Applied and industrial algebra (Math 127), Spring 2019
San José State University
MacQuarrie Hall 423, MW noon–1:15pm (Sec. 01, code 25688)

Instructor: Dr. Tim Hsu (pronounced "shoe").

Office and phone: MacQuarrie Hall 419, (408)924-5071.

Office hours: MW 9:00–10:30; M 2:00-3:00; W 1:30-2:30. Current schedule available at:
 http://www.math.sjsu.edu/∼hsu/courses/generic/sched.pdf

E-mail: tim.hsu@sjsu.edu. I can be reached by e-mail at many times of the day, and will
 try to respond within 24 hours.

Course web page: http://www.timhsu.net/courses/127/

Text: Course notes available online.

Grading: Your semester grade consists of: Homework 20%; Exam 1 14%; Exams 2 and 3
 18% each; Final exam 30%.

Goals of this course. In this course, we define applied math to be math that you can
use to make money in the real world (e.g., in the tech industry). Specifically, our choice of
topics is aimed at teaching you ideas that you can go out and use in industry.

So in contrast with Math 128A, which teaches you to do proofs in abstract algebra,
the goal of this class is to teach you enough of the ideas of abstract algebra to be able
to understand practical applications like encryption, error-correcting communication, and
the Fast Fourier Transform. In short, the goal is for you not to become a *producer* of
abstract algebra (i.e., someone who does proofs and comes up with new theorems), but an
enlightened consumer of abstract algebra: someone who can use the tools of abstract algebra
for practical purposes without having to treat them as a black box.

No proof or abstract algebra experience is expected. Although the homework
will occasionally involve proof, and will deal with abstract algebra, you do not need to
have experience with either proofs or abstract algebra, and Math 108 and Math 128A are
certainly not prerequisites. In fact, if this class succeeds and you become an enlightened
consumer of abstract algebra, my not-so-secret hope is that you will then go on to take
Math 108 and Math 128A, to become an even more enlightened consumer of algebra, or
maybe even a producer of algebra.

Class is a cell-free zone. Please turn off all cellphones before you get to class.

Homework. Homework will be due roughly once a week, with an outline of problem
set 01 due **Wed Jan 30**, and the final version due **Mon Feb 04**. For more details on
homework content and the process of doing homework (including outlines and revisions),
see the handout on homework.

Specific homework assignments will be determined as the term progresses. For a complete
list of all homework assigned to date, and downloadable versions of almost all handouts from
class, you can always check the course web page.

Problem sessions. In addition to my regular office hours, starting on **Fri Feb 01**,
I will also hold problem sessions for this class every **Fri**, from **10:30am–12:30pm**, in
MacQuarrie Hall 425. These sessions are completely optional, and you should be fine
without them, but the time is available for those who can make it.

Checkins. Because we only meet on two days each week, it is *crucial* that you do
substantial independent work in the long gap between Wed and Mon. To that end, I will
reqire you to "check in" with me each week in that time period. See the handout on check-ins
for more details.

Exams. We will discuss this topic in more detail before the first exam, but briefly, the
material on exams will mostly resemble the material from the homework. All exams are
closed-book.

Calculators. You will *not* be allowed to use calculators for *any* in-class exams. The numerical work on exams will be simple enough that a calculator shouldn't be necessary, and even if you make numerical mistakes, you won't lose a lot of points on them.

On the other hand, you are encouraged to use a calculator or computer to help with the homework, especially when the homework involves a fair amount of arithmetic.

Exam dates. The dates of our three in-class exams and final exam are found on the syllabus below. In particular, the final exam will be held on **Fri May 17**, from **9:45am–noon**. Please make sure that you are still on campus at that time (e.g., don't buy a plane ticket that leaves town on May 16).

How to add this course. If you are not registered for this course, and you would like to add it, you must first put a full effort into completing all of the work in the course. Second, if you are a graduating senior, you need to produce documentation to verify that.

I'll make a waiting list, which you get on by filling out and turning in the information form for the course. I'll give out add codes starting **Tue Feb 05** (or possibly earlier), mainly based on completeness of homework, and as long as there is room, I will continue to give out add codes until add date (**Tue Feb 12**). Note, however, that graduating seniors have the highest priority, and that Open University students have the lowest priority.

How to drop this course. Until **Tue Feb 05**, you can drop at `my.sjsu.edu`. Nothing will appear on your transcript, but please let me know if you drop.

To drop after Tue Feb 05, you must go to the student services center and submit a Course Drop form to the Director of Academic Services. Dropping under these circumstances is only allowed for "serious and compelling reasons" (course catalog). A low grade is not a serious and compelling reason.

Academic integrity. Your commitment to learning (as shown by your enrollment at SJSU) and SJSU's Academic Integrity Policy require you to be honest in all of your academic course work. Faculty are required to report all infractions to the Office of Student Conduct and Ethical Development. See: `www.sjsu.edu/studentconduct`

Disabilities. If you need course adaptations or accommodations due to a disability, or if you need special arrangements in case the building must be evacuated, please make an appointment with me as soon as possible, or see me during office hours. Presidential Directive 97-03 requires that students with disabilities register with the Accessible Education Center (formerly the Disability Resources Center) to establish a record of their disability.

(Very) tentative syllabus

Date	Reading		Date	Reading
Mon Jan 28	Euclidean Alg		Mon Apr 01	**SPRING BREAK**
Wed Jan 30	Euclidean Alg		Wed Apr 03	**NO CLASSES**
Mon Feb 04	Euclidean Alg		Mon Apr 08	Cyclic codes
Wed Feb 06	Polynomials		Wed Apr 10	Cyclic codes
Mon Feb 11	Polynomials		Mon Apr 15	Burst codes
Wed Feb 13	Polynomials		Wed Apr 17	Burst codes
Mon Feb 18	Rings		Mon Apr 22	Burst codes
Wed Feb 20	Rings		Wed Apr 24	DFT
Mon Feb 25	**Exam 1**		Mon Apr 29	Abelian groups
Wed Feb 27	Linear alg		Wed May 01	**Exam 3**
Mon Mar 04	Linear alg		Mon May 06	FFT
Wed Mar 06	Linear alg		Wed May 08	FFT
Mon Mar 11	Codes		Mon May 13	FFT
Wed Mar 13	Codes			
Mon Mar 18	Codes		**Fri May 17**	**Final exam,**
Wed Mar 20	Ideals			**9:45am–noon**
Mon Mar 25	Ideals			
Wed Mar 27	**Exam 2**			