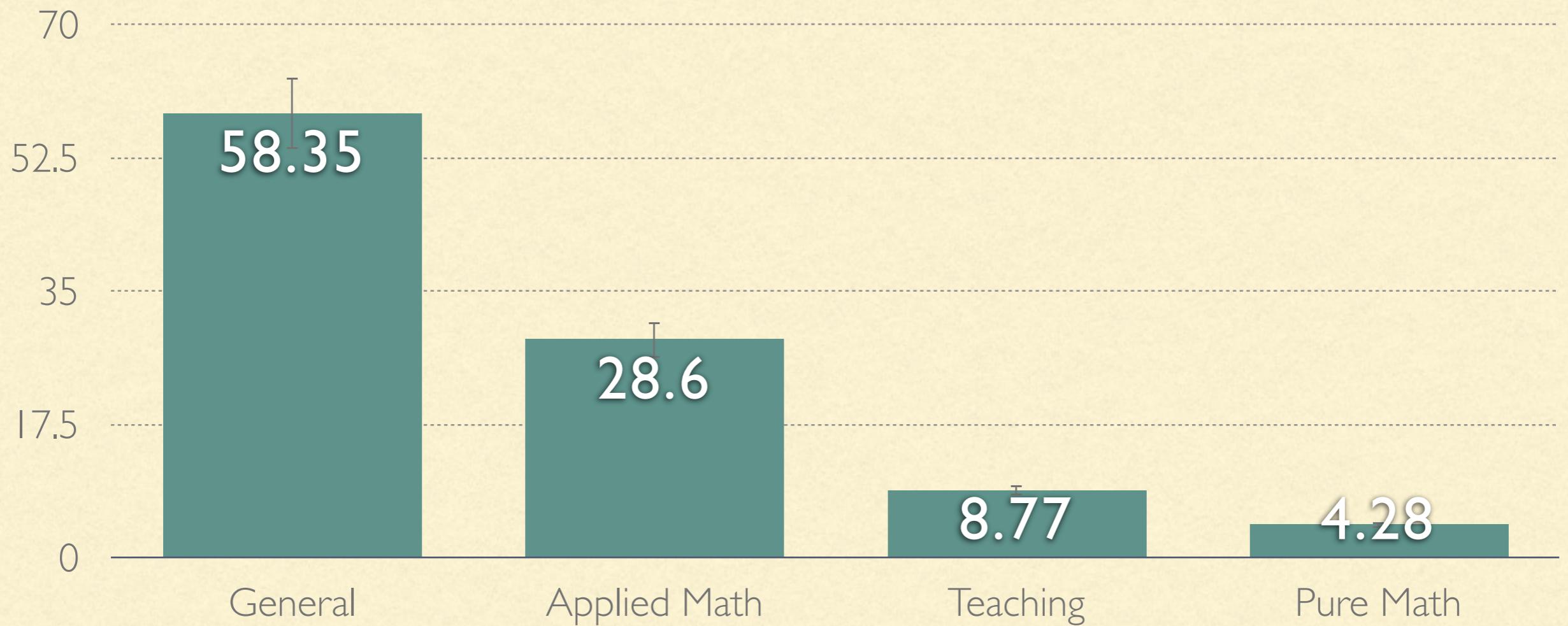

DEPARTMENT OF MATHEMATICS

APPLIED MATHEMATICS

CONCENTRATIONS



WHAT IS APPLIED MATH?

Modeling or analysis of physical or real-world phenomena using mathematics.

