

# MATHEMATICS

## What can I do with this major?

### AREAS

#### MATHEMATICS/COMPUTATIONAL SCIENCE

##### Research:

- Theoretical
- Applied

##### Mathematical specialties:

- Modeling and simulation
- Numerical methods and analysis
- Statistics and probability
- Engineering analysis
- Differential equations
- Operations research
- Discrete mathematics

##### Functional areas:

- Accounting and finance
- Computer programming
- Computer systems analysis
- Operations
- Sales and marketing
- Management
- Actuarial science
- Engineering
- Analysis and control of processes
- Optimization and scheduling of resources

### EMPLOYERS

State government agencies

##### Federal government:

- National Security Agency
- Department of Defense
- National Aeronautics and Space Administration
- National Oceanic and Atmospheric Administration
- Social Security Administration
- Department of Homeland Security
- Department of Energy
- Military
- Government laboratories

Scientific research and development services

Consulting firms

Computer services companies and software publishers

Electronics and computer manufacturers

Engineering firms

Insurance companies

Financial services firms

Chemical and pharmaceutical companies

Aerospace and transportation equipment manufacturers

Airlines and airports

Communications firms

Energy companies and petroleum producers

International government agencies

Nonprofit organizations (e.g., American Institute of Mathematics, Mathematical Association of America, American Mathematical Society)

### STRATEGIES

To work in applied mathematics, consider earning a double major in a scientific or technical area. Many students with a bachelor's or master's degree in math work in related fields (e.g. computer science, engineering, science, or economics).

Some entry-level jobs in industry and government may be available at the bachelor's level.

Develop substantial knowledge of computer programming and software administration. Seek experience with relevant software packages.

Learn to work well with a team of people from diverse backgrounds and differing technical specialties.

Gain experience in an area of interest through internships or research programs (e.g. those sponsored by National Science Foundation).

Maintain a high grade point average and secure strong faculty recommendations to gain graduate school admittance.

Plan to earn a doctoral degree to work as a mathematician.

Research government hiring processes and internship opportunities if the public sector appeals to you.

AREAS	EMPLOYERS	STRATEGIES
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**EDUCATION**

Teaching  
 Research  
 Higher education administration

Public and private K-12 schools  
 Universities and colleges

Develop excellent communication skills, verbal and written.  
 Gain experience working with age group of interest through volunteering and tutoring.  
 Acquire appropriate state teacher certification for K-12 teaching opportunities. Math majors may be eligible for alternative certification programs in certain public school systems.  
 Private schools may hire candidates with degrees in mathematics who don't hold certification.  
 Earn a doctoral degree in math to teach at four-year institutions. A master's degree may be sufficient for two-year colleges.  
 Maintain a high grade point average and secure strong faculty recommendations to prepare for graduate school. Assist a professor with research.  
 Seek appropriate graduate degree to enter higher education administration. Gain experience on campus in student leadership roles such as Resident Assistant or Orientation Leader.

**COMPUTERS**

Programming  
 Systems development  
 Systems analysis  
 Software development  
 Network administration  
 Web administration  
 Technical support  
 Training

Examples of areas of businesses:  
 Computer companies:  
 Computer services companies  
 Software publishers  
 Internet related companies  
 Consulting firms  
 Businesses that hire computer competence:  
 Financial & insurance companies  
 Manufacturers  
 Telecommunications companies  
 Retailers  
 Healthcare organizations  
 Hotels and restaurants  
 Entertainment companies  
 Environmental management firms

Develop substantial knowledge of computer programming and software administration.  
 Take classes to earn relevant certifications.  
 Gain related experience through internships, part-time positions, or summer jobs.  
 Work with campus information technology department or volunteer to develop/maintain the website for a student organization.  
 Learn effective listening and verbal communication skills and how to work well with end users.  
 Stay attuned with developments in computer technology.  
 Consider earning an advanced degree in computer science or management information systems, especially if interested in management.

AREAS	EMPLOYERS	STRATEGIES
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**COMPUTERS CONTINUED**

**INSURANCE**

Actuarial science  
 Risk management/assessment  
 Loss management/control  
 Underwriting

Education institutions  
 City, state, and federal government

Insurance carriers  
 Insurance agents and brokers  
 Professional, scientific, and technical consulting firms  
 Government agencies

Exhibit patience and creativity for problem-solving computer or software issues.  
 To advance into management, learn to effectively manage multiple projects, meet deadlines, and communicate effectively.  
 Obtain experience with public speaking/teaching and learn to develop curriculums for training focused positions.

