UCONN | COLLEGE OF LIBERAL ARTS AND SCIENCES

COMMITTEE ON CURRICULA AND COURSES

# Proposal to Change a Major

Last revised: September 24, 2013

1. Date: March 3, 2014
2. Department or Program: Mathematics
3. Title of Major: Mathematics Major
4. Effective Date (semester, year): Fall, 2014
(Consult Registrar's change catalog site to determine earliest possible effective date. If a later date is desired, indicate here.)
5. Nature of change: To reflect the addition of Mathematics-Actuarial Science-Finance, Bachelor of Arts and Bachelor of Science.

## Existing Catalog Description of Major

**Mathematics**

The Mathematics Department offers programs of study in Mathematics, Applied Mathematical Sciences, Actuarial Science (in cooperation with the School of Business), Mathematical Statistics (in cooperation with the Department of Statistics), and Mathematics - Physics (in cooperation with the Department of Physics).

MATH 2010Q, 2011Q, 2194W, 2720W, 2784, 2794W, and 3670W and STAT 3484 and 3494W may not be counted in any of the major groups listed below.

The Department offers both a Bachelor of Science and a Bachelor of Arts degree in Mathematics, Applied Mathematical Sciences, Mathematics-Statistics, and Mathematics-Actuarial Science and a Bachelor of Science in Mathematics - Physics. The Bachelor of Science program provides in-depth training in Mathematics as preparation for graduate study or for participation in scientific and engineering teams in government, industry, or research laboratories. The Bachelor of Arts degree is designed to provide training in contemporary mathematics without the depth and concentrated specialization required for the Bachelor of Science program. To satisfy the writing in the major and information literacy competencies in the Bachelor of Arts in Mathematics, the Bachelor of Science in Mathematics, the Bachelor of Arts in Applied Mathematical Sciences, and the Bachelor of Science in Applied Mathematical Sciences, all students must pass one of the following courses: MATH 2194W, 2720W, 2794W, or 3796W.

**Bachelor of Science in Mathematics:** The requirements for the B.S. in Mathematics are:

(1) either (i) MATH 2110Q (or 2130Q), 2210Q, 2410Q (or 2420Q), 2710 (or 2141Q-2142Q) or (ii) MATH 2141Q, 2142Q, 2143Q, 2144Q;

(2) MATH 3150 (or 4110), 3151, 3230 (or 4210);

(3) At least 6 additional credits from any of the following courses: MATH 2360Q, 3146, 3160, 3170, 3210, 3231, 3240, 3250, 3260, 3270, 3330 (or 4310), 3370, 3410, 3430, 3435, 3510, 3511, 3710, and approved sections of 3094 and 3795;

(4) At least 3 additional credits from any of the following courses: MATH 3210, 3231, 3240, 3250, 3330 (or 4310), and 3370. In addition, at least 12 credits at the 2000-level or above in approved related areas are required.

**Bachelor of Arts in Mathematics:** The requirements for the B.A. in Mathematics are 27 credits of 2000-level or above course work in Mathematics and 12 credits of course work in approved related areas. The required courses are:

(1) either (i) MATH 2110Q (or 2130Q), 2210Q, 2410Q (or 2420Q), 2710 (or 2141Q-2142Q), or (ii) MATH 2141Q, 2142Q, 2143Q, 2144Q;

(2) MATH 3150 (or 4110), 3230 (or 4210);

(3) At least 3 additional credits from any of the following courses: MATH 3151, 3210, 3231, 3240, 3250, 3330 (or 4310), and 3370. The remaining courses may come from any 2000-level or above Mathematics courses.

**Bachelor of Science in Applied Mathematical Sciences:** The requirements for the B.S. in Applied Mathematical Sciences are

(1) either (i) MATH 2110Q (or 2130Q), 2210Q, 2410Q (or 2420Q), 2710 (or 2141Q-2142Q) or (ii) MATH 2141Q, 2142Q, 2143Q, 2144Q;

(2) MATH 3150 (or 4110), 3410, 3510, and 3511;

(3) Two courses selected from MATH 3146, 3151, 3160, 3170, 3270, 3430, 3435, 3710, and approved sections of 3094 and 3795;

(4) At least 3 additional credits from MATH 2360Q, 3160, 3210 (or 4210), 3230, 3231, 3240, 3250, 3260, 3330 (or 4310), and approved sections of 3094 and 3795. In addition, at least 12 credits at the 2000-level or above in approved related areas are required.

