

Mathematics and Statistics: Bachelor of Arts, Bachelor of Science

For information contact the Department of Mathematics and Statistics, 123 Bachelor Hall (513-529-5818).

Two degrees are offered: Bachelor of Arts and Bachelor of Science. For the Bachelor of Science, choose one of three majors: mathematics, statistics, or mathematics and statistics. The A.B. requires all sections of the College of Arts and Science Requirement (CAS), while the B.S. has only the language requirement. Each program has the related hours requirement. All courses taken from the department and applied to your program, and all courses in the 12-hour section of the related hours, should be taken for grades, not credit/no-credit. In the courses taken from the department, your g.p.a. must be at least 2.00. Service courses do not figure into your g.p.a. unless explicitly approved by the department.

Program Requirements: Bachelor of Arts

This program requires at least 19 semester hours in MTH or STA courses numbered 300 or above with at least 16 hours at the 400 level, and must include:

A calculus sequence ending with one of these: [MTH 252](#) Calculus III (4) [MTH 252H](#) Honors Calculus III (4)

One of these: [MTH 222](#) Introduction to Linear Algebra (3) [MTH 222T](#) Introduction to Linear Algebra (Honors) (2)

A course chosen from one of these three lines: [MTH 421](#) Introduction to Abstract Algebra (4) [MTH 441](#) Real Analysis (3) or [MTH 451](#) Introduction to Complex Variables (3) [MTH 491](#) Introduction to Topology (3)

A course chosen from one of these five lines: [MTH 432](#) Optimization (3) [MTH 437](#) Game Theory and Related Topics (3) or [MTH 438](#) Theory and Application of Graphs (3) or [MTH 439](#) Combinatorics (3) [MTH 447](#) Topics in Mathematical Finance (3) [MTH 453](#) Numerical Analysis (3) [STA 401](#) Probability (3)

At least one more course from the eight previous lines. This course must lie on a line different from the previous two choices.

Additional courses that count in the 19-advanced hour requirement are those in the above lists together with [MTH 331](#), [347](#), [410](#), [411](#), 413, [420](#), [422](#), [425](#) (MPC), 435 (MPC), 440, 442, 454, 470, 483, 492; [STA 462](#), [463](#), [466](#), [467](#), [483](#), [484](#), 486.

Students in the Bachelor of Science in Education Integrated Mathematics Program who complete all of [MTH 408](#), [MTH 409](#), and [MTH 482](#) may count three hours toward the 400 level hours required in the AB.

Program Requirements: Bachelor of Science

Three majors, mathematics, statistics, and mathematics and statistics, are offered for this degree. Each requires the following introductory courses:

A calculus sequence ending with one of these: [MTH 252](#) Calculus III (4) [MTH 252H](#) Honors Calculus III (4)

One of these: [MTH 222](#) Introduction to Linear Algebra (3) [MTH 222T](#) Introduction to Linear Algebra (Honors) (2)

Major in Mathematics: Bachelor of Science

This program requires at least 28 semesterhours of MTH and STA courses at the 300 level or above with at least 22 hours at the 400 level.

Theory courses. Both of these: [MTH 421](#) Introduction to Abstract Algebra (4) [MTH 441](#) Real Analysis (3)

At least two of these: [MTH 411](#) Foundations of Geometry (3) [MTH 422](#) Linear Algebra and Fields (4) [MTH 438](#) Theory and Application of Graphs (3) [MTH 442](#) Real Analysis (3) [MTH 451](#) Introduction to Complex Variables (3) [MTH 483](#) Introduction to Mathematical Logic (3) [MTH 486](#) Introduction to Set Theory (3) [MTH 491](#) Introduction to Topology (3)

Applications courses. At least two of these: [MTH 347](#) Differential Equations (3) [MTH 432](#) Optimization (3) [MTH 437](#) Game Theory and Related Topics (3) [MTH 439](#) Combinatorics (3) [MTH 447](#) Topics in Mathematical Finance (3) [MTH 453](#) Numerical Analysis (3)

Electives: Additional courses to complete the 28 required hours may be chosen from lists above or from [MTH 331](#), [410](#), [413](#), [420](#), [425](#) (MPC), [435](#) (MPC), [440](#), [454](#), [470](#), [482](#) (MPC), [492](#), [STA 401](#), [462](#). At most, two of the 28 hours may be from 430 or independent studies.

