Syllabus Highlights

CS 351: Algorithms - Fall 2025

Lucas P. Cordova, Ph.D.

2025-08-25

Slide Notes or Announcements

None

Alternative Formats

- **Slides**
- **Outline**
- **PDF**

👋 Welcome to CS 351: Algorithms!

Course Information

- **Meeting Time:** MWF 10:20 - 11:20 AM
- **Location:** Smullin B17
- **Instructor:** Lucas Cordova
- **Embedded TA:** Sam Holmes

Course Overview

What We'll Study

- Advanced algorithm design paradigms
- Complexity analysis and Big-O notation
- Graph algorithms and network flows
- Dynamic programming techniques
- Computational complexity theory (P vs NP)
- Critical evaluation of AI-generated solutions

Learning Outcomes

By Course End, You Will:

1. **Design & Analyze** algorithms using major paradigms
2. **Implement** advanced data structures
3. **Solve** complex graph problems
4. **Analyze** computational complexity
5. **Prove** algorithm correctness
6. **Select** appropriate algorithmic approaches
7. **Apply** algorithms to real-world problems
8. **Evaluate** AI-generated solutions critically

Course Materials

Required Resources

- **Primary Text:** Algorithms Illuminated (Omnibus Edition)
  - Author: Tim Roughgarden
  - Available at: algorithmsilluminated.org
- **Canvas:** All course materials and assignments
- **Hardware:** Laptop required for in-class activities

Assessment Structure

Grade Distribution

Component	Weight
Attendance, Participation, Quizzes	15%
Homework Assignments (~10)	25%
Programming Projects (3)	30%
Student Contributed Lecture	10%
Midterm Exam	10%
Final Exam	10%

Programming Projects

Three Major Projects

1. **Divide-and-Conquer Project**
   - Recursive algorithms and mergesort
   - Performance visualization
2. **Dynamic Programming Project**
   - Complex DP implementations

- Edit distance, knapsack variations

3. **Graph Algorithms Project**
   - Network flow modeling
   - Real-world scenario implementation

Student Contributed Lecture

Your Teaching Opportunity

- Work in groups of 3
- Research and present on chosen algorithm topic
- Lead class discussion
- Develop presentation and teaching skills
- Scheduled during weeks 13-15

Important Dates

Mark Your Calendars

- **First Day:** Monday, August 25, 2025
- **Midterm Exam:** October 22, 2025 (Week 9)
- **Thanksgiving Break:** November 26-28, 2025
- **Last Day of Classes:** December 3, 2025
- **Final Exam:** December 9, 2025, 8:00-11:00 AM

Course Schedule Overview

Weekly Topics Flow

- **Weeks 1-2:** Fundamentals & Big-O
- **Weeks 3-4:** Divide-and-Conquer, Sorting
- **Weeks 5-7:** Graph Algorithms, Greedy Methods
- **Weeks 8-9:** Dynamic Programming, **MIDTERM**
- **Weeks 10-11:** Network Flows
- **Weeks 12-13:** Complexity Theory, NP-Completeness
- **Weeks 14-15:** Student Lectures & Review

Office Hours

Getting Help

Professor Office Hours

- Monday: 1:15 - 2:15 PM
- Tuesday: 10:00 - 11:00 AM
- Wednesday: 1:15 - 2:15 PM
- Thursday: 10:00 - 11:00 AM
- **Location:** Ford 210

- **Appointments:** 15-minute slots available

TA: Sam Holmes
- Email: srholmes@willamette.edu
- Office hours: TBD

Course Policies

Attendance & Participation
- **Attendance is essential** - tracked through activities
- Participation activities cannot be made up
- Notify instructor ASAP for emergencies

Late Work Policy
- **Homework:** 3 late tokens for semester (use wisely!)
- **Projects:** −10% per day, max 5 days late
- **Participation:** No makeups

Academic Integrity

Allowed Collaboration ✓
- Discussing problem-solving strategies
- Sharing conceptual insights
- Debugging approaches
- Understanding course concepts together

Prohibited Actions ×
- Copying code or solutions
- Sharing your code with others
- Using solutions from previous semesters
- Submitting AI-generated code without modification/disclosure

Grading Scale

Letter Grade Thresholds

Grade	Range	Grade	Range
A	≥ 92.00	C	72.00-77.99
A-	90.00-91.99	C-	70.00-71.99
B+	88.00-89.99	D+	68.00-69.99
B	82.00-87.99	D	62.00-67.99
B-	80.00-81.99	D-	60.00-61.99

Grade	Range	Grade	Range
		F	≤ 59.99

Support Resources

Academic Support

- **SOAR Center:** Free food, clothing, textbooks (PUC 3rd floor)
- **Tutoring Services:** Academic Resource Center
- **IT Support:** Software and hardware assistance
- **Accessible Education Services:** Matthews 103

Time Commitment

- Expect 6-9 hours per week outside class
- Reading, homework, projects, exam prep
- Consistent effort required!

Creating an Inclusive Environment

Our Classroom Community

- Affirmed names and pronouns respected
- Diverse perspectives welcomed
- Collaborative learning encouraged
- Questions always welcome
- Mistakes are learning opportunities

Accessibility

- Contact AES for accommodations
- Talk to me about any concerns
- We'll work together for your success

Ready to Master Algorithms?

Key Takeaways

- Algorithms are fundamental to CS
- Theory meets practice in this course
- Active participation is crucial
- Multiple support resources available
- AI evaluation skills are now essential

Questions?

Let's have a great semester exploring the fascinating world of algorithms!

Next Topic: Introduction to Algorithm Analysis & Big-O Notation

Reading: Chapters 1-2 in Algorithms Illuminated