

Course ID: Foundations of Computing – Fall, 2016
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Office Hours Thursday 9:30AM – 10:30AM, ECE 134B
Department of Electrical and Computer Engineering

Course Description

This course focuses on computational aspects of engineering problems. Topics include machine models and computability, classification, and performance analysis of algorithms, advanced data structures, approximation algorithms, introduction to complexity theory and complexity classes.

Course Objectives

The course is primarily theoretical in nature, with a focus on understanding fundamental aspects of algorithms and computing. At the meantime, I will put concrete examples in engineering and numerical computing to illustrate how such abstract concept can be used in ECE fields. The main activity associated with homework and exams will be analysis. We will consider various models of computation, the limits of what can and cannot be computed using these models, as well as what problems can be solved efficiently using these models. We will also study a number of important techniques that can be used to improve the efficiency of algorithms. There will be very few (if any) programming activities in this class; however, you may find tools such as Matlab useful in your analyses, and you may use the programming language of your choice to validate solutions.

Prerequisites and Co-requisites

N/A

Specific Course Requirements (If Applicable)

N/A

Technical Skills

In order to participate and succeed in this class, you will need to be able to perform the following basic technical tasks:

- Use UNM Learn (help documentation located in "How to Use Learn" link on left course menu, and also at <http://online.unm.edu/help/learn/students/>).
- Use email – including attaching files, opening files, downloading attachments
- Open a hyperlink (click on a hyperlink to get to a website or online resource)
- Open, download PDF files.
- Use Microsoft Word applications
 - Create, download, update, save and upload MS Word documents
 - Create, download, update, save and upload MS PowerPoint presentations
 - Create, download, update, save and upload MS Excel spreadsheets
 - Download, annotate, save and upload PDF files
- Use the in-course web conferencing tool (Collaborate Web Conferencing software)
- Download and install an application or plug in – required for participating in web conferencing sessions

Technical Requirements

Computer

- A high speed Internet connection is highly recommended.
- Supported browsers include: Internet Explorer, Firefox, and Safari. Detailed Supported Browsers and Operating Systems: <http://online.unm.edu/help/learn/students/>
- Any computer capable of running a recently updated web browser should be sufficient to access your online course. However, bear in mind that processor speed, amount of RAM and Internet connection speed can **greatly** affect performance. Many locations offer free high-speed Internet access including [UNM's Computer Pods](#).
- For using the Kaltura Media Tools inside Learn, be sure you have downloaded and installed the latest version of [Java](#), [Flash](#), and [Mozilla Firefox](#). They may not come preloaded.
- Microsoft Office products are available free for all UNM students (more information on the UNM IT Software Distribution and Downloads page: <http://it.unm.edu/software/index.html>)

For UNM Learn Technical Support: (505) 277-0857 (24/7) or use the “Create a Support Ticket” link in your course.

Web Conferencing

Web conferencing will be used in this course during the following times and dates:

For the online sessions, you will need:

- A USB headset with microphone. Headsets are widely available at stores that sell electronics, at the UNM Bookstore or online.
- A high-speed internet connection is highly recommended for these sessions. A wireless Internet connection may be used if successfully tested for audio quality prior to web conferencing.
- For UNM Web Conference Technical Help: (505) 277-0857

Tracking Course Activity UNM Learn automatically records all students' activities including: your first and last access to the course, the pages you have accessed, the number of discussion messages you have read and sent, web conferencing, discussion text, and posted discussion topics. This data can be accessed by the instructor to evaluate class participation and to identify students having difficulty

Textbook and Supplemental Materials

Required Textbooks:

There is no mandatorily required textbook

Recommended and/or Optional Textbooks, Journals and Articles:

The following textbook is highly recommended:

T. H. Cormen, C. E. Leiserson, R. L. Rivest and C. Stein, Introduction to Algorithms, 2nd Edition, McGraw-Hill, 2001.

Required Supplementary Materials:

N/A

Coursework and Participation

Instructor Response Time

I routinely check the course for postings or emails, Monday (8 am) – Friday (12 pm) and sometimes on the weekend. You can anticipate a 24 to 48 hour response from me, Monday – Thursday. I will try and respond to all weekend (Friday afternoon to Sunday) emails and postings by noon on Monday or earlier.

Procedures for Completing Coursework

There will be three exams. The time available for each exam will be 75 minutes. I will notify the date of the exam in advance at least for two weeks. In general, the first exam is at mid September, the second exam is at mid October, and the third one is at final week. If you already have travel scheduled during these dates, contact me so that other arrangements can be made.