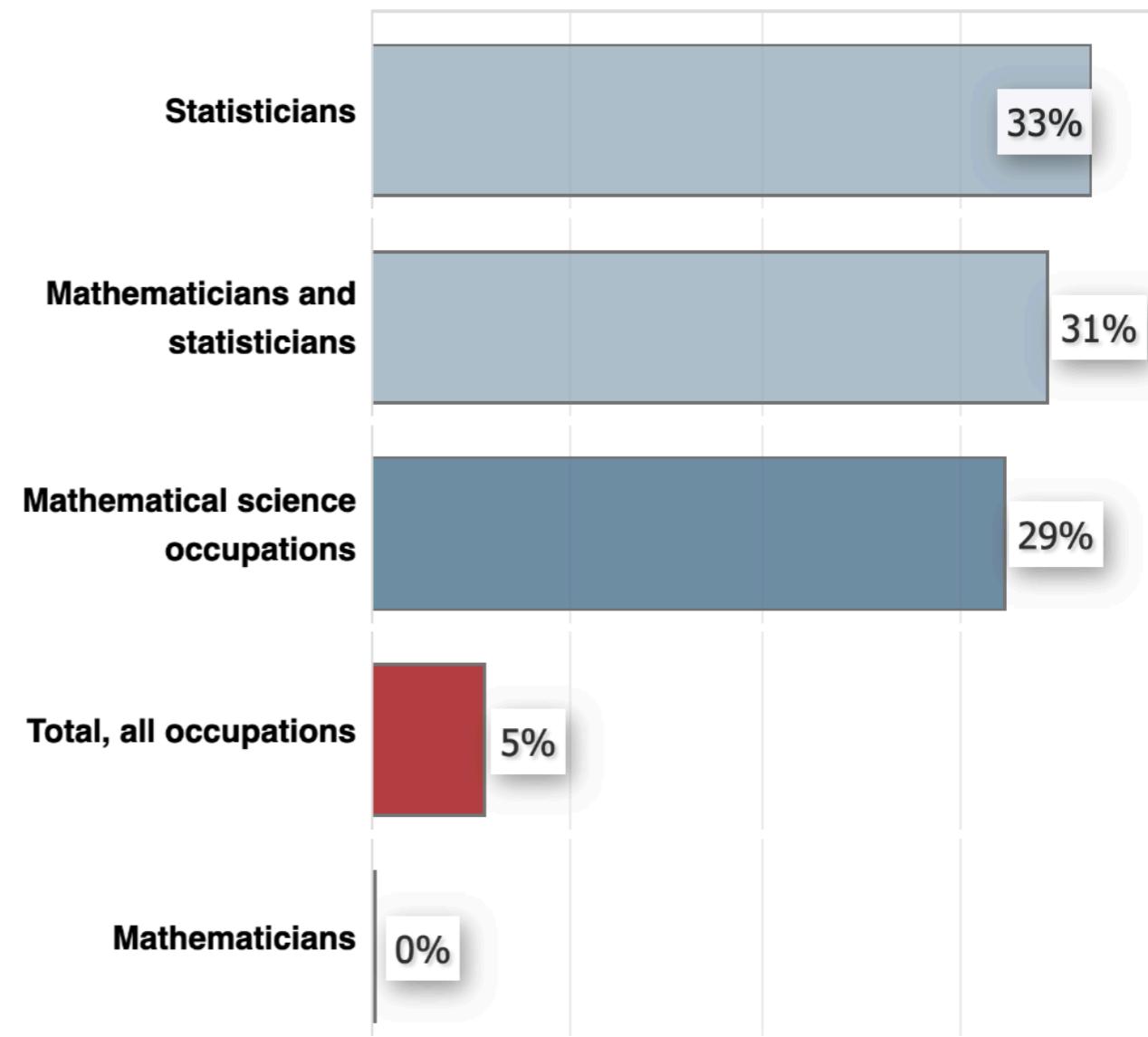
- Computational Mathematics/Digital Imaging/Numerical Analysis
 - Finance/Economics
 - Data Analysis/Big Data/Machine Learning/Optimization
 - Systems Biology/Mathematical Biology/Epidemiology
 - Fluid Dynamics/Climatology/Geophysics/Dynamical Systems
-

JOB GROWTH

- US Bureau of Labor Predicts a 31% growth in employment for mathematicians and statisticians

Mathematicians and Statisticians

Percent change in employment, projected 2021-31



Note: All Occupations includes all occupations in the U.S. Economy.

Source: U.S. Bureau of Labor Statistics, Employment Projections program

INDUSTRIES FOR APPLIED MATH

- **Finance:** Developing financial models, analyzing financial data, and creating risk management strategies.
 - **Technology:** Designing algorithms, creating computer programs, and solving complex technical problems.
 - **Science:** Working in research and development for scientific organizations, using mathematical skills to analyze data and develop theories.
 - **Government:** Analyzing data and solving problems related to national security, public policy, and related issues.
 - **Healthcare:** Interpreting patient data and developing algorithms to improve quality of care.
 - **Business:** Identifying trends and patterns in data and producing corresponding reports that clearly communicate how certain factors might impact a company.
-

SAMPLE JOBS/SALARIES

- **Financial Analyst** (working with market data or investment strategies): Bachelors and Masters preferred. \$91,580 (Average yearly salary)
- **Mathematician** (analyzing data, developing algorithms, modeling complex systems): Bachelors/Masters/Ph.D. \$108,100
- **Actuary** (risk analysis for insurance or financial industries): Bachelors and sometimes Masters. \$105,900
- **Computer Programmer** (coding and algorithm development): Bachelors and sometimes Masters. \$93,000
- **Operations Research Analyst** (math methods to solve complex business problems and optimize decision making. Bachelors and often Masters. \$82,360

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Students & Education

Programs & Initiatives

Thinking of a Career in the Mathematical Sciences?

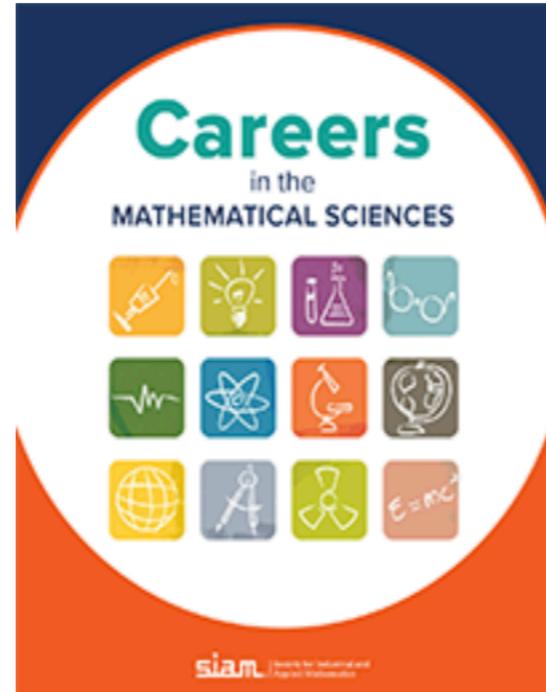
[Nominations Open for SIAM Major Prizes](#)[READ MORE](#)

Thinking of a Career in the Mathematical Sciences?