**Bachelor of Arts in Applied Mathematical Sciences:** The requirements for the B.A. in Applied Mathematical Sciences are 27 credits of 2000-level or above course work in Mathematics and 12 credits of course work in approved related areas. The required courses for the degree are MATH 2110Q (or 2130Q or 2143Q), 2210Q (or 2143Q-

2144Q), 2410Q (or 2420Q or 2144Q), 3510, 3410, and 3511. The remainder of the 27 credits of Mathematics must be chosen from MATH 2710, 3146, 3150 (or 4110), 3160, 3170, 3210 (or 4210), 3250, 3270, 3430, 3435, and 3710.

**Bachelor of Science or Arts in Mathematics-Statistics:** The requirements for the B.S. or B.A. in Mathematics-Statistics degree are 36 credits at the 2000-level or above in Mathematics and Statistics (in addition to MATH 2110Q or 2130Q), with at least 12 credits in each department. The required courses for the Mathematics-Statistics major are MATH 2210Q or 3210 or (2143Q and 2144Q); 2410Q (or 2144Q); and STAT 3375Q and 3445. To satisfy the Writing in the Major and Information Literacy competencies, all students must pass one of the following courses: MATH 2194W, 2720W, 2794W, 3796W, or STAT 3494W.

**Bachelor of Science or Arts in Mathematics-Actuarial Science:** The requirements for the B.S. or B.A. degree in Mathematics-Actuarial Science are 36 credits at the 2000-level or above in Mathematics, Statistics, Business, and related areas (in addition to MATH 2110Q or 2130Q or 2143Q). The required courses are MATH 2210Q (or 2144Q), 2620, 3160, 3630 - 3631; STAT 3375Q- 3445; either MATH 3632 or 3634; and either MATH 2610, FNCE 3221 or 4325. Students should include ECON 1201 and 1202, a Computer Science course, and ACCT 2001 and 2101 in their program of study as early as possible. To satisfy the writing in the Major and Information Literacy competencies, all students must pass one of the following courses: MATH 2194W, 2720W, 2794W, 3670W, or 3796W.

Admission to the Actuarial Science program will be available only to students who meet the following two requirements. First, the student must have a total grade point average of 3.2 or higher or a grade point average of 3.2 or higher in mathematics. The student must also satisfy one of the following:

1. completed MATH 1121Q, 1126Q, or 1131Q with a grade of at least B;
2. successfully completed an honors calculus course with a grade of at least C;
3. received AP credit for MATH 1131Q; or
4. received a passing score on one or more of the actuarial examinations.

Students not satisfying one or more of the requirements may be admitted into the program by the Mathematics Department Actuarial Committee.

To remain as an Actuarial Science Major, the student is expected to maintain a total grade point average of 3.2 or higher.

**Bachelor of Science in Mathematics-Physics:** The B.S. degree in Mathematics- Physics may be completed by following either track A, which has a physics emphasis, or track B, which has a mathematics emphasis. Students in track A should choose an advisor from the Physics Department, and those in Track B should choose an advisor from the Mathematics Department. In either track the writing in the major and information literacy competencies are met using PHYS 2501W.

The required courses for the Mathematics-Physics Major Track A (Physics Emphasis) are:

(1) either: i) MATH 2110Q (or 2130Q or 2143Q) and 2210Q and 2410Q (or 2420Q) or: ii) MATH 2141Q and 2142Q and 2143Q and 2144Q.

(2) All of: MATH 3146, 3410, 3510 and PHYS 2300, 2501W, 3101, 3201, 3202, 3300, 3401.

(3) Any nine credits from: PHYS 2200, 2400, 2502, 3102, 3103, 3104, 3150, 3402, 3989, 4093, 4095, 4096, 4098, 4099, 4100, 4130, 4140, 4150, 4210, 4300, 4350, 4900.

