

Are you considering a Math Major?

There are numerous reasons to major in math. You like math, you're good at it... Studying mathematics at any level develops critical thinking and reasoning skills and the ability to solve problems in a variety of situations. Even if you're not sure about your career choice, math is a bridge to careers in medicine, law, and business. In fact, in an 18 year longitudinal study by the National Institute of Education, comparing the scores of 550,000 college students taking the Law School Admission Test (LSAT) and the Graduate Management Admission Test (GMAT), math majors scored substantially higher than the average on both tests. The table below shows data from this study as it appeared in *The Chronicle of Higher Education*. The entries show the percentage by which the mean score of test takers from specific undergraduate majors differs from the mean score of all test takers.

Major	LSAT	GMAT
Mathematics	+12.8%	+13.3%
Arts and Music	-0.05%	-1.2%
Biology	+4.0%	+3.3%
Business	-4.5%	-0.8%
Chemistry	+7.6%	+7.5%
Economics	+9.6%	+7.3%
Education	-8.7%	-4.2%
English	+5.6%	+4.1%
History	+2.9%	+4.6%
Political Science	-1.6%	+0.06%
Psychology	+0.9%	+0.8%
Sociology	-7.0%	-5.0%

How is the Job Market for a Math Major?

The chart below, extracted from the National Association of Colleges and Employers 2005 salary survey, provides a comparison of average starting salaries for students by undergraduate major.

Major	Salary Differential (compared to English major)
Mathematics	+37.7%
Biology	+0.8%
Chemistry	+22.8%
Economics	+33.5%
English	0%
Foreign Languages	+5.1%
History	+0.9%
Political Science	+4.9%
Psychology	-4.4%
Sociology	-0.3%

In addition to higher pay, a math major's employment promises higher levels of job satisfaction. [JobsRated.com](http://www.jobsrated.com) ranks 200 jobs according to environment, income, outlook, physical demands, and stress. Based on [these criteria](#), "Mathematician" takes the number one spot on the list -- outranking jobs in medicine, finance, engineering, and law (for a more complete ranking, see the chart on the next page).

What are the degree offerings in Mathematics at UNA?

Undergraduate degrees

- ⤴ Bachelor of Science in Mathematics
- ⤴ Bachelor of Arts in Mathematics
- ⤴ Minor in Mathematics
- ⤴ Bachelor of Science in Education (for students planning to teach mathematics)

Graduate degrees

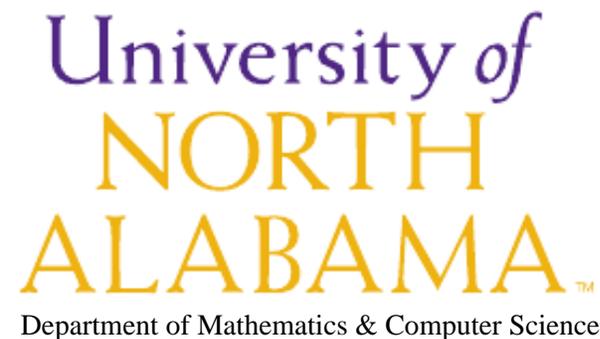
- ⤴ Master of Arts in Education (with Mathematics as a major field)

Detailed information about the program of study for mathematics is available online in the 2011-2012 catalog.

<http://www.una.edu/catalog/>

If you want to learn more about getting a major in mathematics, come by the math department and talk to us or visit our web page.

<http://www.una.edu/math/>



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Job Satisfaction Ranking

JobsRated.com

<u>JOB</u>	<u>SATISFACTION RANKING</u>
Mathematician	1
Actuary	2
Statistician	3
Biologist	4
Software Engineer	5
Economist	11
Physicist	13
Computer Programmer	18
Aerospace Engineer	33
Nuclear Engineer	41
Chemist	57
Electrical Engineer	62
Federal Judge	69
Civil Engineer	71
Mechanical Engineer	74
Attorney	82
Stockbroker	84
Senior Corporate Executive	88
Dentist	101
Orthodontist	103
General Practice Physician	142
Surgeon	156

Jobs for Math Majors

Studying Mathematics develops logical thinking and the ability to think abstractly, formulate and solve problems, analyze data, and create mathematical models. These skills are in high demand by employers for careers in a wide variety of fields.

The list of careers a math major is prepared for includes statistics, actuarial sciences, mathematical modeling, and cryptography, mathematics education, as well as for graduate school leading to a research career in engineering, mathematics or statistics. A strong background in mathematics is also necessary for research in many areas of computer science and social science. Below is a more detailed description of a few of these fields.

Mathematical Modeling

In mathematical modeling, you write down equations to describe how a real world system behaves. The "system" might be drawn from many different fields. For example, most financial companies hire mathematicians to study financial models and make predictions based on statistical evidence. In physics or engineering you might be interested in how heat is dissipated through the heat shield of a space vehicle. In physiology you might want to apply the laws of fluid dynamics to describe how blood flows in vessels and what happens when blood pressure is

increased. In economics you might want to predict how a strike in the automotive industry will affect other parts of the economy.

Building a mathematical model is usually a multi-stage process: you study the problem, write down the equations, use them to predict what will happen, see if your predictions agree with experiments, modify your equations if necessary, make new predictions, and so on.

The model may be solved exactly (you may be able to write down a function that tells you the values you want to know), or you may have to approximate the values because they can't be found exactly, or you may have to simulate the model on a computer -- i.e., let the computer imitate the real system to see what happens as you change some of the parameters.

As usual, the power of mathematics comes from its ability to handle general abstract problems and then to apply these general methods to an enormous variety of problems.

Finance

Wall Street has become a major employer of math majors. Trying to match the outstanding success of multibillionaire Differential Geometer, [James Simons](#) (founder of the Renaissance Technologies Corporation and the top hedge fund, the Medallion Fund), many investment and financial firms consider mathematicians prized hires.

Statistics

The proliferation of statistics in everything ranging from business to government has induced many organizations to seek math majors. Statisticians use surveys -- for example, opinion polls -- to predict the patterns of behavior of large groups based on relatively small samples. They ask questions such as: How can we be sure that what we predict from our small sample is true of the population being sampled? Probability theory provides the theoretical foundation for statistics.

One business with an extreme interest in statistics is insurance. The (highly paid) professionals responsible for computing insurance rates are specialist statisticians called **actuaries**.

Cryptography

One area that is particularly "hot" these days is cryptography - the making and breaking of secret codes. Not only the [CIA](#), [NSA](#), and other spy agencies are devotees. Numerous businesses also require cryptography. For example, the cable TV companies encode their signals, forcing the viewer to rent their decoding devices in order to turn the signals back into a television picture. Banks also employ cryptography in order to protect the privacy and integrity of their transactions. Number theory is the branch of pure mathematics which provides the theoretical underpinnings for much of the recent progress in cryptography.

Biotech

Recent breakthroughs in the study of DNA and proteins have generated a great deal of interest in mathematical biology. Many biotech companies hire mathematics majors because of the high (and growing) mathematical content of the field.

Teaching

If you would like to give back to your community and serve children, teaching mathematics at the secondary school level can be very rewarding. Every year, roughly half of the positions advertised for secondary school teachers in math go unfilled. Schools are desperate for qualified math majors.

Graduate School

At the end of your undergraduate years, you may have fallen in love with the beauty of mathematics and want to learn more. You may wish to go to graduate school in mathematics or a related field (e.g., operation research, economics, computer science, etc.). In graduate school, students typically get paid (albeit not much) to pursue a Master or PhD degree. With a graduate degree, you may find a teaching or research job in academia, or a leadership position in industry.