PROPOSED CHANGES TO DEGREE PROGRAMS IN THE
UNDERGRADUATE CATALOG 2014-2016

Type of Change  ___ Nonacademic Change
                 ___ Academic Change
                 ___X Degree Program Change

1. NAME OF DEGREE PROGRAM:  B.S. IN MATHEMATICS: OPTION V: TEACHING

2. IF THE ANSWER TO ANY OF THE FOLLOWING QUESTIONS IS YES, THE COLLEGE MUST CONSULT NEAL ARMSTRONG WHO WILL DETERMINE WHETHER SACS-COC APPROVAL IS NEEDED.
   • Is this a new degree program? Yes or no?  NO
   • Does the program offer courses that will be taught off campus? Yes or no?  NO
   • Will courses in this program be delivered electronically? Yes or no?  NO

3. EXPLAIN CHANGE TO DEGREE PROGRAM:
   1) Option I, Actuarial Science: A new Actuarial course, M339D, is being offered as an option for actuarial science majors. In addition we are allowing students slightly more flexibility when selecting four “actuarial” Courses.
   2) Option V, Teaching, Mathematics, Physical Science, and Engineering certification. Allow students to choose between M 325K and M 328K, rather than taking both courses.

3a. Indicate pages in the undergraduate catalog where changes will be made. Page

4. GIVE A DETAILED RATIONALE FOR CHANGE. INDIVIDUAL CHANGES SHOULD BE LISTED SEPARATELY.

   1) Add M339D as an option for “Actuarial Course” requirement. This will help decrease travel time to graduation for Students. Relax requiring both M339U and M339J for actuarial course requirements. Make these two classes options like the other 5 Actuarial courses. This will increase student flexibility and decrease travel time to graduation.
   2) Option V, Teaching, Mathematics, Physical Science, and Engineering certification. Students need only M 325K or 328K to develop sufficient understanding of proofs to handle more complex proofs that are in other required courses. This change was already made to the Mathematics certification in the 2012-14 catalog. The change was left out of the Mathematics, Physical Science, and Engineering certification in error.

5. SCOPE OF PROPOSED CHANGE

5a. Does this proposal impact other colleges/schools? If yes, then how?  NO

       If yes, impacted schools must be contacted and their response(s) included:
       Person communicated with:
       Date of communication:
       Response:

Last modified June 2011. Submit form electronically to Office of the General Faculty and Faculty Council- fc@austin.utexas.edu
5b. Does this proposal involve changes to the core curriculum or other basic education requirements (42-hour core, signature courses, flags)? If yes, explain: NO

If yes, undergraduate studies must be informed of the proposed changes and their response included:
Person communicated with:
Date of communication:
Response:

5c. Will this proposal change the number of hours required for degree completion? If yes, explain: NO

6. COLLEGE/SCHOOL APPROVAL PROCESS
Department approval date: (1) 2/6/12; (2) 5/12/11
College approval date:
Dean approval date:

Include proposed catalog copy below. The proposed text should be based on the text of the current catalog available at http://www.utexas.edu/faculty/council/pages/catalog_chgs/catcopy.html. Strike through and replace only the specific language to be changed. For questions on completing this section, please contact Anita Ahmadi, fc@austin.utexas.edu, 471-5936 or Brenda Schumann, brenda.schumann@austin.utexas.edu, 475-7654.

Bachelor of Science in Mathematics

As an alternative to the Bachelor of Arts degree, the Bachelor of Science in Mathematics is designed with a twofold purpose: to offer students a more extensive scientific program that may better prepare them for graduate study or employment, and to recognize students who choose to pursue a more demanding program. Students are given the opportunity to develop greater breadth and depth in their mathematical programs as well as to combine mathematics with a concentration in another scientific discipline.
To accomplish these goals, the minimum number of semester hours is increased and the maximum limit is removed. Specialization in one additional scientific area is encouraged, and the foreign language requirement is shortened by one semester.
Students seeking the Bachelor of Science in Mathematics must select one of six options: actuarial science, applied mathematics, mathematical sciences, pure mathematics, mathematics for secondary teaching, and mathematics honors. Students who choose the option in mathematical sciences must also select a specialization in either scientific computation or statistics, probability, and data analysis. Students who plan to follow option VI, mathematics honors, must be admitted to the Dean’s Scholars Honors Program.

