

CS341L: Introduction to Computer Architecture and Organization
Fall 2018
Syllabus¹ and Calendar

Instructor:

Soraya Abad Mota (email: soraya@cs.unm.edu)
Office: Farris Engineering Center 2040. Phone: 277-3052
Office hours: Monday 3:30-5:30 pm,
some Wednesdays 3-5 pm
by email, and by appointment.

Teaching Assistant:

Md Parevz Mollah (email: parvez@unm.edu)
Office Hours: pm
where?

Class meets: Lectures Monday and Wednesday 1:00 - 2:15 pm, Dane Smith Hall 123
 Laboratory Tuesday 10:00 - 10:50 am, CEC B-146
 Friday 11:00 - 11:50 am, CEC B-146

1 Course Description

This course provides a: “Survey of various levels of computer architecture and design: microprogramming and processor architecture, advanced assembly language programming, operating system concepts and input/output via the operating system.” (from the UNM catalog).

The course is an introduction to Computer Systems, a sophomore/junior level class in computer hardware and software systems, particularly the essential interfaces and interactions between the hardware, assembly language, programming systems, and operating systems. It is also designed to increase student’s understanding of C, C programming, and program performance through programming assignments. The class covers a wide range of introductory topics in modern computer organization and computer systems, including but not limited to:

- Basic computer hardware components
- Computer representation of complex data and control structures (e.g. floating point numbers, structures, strings, and functions)
- Basic x86 assembly language concepts
- Machine level representation of programs

¹Parts of this syllabus were borrowed from Prof. Bridges’ syllabus for the fall 2016 semester.

- Basic processor architecture
- Basic performance optimization
- Basic memory system architecture (e.g. caching and virtual memory hardware)
- Running programs on a system
- Basic operating systems goals (system level I/O, network programming, concurrency)

Because of the wide range of topics that will be covered, students will be expected to read ahead in the textbook (cited below), so that the class can move along at the necessary pace. In the last section of this document there is a tentative calendar with a distribution of the topics on the lecture days. The calendar is not final and it is subject to changes along the semester.

At the end of the term, the student should be able to:

- Use the acquired foundational background in key computer systems topics, to reason about and discuss/understand new systems. Examples of these topics are: mapping higher-level languages to assembly language, data and control structures, program performance, role of programming language and OS tools such as linkers, loaders, libraries, and kernels in executing real programs.
- Demonstrate experience in writing, debugging, and analyzing C and assembly programs.

Textbook: (mandatory)

“Computer Systems: A Programmer’s Perspective” Randal Bryant and David O’Hallaron. 3rd edition. Pearson 2016. It has a student companion website.

2 Prerequisites and expected background

CS241L and ECE 238L, or equivalent classes, are the prerequisites for this course. In particular, knowledge of C/C++ programming in the UNIX environment, basic computer data structures (arrays, structures, and linked data structures), integer data representation, binary data operations (bitwise AND, OR, NOT, and two’s complement arithmetic), and basic math is required. Prerequisites courses may be waived with instructor permission, but students will be expected to know and will be held responsible for the material in these classes.

3 Evaluations

Grades will be determined through the following types of evaluations.

- Exams (40%): One midterm exam (15%): Wednesday, October 10th (Week 8)
 Undecided. Final (25%): Alternatives are:
 Wednesday, Dec. 5 from 1:00 to 2:15 pm
 or Monday Dec 10 or Wed. Dec. 12, or
 some other day on Finals Week but since not scheduled by UNM
 have to find time and room that everyone can make.
- Lab (60%): Overall grades for this portion are broken down as follows:
 Written Homeworks (approximately 4): 15%
 Short Lab Assignments (approximately 3): 15%
 Projects (3): 30%

The lab assignments are to help students develop systems programming skills, the projects are primarily in C but will frequently have an assembly language component. The homework assignments are to help the students keep up to date with the material covered in the lectures.

Grading: The final grade will be calculated by weighing each exam and assignment score obtained by the student, according to the percentages described above. This numeric final grade (in a scale of 100) is converted into a letter final grade (A+,A,A-,B+,B, etc.). Since the conversion process (from number to letter) is left to the instructor to decide, the student should not compute their letter grade according to their own or other faculty's conversion table. In particular, in this class we use the average and standard deviation to determine the range for each of the 4 letter grades.

4 UNM learn platform

For all announcements and submissions of assignments we will use UNM learn available with your Net ID at learn.unm.edu. When you register for this class your UNM id is automatically included in the course platform list and this will allow you access to all the course materials. There will be no other formal website for this class. Students should be up to date with the announcements and material published in this platform. The programming assignments will be submitted through Learn. Communication with the instructor and the teaching assistant will be done via email, if the email is individual. But if the question or comment pertains to the whole group of students in the class, it should be done through the discussion board in Learn.