The required courses for the Mathematics-Physics Major Track B (Mathematics Emphasis) are:

(1) either: i) MATH 2110Q (or 2130Q or 2143Q) and 2210Q and 2410Q (or 2420Q) and 2710 (or 2141Q and 2142Q) and 3146, or: ii) MATH 2141Q and 2142Q and 2143Q and 2144Q and 3146

(2) All of: PHYS 2300, 2501W, 3101, 3201, 3202, 3401.

(3) Any 3 credits from: PHYS 2200, 2400, 2502, 3102, 3103, 3104, 3150, 3300, 3989, 4093, 4095, 4096, 4098, 4099, 3402, 4100, 4130, 4140, 4150, 4210, 4300, 4350, 4900.

(4) Any 4 courses from MATH 3150 (or 4110), 3151, 3160, 3210, 3230 (or 4210), 3330 (or 4310), 3370, 3410.

A minor in Mathematics is described in the “Minors” section.

## Proposed Catalog Description of Major

**Mathematics**

The Mathematics Department offers programs of study in Mathematics, Applied Mathematical Sciences, Actuarial Science (in cooperation with the School of Business), Mathematical Statistics (in cooperation with the Department of Statistics), and Mathematics - Physics (in cooperation with the Department of Physics).

MATH 2010Q, 2011Q, 2194W, 2720W, 2784, 2794W, and 3670W and STAT 3484 and 3494W may not be counted in any of the major groups listed below.

The Department offers both a Bachelor of Science and a Bachelor of Arts degree in Mathematics, Applied Mathematical Sciences, Mathematics-Statistics, Mathematics-

Actuarial Science and Mathematics-Actuarial Science-Finance, and a Bachelor of Science in Mathematics - Physics. The Bachelor of Science program provides in-depth training in Mathematics as preparation for graduate study or for participation in scientific and engineering teams in government, industry, or research laboratories. The Bachelor of Arts degree is designed to provide training in contemporary mathematics without the depth and concentrated specialization required for the Bachelor of Science program. To satisfy the writing in the major and information literacy competencies in the Bachelor of Arts in Mathematics, the Bachelor of Science in Mathematics, the Bachelor of Arts in Applied Mathematical Sciences, and the Bachelor of Science in Applied Mathematical Sciences, all students must pass one of the following courses: MATH 2194W, 2720W, 2794W, or 3796W.

**Bachelor of Science in Mathematics:** The requirements for the B.S. in Mathematics are:

(1) either (i) MATH 2110Q (or 2130Q), 2210Q, 2410Q (or 2420Q), 2710 (or 2141Q-2142Q) or (ii) MATH 2141Q, 2142Q, 2143Q, 2144Q;

(2) MATH 3150 (or 4110), 3151, 3230 (or 4210);

(3) At least 6 additional credits from any of the following courses: MATH 2360Q, 3146, 3160, 3170, 3210, 3231, 3240, 3250, 3260, 3270, 3330 (or 4310), 3370, 3410, 3430, 3435, 3510, 3511, 3710, and approved sections of 3094 and 3795;

(4) At least 3 additional credits from any of the following courses: MATH 3210, 3231, 3240, 3250, 3330 (or 4310), and 3370. In addition, at least 12 credits at the 2000-level or above in approved related areas are required.

**Bachelor of Arts in Mathematics:** The requirements for the B.A. in Mathematics are 27 credits of 2000-level or above course work in Mathematics and 12 credits of course work in approved related areas. The required courses are:

(1) either (i) MATH 2110Q (or 2130Q), 2210Q, 2410Q (or 2420Q), 2710 (or 2141Q-2142Q), or (ii) MATH 2141Q, 2142Q, 2143Q, 2144Q;

(2) MATH 3150 (or 4110), 3230 (or 4210);

(3) At least 3 additional credits from any of the following courses: MATH 3151, 3210, 3231, 3240, 3250, 3330 (or 4310), and 3370. The remaining courses may come from any 2000-level or above Mathematics courses.

