MATHEMATICS

A mathematics degree has many practical applications in the world of work, both directly and indirectly. But, as in every field, the primary need is for college-educated individuals who are able to solve problems, who are also flexible thinkers with the ability to effectively articulate their thoughts orally and in writing. What this means to the job-seeking graduate is that college/life-learned skills can be used in a variety of fields, thus allowing him or her to use work ethics, transferable skills, personal goals and specific interests to dictate a choice of career/job rather than an academic major. As in most fields, graduates in mathematics with demonstrated positive work ethics, honesty and integrity, willingness to be team players while able to work independently AND who possess strong academic records, regardless of major, are the persons likely to be the first hired. Some jobs are available only to those with more advanced degrees and in some, a willingness to relocate is important.

TYPICAL SKILLS LIST FOR MATHEMATICS MAJORS

Problem solving
Numerical computation
Critical thinking
Logical thinking
Efficient Systemizing skills
Testing skills
Organizational skills
Ability to analyze & interpret data
Computer literacy
Team skills
Advanced quantitative skills

TYPICAL JOBS LIST

The following are actual job titles of people who have graduated with an undergraduate degree in Mathematics although some of these positions may require education beyond a bachelors.

ACCOUNTANT
This person keeps an accurate and on-going written account of financial transactions for businesses, institutions and/or individuals.

ACTUARY
This person is a statistician who computes insurance risks and premiums.

AEROSPACE TECHNOLOGIST
This person works as a support person in the field of aerospace science field to assist with the design, development and support of processes related to space flight.

ASTRONOMER
This person would study the positions, distributions, motion and compositions of celestial bodies.

AUDITOR
This person examines and verifies financial accounts. He or she may work for a financial institution, a business, local, state and government agencies. He or she may also freelance as an independent consultant.

BANKING/ CREDIT/ INVESTMENT MANAGER
Works in department responsible for optimum financial operation of business organization. Manages cash flows and borrows on bank lines of credit to cover shortages. Manages relations with financial institutions such as commercial banks. Often engages in risk management activities involving foreign exchange rates, interest rates etc. Great majority work in medium- to large-sized companies.

BIOMETRICIAN/ BIOSTATICISTICIAN
This individual applies statistics to biological and medical data. He or she would be employed within the research or medical community or in service of local, state and federal entities.

CARTOGRAPHER
This person would be employed by a publisher to make maps.

COMMODITY MANAGER
This person may be employed by agricultural or mining entities to oversee the trade and/or distribution of transportable goods.

COMPUTER ENGINEER
Researches, designs, develops, tests and assists in the manufacture of computer hardware (computer chips, circuit boards, modems, printers, embedded systems, optical character recognition devices, display devices etc.), software (programs for operating systems, network distribution, compilers), other computer-related equipment, computer components or complete computer systems.

COMPUTER PROGRAMMER
This person creates and installs specific computer programs to meet client requirements and teaches the client how to use them. He or she may work for a hardware/software company or be an independent contractor.

COMPENSATION/ BENEFITS ADMINISTRATOR
This person would usually work within the Human Resources industry to evaluate options and develop benefit packages for employers. He or she would also oversee claims, appeals and adjustments.

COMPUTER PROGRAMMER
This person would control the various activities related to the operation of the firm's mainframe computer or its client-server network, as well as all of the peripheral equipment. Major users of EDP systems are banks, public utilities, transportation and insurance companies, large manufacturing firms, and government and educational establishments. Computer equipment manufacturers and independent computer service firms also operate computer centers on a fee or contract basis.

CONSUMER LOAN/ CREDIT OFFICER
This person would be employed by financial institutions and would determine credit worthiness of clients and degrees of risk to the institution before processing applications for loans.

COST ESTIMATOR
This person could be employed in any number of areas such as construction, engineering, manufacturing and even institutional to research and project the cost of a specific project.

CRYPTOLOGIST/ CRYPTOGRAPHER
This individual would use mathematics patterns to develop and decipher numerical and alphabet-based codes.

COMPUTER SCIENTIST
This person is a scientist who specializes in the theory of computation and design of computers.

DATABASE MANAGER
This person oversees input and dissemination of data to and from a computer database.

DATA PROCESSING MANAGER

This person would be in charge of creating databases and entering the initial information into the database.

DEMOGRAPHER
This person would be involved in research to identify and develop profiles of selected sections of the population for various purposes. He or she may be employed by local, state or federal governments, banks, marketing companies, sociologist, pharmaceutical companies and the like.

ECONOMETRICIAN
This person would use mathematical and statistical applications to the study of economics. He or she might work for local, state and federal government entities.

EMPLOYEE RELATIONS SPECIALIST
This person would serve as a liaison between employer and employee to determine and resolve issues in the workplace. He may work for a specific company or as an independent negotiator.

ENGINEER
This person applies scientific engineering principles to specific practical ends in the design and building of complex, large-scale structures such as bridges, roadways, and buildings. He or she may also design products requiring complex mechanical and electrical functions such as machinery or airplanes.

