, critical section problems, CPU scheduling, threads and their management, deadlock, memory management, I/O management and disk scheduling

**Database Management System:** Data Models, Introduction to E-R model and relational model, Relational algebra and relational calculus, Normalization (All normal forms), Transaction, Query optimization, Query Language(SQL)

**Design and Analysis of Algorithms:** Introduction - Algorithms, Analyzing algorithms, Complexity of algorithms, Advanced Data Structures: Red-Black trees, B – trees, Binomial Heaps, Fibonacci Heaps. Divide and Conquer with examples such as Sorting, Matrix Multiplication and Searching. Greedy methods, Dynamic programming with examples such as Knapsack, All pair shortest paths – Warshall's and Floyd's algorithms, Resource allocation problem. Backtracking, Branch and Bound with examples such as Travelling Salesman Problem, Graph Coloring, n-Queen Problem, Hamiltonian Cycles and Sum of subsets. Spanning trees – Prim's and Kruskal's algorithms, Single source shortest paths - Dijkstra's and Bellman Ford algorithms.

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