

# Department of Mathematics and Statistics

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**Department Head: Mohsen Razzaghi**

**Associate Director and Graduate Coordinator: Corlis Johnson**

**Undergraduate Coordinator: Len Miller**

**Associate Undergraduate Coordinator for Advising: Robert Banik**

Office: 410 Allen Hall

The Department of Mathematics and Statistics offers a Bachelor of Arts degree and a Bachelor of Science degree. Both degrees are 124 hours. The department also offers undergraduate minors in mathematics and statistics which are described below.

Candidates for the Bachelor of Arts degree are required to complete a minimum of 36 hours of mathematics. Candidates for the Bachelor of Science degree are required to take a minimum of 42 hours of mathematics. Required courses for each degree are listed below. Students must also satisfy the General Education requirements and College Core requirements, including speech, computer literacy and writing requirements.

Mathematics courses below Calculus I (MA 1713), do not count toward a degree in mathematics. Entering freshmen who plan to major in mathematics but do not meet the prerequisites for MA 1713 are encouraged to take the necessary courses during the summer in order to avoid adding one or two semesters to their degree. Otherwise, students who wish to major in mathematics but who do not meet the prerequisites of MA 1713 should join the undeclared major until they are ready to take Calculus I. At that time, they will be assigned an advisor in the Department of Mathematics and Statistics.

For all degree programs, including minors, a student must have an overall C average and a C average in the math classes which count toward the degree. Moreover, students pursuing a B.A. or B.S. degree in mathematics must have at least a GPA of 2.5 in Calculus I-IV, Linear Algebra and Differential Equations (MA 1713, MA 1723, MA 2733, MA 2743, MA 3113 and MA 3253). Students who fail to meet this requirement must withdraw from the B.A. and B.S. degree programs in Mathematics, subject to appeal to the department's undergraduate coordinator.

Regarding graduate study, the Department of Mathematics and Statistics offers a Master of Science in Mathematics, Master of Science in Statistics, and a Doctor of Philosophy in Mathematical Sciences. Major areas of study for the Doctor of Philosophy in Mathematical Sciences include applied and computational mathematics, ordinary and partial differential equations, functional analysis and operator theory, graph theory, geometric combinatorics, topology and statistics. Please see the graduate coordinator for more details.

## B.A. in Mathematics

### General Education and College Requirements

#### English Composition

|            |                            |   |
|------------|----------------------------|---|
| EN 1103    | English Composition I      | 3 |
| or EN 1163 | Accelerated Composition I  |   |
| EN 1113    | English Composition II     | 3 |
| or EN 1173 | Accelerated Composition II |   |

#### Foreign Language

|  |   |
|--|---|
| 3 semesters - one Foreign Language - see advisor | 9 |
|--|---|

#### Humanities

|   |   |
|---|---|
| Literature - see University/A&S Core          | 3 |
| History - see University/A&S Core             | 3 |
| Philosophy - see University/A&S Core          | 3 |
| From at least 2 different areas of Humanities | 9 |

#### Math

|                |   |
|----------------|---|
| See Major Core | 6 |
|----------------|---|

#### Fine Arts

|                      |   |
|----------------------|---|
| See A&S Requirements | 3 |
|----------------------|---|

#### Natural Sciences

|             |                               |   |
|-------------|-------------------------------|---|
| BIO 1134    | Biology I                     | 4 |
| or BIO 1144 | Biology II                    |   |
| AND         |                               |   |
| CH 1213     | Chemistry I                   | 3 |
| CH 1223     | Chemistry II                  | 3 |
| CH 1211     | Investigations in Chemistry I | 1 |

