Bachelor of Arts or Bachelor of Science
Mathematics

INFORMATION

Mathematicians use math theory, computational techniques, algorithms and computer technology to solve problems in various fields, including basic sciences, engineering, computer science, economics, business, finance and social sciences. The study of math is divided into pure (theoretical) mathematics, which involves discovering new mathematical principles and relationships and applied mathematics, which involves the use of mathematics to solve practical problems. Statistics is a category in applied mathematics that involves data analysis.

CAREER OPPORTUNITIES

Advances in technology have led to an increased demand for workers with knowledge of mathematics.
Math graduates work in a broad range of positions in business, education and government. The most common areas of employment for mathematicians are in computer science and software development, engineering, operations research, actuarial analysis, financial analysis, statistics and teaching.
The federal government employs many mathematicians. Bachelor graduates work in entry-level jobs in government, as software developers and programmers (with computer science experience), as actuarial analysts (with actuarial concentration), as budget and financial analysts, as secondary teachers (licensure required) and other areas.
A master's degree in math/statistics or a related field is required for research associates, statisticians and operations research positions, which involve finding solutions in organizations for managing money, materials, inventory, scheduling, pricing, facilities, people and other issues. A doctoral (Ph.D.) degree is required for high-level research positions in industry, government and medical facilities, in which math modeling/statistics is needed for solutions to complex problems. A Ph.D. is also required for university faculty positions, which involve teaching and directing research.

PROGRAMS

BACHELOR OF SCIENCE (B.S) IN MATHEMATICS and a ***BACHELOR OF ARTS (B.A.) IN MATHEMATICS***: The math requirements for the B.S. and B.A. degrees are identical; the programs differ only in the number of science credits. Students who wish to concentrate in the sciences should pursue a B.S. degree. The following tracks are available in both degrees.

General Track: Offers flexibility in choosing courses in the mathematics major.

Actuarial Track: Involves the assembling and analysis of data to estimate probability and risk, used in the insurance industry.

Applied Mathematics Track: Involves the use of theories and techniques, such as mathematical modeling and computational methods, to formulate and solve practical problems.

Pure Mathematics Track: Involves the development of new principles and previously unknown relationships between existing principles of mathematics.

Statistics Track: Involves the application of mathematical principles to the collection, analysis, presentation and interpretation of numerical data.

Second Major for Computer Science Students Track: Contact a Computer Information Science advisor and a Mathematics advisor for further information.

Secondary Teacher Licensure Track: Available within both the B.S. and B.A. programs for students interested in high school teaching. Contact a mathematics advisor for the math/science course requirements and the Education Student Service Center for the education course requirements.

An **Honors Program** is available for students and includes a special topics seminar and honors project in place of the traditional senior seminar. Engaged learning experiences (for all programs) include research with nationally recognized Cleveland State University faculty, project presentation by students at math conferences, and co-op and internships. Most courses are taught by doctoral faculty. A mathematics minor requires 24 credit hours of specified math courses, and a statistics minor can be completed in 19 credit hours. Student organizations include the Math Club and Pi Mu Epsilon. Some of the courses are offered in the evenings. All students receive individual advising.

For more information, contact:
College of Science
Department of Mathematics
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Cleveland, OH 44115-2214
Phone: (216) 687-4680
Website:
http://www.csuohio.edu/sciences/dept/mathematics/index.html

Bachelor of Arts or Bachelor of Science
Mathematics

Requirements of the College of Science: A minimum of 128 credit hours is required for a Bachelor of Science (B.S.) degree or a Bachelor of Arts (B.A.) degree, of which 42 semester credit hours must be earned in 300 and/or 400 level courses. Introduction to University Life (1 credit hour) is required for all newly admitted freshmen (not required for transfer students).
General Education Requirements: All degree-seeking students are required to meet general education requirements. Students are responsible for ensuring that courses chosen satisfy these requirements and are encouraged to consult with their academic advisors. A comprehensive description of the requirements is available online at http://www.csuohio.edu/academic/gened.

Required Courses for the B.A. and B.S. Degrees (credit hours in parentheses):

EACH of the Following Math Courses:
MTH 181 Calculus I (4)*
MTH 182 Calculus II (4)*
MTH 396 Junior Seminar (2) *Taken during junior year*
MTH 496 Senior Project (4) *Taken during senior year*

THREE Math Courses from the Following:**
MTH 220 Discrete Mathematics (4)*
MTH 281 Multivariable Calculus (4)*
MTH 286 Introduction to Differential Equations (4)*
MTH 288 Linear Algebra (4)*

(**Students seeking secondary teaching licensure must take MTH 220, MTH 286, and MTH 288)

300- and 400-Level Math Courses
An additional 20 credits in mathematics courses numbered 300 or above (excluding MTH 326, 327, 328, 329, and 330). Two of these courses must be numbered 400 or above.

Science Course Requirements for Each Degree

B.A.: An additional 11 science credits, distributed in one of or any combination of the following fields: biology, geology, environmental sciences, chemistry, and physics.

B.S.: An additional 24 credits distributed in one of or any combination of the following fields: biology, geology, environmental sciences, chemistry, physics; and computer and information science. These 24 credits must include PHY 241 (or PHY 243) and PHY 242 (or PHY 244). Any CIS courses used to meet this requirement must be courses that satisfy CIS major-field requirements.

Recommended Electives for the Various Tracks:

Actuarial:
MTH 301 Introduction to Applied Mathematics (4)
MTH 323 Statistical Methods (4)
MTH 424 Probability Theory and Applications (4)

Applied Mathematics (Engineering/Physical Science Emphasis):
MTH 301 Introduction to Applied Mathematics (4)
MTH 311 Numerical Analysis (4)
MTH 401 Mathematical Modeling (4)
MTH 434 Differential Geometry (4)
MTH 487 Dynamical Systems (4)

Applied Mathematics (Numerical Computation Emphasis):
MTH 301 Introduction to Applied Mathematics (4)
MTH 311 Numerical Analysis (4)
MTH 487 Dynamical Systems (4)

Pure Mathematics:
MTH 301 Introduction to Applied Mathematics (4)
MTH 358 Abstract Algebra (4)
MTH 381 Analysis (4)
MTH 420 Combinatorial Mathematics (4)
MTH 434 Differential Geometry (4)

Statistics:
MTH 301 Introduction to Applied Mathematics (4)
MTH 323 Statistical Methods (4)
MTH 424 Probability Theory and Applications (4)

Secondary Teacher Licensure:
MTH 301 Introduction to Applied Mathematics (4)
MTH 323 Statistical Methods (4)
MTH 333 Geometry (4)
MTH 358 Abstract Algebra (4)
MTH 401 Mathematical Modeling (4)

**A grade of C or better must be earned in each of MTH 181, 182, 220, 281, 286, and 288. Prospective Mathematics majors should make every effort to complete 100- and 200-level mathematics courses by the end of their sophomore year.*

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Cleveland State University
engaged learning
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