SYLLABUS
Old Dominion University • College of Sciences • Department of Computer Science
CS 500 • Foundations of Computing • Fall 2020

Instructor
Dr. Andrey Chernikov
• Email: achernik@cs.odu.edu, please include “CS500” in the subject line
• Office location: ECS 3311A, phone: 757-683-7732
• Office hours (both physical and virtual): Fridays 2:00pm to 6:00pm
• Email for appointments outside office hours

Course Information
Meeting hours  Mondays and Wednesdays 3:00pm to 4:15pm

Modes of delivery  Subject to available technology, class sessions will be streamed live and recorded.
• CRN 17933, Scheduled In-Class Meetings, Mills Godwin Hall 0342: a face-to-face section in a traditional classroom, adjusted for all COVID-19 safety protocols required by the university and for accommodating the WEB2 section
• CRN 23752, Scheduled Online Meetings, WEB2 Online: students who are uncomfortable with participating in the classroom are encouraged to switch to this section

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

Prerequisites  MATH 211 or equivalent, CS 250 or equivalent experience with C++ programming and basic data structures

Course Objectives  Students completing this course should be able to develop efficient solutions to basic computational problems via
• understanding the existing algorithmic approaches and data structures, their pros and cons,
• analyzing the computational costs of the existing approaches with respect to the given problem, and
• selecting and customizing an appropriate solution technique.

Outline
• Examples of algorithms and their applications, the use of asymptotic notation.
• Basic discrete structures relevant to computer science (functions, vectors, matrices, linked lists, graphs), counting and combinatorics, probability.
• Recursive thinking and recurrence relations.
• Proof methods: proof by construction, proof by counterexample, proof by induction, etc.
• Basic algorithm design and analysis techniques: exhaustive search, incremental insertion, divide-and-conquer, amortized analysis, greedy algorithms, and dynamic programming.
• Basic automata theory (DFA, NFA and regular languages). Primer on Computability and Computational Complexity: NP-complete problems, P vs NP, etc.
• Selected topics, such as multithreaded algorithms and computational geometry.

Current course information and assignments:  https://www.blackboard.odu.edu (check frequently)

Required textbooks
• Introduction to Algorithms (3rd edition) by Cormen et al., MIT Press, 2009
• Introduction to the Theory of Computation (3rd edition) by M. Sipser, Cengage, 2013
Attendance policy Class attendance is not factored into the grade. However, attending class meetings is strongly encouraged as they provide a dedicated environment to stay focused and to ask questions. Students are responsible for all material covered and announcements made in class.

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 weekly tests
- 20% is allocated to the final take-home exam

Grades The final percentage score will be computed as follows:

\[
\text{final score} = \frac{\text{individual total weekly test score} - x}{\text{maximum total weekly test score}} \times 80 + \frac{\text{individual final exam score}}{\text{maximum final exam score}} \times 20,
\]

where \( x \) is student’s lowest weekly test score, and \( y \) is the number of points allocated for this test. The letter grade will be looked up from the following table.

<table>
<thead>
<tr>
<th>final score</th>
<th>letter grade</th>
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<tbody>
<tr>
<td>0 60 65 70 75 80 85 90 95 100</td>
<td>F C- C C+ B- B B+ A- A</td>
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Submission rules

- All assignments will be published and submitted through the Blackboard system. No other medium will be accepted without prior instructor’s permission.
- Late assignments will not be accepted. Make-up assignments will be allowed only if justified by a documented evidence (e.g., doctor’s note) of student’s inability to complete the corresponding work before the original deadline. The final exam can be taken outside the scheduled interval only with the permission from the dean’s office.
- An interruption in the internet connection will not be recognized as a reason for deadline extension, unless accompanied by a note from the university IT department. Therefore, it is strongly advised to complete the assignments well before the deadlines.
- Weekly tests will have week-long intervals of submission. Once the interval expires, the test will close automatically. The correct answers will be revealed after the test closes.
- For open-ended questions either typed or handwritten (and then scanned) answers can be uploaded. However, appeals of low grades based on misread handwriting will not be accepted.
- 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 internet and any printed materials can be consulted as needed. However, all sources used in the graded work must be cited.
- If a cited source has to be quoted verbatim, quotation marks and indentation must be used.
- 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.