

Math and  
stats at SJSU

Tim Hsu

Math/stats  
careers

The major

"Flavors" and  
requirements

Some tips

Getting  
support

# Welcome to the mathematics and statistics major at SJSU

Tim Hsu

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# You've heard about teaching math. . .

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- A **bachelor's degree** in math, plus additional training (single-subject credential) qualifies you to teach high school math. Our integrated program does it all in 4 years!
- A **master's degree** (2 extra years) in math qualifies you to teach at a community college (or work as a lecturer at a 4-year college or university).
- A **doctoral degree** (5–7 extra years) qualifies you to be a professor at a 4-year college or university.

# ... but there are many other careers in math/stats

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Recent SJSU grads have gotten jobs in many different non-teaching careers.

- Bachelor's graduates

- Investment advising (WaMu/Chase)
- QA Engineer (Cohesity)
- Programming (Sun Microsystems/Oracle)
- Senior analyst (Salesforce)
- Tech (Zoox)

- Master's graduates

- Anti-satellite technology (Lockheed-Martin)
- Aviation analysis (ATAC Corp.)
- Sports broadcasting technology (Sportvision)
- Algorithm-based computing (Google)

And Ph.D.'s are in demand in the fields of cryptography and operations research (optimization), among other highly technical fields.

# Hot fields in the mathematical sciences

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## ■ Statistics

- Any company that deals with data needs statisticians
- **Actuaries** use statistics to help determine pricing for insurance companies, etc.
- **“Artificial intelligence”** and **“machine learning”** and **“data mining”** are really statistics and optimization.

## ■ Mathematical biology

- **Bioinformaticians** apply statistics and discrete mathematics to molecular biology
- **Epidemiologists** apply mathematical models and statistics to study disease spread and treatment effectiveness

# Types of bachelor's degrees in math/stats

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There are three main “flavors” of bachelor's degrees in math/stats at SJSU:

- B.A. Mathematics
  - Sub-flavor: Preparation for Secondary Teaching
- B.S. Applied Math, with two choices of track:
  - Applied math: E.g., diff eqs and continuous models
  - Discrete math: E.g., networks, applied algebra, discrete models
- B.S. Statistics (**new!**)

(Students interested in business, economics, or being an actuary often choose the BS Statistics.)

# Requirements, in sequence

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**Fact:** You need to do some advance planning to make sure you graduate on time with your math/stats degree.

Why does it take so long? Several reasons, but mainly, a math/stats degree has 3 stages that can't be skipped, and shouldn't be shortened:

- **Calculus sequence:** 3 semesters, can't be shortened except by summer classes.
- **Understanding what math is:** 2 semesters; very difficult to do faster.
- **Specialized classes:** 3 semesters; terrible idea to do them faster.

Assuming you start from Calculus II! If starting from precalc, add one semester or summer classes.

# Comparing the different “flavors” of the math degree

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- In the **BA Math** degree (including teacher prep), core classes involve proofs and theory.
- In the **BS Applied Math (Applied track)** degree, core classes are often about applying math to solve numerical problems coming from science, engineering, and technology.
- In the **BS Applied Math (Discrete track)** degree, core classes are something like the math/stats version of a CS degree.
- In the **BS Statistics** degree, core classes are in statistics (analyzing data with uncertainty/error in mind).

# Finish your GE classes slowly

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**The worst advice commonly given:** To “get all of your GEs done first.” The problem with that is:

- You have nothing but math/stats classes left to take. GE classes are valuable later on as sanity maintenance.
- You end up taking lots of math/stats classes each semester. Often leads to failing one or more and delaying graduation.

**An exception:** If English is not your native language, or if you know you don't enjoy writing, start working on getting ENGR 100W (the writing class for math/stats majors) done as soon as you can.



# Don't take too many math/stats classes

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## DO NOT TAKE MORE THAN 2–3 MATH/STATS CLASSES EACH SEMESTER

Taking more usually leads to failing grades and **delayed graduation**, or at least lowering your GPA. Make sure your grades are as good as possible — a good GPA helps to get a better job.

# Allow lots of time for upper-division classes

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For hard upper-division classes (e.g., proof classes), you will need to put in 10, 12, or more hours of work outside of class to do your best.

Think ahead: Where will you find this time?

- Unplug your video games, quit your scrapbooking hobby, stop wasting time on the internet.
- If you can afford it, cut down your hours on non-school jobs.

# Find community

You don't have to do it alone: Get to know other math/stats majors and profs.

- Talk to other people in your classes. Form study groups! Join (or start) the class Discord!
- Join the **Math Club**.
- Leave MW 3:00–4:15pm free on your schedule, and come to math/stats colloquium and other events at those times. **Colloquium** is: Free food and current developments and research in the mathematical sciences.
- Go to your professors' office hours — make sure the prof knows your name.
- **MH439** is now a math/stats majors common area where y'all can socialize, talk math/stats, get help with classes, play board games, . . . .

# Where can you get support?

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Wondering what classes to take? Stumped by proofs or by numerical linear algebra?

- Talk to your fellow majors that you meet in classes.
- Go to professors' office hours and bug us — that's why we make the big money, heh.
- Talk to your advisor! (You're required to meet with your advisor once per semester, but you can always ask us questions anytime. . . .)

Welcome and enjoy your time here!