Careers Brochure

Applied mathematics and computational and data science impact nearly every facet of our lives.

Careers in these areas rarely carry the title of “mathematician” and are often coupled with a specialty or area of research interest. In this guide, you will find answers to questions about careers in applied mathematics and computational and data science, and profiles of professionals working in a variety of environments for which a strong background in mathematics is necessary for success.

[Download](#)[Purchase](#)

CORE APPLIED CLASSES

- Math 304 - Vector Analysis
 - Math 344 - Linear Analysis 2
 - Math 350 - Mathematical Software or CSC/CPE 202
 - Math 408 - Complex Analysis I
 - Math 413 - Intro to Analysis 2
 - Math 416 - Diff Eqns 2 or Math 418 - PDEs
 - Math 451- Numerical Analysis I
 - Stat 301 or Stat 305
-

APPLIED TRACKS

- Physics
 - Statistics
 - Computer Science
 - Mechanical Engineering
 - Economics
-

CAPSTONE EXPERIENCE

- Math 459 Senior Seminar (4 units, one quarter)
 - Math 460 Senior Seminar — Applied (4 units, one quarter)
 - Math 461/462 Senior Project (2 units, 2 quarters)
-

GRADUATE SCHOOL - MASTERS

- Typically a 2 year program
 - monster.com listed Mathematics and Statistics as the 7th best-paying master's degree
 - U.S News listed graduate degrees in mathematics as one of the “45 Graduate Degree Jobs that Pay More Than \$100K” based on salary and job growth.
 - Top employers: Software Development, Aerospace and Defense, Finance, Health Care, Research and Development
 - Top job titles: Data Scientist, Data Analyst, Software Engineer
-

GRADUATE SCHOOL - PH.D.

- Typically a 5-6 year program
 - Vast majority go on to academia
 - For those that go on to industry:
 - Top employers: Business, Finance/Insurance, Research/Development
 - Top job titles: Data Scientist, Engineer, Analyst
-

WHAT TO KNOW

From surveys of employers and employees, the most important experiences/skill sets were:

- Computational Skills
 - Modeling Experience
 - Internships
-

MATH MASTERS AT CAL POLY

- Typically a two year program
 - Blended masters program available to our math majors!
 - We have an Applied Math Specialization! Hybrid curriculum of pure and applied topics.
 - Opportunities include: summer internships, thesis research, summer research, teaching, grading, tutoring.
 - Applied Math Masters Coordinator: Dr. Joyce Lin ([jlin46](#))
 - Traditional Math Masters Coordinator: Dr. Anton Kaul ([akaul](#))
-



Specialization in Applied Mathematics

Required Course Descriptions

[Math 476](#) Special Topics in Applied Mathematics

[Math 502](#) Methods of Applied Mathematics 2

[Math 520](#) Applied Analysis I

[Math 521](#) Applied Analysis II

[Math 530](#) Discrete Mathematics with Applications I

[Math 531](#) Discrete Mathematics with Applications II

[Math 548](#) Transition to Graduate Mathematics

[Math 550](#) Measure Theory (requires first passing the Analysis Preliminary Exam)

[Math 561](#) Graduate Algebra (requires first passing the Algebra Preliminary Exam)



- [Graduate Program](#)
- [Course & Exam Requirements](#)
- [Faculty Research Interests](#)
- [Graduate Student Opportunities](#)
- [FAQ](#)
- [Credential Program](#)
- [Minor in Mathematics](#)
- [Course Outlines](#)



Typical Curriculum Flowchart

| | FALL | WINTER | SPRING |
|--------|---|--|--|
| YEAR 1 | <ul style="list-style-type: none">• Math 530• Math 548 | <ul style="list-style-type: none">• Math 531• Math 502 | <ul style="list-style-type: none">• Math 476• Elective* |
| YEAR 2 | <ul style="list-style-type: none">• Math 550• Math 561 | <ul style="list-style-type: none">• Math 520• Elective* | <ul style="list-style-type: none">• Math 521• Elective* |

*Mathematical Sciences Electives

Nine additional units at the 400 or 500 level as approved by the Graduate Committee (Math 599 Thesis class is three units each)

WEBSITE UPDATE

[Submit Update Request](#)

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-

APPLIED MATH PROFESSORS



Stathis Charalampidis



Dave Camp



Colleen Kirk



Joyce Lin



Paul Choboter



Elena Dimitrova



Dana Paquin