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# Mathematics BS, Fiscal Mathematics Emphasis

#### **General Education Requirements**

All department majors must satisfy the university and appropriate school or college general education requirements. All mathematics courses may be used to meet the university's general education breadth of study requirement in natural sciences and mathematics.

#### Satisfactory/Unsatisfactory Restrictions

All department majors may not take mathematical sciences or related area courses on a satisfactory/unsatisfactory basis. Students considering graduate study should consult with their advisers about taking work on a satisfactory/unsatisfactory basis.

#### **Degree Requirements**

All courses of the department presented to meet the degree requirements must be completed with a grade of C- or better. At least four courses numbered 3000 or above must be taken in residence. Students must have a 2.0 grade point average in the mathematical sciences courses completed.

Students enrolling in introductory mathematics courses should check the prerequisites to determine if a satisfactory score on the Mathematics Placement Test is necessary. Placement into introductory courses assumes a mastery of two years of high school algebra.

A minimum grade of C- is required to meet the prerequisite requirement for any course except with permission of the department.

Note: Courses that are prerequisites for higher-level courses may not be taken for credit or quality points if the higher-level course has been satisfactorily completed.

Many students are qualified, as a result of having studied calculus in high school, to begin their major with MATH 1900, Analytic Geometry and Calculus II, or MATH 2000, Analytic Geometry and Calculus III. These students are urged to consult with the department before planning their programs. Credit for MATH 1800, Analytic Geometry and Calculus I, will be granted to those students who complete MATH 1900 with a grade of Cor better.

## **Declaring the Mathematics Major**

Students seeking to major in mathematics are first designated as "premathematics majors" until they have completed both MATH 1900 and MATH 2000 or equivalent courses. Upon successful completion of these two courses with grades of C or better, students will be allowed to declare mathematics as their major. Each of these courses must be completed successfully within two attempts.

## **Degree Requirements in Mathematics**

All mathematics majors in all undergraduate programs must complete the mathematics core requirements.

#### Core Requirements

The following courses are required:

| CMP SCI 1250    | Introduction to Computing <sup>1</sup>     | 3  |
|-----------------|--|----|
| MATH 1320       | Introduction to Probability and Statistics | 3  |
| MATH 1800       | Analytic Geometry and Calculus I           | 5  |
|                 |  | _  |
| MATH 1900       | Analytic Geometry and Calculus II          | 5  |
| MATH 2000       | Analytic Geometry and Calculus III         | 5  |
| MATH 2020       | Introduction to Differential Equations     | 3  |
| MATH 2450       | Elementary Linear Algebra                  | 3  |
| MATH 3250       | Foundations of Mathematics                 | 3  |
| or CMP SCI 3130 | Design and Analysis of Algorithms          |    |
| MATH 4100       | Real Analysis I <sup>2</sup>               | 3  |
| Total Hours     |  | 33 |

Students in the Fiscal Mathematics program will take MATH 4200 instead.

Students in the Fiscal Mathematics program will take MATH 4210 instead.

The related area requirements as described below must be satisfied. Students seeking a double degree, either within this department or with another department, do not have to fulfill the related area requirements.

Mathematical Statistics I

#### **Emphasis Area Requirements**

MATH 4200

| Total Hours                     |  | 38 |  |
|---------------------------------|--|----|--|
| FINANCE 3561                    | Principles of Insurance                                      |    |  |
| FINANCE 3540                    | Introduction to Financial Institutions and Financial Markets |    |  |
| FINANCE 3523                    | Fixed Income Analysis  |    |  |
| FINANCE 3521                    | Financial Engineering: Applying Derivatives                  |    |  |
| FINANCE 3520                    | Investments  |    |  |
| FINANCE 3503                    | Computer Applications in Finance                             |    |  |
| Complete two of the following   | courses:   | 6  |  |
| or ECON 4130                    | Business and Economic Forecasting                            |    |  |
| ECON 4110                       | Applied Econometrics   | 4  |  |
| ECON 4100                       | Introduction to Econometrics                                 | 4  |  |
| Related Requirements            |  |    |  |
| computer science numbered       | above 4000.  |    |  |
| In addition, two further course | es in mathematics, statistics or                             | 6  |  |
| MATH 4005                       | Exploratory Data Analysis with R                             | 3  |  |
| FINANCE 3500                    | Financial Management   | 3  |  |
| MATH 4020                       | Financial Mathematics II                                     | 3  |  |
| MATH 4010                       | Financial Mathematics I                                      | 3  |  |
| Specialized Requirements        |  |    |  |
| MATH 4210                       | Mathematical Statistics II                                   |    |  |
|                                 |  |    |  |