ENGINEERING LAB TECHNICIAN
This person would be employed to assist an engineer in the design and construction of specific projects.

ENVIRONMENTAL TECHNOLOGIST
This person would collect, collate and examine data from a variety of environmental situations to be acted upon by an environmentalist.

ESTATE PLANNER
This person works with individuals or families to develop a plan to meet financial obligations and plan for resolution of an estate after death. He or she may be employed by financial institutions, insurance companies or freelance.

FINANCIAL CONSULTANT
This person is usually employed by financial institutions like banks and savings and loan companies or insurance companies to work with their clients to develop sound financial management strategies such as meeting current obligations, saving for retirement, making investments and evaluating insurance needs. He or she may also freelance.

HYDRO GEOLOGIST
This person is a water scientist who works to identify and develop fresh water supplies for developing countries. Concerned with current circulation of deep ground water, discharge outlets and quality of ground water.

INVENTORY CONTROL MANAGER
This person uses special programs and methods of calculation to control a company's inventory (amount on hand of raw materials, parts, packaging and finished products). Optimizes costs by keeping inventories at level necessary to fill orders--small enough to avoid excess costs for storage and related expenses yet large enough to allow for transportation economics; accurate forecasting is essential for success.

INVESTMENT BANKER

This person works with a team of financial professionals including researcher to study and predict economic trends and particular companies or industries that affect the growth of that market sector.

MARKET RESEARCH ANALYST
This person analyzes existing and potential product/service markets. Collects and interprets data on established and prospective customers and on competitors. Prepares data for use by marketing and sales management in pricing, marketing programs and future product development. Investigates methods and costs of distribution and advertising. Prepares reports that interpret market conditions and potentials.

MATHEMTICIAN
This person solves or directs the solution of problems using higher mathematics. Pure or theoretical mathematicians conduct research to discover, create and develop new mathematical principles or new relationships between existing principles. Applied mathematicians develop and use mathematical principles and methods (including algorithms) to find solutions to practical problems in science, business, engineering, industry etc.

METEROLOGIST
This person studies atmospheric phenomenon to predict the weather. He or she may be employed by a local, state or federal agency or the news media.

OPERATIONS RESEARCH ANALYST
This person uses mathematical modeling and other scientific methods to help improve the effectiveness of operations, system design, decisions and management. Develops scientifically based information that gives insight and guides decision-making. Many assist management with problem solving, policy setting, planning, performance measurement, or control.

NETWORK PROGRAMMER
This person would assess need within a group of clients, develop a network of computers and programs to meet that need and maintain the integrity of the network.

PHYSICIST
This person is a scientist who studies, works with the science of matter and energy, the interactions between them and properties or processes associated with them.

POLLUTION METEROLOGIST
This individual studies the effect of pollution on atmospheric phenomenon.

PRODUCTION MANAGER
This person is employed in a manufacturing setting and works to develop and maintain a production schedule for the product.

PSYCHOMETRICIAN
This person work within the branch of psychology that deals with the testing and measuring of psychological variables such as intelligence.

PUBLIC HEALTH STATISTICIAN
Investigates, understands and applies methods for reasoning under uncertainty. Designs and implements studies to collect, analyze and interpret numerical data pertaining to a particular subject area. Advises on sampling techniques, data collection methods, survey design/methodology and methods of data analysis to make valid interpretations possible.

SYSTEMS ANALYST
Designs scientific, engineering and business systems through the use of analytic, diagramming and documentation tools such as HIPO charts, logic diagrams, decision trees, pseudo code and

CASE (Computer Assisted Software Engineering) tools. Analyzes problems and devises information-based solutions.

TECHNICAL SUPPORT REPRESENTATIVE
Acts as liaison and primary contact between a company and customers who have bought its products or services. Handles customers' inquiries; attempts to resolve any problems to their satisfaction in order to keep and increase their business. Has extensive, specialized knowledge of the company's services or products and applications.

TECHNICAL WRITER
Creates instructional/reference materials for users of technical and scientific products, especially for the computer, telecommunications, and consumer electronics industries. Materials include manuals, online help systems, online documentation, screen messages and prompts.

HIRING ORGANIZATIONS

PROFESSIONAL ASSOCIATION/ORGANIZATION WEBSITES

American Mathematical Society http://www.ams.org

Association of Women in Math www.awm-math.org/ads.html

National Council of Teachers of Mathematics http://www.nctm.org

American Statistical Association http://www.amstat.org

Mathematical Association of America http://www.maa.org

Society for Industrial and Applied Mathematics http://www.siam.org

Society of Actuaries http://11www.soa.org/

IEEE Computer Society http://www.computer.org/pubs/computer/career/career.htm

Intelligent Information Systems http://www2.renewal-iis.com

Microsoft http://www.microsoft.com/ms.htm

SAS http://www.sas.com

US Census Bureau http://www.census.gov/hrd/www.index.html

Computing Research Association http://cra.org

WEBSITES: JOB INFO

Developers.Net - Great jobs & career information for developers. Over 30,000 jobs in a searchable database on this site! http://www.developers.net

