



**THE OHIO STATE UNIVERSITY**  
COLLEGE OF ENGINEERING

# Foundations II: Data Structures and Algorithms

## CSE 2331

**Credit Hours:**

3.00

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**Course Levels:**

Undergraduate (1000-5000 level)

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**Course Components:**

Lecture

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**Course Description:**

Design/analysis of algorithms and data structures; divide-and-conquer; sorting and selection, search trees, hashing, graph algorithms, string matching; probabilistic analysis; randomized algorithms; NP-completeness.

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**Prerequisites and Co-requisites:**

Prereq: 2231, 2321, and Stat 3460 or 3470, and enrollment in CSE, CIS, ECE, Data Analytics, Math majors or CIS minor. Concur: Math 3345.

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**Course Goals / Objectives:**

- Be competent with using asymptotic notation
  - Be familiar with designing graph algorithms
  - Be familiar with designing and analyzing divide-and-conquer algorithms
  - Be familiar with the use of balanced trees
  - Be familiar with hashing
  - Be familiar with heaps
  - Be familiar with designing backtracking algorithms.
  - Be familiar with string matching.
  - Be exposed to selection algorithms
  - Be exposed to probabilistic algorithms
  - Be exposed to formal languages and finite automata
  - Be exposed to NP-completeness
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**Course Topics:**

- Design and analysis of recursive algorithms
  - Balanced trees and heaps
  - Hashing
  - Graph algorithms
  - Backtracking algorithms
  - Sorting and selection
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**Designation:**

Required