ECE 175  
Computer Programming for Engineering Applications  
FALL 2015  
University of Arizona

Credits: 3

Instructors: Loukas Lazos  
ECE 356H  
llazos@ece.arizona.edu.  
Office Hours: T TH: 11:00 AM – 12:00 PM

Lecture: T TH 12:30 PM – 1:45 PM, Science and Engineering Library, Room 200S (Section A)

Course Website: https://piazza.com/arizona/fall2015/ece175 and the D2L website (HW submission and grades).

TAs: Keeley Criswell, Nicholas Fragiskatos, Heng Liu, Sree Malladi, Peyman Siyari, Xin Xiao, Troy Shengxiang Zhu, Email: ece175@ece.arizona.edu

Office hours: M 2:00 PM – 5:00 PM, T 8:00 AM – 11:00 AM @ ECE 250

Course description:
ECE 175 introduces undergraduate students to the fundamental principles of programming for solving engineering programs, using the C programming language. It familiarizes students with the process of computational thinking and the translation of real-life engineering problems to computation problems. Further, it describes the basic techniques for systematic software design. It provides fundamental knowledge in basic programming concepts such as program flow control, memory management, and elementary data structures.


Recommended Supplement: C: From Theory to Practice, George Tselikis and Nikolaos Tselikas, CRC Press, 1st edition

Course objectives:
Upon the completion of this course, students should have achieved the following objectives:

- Conceptualize engineering problems as computational problems
- Code basic computing problems using the C language
- Learn fundamental software design principles and commonly used techniques
Specifically, students will gain fundamental understanding of the following topics:

**Introduction to computer systems**
- Engineering problems as computational problems
- Overview of computer systems
- Software design

**Introduction to C**
- Code build process (editing, compiling, linking, executing)
- Elements of a C program; preprocessor directives; statements and expressions; functions; coding formatting style
- Identifiers; simple data types; constants and variables; type casting; binary arithmetic representations
- The IDE environment

**Branching**
- Conditional expressions; relational operators; logical operators; precedence rules
- Selection structures; if-else statements; while statements; switch statements

**Loops**
- Repetition and loop statements; for statements; do-while statements
- Increment/decrement operators; nested loops; loop tracing

**Modular programming**
- User functions; library functions; function declaration and definition; function calls; pass by value; scope rules; programs with multiple functions
- Pointers and addresses; pass by reference; pointer arithmetic
- File input/output

**Simple data structures**
- Arrays; declaration and initialization; multi-dimensional arrays; searching and sorting arrays; pointers and arrays
- String arrays; string library functions; substrings; concatenation; strings vs. characters
- Engineering applications; matrix algebra; numerical integration and differentiation; quadratic equations
- Recursion
- Structures; structures and functions; arrays of structures; dynamic data structures

**Important dates:**
Last day to drop a course so it does not appear on the record of enrollment: **September 6, 2015.**
Last day to drop a course with a withdrawal of W: **November 1, 2015.** Students must be passing the course in order to withdraw at this time. Signature of the Instructor is required.

**Course assignments and exams:**
- Weekly homework assignments on the topics covered in class (approximately 9)
- Two midterm exams
- One final project
*There will be no final exam.*
The grading distribution for the course assignments and exams is as follows:

- Zyante Participation: 10%
- Homework Assignments: 35%
- Midterm 1: 15% (Sep. 29th, tentative)
- Midterm 2: 15% (Nov. 3rd, tentative)
- Final Project: 25% (Dec. 6th)
- Total: 100%

Grading scheme:

<table>
<thead>
<tr>
<th>Percentage</th>
<th>Letter Grade</th>
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<tbody>
<tr>
<td>90%–100%</td>
<td>A</td>
</tr>
<tr>
<td>80%–89%</td>
<td>B</td>
</tr>
<tr>
<td>70%–79%</td>
<td>C</td>
</tr>
<tr>
<td>60%–69%</td>
<td>D</td>
</tr>
<tr>
<td>&lt;60%</td>
<td>E</td>
</tr>
</tbody>
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Homework assignment guidelines:
To receive a grade in the programming assignments, students must demonstrate and explain their code to the TAs during the mandatory lab hours. Moreover, they must complete the assignment handed out during those lab hours. The homework, exam and project grades will be based upon the following components:

- Output correctness on pre-specified inputs (50%).
- Code explanation (50%)

Recipe to success:
In order to be successful in this course a student must:

1) Regularly follow all lectures. Notes and examples given during lecture will be most helpful for completing the homework assignments. Surprise quizzes may be given the first few minutes of class
2) Turn in homework assignments on time and follow the submission guidelines. Each assignment is building upon previous ones. Missing one assignment will make it difficult to complete the ones that follow
3) Attend lab hours. You need to demonstrate your code to receive a grade. A submitted program that has not been demonstrated will not receive any grade
4) Ask for help from TAs and ULAS during office hours. TAs can provide you with many helpful hints
5) Spend extra care to make your turn-in assignments readable, concise, and complete
6) Collaborate with your group to timely complete the group project

Course grading policy:
- Homework is due every Tuesday 11:59pm unless otherwise specified.
- Late homework will be accepted until your lab is in session. All late homework will receive 20-point deduction per day (e.g., if your score is 90/100, the reduced grade will be 70/100)
- Homework must be submitted via D2L
• Re-grading: Any request for re-grading must be submitted in writing up to one week after the grade has been received. In case of grade dispute, the entire homework assignment will be re-graded. After the one-week time limit, no changes can be made to an assigned grade.

Make-up exams:
A make-up exam may only be given under extraordinary circumstances. The student requesting a make-up exam should contact the instructor well in advance and provide written documentation for the reason that he/she will not be able to attend the regularly scheduled exam. It is up to the discretion of the Instructor to accept the justification provided by the student.

Students with disabilities:
If you anticipate barriers related to the format or requirements of this course, please meet with me so that we can discuss ways to ensure your full participation in the course. If you determine that disability-related accommodations are necessary, please register with Disability Resources (621-3268; http://drc.arizona.edu) and notify me of your eligibility for reasonable accommodations. We can then plan how best to coordinate your accommodations. Make sure that such a request is set forth at least 2 weeks before the first exam to allow sufficient time for any preparations that may be needed.

Plagiarism policy:
The University’s Code of Academic Integrity (Section 2.1a) is based on the guiding principle that a student's submitted work must be the student's own. In ECE 175, this policy will be applied to all work submitted for a grade, including exams, quizzes, homework, and lab assignments. Copying previously posted solutions, solution manuals, and work of other students is strictly forbidden; all work must be original. The minimum penalty for submitting work that is not your own is an E grade. The instructor will report violators of this policy to the Dean’s office. Repeated violations may result in expulsion from the University. For further details, read the Student Code of Academic Integrity http://deanofstudents.arizona.edu/codeofacademicintegrity.

Absence policy:
According to University policy, the instructor will honor absences due to holidays or special events observed by organized religions and absences pre-approved by the UA Dean of Students (or Dean’s designee).

Student conduct:
Students are expected to treat the class and the instructor with respect. No cellphone ringing and texting is allowed during the lecture. For further info, please see http://policy.arizona.edu/threatening-behavior-students.