Prescribed Work Common to All Options

All students pursuing an undergraduate degree must complete the University’s Core Curriculum. The core includes courses in language, literature, social sciences, natural sciences, and fine arts.
In addition, students seeking the Bachelor of Science in Mathematics must complete the following degree-level requirements. In some cases, courses that fulfill degree-level requirements also meet the requirements of the core.

1. Two courses with a writing flag. One of these courses must be upper-division. Courses with a writing flag are identified in the *Course Schedule* available at http://registrar.utexas.edu/schedules. They may be used simultaneously to fulfill other requirements, unless otherwise specified.

2. Options I–IV: One of the following foreign language/culture choices:
   a. Second-semester-level proficiency in a foreign language course.
   b. First-semester-level proficiency in a foreign language and a three-semester-hour course in the culture of the same language area.
   c. Two three-semester-hour culture courses chosen from one foreign culture category from an approved list in the dean's office and college advising centers. Students in options V and VI are exempt from this requirement.

3. Forty-two semester hours of upper-division coursework. At least twenty-one semester hours of upper-division coursework must be completed in residence at the University.

4. Eighteen semester hours in mathematics must be completed in residence at the University.

**Additional Prescribed Work for Each Option**

**Option I: Actuarial Science**

5. Eight semester hours in one of the following areas: astronomy, biology, chemistry, geological sciences, and physics.

6. Mathematics 408C and 408D, or 408N, 408S, and 408M.


8. Economics 304K and 304L.

9. Accounting 310F or both 311 and 312.

10. Finance 357.

11. At least thirty-two semester hours of upper-division coursework in mathematics and supporting areas, consisting of
   a. One of the following courses: Mathematics 328K, 343K, 361, 361K, 365C, 367K, 373K.
   b. Mathematics 340L or 341.
   c. Mathematics 362K and either 358K or 378K.
   e. Enough additional coursework to provide a total of at least thirty-two hours. In addition to upper-division mathematics courses, the following courses in supporting areas may be counted toward this requirement: Economics 420K, Finance 354, 367, 377 (Topic 2: *Financial Risk Management*), Legal Environment of Business 320F, 323, Management Information Systems 325, Risk
Management 357E, 369K, 377. Courses used to satisfy this requirement may not be counted toward requirement 12.

12. At least six semester hours of upper-division coursework must be outside both mathematics and the fields of study listed in requirement 5. Philosophy courses in logic, computer science courses in discrete mathematics, engineering courses, and courses counted toward requirement 11e may not be used to fulfill this requirement.

13. Enough additional coursework to make a total of 126 semester hours.

Option II: Applied Mathematics

5. Eight semester hours in one of the following areas: astronomy, biology, chemistry, geological sciences, and physics.
6. Mathematics 408C and 408D, or 408N, 408S, and 408M.
7. Computer Science 303E or the equivalent.
8. Thirty-two semester hours of upper-division coursework in mathematics, consisting of the following courses. The student should consult the applied mathematics adviser for information on other courses that may be counted toward this requirement.
   a. Mathematics 340L or 341.
   b. Mathematics 427K, 348, 362K, and 374M.
   c. Mathematics 361 and 365C.
   d. Mathematics 343K or 373K.
   e. Enough of the following coursework to provide a total of at least thirty-two hours: Mathematics 346, 365D, 368K, 372K, 376C.
9. At least six semester hours of upper-division coursework must be outside both mathematics and the fields of study listed in requirement 5. Philosophy courses in logic, computer science courses in discrete mathematics, and engineering courses may not be used to fulfill this requirement.
10. Enough additional coursework to make a total of 126 semester hours.