Assignments

There will be 3 homework assignment. Homework is designed for your own practice. The solution of homework will be released one week after the homework is released. You DO NOT need to submit your homework solution, and your homework does not count towards your final grade.

Expectations for Participation

Expectations:

- *time required (9-12 hrs per week)*
- *students are expected to learn how to navigate in Learn*
- *students are expected to communicate with one another in team projects*
- *students are expected to keep abreast of course announcements*
- *students are expected to use the Learn course email as opposed to a personal email address*
- *students are expected to keep instructor informed of class related problems, or problems that may prevent the student from full participation*
- *students are expected to address technical problems immediately*
- *students are expected to observe course netiquette at all times*

Netiquette

- *“In following with the UNM Student Handbook, all students will show respect to their fellow students and instructor when interacting in this course. Take Netiquette suggestions seriously. Flaming is considered a serious violation and will be dealt with promptly. Postings that do not reflect respect will be taken down immediately.” (Rebecca Adams, OLIT 535)*
- *“This course encourages different perspectives related to such factors as gender, race, nationality, ethnicity, sexual orientation, religion, and other relevant cultural identities. The course seeks to foster understanding and inclusiveness related to such diverse perspectives and ways of communicating.”*

- *Link to Netiquette document:*
<http://online.unm.edu/help/learn/students/pdf/discussion-netiquette.pdf>

Grading Procedures

Include a detailed statement of

- *how grades are related to or reflective of the expected learning objectives*
- ***your expected grading response time***
- *how weighted grades will be calculated (if using)*

Grading Scale (*below is just an example – you will need to add your full grading scale*)

| Points | Grade |
|--------|-------|
| >95 | A+ |
| 90-95 | A |
| 85-89 | A- |
| 80-84 | B+ |
| 75-79 | B |
| 70-74 | B- |
| 65-69 | C+ |
| 60-64 | C |
| <60 | C- |

UNM Policies

Title IX: Gender Discrimination

In an effort to meet obligations under Title IX, UNM faculty, Teaching Assistants, and Graduate Assistants are considered “responsible employees” by the Department of Education (see pg. 15 <http://www2.ed.gov/about/offices/list/ocr/docs/ga-201404-title-ix.pdf>). This designation requires that any report of gender discrimination which includes sexual harassment, sexual misconduct and sexual violence made to a faculty member, TA, or GA must be reported to the Title IX Coordinator at the Office of Equal Opportunity (oeo.unm.edu).

For more information on the campus policy regarding sexual misconduct, see: <https://policy.unm.edu/university-policies/2000/2740.html>

Copyright Issues

All materials in this course fall under copyright laws and should not be downloaded, distributed, or used by students for any purpose outside this course.

Accessibility

The American with Disabilities Act (ADA) is a federal anti-discrimination statute that provides comprehensive civil rights protection for persons with disabilities. Among other things, this legislation requires that all students with disabilities be guaranteed a learning environment that provides for reasonable accommodations of their disabilities. If you have a disability requiring

accommodation, please contact the UNM Accessibility Resource Center in 2021 Mesa Vista Hall at 277-3506 or <http://arc.unm.edu/> . Information about your disability is confidential.

- Blackboard's Accessibility statement: <http://www.blackboard.com/accessibility.aspx>
- Microsoft: <https://www.microsoft.com/enable/microsoft/mission.aspx>
- *Include links to accessibility statements for all other technologies included in the course.*

Academic Misconduct

You should be familiar with UNM's [Policy on Academic Dishonesty](#) and the [Student Code of Conduct](#) which outline academic misconduct defined as plagiarism, cheating, fabrication, or facilitating any such act.

Example Drop Policy:

This section states your departmental policy for dropping students.

UNM Policies: This course falls under all UNM policies for last day to drop courses, etc. Please see <http://www.unm.edu/studentinfo.html> or the UNM Course Catalog for information on UNM services and policies. Please see the UNM academic calendar for course dates, the last day to drop courses without penalty, and for financial disenrollment dates.

UNM Resources

CAPS Tutoring Services <http://caps.unm.edu/programs/online-tutoring/>

CAPS is a free-of-charge educational assistance program available to UNM students enrolled in classes. Online services include the Online Writing Lab, Chatting with or asking a question of a Tutor.

*Embedded Tutor – if this course has a tutor assigned, substitute the following:
This course has tutoring services incorporated into the course. Please see the “CAPS Tutor” link in the course menu on the left for more details.*

UNM Libraries <http://library.unm.edu>

Student Health & Counseling (SHAC) Online Services

<http://online.unm.edu/help/learn/support/shac>