Take additional courses in statistics and finance. Complete an internship with an insurance agency to gain relevant experience.  
 Actuarial science is a good career path for those who want to extensively use math on the job. Areas such as claims, underwriting, and risk management are less math-intensive. Talk to professionals in the industry to learn more about various positions.  
 Develop strong communication skills, as many positions require interaction with others and the ability to explain information clearly and concisely.  
 Learn how to use statistical analysis software and various computer programming languages.  
 Plan to take a series of actuarial exams to gain licensure from either the Society of Actuaries or the Casualty Actuarial Society. The type of insurance you deal with will determine which path to pursue. Most actuaries take these exams while working full-time, and the process takes several years.  
 More than half of actuaries work for insurance carriers.

**AREAS**

**EMPLOYERS**

**STRATEGIES**

**BANKING AND FINANCE**

Corporate and consumer credit analysis  
Commercial lending  
Trust management  
Capital services and mergers and acquisitions  
Mortgage loans  
Originations and packaging  
Branch management  
Operations  
Cash management  
Credit scoring and risk management  
Private banking  
Financial analysis  
Investment banking

Commercial banks  
Credit unions  
Savings and loan associations  
Savings banks  
Mortgage banks  
Captive finance companies  
Regulatory agencies:  
    Federal Reserve  
    Federal Deposit Insurance Corporation (FDIC)  
    Office of the Comptroller of the Currency (OCC)  
    Office of Thrift Supervision (OTS)  
Brokerage firms

Double major or minor in business to build a solid background in marketing, finance, and accounting.  
Gain experience through part-time, summer, or internship positions in a financial services firm.  
Develop strong interpersonal and communication skills in order to work well with a diverse clientele.  
Serve as the financial officer or treasurer of a student organization.  
Plan to earn a graduate business degree to enter investment banking.  
Be geographically flexible when job searching.

**OTHER BUSINESS AREAS**

Buying  
Purchasing  
Sales:  
    Industrial sales  
    Consumer product sales  
    Financial services sales  
    Services sales  
    Advertising sales  
    E-commerce  
    Customer service  
    Sales management: district, regional, and corporate

Retailers  
Wholesalers  
Hospitals  
Universities and schools  
Local, state, and federal government  
For-profit and nonprofit organizations  
Product and service organizations  
Manufacturers  
Financial companies  
Insurance companies  
Print and electronic media outlets  
Software and technology companies  
Internet companies

Obtain experience through part-time, summer, or internship positions.  
Seek leadership positions in campus organizations.  
Become highly motivated and well-organized.  
Develop strong analytical skills and the ability to communicate effectively with a wide range of people. Take additional courses in interpersonal communication and public speaking.  
To prepare for a buying position, work in a retail store to learn about the industry.  
Research certification options within the purchasing field.  
For sales:  
    Work for the campus newspaper, directory, or radio station selling advertisements.  
    Learn to work well under pressure and to be comfortable in a competitive environment.  
    Prepare to work independently and to be self-motivated.  
    Plan to work irregular and/or long hours.

**GENERAL INFORMATION**

- Math can be found in almost every sector of the world of work. Students majoring in math should consider if they want to use math skills directly or indirectly in the work place. This may determine the types of experiences and further education necessary to prepare for area of interest.
- Math backgrounds may work in a variety of settings and jobs such as analyst, researcher/research assistant, technical consultant, computer scientist, or systems engineer.
- Math majors develop many transferable skills including critical thinking, problem diagnosis and solving, computer skills, and quantitative skills. Other important skills to develop include good reasoning, persistence, and communication, both verbal and written.
- Seek relevant experiences through internships, part-time, and summer positions.
- Supplement curriculum with courses in business, economics, computers, or statistics for increased opportunities.
- Consider earning a graduate degree in a related area such as statistics, computer science, science, business, engineering, or other integrated degrees. Some examples of specialties that utilize a background in math combined with study in another field include bioinformatics, computer animation and digital imaging, climatology, or financial mathematics.
- Join relevant organizations and seek leadership roles. Learn to work well in a team environment.
- Conduct informational interviews with professionals in areas of interest to enhance knowledge and make contacts.
- Stay informed of new developments and current trends in the field.