OR

|  |                                 |       |
|--|---------------------------------|-------|
| PH 2213  | Physics I                       |       |
| PH 2223  | Physics II                      |       |
| <b>Social Sciences Electives</b>   |                                 |       |
| Courses must spread over at least 4 disciplines with a max of one Economics and a max of 2 in each remaining discipline; 6 hours need to be from A&S requirements. |                                 | 18    |
| <b>Major Core</b>  |                                 |       |
| Students should check for prerequisites for all courses and consult their advisor.   |                                 |       |
| MA 1713  | Calculus I                      | 3     |
| MA 1723  | Calculus II                     | 3     |
| MA 2733  | Calculus III                    | 3     |
| MA 2743  | Calculus IV                     | 3     |
| MA 3053  | Foundations of Mathematics      | 3     |
| MA 3113  | Introduction to Linear Algebra  | 3     |
| MA 3163  | Introduction to Modern Algebra  | 3     |
| MA 3253  | Differential Equations I        | 3     |
| MA 4633  | Advanced Calculus I             | 3     |
| Math Elective - 3000+  |                                 | 3     |
| Math Elective - 4000   |                                 | 3     |
| <b>Oral Communication Requirement</b>  |                                 |       |
| CO 1003  | Fundamentals of Public Speaking | 3     |
| <b>Writing Requirement</b>   |                                 |       |
| MA 4213  | Senior Seminar in Mathematics   | 3     |
| <b>Computer Literacy</b>   |                                 |       |
| CSE 1233   | Computer Programming with C     | 3     |
| <b>General Electives</b>   |                                 |       |
| Consult advisor  |                                 | 16-28 |
| <b>Total Hours</b>   |                                 | 124   |
| (31 hours must be 3000/4000 from A&S)  |                                 |       |

## B.S. in Mathematics

### General Education and College Requirements

#### English Composition

|            |                            |   |
|------------|----------------------------|---|
| EN 1103    | English Composition I      | 3 |
| or EN 1163 | Accelerated Composition I  |   |
| EN 1113    | English Composition II     | 3 |
| or EN 1173 | Accelerated Composition II |   |

#### Foreign Language

|  |  |   |
|--|--|---|
| 2 semesters - one Foreign Language - see advisor |  | 6 |
|--|--|---|

#### Humanities

|                                      |  |   |
|--------------------------------------|--|---|
| Literature - see University/A&S Core |  | 3 |
| History - see University/A&S Core    |  | 3 |

#### Math

|                |  |   |
|----------------|--|---|
| See Major Core |  | 6 |
|----------------|--|---|

#### Fine Arts

|                      |  |   |
|----------------------|--|---|
| See A&S Requirements |  | 3 |
|----------------------|--|---|

#### Natural Sciences

|                              |  |       |
|------------------------------|--|-------|
| Choose one of three options: |  | 15-18 |
|------------------------------|--|-------|

##### Option 1

|         |             |  |
|---------|-------------|--|
| PH 2213 | Physics I   |  |
| PH 2223 | Physics II  |  |
| PH 2233 | Physics III |  |
| CH 1213 | Chemistry I |  |

|                                   |                               |  |
|-----------------------------------|-------------------------------|--|
| CH 1223                           | Chemistry II                  |  |
| CH 1211                           | Investigations in Chemistry I |  |
| <b>Option 2</b>                   |                               |  |
| PH 2213                           | Physics I                     |  |
| PH 2223                           | Physics II                    |  |
| PH 2233                           | Physics III                   |  |
| PLUS choose two of the following: |                               |  |
| BIO 1134                          | Biology I                     |  |
| BIO 1144                          | Biology II                    |  |
| BIO 3103                          | Genetics I                    |  |
| <b>Option 3</b>                   |                               |  |
| BIO 1134                          | Biology I                     |  |
| BIO 1144                          | Biology II                    |  |
| BIO 3103                          | Genetics I                    |  |
| CH 1213                           | Chemistry I                   |  |
| CH 1223                           | Chemistry II                  |  |
| CH 1211                           | Investigations in Chemistry I |  |

**Social Sciences**

See A&S Requirements 6

**Major Core**

Students should check for prerequisites for all courses and consult their advisor.

