

CSCI 5870 - Data Structures and Algorithms

Fall 2026 Syllabus, Section 01, CRN 40777,

Credit hours: 3

Instructor

Robert Kramer

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Public Instructor Information

Instructor Title: Associate Professor

Instructor Professional Qualifications: PhD, Computer Science, University of Pittsburgh, 1998

MS, Computer Science, University of Pittsburgh, 1991

BS, Mathematics / Computer Science,

Youngstown State University, 1987

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Course Description

5870. Data Structures and Algorithms. Study and application of analysis and design techniques to nonnumerical algorithms. Topics selected from algorithms acting on sets, trees, graphs; memory management; notions of complexity and related areas. Prereq.: CSIS 3700 and CSCI 3710 or graduate standing.. 3 s.h.

Course Readings

Group	Title	Author	ISBN
Required	Algorithm Design and Applications, 1st edition	Goodrich and Tamassia	978-1118335918

The course readings are subject to change in the event of extenuating circumstances, research developments, current events, and/or to ensure better learning.

Schedule of Topics and Assignments

Week of	Reading(s)	Proposed Topic	Due/To Prepare for Class
8/24	Chapter 1 Chapter 2 Additional Material (Slides)	Introductory Material Analyzing Algorithms Growth of Functions	
8/31	Chapter 1 Additional Material (Slides)	Amortization Algorithm Correctness	
9/7	Additional Material (Slides)	More Algorithm Correctness Recurrence Equations	
9/14	Chapter 11 Additional Material (Slides)	Divide and Conquer Master Theorem	Homework 1
9/21	Chapter 11 Chapter 5 Chapter 8	More Master Theorem Sorting	
9/28	Chapter 5 Chapter 8 Additional Material (Slides)	More Sorting	
10/5	Chapter 5 Additional Material (Slides)	Heaps Adversarial Arguments	



10/12	Chapter 9 Additional Material (Slides) Chapter 7	Selection by Rank Disjoint Set Structures	Homework 2
10/19	Chapter 3	Binary Search Trees Balanced Binary Search Trees	Midterm 2
10/26	Chapter 3 Chapter 10	More Balanced BSTs Greedy Algorithms	
11/2	Chapter 10 Chapter 13	More Greedy Algorithms Graph Algorithms	
11/9	Chapter 13 Chapter 14 Chapter 15 Chapter 12	More Graph Algorithms Dynamic Programming	Homework 3 Midterm 3
11/16	Chapter 12	More Dynamic Programming	
11/23	Chapter 12 Chapter 17	Yet More Dynamic Programming NP-Completeness	
11/30	Chapter 17	More NP-Completeness	Homework 4

The course schedule, policies, procedures, and assignments in this course are subject to change in the event of extenuating circumstances, by mutual agreement, and/or to ensure better learning.