American Mathematical Society undergraduate resources http://www.ams.org/employment

Math Jobs http://math-jobs.com/us

The National Security Agency www.nsa.gov/programs/employ/index.html

Professional Opportunities www.siam.org/profops/profops.htm

Jobs for Mathematics www.mathjobs.org/jobs

Jobs in Computational Fluid Dynamics www.cfd-online.com

NC State Government Research & Statistics http://www.osp.state.nc.us/jobs

MonsterTRAK http://www.monstertrak.com

WEBSITES: CAREER INFO

Cool Math: careers in math http://www.coolmath.com/careers.htm

Careers in math http://www.cln.org/themes/careers_math.html

Occupational Outlook Handbook http://stats.bls.gov/oco/ocos043.htm

Career Resources www.awm-math.org

Math Archives http://archives.math.utk.edu/undergraduates.html#careers

Women in NASA http://quest.arc.nasa.gov/women/intro.html

Mathematics of Cartography http://math.rice.edu/~lanius/pres/map/mapcar.html

PLUS Magazine (math journal) - great descriptions of job options http://www.pass.maths.org

Careers in Science & Engineering– A Student Planning Guide to Grad School and Beyond http://www.nap.edu/readingroom/books/careers/

*Career Converter http://6steps.monster.com/step1/careerconverter

*Career Fields http://career.berkeley.edu/Infolab/CareerFields.stm

*UTK http://career.utk.edu/majors/majors/asp

*Resources http://guide.symplicity.com/resources/profession_index_a_z.php

*http://www.bw.edu/career/programs/wcidwami

*KSU http://www.ksu.edu/acic/career/careerbymajor.html

*NCSU http://www.ncsu/edu/career/students/major.htm

*Delaware http://www.udel.edu/CSC/mrk.html

MISCELLANEOUS WEBSITES

Mathematics on the Web http://www.ams.org/mathweb/

INTERNSHIP WEBSITES

Internship Search Resources

US Department of Energy Career Intern Program www.ma.mbe.doe.gov/pers/cip/index.htm

Internships at NASA www.nasajobs.nasa.gov/jobs/student_opportunities/temporary_stay.htm

Internships and Co-ops www.ams.org/employment/internships.html

4work Internships http://www.4work.com/

Internship Hotspots www.uncwil.edu/stuaff/career/internhotspots.htm

UNIVERSITY OF LOUISVILLE DEPARTMENT OF MATHEMATICS

Undergraduate Study

The Mathematics Department offers a wide range of undergraduate courses. General education courses in mathematics provide a basis in rigorous thinking and an understanding of mathematical skills and reasoning that are vital for success in other university courses and in post-college life. Higher level mathematics courses develop the mathematical background that is becoming increasingly necessary for study in diverse areas such as business, medicine, philosophy, psychology, the physical sciences and engineering. Course work for mathematics majors provide them with an integrated view of mathematics, its history and current activity, and the opportunity to participate in the challenge and excitement of mathematical discovery.

Mathematics majors are continually provided with a view of the interplay between the applied and the abstract. Upon graduation a typical major can expect to have well-developed writing and critical skills, as well as familiarity and confidence with several aspects of computer usage. The technical, theoretical and communication skills that the mathematics major develops are highly valued. Recent graduates currently hold positions in the community as actuaries, lawyers, statistians, program analysts, and teachers. The mathematics degree is a very solid foundation for further study in graduate programs. Mathematics majors are currently enrolled in graduate programs in mathematics, and in graduate programs in computer science, engineering, law, mathematics, medicine, physics, and public administration.

The Department of Mathematics also offers the Master of Arts in Mathematics.

Facilities

The University of Louisville library system has holdings of about 1.2 million volumes and has subscriptions to over 200 mathematics journals.

The University of Louisville Computer Center is equipped with a variety of computers ranging from microcomputer labs and UNIX-based RISC workstations to a large IBM mainframe. Students use these computer facilities as an aid in learning such mathematics as statistics and numerical analysis. The Department has two microcomputer labs and many scattered workstations connected to the University TCP/IP network and the Internet.

Scholarships, Awards, and Fellowships

A detailed description of scholarships can be found in this pdf document:
http://www.math.louisville.edu/undergrad/scholarships.pdf
Click on the titles below to view an application in pdf format.
Robert J. Bickel Scholarship An annual scholarship to a promising student on the basis of merit.
Petty Scholarship Provides financial assistance to a student who is majoring in mathematics.
Mary Ruth Brookover Award Presented annually to an outstanding senior majoring in mathematics
Joe McSweeny Scholarships Two annual scholarships to promising undergraduates on the basis of merit.
Gems Fellowships
For more information, visit the GEMS website:
http://www.math.louisville.edu/gems/