

Course name	ECE 35900 Data Structures
Credit and contact hours	(3 cr.) Class 3
Course coordinator's name	Stanley Chien
Textbook	Thomas A. Standish, <i>Data Structures, Algorithms, & Software Principles in C</i> , 1 st Ed., Pearson, 1994, ISBN 9780201591187.
Course information	<p>2020-21 IUPUI Campus Bulletin description: ECE 35900 Data Structures (3 cr.) P: ECE 26300. Class 3. An introductory course in computer engineering, with emphasis on data structure and program design using the C language. The classical concepts of structured programming such as stack, queue, linked list, tree, recursion, sorting, and searching. Applications of structured programming in engineering.</p> <p>Prerequisites/ Co-Requisite ECE 26400 or equivalent</p> <p>Required, Elective, or Selected Elective: EE Elective, CE Elective</p>
Goals for the course	<p>Upon successful completion of the course, students should be able to</p> <ol style="list-style-type: none"> 1. Design and analyze data structures (arrays, stacks, queues, lists, trees, graphs) for a given application. [6, 2] 2. Select appropriate data structures for a given application. [1,1,2,6] 3. Design and analyze algorithms (sorting, searching, and hashing.) for a given application. [6, 2] 4. Select appropriate algorithms for a given application. [1, 1,2,6]
List of topics to be covered	<ol style="list-style-type: none"> 1. Introduction 2. Complexity and Asymptotic Notation 3. Stacks, Queues, Dequeues; Abstract Data types; Implementation; Arrays, Pointers, Linked Lists; Applications 4. Stack and Recursion 5. Sorting; Exchange, Selection, Tree, Insertion, Merge 6. Searching; Sequential, Binary, Tree, and Hashing; Balanced Trees, B-Trees, Tries 7. Graphs; Graph Traversal, PERT Diagrams, Spanning Trees, Shortest Paths 8. Advanced Topics: Greedy Algorithms (e.g., Huffman Coding) and Dynamic Programming (e.g., Optimal Search Tree, 0-1 Knapsack Problem)
Syllabi approved by	Stanley Chien
Date of approval	12/04/2021