Major in Statistics: Bachelor of Science

The program requires at least 29 hours of STA courses at the 300 level or above.

Statistics courses. All of these: [STA 301](#) Applied Statistics (3) [STA 401](#) Probability (3) [STA 402](#) Statistical Programming (3) [STA 462](#) Inferential Statistics (3) [STA 463](#) Regression Analysis (4) [STA 466](#) Experimental Design Methods (4)

At least three of these: [STA 333](#) Nonparametric Statistics (3) [STA 365](#) Statistical Quality Control (3) [STA 432](#) Survey Sampling in Business (3) [STA 467](#) Multivariate Analysis (3) [STA 475](#) Data Analysis Practicum (MPC) (3) [STA 483](#) Analysis of Forecasting Systems (3) [STA 484](#) Analysis of Categorical Data (3)

Note: Students with previous credit for [STA 261](#) may not take [STA 301](#) and must take additional hours from the electives list to complete the 29 required hours.

Major in Mathematics and Statistics: Bachelor of Science

The program requires at least 31 semester hours of MTH and STA courses at 300 level or above with at least 22 hours from MTH and STA courses at the 400 level.

Mathematics courses. All of these: [MTH 347](#) Differential Equations (3) [MTH 421](#) Introduction to Abstract Algebra (4) [MTH 441](#) Real Analysis (3) or [MTH 451](#) Introduction to Complex Variables(3)

At least one of these: [MTH 432](#) Optimization (3) [MTH 437](#) Game Theory and Related Topics (3) [MTH 438](#) Theory and Applications of Graphs (3) [MTH 439](#) Combinatorics (3) [MTH 447](#) Topics in Mathematical Finance (3) [MTH 453](#) Numerical Analysis (3)

Statistics courses. All of these: STA 301 Applied Statistics (3) STA 401 Probability (3) STA 463 Regression Analysis (4)

At least one of these: STA 462 Inferential Statistics (3) STA 466 Experimental Design Methods (4)

Electives: Additional courses to complete the 31 required hours from lists above or from MTH 331, 410, 411, 413, 420, 422, 425 (MPC), 435 (MPC), 440, 442, 454, 470, 482 (MPC), 483, 486, 491, 492; STA 402, 467, 475 (MPC), 483, 484. At most, two of the 31 hours may be from 430 or independent studies.

Important Note: Students with previous credit for STA 261 may not take STA 301 and must take additional hours from the electives list to complete the 31 required hours.

Related Hours

A program of related courses is intended to provide the student with opportunities to see and do mathematics or statistics in the context of other disciplines and, perhaps, enhance the student's employment prospects. The departmental requirement is for a program of at least 15 hours. Each program includes:

A computer programming course, CSA 153, 157, 163, 174, or any CSA course with one of these as a prerequisite.

At least 12 semester hours in one subject area with at least six hours at 300 level or above (200 or above in chemistry, physics, engineering, or computer science and systems analysis)

You may elect to design your own program of related courses. Such programs must be approved by the chief departmental adviser *in advance of applying for graduation*. For a list of pre-approved programs of related courses and those that include a thematic sequence, see the chief departmental adviser.

Teacher Licensure

Students who wish to combine teacher licensure with a major in the Department of Mathematics and Statistics should apply for admission to a licensure cohort as outlined in the School of Education, Health and Society chapter. For information, contact the Office of Student Services in the School of Education, Health and Society, 202 McGuffey Hall (513-529-6418).

To earn an A.B. degree in addition to teacher licensure, you must complete the requirements for the Bachelor of Arts degree as stated earlier, while also satisfying your professional education course requirements. As a consequence, the following courses (not all of which apply toward the A.B.) are automatically required to be in your academic program:

These courses must include: MTH 331 Discrete Mathematics (3) MTH 408 Mathematical Problem Solving With Technology (3) MTH 409 Secondary Mathematics from an Advanced Perspective (3) MTH 411 Foundations of Geometry (3) MTH 421 Introduction to Abstract Algebra (4) MTH 482 Great Theorems of Mathematics (3) STA 301 Applied Statistics (3) STA 401 Probability (3)

Two additional courses are required for completion of the A.B. degree. See the A.B. requirements for details about the selection of those courses.

To earn a B.S. degree in addition to teacher licensure, you must complete the requirements for the B.S. in Mathematics or the B.S. in Mathematics and Statistics. Each of these programs requires four or five additional courses. See the B.S. requirements for details about the selection of these courses.