|                       |                                |   |
|-----------------------|--------------------------------|---|
| MA 1713               | Calculus I                     | 3 |
| MA 1723               | Calculus II                    | 3 |
| MA 2733               | Calculus III                   | 3 |
| MA 2743               | Calculus IV                    | 3 |
| MA 3053               | Foundations of Mathematics     | 3 |
| MA 3113               | Introduction to Linear Algebra | 3 |
| MA 3163               | Introduction to Modern Algebra | 3 |
| MA 3253               | Differential Equations I       | 3 |
| MA 4313               | Numerical Analysis I           | 3 |
| MA 4633               | Advanced Calculus I            | 3 |
| MA 4643               | Advanced Calculus II           | 3 |
| Math Elective (3000+) |                                | 3 |
| Math Elective (4000)  |                                | 3 |

**Oral Communication Requirement**

|         |                                 |   |
|---------|---------------------------------|---|
| CO 1003 | Fundamentals of Public Speaking | 3 |
|---------|---------------------------------|---|

**Writing Requirement**

|         |                               |   |
|---------|-------------------------------|---|
| MA 4213 | Senior Seminar in Mathematics | 3 |
|---------|-------------------------------|---|

**Computer Literacy**

|          |                             |   |
|----------|-----------------------------|---|
| CSE 1233 | Computer Programming with C | 3 |
|----------|-----------------------------|---|

**General Electives**

|                 |  |       |
|-----------------|--|-------|
| Consult advisor |  | 30-40 |
|-----------------|--|-------|

|                    |  |            |
|--------------------|--|------------|
| <b>Total Hours</b> |  | <b>124</b> |
|--------------------|--|------------|

(31 hours must be 3000/4000 from A&S)

**Math Minor**

A minor in mathematics consists of

|         |                                |   |
|---------|--------------------------------|---|
| MA 1713 | Calculus I                     | 3 |
| MA 1723 | Calculus II                    | 3 |
| MA 2733 | Calculus III                   | 3 |
| MA 2743 | Calculus IV                    | 3 |
| MA 3113 | Introduction to Linear Algebra | 3 |

|  |                          |   |
|--|--------------------------|---|
| MA 3253  | Differential Equations I | 3 |
| One additional math course at the 3000 level and one additional 4000-level math course |                          |   |

## Statistics (ST)

**Major Advisor: Associate Professor Janice DuBien**

Office: 448 Allen Hall

Courses in statistics are designed to satisfy two objectives. The first objective is to provide graduate training for those students wishing to pursue a career as professional statisticians. Both graduate and undergraduate courses are available for this purpose. The second is to provide minors for students from other disciplines. A minor in statistics consists of

|                              |   |   |
|------------------------------|---|---|
| MA /ST 3123                  | Introduction to Statistical Inference     | 3 |
| ST 4111                      | Seminar in Statistical Packages           | 1 |
| ST 4213                      | Nonparametric Methods                     | 3 |
| or ST 4313                   | Introduction to Spatial Statistics        |   |
| Choose one of the following: |   | 3 |
| MA /ST 4523                  | Introduction to Probability               |   |
| MA /ST 4543                  | Introduction to Mathematical Statistics I |   |
| ST 4243                      | Data Analysis I                           | 3 |
| ST 4253                      | Data Analysis II                          | 3 |

Please notice that MA 2743 and MA 3113 are prerequisites for ST 4243 and ST 4253.

Graduate study is offered in the Department of Mathematics and Statistics leading to the degree of Master of Science in Mathematics, Master of Science in Statistics, and a Doctor of Philosophy in Mathematical Sciences. Many applied statistics courses are offered which are suitable for a minor in statistics at the master's or doctoral level. Specific course requirements for the graduate minor in statistics may be obtained from the Graduate Coordinator of the Department of Mathematics and Statistics.

Admission to the master's program in statistics is open to graduates in all disciplines. The program of study is a blend of both statistical theory and statistical methods. In addition, there is ample flexibility in the non-thesis option to allow a graduate student with special interests in an area of statistical application to minor in that particular applied field. The department awards a limited number of teaching assistantships. For further details, consult the Graduate Coordinator of the Department of Mathematics and Statistics.