**Bachelor of Science in Applied Mathematical Sciences:** The requirements for the B.S. in Applied Mathematical Sciences are

(1) either (i) MATH 2110Q (or 2130Q), 2210Q, 2410Q (or 2420Q), 2710 (or 2141Q-2142Q) or (ii) MATH 2141Q, 2142Q, 2143Q, 2144Q;

(2) MATH 3150 (or 4110), 3410, 3510, and 3511;

(3) Two courses selected from MATH 3146, 3151, 3160, 3170, 3270, 3430, 3435, 3710, and approved sections of 3094 and 3795;

(4) At least 3 additional credits from MATH 2360Q, 3160, 3210 (or 4210), 3230, 3231, 3240, 3250, 3260, 3330 (or 4310), and approved sections of 3094 and 3795. In addition, at least 12 credits at the 2000-level or above in approved related areas are required.

**Bachelor of Arts in Applied Mathematical Sciences:** The requirements for the B.A. in Applied Mathematical Sciences are 27 credits of 2000-level or above course work in Mathematics and 12 credits of course work in approved related areas. The required courses for the degree are MATH 2110Q (or 2130Q or 2143Q), 2210Q (or 2143Q-2144Q), 2410Q (or 2420Q or 2144Q), 3510, 3410, and 3511. The remainder of the 27 credits of Mathematics must be chosen from MATH 2710, 3146, 3150 (or 4110), 3160, 3170, 3210 (or 4210), 3250, 3270, 3430, 3435, and 3710.

**Bachelor of Science or Arts in Mathematics-Statistics:** The requirements for the B.S. or B.A. in Mathematics-Statistics degree are 36 credits at the 2000-level or above in Mathematics and Statistics (in addition to MATH 2110Q or 2130Q), with at least 12 credits in each department. The required courses for the Mathematics-Statistics major are MATH 2210Q or 3210 or (2143Q and 2144Q); 2410Q (or 2144Q); and STAT 3375Q and 3445. To satisfy the Writing in the Major and Information Literacy competencies, all students must pass one of the following courses: MATH 2194W, 2720W, 2794W, 3796W, or STAT 3494W.

**Bachelor of Science or Arts in Mathematics-Actuarial Science:** The requirements for the B.S. or B.A. degree in Mathematics-Actuarial Science are 36 credits at the 2000-level or above in Mathematics, Statistics, Business, and related areas (in addition to MATH 2110Q or 2130Q or 2143Q). The required courses are MATH 2210Q (or 2144Q), 2620, 3160, 3630 - 3631; STAT 3375Q- 3445; either MATH 3632 or 3634; and either MATH 2610, FNCE 3221 or 4325. Students should include ECON 1201 and 1202, a Computer Science course, and ACCT 2001 and 2101 in their program of study as early as possible. To satisfy the writing in the Major and Information Literacy competencies, all students must pass one of the following courses: MATH 2194W, 2720W, 2794W, 3670W, or 3796W.

Admission to the Actuarial Science program will be available only to students who meet the following two requirements. First, the student must have a total grade point average of 3.2 or higher or a grade point average of 3.2 or higher in mathematics. The student must also satisfy one of the following:

1. completed MATH 1121Q, 1126Q, or 1131Q with a grade of at least B;
2. successfully completed an honors calculus course with a grade of at least C;
3. received AP credit for MATH 1131Q; or
4. received a passing score on one or more of the actuarial examinations.

Students not satisfying one or more of the requirements may be admitted into the program by the Mathematics Department Actuarial Committee.

To remain as an Actuarial Science Major, the student is expected to maintain a total grade point average of 3.2 or higher.

## Mathematics-Actuarial Science-Finance

**Bachelor of Science or Arts in Mathematics-Actuarial Science-Finance:** The requirements for the B.S. or B.A. degree in Mathematics-Actuarial Science-Finance are 36 credits at the 2000-level or above in Mathematics, Statistics, Business, and related areas (in addition to MATH 2110Q or 2130Q or 2143Q) and 15 credits in Finance. The required courses are MATH 2210Q (or 2144Q), 2620, 3160, 3630, 3631, 3650, 3660; STAT 3375Q, 3445, ACCT 2001, FNCE 3302, 4209, 4302, 4305, either MATH 3632 or 3634; either MATH 2610, FNCE 3221 or 4325, and either FNCE 4306 or 4895. Students should include ECON 1201 and 1202, and a Computer Science course in their program of study as early as possible. To satisfy the writing in the Major and Information Literacy competencies, all students must pass one of the following courses: MATH 2194W, 2720W, 2794W, 3670W, or 3796W.

