Terminology and ideas to be familiar with: trees, properties of trees, spanning trees, balanced and complete trees, root vertex, leaf, parent, child, siblings, height, level, \( m \)-ary tree, relationships between parameters in a balanced \( m \)-ary tree, bubble sort, merge sort, heap sort, run-time analysis of sorting algorithms, depth-first search, breadth-first search, prufer code, number of trees on \( n \) vertices, Prim’s algorithm, Kruskal’s algorithm, Dijkstra’s algorithm, the Traveling Salesperson problem, the Branch and Bound algorithm, the Approximate Tour construction, networks and flow assignments, the max cut-min flow theorem, the flow-augmentation algorithm, constructing a cut in a network which demonstrates maximal flow has been achieved, matchings, edge covers, modeling and solving problems using network flow, and the Transportation Problem and its solution.