

CS530: Geometric and Probabilistic Methods for Computer Scientists aka Introduction to Applied Mathematics for Computer Scientists

Class Meeting Times and Location:

MWF 12:00-12:50 @ ME 220

Note: CS530 is face-to-face only and attendance is required. The instructor will make an effort to record all lectures. However, please note there is no guarantee.

Instructor:

Prof. Shuang (Sean) Luan, Ph.D.

Email: sluan@unm.edu

Office: CEC 3071

Office Hours: W F 1:00-2:00pm

Textbook:

There is no required textbook for CS530.

Topics:

Introduction to applied mathematics for computer science students. Topics include linear algebra and its geometric interpretation, discrete Fourier and wavelet transforms, principal component analysis, introduction to numerical optimization, stochastic matrices, etc.

Exam Schedule:

There will be 3 exams for this course. All exams are in-person. We will NOT use the University Final Exam Schedule. Please mark your calendars with the exam dates. You will be dropped from the class if you miss any exam.

Exam 1: Oct 3rd (Friday) during class period.

Exam 2: Nov 7th (Friday) during class period.

Exam 3: Dec 5th (Friday) during class period.

Grading:

Homework (20%) + Exam 1 (25%) + Exam 2 (25%) + Exam 3 (25%) + Attendance (5%)

Note that a final cumulative grade of $\geq 90\%$ is guaranteed an A, $\geq 60\%$ is guaranteed a C, and the highest of the entire class is guaranteed an A+.

UNM Canvas:

All announcements, lecture notes, lecture recordings, homework, homework solutions, and various course information will be available through UNM Canvas.

Homework Assignment:

Homework must be turned in on time and online through Canvas. Submission turned in up to 24 hours later will incur a 25% grade penalty. Submission turned in past 24 hours will be graded 0.

All grade change of the homework must be done within 7 days after students get them back.

Academic Honesty:

You should be familiar with the UNM Academic Honesty Policy contained in the Pathfinder. Courses in the Internet age can present some difficult situations for the student as to what is allowable. The guiding principle is that the work you turn in must be your own, not merely in terms of the specific writing or code, but also in terms of the overall design. You are encouraged to collaborate on homework problems. If you choose to work in a study group, you are required to spend at least half an hour trying to solve each problem beforehand. If your group is unable to solve a problem, it is OK to talk to other groups or ask your instructor or TA for hints. You must write up each problem solution **on your own**. If you collaborate with others to solve the problem, please identify your collaborators. If you did not work with anyone, you should write **Collaborators: none**. The following are some examples of behavior that is not acceptable: Copying another person's solutions with or without their knowledge, emailing all or portions of your solution to another person, having another person write any portion of your solutions for you, copying a solution from the Internet with or without acknowledgement of source. Cheating will result in an automatic **F** for the entire course and turning the case over to the appropriate authorities for further disciplinary action. In cases of copying, where it is sometimes difficult to tell who was copying from whom, all students with knowledge of the cheating will be penalized except in rare circumstances. If in doubt as to whether a collaboration is cheating it is your responsibility to ask your instructor in advance.

Travels:

In the case of foreseeable travels for the instructor, the class will be notified ahead of time and the lectures will be pre-recorded and uploaded onto Canvas.

SYLLABUS LANGUAGE PROVIDED BY UNM (COVID-19 Related)

COVID-19 Health and Awareness

UNM is a mask friendly, but not a mask required, community. If you are experiencing COVID-19 symptoms, please do not come to class. If you have a positive COVID-19 test, please stay home for five days and isolate yourself from others, per the Centers for Disease Control (CDC) guidelines. UNM faculty and staff know that these are challenging times. Please let me, an advisor, or another UNM staff member know that you need support so that we can connect you to the right resources. Please be aware that UNM will publish information on websites and email about any changes to our public health status and community response.

Student Support for COVID-19:

Student Health and Counseling (SHAC) at (505) 277-3136. If you are having active respiratory symptoms (e.g., fever, cough, sore throat, etc.) AND need testing for COVID- 19; OR If you recently tested positive and may need oral treatment, call SHAC.

LoboRESPECT Advocacy Center (505) 277-2911 can offer help with contacting faculty and managing challenges that impact your UNM experience.

STANDARD REQUIRED UNM SYLLABUS LANGUAGE (not COVID-19 related)

Accommodations: UNM is committed to providing equitable access to learning opportunities for students with documented disabilities. As your instructor, it is my objective to facilitate an inclusive classroom setting, in which students have full access and opportunity to participate. To engage in a confidential conversation about the process for requesting reasonable accommodations for this class and/or program, please contact Accessibility Resource Center at arcsrvs@unm.edu or by phone at 505-277-3506.

Support: Contact the instructor via email or during office/check-in hours and contact Accessibility Resource Center (<https://arc.unm.edu/>) at arcsrvs@unm.edu (505) 277-3506.

Credit-hour statement This is a three credit-hour course. Class meets for three 50-minute sessions of direct instruction for fifteen weeks during the semester. Please plan for a minimum of six hours of out-of-class work (or homework, study, assignment completion, and class preparation) each week.

Center for Academic Program Support (CAPS): This is a three credit-hour course. Class meets for three 50-minute sessions of direct instruction for fifteen weeks during the Fall 2022 semester. Please plan for a minimum of six hours of out-of-class work (or homework, study, assignment completion, and class preparation) each week.

Support: Center for Academic Program Support (CAPS). Many students have found that time management workshops can help them meet their goals (consult (CAPS) website under "services").

Title IX: In an effort to meet obligations under Title IX, UNM faculty, Teaching Assistants, and Graduate Assistants are considered "responsible employees." 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>

Support: LoboRESPECT Advocacy Center and the support services listed on its website, the Women's Resource Center and the LGBTQ Resource Center all offer confidential services and reporting.

Land Acknowledgement: Founded in 1889, the University of New Mexico sits on the traditional homelands of the Pueblo of Sandia. The original peoples of New Mexico Pueblo, Navajo, and Apache since time immemorial, have deep connections to the land and have made significant contributions to the broader community statewide. We honor the land itself and those who remain stewards of this land throughout the generations and also acknowledge our committed relationship to Indigenous peoples. We gratefully recognize our history.

Resource: Division for Equity and Inclusion. Citizenship and/or Immigration Status: All students are welcome in this class regardless of citizenship, residency, or immigration status. Your professor will respect your privacy if you choose to disclose your status. As for all students in the class, family emergency-related absences are normally excused with reasonable notice to the professor, as noted in the attendance guidelines above. UNM as an institution has made a core commitment to the success of all our students, including members of our undocumented community. The Administration's welcome is found on our website: <http://undocumented.unm.edu/>.

Respectful and Responsible Learning: We all have shared responsibility for ensuring that learning occurs safely and equitably. UNM has important policies to preserve and protect the academic community, especially policies on student grievances (Faculty Handbook D175 and D176), academic dishonesty (FH D100), and respectful campus (FH CO9). These are in the Student Pathfinder (<https://pathfinder.unm.edu>) and the Faculty Handbook (<https://handbook.unm.edu>). Please ask for help in understanding and avoiding plagiarism or academic dishonesty, which can both have very serious consequences.

Support: Center for Academic Program Support (CAPS). Many students have found that time management workshops can help them meet their goals (consult (CAPS) website under "services").

Connecting to Campus and Finding Support: UNM has many resources and centers to help you thrive, including opportunities to get involved, mental health resources, academic support

including tutoring, resource centers for people like you, free food at Lobo Food Pantry, and jobs on campus. Your advisor, staff at the resource centers and Dean of Students, and I can help you find the right opportunities for you.