This degree is offered through the College of Liberal Arts and Sciences. Admission to the Actuarial Science program will be available only to students who meet the following two requirements. First, the student must have a total grade point average of 3.2 or higher or a grade point average of 3.2 or higher in mathematics. The student must also satisfy one of the following:

1. completed MATH 1121Q, 1126Q, or 1131Q with a grade of at least B;
2. successfully completed an honors calculus course with a grade of at least C;
3. received AP credit for MATH 1131Q; or
4. received a passing score on one or more of the actuarial examinations.

Students not satisfying one or more of the requirements may be admitted into the program by the Mathematics Department Actuarial Committee.

To remain as an Actuarial Science Major, the student is expected to maintain a total grade point average of 3.2 or higher.

**Bachelor of Science in Mathematics-Physics:** The B.S. degree in Mathematics- Physics may be completed by following either track A, which has a physics emphasis, or track B, which has a mathematics emphasis. Students in track A should choose an advisor from the Physics Department, and those in Track B should choose an advisor from the Mathematics Department. In either track the writing in the major and information literacy competencies are met using PHYS 2501W.

The required courses for the Mathematics-Physics Major Track A (Physics Emphasis) are:

(1) either: i) MATH 2110Q (or 2130Q or 2143Q) and 2210Q and 2410Q (or 2420Q) or: ii) MATH 2141Q and 2142Q and 2143Q and 2144Q.

(2) All of: MATH 3146, 3410, 3510 and PHYS 2300, 2501W, 3101, 3201, 3202, 3300, 3401.

(3) Any nine credits from: PHYS 2200, 2400, 2502, 3102, 3103, 3104, 3150, 3402, 3989, 4093, 4095, 4096, 4098, 4099, 4100, 4130, 4140, 4150, 4210, 4300, 4350, 4900.

The required courses for the Mathematics-Physics Major Track B (Mathematics Emphasis) are:

(1) either: i) MATH 2110Q (or 2130Q or 2143Q) and 2210Q and 2410Q (or 2420Q) and 2710 (or 2141Q and 2142Q) and 3146, or: ii) MATH 2141Q and 2142Q and 2143Q and 2144Q and 3146

(2) All of: PHYS 2300, 2501W, 3101, 3201, 3202, 3401.

(3) Any 3 credits from: PHYS 2200, 2400, 2502, 3102, 3103, 3104, 3150, 3300, 3989, 4093, 4095, 4096, 4098, 4099, 3402, 4100, 4130, 4140, 4150, 4210, 4300, 4350, 4900.

(4) Any 4 courses from MATH 3150 (or 4110), 3151, 3160, 3210, 3230 (or 4210), 3330 (or 4310), 3370, 3410.

A minor in Mathematics is described in the "Minors" section.

## Justification

1. Reasons for changing the major:

This change reflects the addition of a new Mathematics-Actuarial Science-Finance major, a proposal for which has been submitted separately on an Add-Major form. This new major combines the technical actuarial skills and knowledge learned through study in the existing Mathematics-Actuarial Science major with Finance courses emphasizing forecasting, security valuation, globally oriented financial management topics, risk management and case studies.

2. Effects on students:

Offers students a choice of a new major which combines the technical actuarial skills and knowledge learned through study in the existing Mathematics-Actuarial Science major with Finance courses emphasizing forecasting, security valuation, globally oriented financial management topics, risk management and case studies.

3. Effects on other departments:

This will increase demand and enrollment in the FNCE courses required in the Mathematics-Actuarial Science-Finance major. This has been discussed and approved in the School of Business.

4. Effects on regional campuses: None

5. Dates approved by
Math Department Curriculum Committee: October 18, 2013
Math Department Faculty: November 26, 2013
School of Business Faculty: November 14, 2013

6. Name, Phone Number, and e-mail address of principal contact person:
James Trimble, 860-486-8392, James.Trimble@uconn.edu

## Plan of Study

If the proposed change modifies the requirements of the major, then attach a revised "Major Plan of Study" form to your submission email.