


# Career Paths in Applied Mathematics

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# What can I do with an applied math degree?

- ▶ Mathematics and computational science are utilized in almost every discipline of science, engineering, industry, and technology.
- ▶ What kinds of problems might you work on?
- ▶ While careers in mathematics may differ widely by discipline and job title, one thing remains constant among them — **problem solving**.

**Source:**

<https://www.siam.org/students-education/programs-initiatives/thinking-of-a-career-in-applied-mathematics>

## HERE ARE SOME EXAMPLES OF ORGANIZATIONS THAT HIRE MATHEMATICIANS AND COMPUTATIONAL SCIENTISTS:

- ACADEMIC INSTITUTIONS AND RESEARCH INSTITUTES
- AEROSPACE AND TRANSPORTATION EQUIPMENT MANUFACTURERS OR SERVICE PROVIDERS
- ANALYTICS AND FORECASTING ORGANIZATIONS
- CHEMICAL OR PHARMACEUTICAL MANUFACTURERS
- COMMUNICATIONS SERVICES PROVIDERS
- COMPUTER INFORMATION AND SOFTWARE FIRMS; ESTABLISHED OR START-UPS
- CONSUMER PRODUCTS COMPANIES
- ENERGY SYSTEMS FIRMS
- ELECTRONICS AND COMPUTER MANUFACTURERS
- ENGINEERING RESEARCH ORGANIZATIONS
- FINANCIAL SERVICE AND INVESTMENT MANAGEMENT FIRMS
- GOVERNMENT LABS, RESEARCH OFFICES AND AGENCIES
- INSURANCE COMPANIES
- MEDICAL DEVICE COMPANIES
- PRODUCERS OF PETROLEUM AND PETROLEUM PRODUCTS

## POSSIBLE JOB TITLES FOR PEOPLE WITH APPLIED MATH & COMPUTATIONAL SCIENCE BACKGROUNDS AND EDUCATION:

- Actuary
- Analyst
- Analytics Consultant
- Analytics Manager
- Applied Mathematics Researcher
- Associate Editor
- Biostatistician
- Business Analyst
- Business Intelligence Developer
- Claims Specialist
- Consultant
- Cryptanalyst
- Cryptographer
- Data Analyst
- Data Engineer
- Data Operations Associate
- Data Processing Specialist
- Data Scientist
- Director of Math Tutorial Curriculum
- Engineer
- Forecast Analyst
- Functional Analyst
- Game designer/slot game designer/game mathematician
- Geolocation Engineer
- Global Pricing Analyst
- Guidance and Navigation Engineer
- Informatics Scientist
- Information Analyst
- Investment Analytics Quant
- Manager
- Math Curriculum Coach
- Math Curriculum Consultant
- Mathematician
- Modeler
- Modeling Engineer
- Operations Researcher
- Operations Support Specialist
- Pharmacokineticist
- PK/PD Modeler
- Planner
- Principal Scientist
- Product Manager
- Program Manager
- Programmer
- Project Manager
- Quality Systems and Compliance Manager
- Quantitative Analyst
- Quantitative Developer
- Quantitative Pharmacologist
- Quantitative Researcher
- Quantitative Scientist
- Quantitative Software Engineer
- Reporting Engineer
- Research and Development Engineer
- Research Analyst
- Researcher
- Research Scientist
- Risk Analyst
- Risk Strategist
- Scientist
- Simulation Engineer
- Software Engineer
- Staff Scientist
- Statistician
- Strategist
- Supply Chain Analyst
- Systems Engineer
- Technical Staff
- Tutor



# Some applications to work on...

- ▶ How can an **airline** use smarter scheduling to reduce costs of aircraft parking and engine maintenance? Or smarter pricing to maximize profit?
- ▶ How can **automotive and aircraft companies** test performance, safety, and ergonomics, while at the same time lowering the cost of construction and testing prototypes?
- ▶ A **pharmaceutical company** wants to search a very large database of proteins to find one that is similar in shape / activity to one they have discovered. What's the most efficient way to do so?
- ▶ How do we use major advances in computing power to incorporate knowledge about interactions between the **oceans, the atmosphere and living ecosystems** into models used to predict long-term change?
- ▶ How might **disease spread** in populated areas in the event of a bioterrorism event, and how would it be contained?
- ▶ Can we measure sentiment change as a result of **social media** shares, likes and comments?
- ▶ How can you allocate an **investment** among various financial instruments to meet a risk/reward trade-off?



# Some applications to work on...

- Can mathematical models be coupled with efficient computational implementations to obtain practical, low-cost simulations to guide **computer chip design and manufacture**?
- How can genome sequencing analysis help in making clinical decisions based on a **personalized medicine** approach?
- How can mathematics improve rating prediction performance of **e-commerce systems** and help enhance the consumer experience based on their past purchases, behavior and interests?
- Can we provide insight to **coastal communities** about future sea level rise and the risk and likelihood of effects of climate related events on their communities?
- How can you mathematically model the **spread of a forest fire** depending on weather, ground cover and type of trees?
- How do you design a **robotic hand** to grip a coin and drop it in a slot?





# Former students & friends with applied math degrees have jobs at:

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- Academic institutions
  - High school math teacher
  - NSA (National Security Agency)
  - Google
  - Las Alamos National Lab
  - FDA (US Food and Drug Administration)
  - USDA (US Dept of Agriculture)
  - Pfizer; Norvartis
  - Wall street Jobs
  - Credit One Bank, Las Vegas
  - Medical Information Bureau, NYC
  - NV Dept of Health and Human Services
  - Nevada Central Cancer Registry (NCCR)
  - NV Energy
  - Volvo IT
  - Stitch Fix
  - LinkedIn



# TechWise Program at UNR

- A diversity, equity, and inclusion program offered by TalentSprint and supported by Google.
- An **18-month virtual program** offering **technical training, 100% financial assistance** (\$5000 stipend) and **1:1 Google mentorship** to students from UNR and 4 other community and undergraduate colleges across the USA. It aims to empower students to become world-class entry-level software engineers / data scientists by the time they graduate college and complete the virtual program.
- Organized and run by:
  - **TalentSprint:** Faculty and mentors help you build the required technical skills
  - **Google:** 1:1 mentoring from Google helps you evolve as a professional
  - **UNR:** Supports you throughout the program
- 1<sup>st</sup> cohort started March 2022: 30 students from UNR (120 total across 5 colleges)
- 2<sup>nd</sup> cohort started March 2023: 27 students from UNR (120 total across 8 colleges)



# TechWise Program at UNR

- Why is Google supporting the program?
- Google is committed to creating a diverse and inclusive workforce. They recognize the importance of building inclusive technology cultures that foster engagement, collaboration, and a sense of belonging, and hence Google is supporting TechWise.
- If students successfully complete the program, they will be offered an interview with Google. Also competitive for jobs in other leading tech companies.
- Internship opportunities available as well.





# TechWise Program at UNR

- Structure of program:
    - 3 courses, each 3 months long
    - 3 group projects, each 2-3 months long, oral presentations/demonstrations
  - Course 1: Computational thinking, Good programming practice, Python
  - Course 2: Web basics, JS, CSS, DOM, DBMS basics, DSA basics, Analysis of performance
  - Course 3: Issues of scale, Advanced data structures and algorithms
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