

# SYLLABUS

Old Dominion University • College of Sciences • Department of Computer Science  
CS 500 • Foundations of Computing • Spring 2026

**Instructor** Dr. Andrey Chernikov

- Email: [achernik@odu.edu](mailto:achernik@odu.edu), please include “CS500” in the subject line.
- Office location: ECS 3311A, phone: 757-683-7732.
- Office hours: MW 12:45pm – 2:45pm. Zoom link: <https://odu.zoom.us/my/chernikov>.
- Send email for appointments outside office hours.

## Mode of delivery

Scheduled in-class meetings, MW 3:00pm – 4:15pm, Batten 2069.

## Catalog description

The course aims to provide students foundational training in computing. This includes topics in discrete mathematics, counting and combinatorics, probability, proof methods, basic automata theory and algorithm design and analysis.

## Prerequisites

MATH 211 or equivalent, CS 250 or CS 251 or CS 253 or equivalent experience with programming and basic data structures.

## Course objectives

Students completing this course should be able to develop efficient solutions to basic computational problems via

- applying mathematical reasoning and foundational algorithmic approaches,
- quantifying the resource requirements of relevant algorithms and data structures,
- selecting, customizing, and arguing about an appropriate solution technique.

## Outline

- Logic and Proofs<sup>†</sup>
- Algorithms<sup>†</sup>
- Induction and Recursion<sup>†</sup>
- Counting<sup>†</sup>
- Discrete Probability<sup>†</sup>
- Graphs<sup>†</sup>
- Modeling Computation<sup>†</sup>
- Online Algorithms<sup>\*</sup>
- Matrix Operations<sup>\*</sup>
- Linear Programming<sup>\*</sup>
- Polynomials and the FFT<sup>\*</sup>
- Machine-Learning Algorithms<sup>\*</sup>
- NP-Completeness<sup>\*</sup>
- Approximation Algorithms<sup>\*</sup>

## Required textbooks

<sup>†</sup> Discrete Mathematics and Its Applications by Kenneth H. Rosen (8th edition), McGraw Hill, 2019

<sup>\*</sup> Introduction to Algorithms (4th edition) by Cormen et al., MIT Press, 2022

## Attendance policy

- Class attendance is not factored into the grade. However, participation in class meetings is strongly encouraged as they provide a helpful environment to stay focused and to ask questions.
- **Extended absences** Reasonable accommodations, at the discretion of the instructor, will be provided to students who encountered extended roadblocks, or absences (at least one consecutive week of courses), to making progress that have been verified by the Student Outreach & Support (SOS) office. The definitions of recognized events that cause extended absences, as well as the documentation requirements can be found at <https://www.odu.edu/life/dean-students/student-outreach#tab134=1&done1612907281342>. The request for an absence notification must be filed within five business days of the event.
- **Short absences** Disruptive life events that are not recognized as extended absences by the SOS office will not be considered valid excuses for missed deadlines. In order to minimize the impact of such events it is strongly advised to submit all assignments well before their deadlines. A one-time blanket excuse, however, is automatically granted to every student that consists in disregarding their lowest quiz score (which could be a zero due to a missed deadline).

## Disability

Students are encouraged to self-disclose disabilities that have been verified by the Office of Educational Accessibility by providing Accommodation Letters to their instructors early in the semester in order to start receiving accommodations. Accommodations will not be made until the Accommodation Letters are provided to instructors each semester.

## Assignments

- 80% of the overall grade is allocated to all quizzes, posted weekly on Fridays and open until 11:59 pm on the following Friday.
- 20% is allocated to the final exam which will be open online on Friday, May 8th from 9:00am to 11:59pm (expected to take two to three hours to complete).

## Grades

The final percentage score will be computed as follows:

$$\text{final score} = \frac{\text{individual total quiz score} - x}{\text{maximum total quiz score} - y} \times 80 + \frac{\text{individual final exam score}}{\text{maximum final exam score}} \times 20,$$

where  $x$  is student's lowest quiz score, and  $y$  is the number of points allocated for it. The letter grade will be looked up from the following table.

final score:	0	60	65	70	75	80	85	90	95	100
letter grade:	F	C-	C	C+	B-	B	B+	A-	A	

## Submission rules

- All assignments will be published and submitted through the Canvas system. No other medium will be accepted without prior instructor's permission.
- Late assignments will not be accepted. Make-up assignments may be allowed only if student's absence has been verified by the SOS office. The final exam can be taken outside the scheduled interval only with the permission from the dean's office.
- An interruption in the Canvas accessibility will not be recognized as a reason for deadline extension, unless accompanied by a note from the university IT department.
- Weekly quizzes will have week-long intervals for submission. Once the interval expires, the quiz will close automatically.
- For file-upload questions only typed answers will be accepted. No handwritten (and then scanned) solutions can be uploaded. ODU offers the essential software, e.g., Microsoft Office, for the students that can be downloaded or used in the computer labs.
- The portable document format (pdf) is preferred, as formulas and charts sometimes do not render correctly across platforms when native formats are used.
- The writing must be clear and concise. Points will be taken off for unnecessarily wordy or incomprehensible solutions.

## Academic integrity

- All assignments must be completed individually. No person, except the instructor or the teaching assistant, can be asked for help with solving the assignments. The use of artificial intelligence is also prohibited.
- The internet and any printed materials can be consulted as needed. However, all sources (except the textbooks) used in the graded work must be cited. If a cited source has to be quoted verbatim, quotation marks and indentation must be used. The material in the textbooks, however, is sufficient for solving all quiz and exam questions.
- Students are cautioned against replicating problem solutions found on the internet, as they are sometimes incorrect and often poorly written. The goal of the class is developing individual proficiency in the material. The instructor may question the student to determine if submitted work corresponds to student's proficiency and assign the grade accordingly.
- Students must be familiar with and abide by the University Honor Code:  
<https://www.odu.edu/about/monarchcitizenship/student-conduct/code>.