#### B.S. Ed. in Secondary Education with Emphasis in Mathematics

The B.S. Ed. is a professional education degree designed for students who wish to pursue a teaching career in secondary schools. Much of the discipline-specific coursework parallels the B.A. or B.S. degree in the discipline; however, the Missouri Department of Elementary and Secondary Education (DESE) requires specific coursework for teacher certification. Therefore, students interested in the B.S. Ed. should contact

the advising office (OASIS) 314-516-5937 in the College of Education for discipline-specific requirements. *Note: To obtain teaching certification, DESE requires a 3.0 GPA in the discipline and professional education coursework, as well as a 2.75 GPA overall.* 

# B.A. or B.S. in Mathematics with Master's Level Coursework for Secondary Teacher Certification

In addition to the B.S. Ed., students may opt to complete a B.A. or B.S. degree in their discipline as an undergraduate, followed by admission to the Graduate School for Master's level teaching certification. The College of Education has a one-year accelerated program for post-graduate certification called Teach in 12, or students can choose a traditional path to certification. Graduate coursework for certification can apply towards a Master's Degree in Secondary Education, with additional coursework. Students interested in Master's Level teacher certification should contact the advising office (OASIS) 314-516-5937 in the College of Education. Note: To obtain teaching certification, DESE requires a 3.0 GPA in the discipline and professional education coursework, as well as a 2.75 GPA overall.

#### **Learning Outcomes**

A successful undergraduate should, upon completion, be able to:

- · Write clear, logically consistent proofs.
- Read, understand and assess the veracity of logical arguments or mathematical proofs.
- Reformulate problems or questions in relevant mathematical terms
- Solve problems which involve analysis, algebra or linear algebra, elementary number theory.
- Interpret, formulate and solve applied problems in probability and statistics.
- Interpret, formulate and solve applied problems in mathematics relating to annuities, bonds and derivative investments.

#### Sample Four Year Plan

| •                                   |       |  |             |  |  |
|-------------------------------------|-------|--|-------------|--|--|
| First Year                          |       |  |             |  |  |
| Fall                                | Hours | Spring                                       | Hours       |  |  |
| INTDSC 1003 <sup>1</sup>            |       | 1 MATH 1900                                  | 5           |  |  |
| ENGL 1100                           |       | 3 MATH 1320                                  | 3           |  |  |
| MATH 1800                           |       | 5 ECON 1001                                  | 3           |  |  |
| INFSYS 1800                         |       | 3 EXPLORE - Humanities and Fine Arts         | 3           |  |  |
| CORE - Communication Proficiency    |       | 3 INFSYS 2800                                | 3           |  |  |
| 15 17                               |       |  |             |  |  |
| Second Year                         |       |  |             |  |  |
| Fall                                | Hours | Spring                                       | Hours       |  |  |
| MATH 2000                           |       | 5 MATH 2020                                  | 3           |  |  |
| MATH 2450                           |       | 3 MATH 3250                                  | 3           |  |  |
| CMP SCI 1250                        |       | 3 CORE - U.S. History and Government         | 3           |  |  |
| ECON 1002                           |       | 3 Cultural Diversity Requirement             | 3           |  |  |
| ACCTNG 2400                         |       | 3 Elective or minor                          | 2           |  |  |
|                                     | 1     | 7  | 14          |  |  |
| Third Year                          |       |  |             |  |  |
| Fall                                | Hours | Spring                                       | Hours       |  |  |
| MATH 4010                           |       | 3 MATH 4200                                  | 3           |  |  |
| ECON 4100                           |       | 4 MATH 4020                                  | 3           |  |  |
| MATH 4005                           |       | 3 FINANCE 3500                               | 3           |  |  |
| ENGL 3100                           |       | 3 EXPLORE - Humanities and Fine Arts         | 3           |  |  |
| MATH 4010<br>ECON 4100<br>MATH 4005 |       | 3 MATH 4200<br>4 MATH 4020<br>3 FINANCE 3500 | 3<br>3<br>3 |  |  |

| Elective or minor                  |       | 3 Elective or minor              | 3     |
|------------------------------------|-------|----------------------------------|-------|
|                                    |       | 16                               | 15    |
| Fourth Year                        |       |                                  |       |
| Fall                               | Hours | Spring                           | Hours |
| MATH 4210                          |       | 3 MATH/CMP SCI 4000-level course | 3     |
| ECON 4130                          |       | 4 ECON 4110                      | 4     |
| FINANCE 35XX Course                |       | 3 FINANCE 35XX Course            | 3     |
| EXPLORE - Humanities and Fine Arts |       | 3 EXPLORE - Social Sciences      | 3     |
|                                    |       | 13                               | 13    |

Total Hours: 120

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INTDSC 1003 is required only for first-time freshmen and transfer students with less than 24 college credits.

PLEASE NOTE: This plan is an example of what a four year plan could look like for a typical student. Placement exam scores in math as well as the completion of coursework may change the plan. It should not be used in the place of regular academic advising appointments. All students are encouraged to meet with their advisor each semester. All requirements are subject to change.