5 Course and UNM Policies

This section contains the most important policies students are expected to comply with.

5.1 Specific Course Policies

1. Communication with instructor and TA will always be respectful. The instructor requires that you use the email address `soraya@cs.unm.edu` and to get a timely response add CS341 to the subject line.
2. Assignments will be handed out and collected using UNM Learn; assignments should only be submitted through learn, not email or other means. If you are unable to submit assignments on Learn due to technical difficulties, please email me the submission on time and we will coordinate later submission through Learn once the technical difficulties are resolved.
3. Students are responsible for turning in assignments on time. Unexcused late assignments will only be accepted by prior arrangement with the instructor before the due date/time, with significant penalties determined by this instructor. Late assignments will be accepted without penalty only in the case of documented extraordinary circumstances that make prior arrangement impossible. If you know that you will be unable to make a turn-in date due to circumstances outside of your control (e.g. illness, death in the family, etc.), please make arrangements with me either in person, by email, or by phone as soon as possible for an extension.
4. No make-up or extra credit assignments or tests will be given. In general, the dates of the exams and the due dates for assignments will be announced well in advance. If you must miss a midterm, your final exam grade will count for that midterm grade as well.
5. Requests for regrades of assignments must be made within two weeks from when the assignment is returned. Assignments will not be regraded after that point.
6. Assignments and tests for which a regrade is sought will be regraded in their entirety. Therefore the new grade could be lower or higher than the original grade (before regrading).
7. This course falls under all UNM policies for last day to drop courses, as described at <http://www.unm.edu/studentinfo.html> and in the UNM Course Catalog. Please see the UNM academic calendar for course dates, the last day to drop courses without penalty, and for financial disenrollment dates.
8. Any requests to drop the class or change grade mode (e.g. audit, CR/NC) with instructor permission must be made on or before the last regular class/lab meeting. Such request made after this date will not be approved except in the case of documented, extraordinary circumstances.

5.2 Academic Honesty

The university policy on academic honesty is contained in the Pathfinder; you should review this policy if you are unfamiliar with it. Any academic dishonesty will result in an automatic F for the entire semester and will be referred to the UNM Dean of Students for further disciplinary action as they deem appropriate. There will be no second chances or extra warnings.

As a general rule, any work you hand in for this class must be your own original work. Do not, under any circumstances, share source code, writings, or assignments with your classmates without my explicit prior approval. Students can, however, verbally discuss assigned readings, written and lab assignments, and programming assignments outside of class, or using online mechanisms (email, Piazza, etc) that are the general equivalent of verbal communication. For example, feel free to describe verbally over email generally how you attacked a particular problem in a programming assignment.

Any conversation or sharing of information that moves beyond simple verbal discussion and begins discussing or sharing specifics of source code or mathematical operations, however, is potentially a violation of academic honesty requirements. If you are unsure about whether or not you can share a particular piece of information, please consult with Prof. Abad-Mota prior to sharing it.

As examples, the following, are clearly not acceptable and will be considered cheating: copying another person's code; co-developing code with someone else; mailing your code to another person; using the Internet (e.g. StackOverflow) to find a solution to the problem; making your files readable so another person can copy them; reading another person's files; using another person's listing (taken from the trash, for example); having another person write a portion of your code for you.

5.3 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.

5.4 Title IX

Our classroom and our university should always be spaces of mutual respect, kindness, and support, without fear of discrimination, harassment, or violence. Should you ever need assistance or have concerns about incidents that violate this principle, please access the resources available to you on campus, especially the LoboRESPECT Advocacy Center and the support services listed on its website (<http://loborespect.unm.edu/>). Please note that, because UNM faculty, TAs, and GAs are considered "responsible employees" by the Department of Education, any disclosure of gender discrimination (including sexual harassment, sexual misconduct, and sexual violence) made to a faculty member, TA, or GA must be reported by that faculty member, TA, or GA to the university's Title IX coordinator. For more information on the campus policy regarding sexual misconduct,

please see: <https://policy.unm.edu/university-policies/2000/2740.html>.

5.5 ADA

In accordance with University Policy 2310 and the Americans with Disabilities Act (ADA), academic accommodations may be made for any student who notifies the instructor of the need for an accommodation. It is imperative that you take the initiative to bring such needs to the instructor's attention, as I am not legally permitted to inquire. Students who may require assistance in emergency evacuations should contact the instructor as to the most appropriate procedures to follow. Contact Accessibility Resource Center at 277-3506 for additional information.