| Course Title | **ADVANCED DATA STRUCTURES & ALGORITHMS** |
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| Course Code | **CSC 316** |
| Course Purpose and Objectives | In this course students will extend their knowledge on data structures (Trees and Heaps) and algorithms (Advanced Sorting, Greedy and Dynamic). Through this course students will advance their programming skills by implementing and using advanced data structures and complex algorithms. At the beginning of this course students will learn how to implement advanced data structures such as Trees, Binary Trees, AVL Trees, Heaps, Binary Heaps and Hash Tables. During the course, they will also be able to implement advanced sorting algorithms such as Heapsort, Mergesort, Quicksort and Bucket Sort. Moreover, on the completion of this course students will have advanced knowledge in analyzing the complexity of the above algorithms and implementing others for solving common problems in the field of Computing (e.g Knapsack, Optimal Merge and Minimum Spanning Trees and String Matching). |
| Learning Outcomes | 1. Implement advanced data structures (Trees, Binary Trees, AVL Trees, Heaps, Binary Heaps and Hash Tables).<br>2. Implement advanced searching algorithms (Heapsort, Mergesort, Quicksort and Bucket Sort).<br>3. Implement advanced algorithms for solving common problems in the field of Computing (e.g Knapsack, Optimal Merge and Minimum Spanning Trees and String Matching).<br>4. Analyze and evaluate the efficiency of an algorithm based on its complexity |
| Course Content | Advanced data structures<br>Greedy algorithms<br>String matching |