Option III: Mathematical Sciences

Specialization in Statistics, Probability, and Data Analysis

5. Eight semester hours in one of the following areas: astronomy, biology, chemistry, geological sciences, and physics.
6. Mathematics 408C and 408D, or 408N, 408S, and 408M.
7. Computer Science 303E or the equivalent.
8. At least thirty-two semester hours of upper-division coursework in mathematics and related areas, consisting of
   a. Mathematics 325K or Computer Science 336.
   b. Mathematics 427K and 362K.
   c. Mathematics 340L or 341.
   d. Mathematics 361K or 365C.
   e. Mathematics 358K and 378K.
   f. Mathematics 328K, 343K, 346, or 373K.

Most of these courses have substantial prerequisites, sometimes including courses in other departments. Some have restricted enrollment. The student is responsible for meeting prerequisites and other requirements for enrollment in the courses selected to fulfill this requirement. Courses should be chosen in consultation with the specialization adviser to form a coherent program consistent with the student’s background and goals.

Educational Psychology 371 may not be counted toward this degree if it is taken after Mathematics 358K or 378K.

9. At least six semester hours of upper-division coursework must be outside both mathematics and the fields of study listed in requirement 5. Philosophy courses in logic, computer science courses in discrete mathematics, engineering courses, and courses counted toward requirement 8g may not be used to fulfill this requirement.

10. Enough additional coursework to make a total of 126 semester hours.

Specialization in Scientific Computation

Students who complete this specialization may simultaneously fulfill some of the requirements of the Elements of Computing Certificate or the Certificate in Scientific Computation. These certificate programs are described in Transcript-Recognized Certificate Programs.

5. Eight semester hours in one of the following areas: astronomy, biology, chemistry, geological sciences, and physics.

6. Mathematics 408C and 408D, or 408N, 408S, and 408M.

7. One of the following sequences: Statistics and Scientific Computation 318 and 222; Computer Science 312 and 314; or Computer Science 303E and 313E.

8. At least thirty-two semester hours of upper-division coursework in mathematics and related areas, consisting of
   a. Mathematics 340L or 341.
   b. Mathematics 427K, 348, 362K, and 368K.
   c. Mathematics 361K or 365C.
   d. Students who fulfill the requirements of the Elements of Computing Certificate or the Certificate in Scientific Computation may count up to six hours of upper-division certificate coursework toward this requirement. Computer Science 323E may not be counted toward this requirement. Courses used to satisfy this requirement may not be counted toward requirement 9.
e. Additional coursework chosen from the following: Mathematics 325K or 328K (but not both), 427L, 343K or 373K (but not both), 343L, 346, 358K, 361, 365D, 372K, 374M, 376C, 378K.

9. At least six semester hours of upper-division coursework must be outside both mathematics and the fields of study listed in requirement 5. Philosophy courses in logic, computer science courses in discrete mathematics, engineering courses, and courses counted toward requirement 8e may not be used to fulfill this requirement.

10. Enough additional coursework to make a total of 126 semester hours.

Option IV: Pure Mathematics

5. Eight semester hours in one of the following areas: astronomy, biology, chemistry, geological sciences, and physics.

6. Mathematics 408C and 408D, or 408N, 408S, and 408M.

7. At least thirty-two semester hours of upper-division coursework in mathematics, consisting of
   a. Mathematics 340L or 341.
   d. Additional hours of upper-division coursework in mathematics chosen with the approval of the mathematics adviser. Either Mathematics 343K or 361K may be counted toward this requirement, but not both.

8. At least six semester hours of upper-division coursework must be outside both mathematics and the fields of study listed in requirement 5. Philosophy courses in logic, computer science courses in discrete mathematics, and engineering courses may not be used to fulfill this requirement.

9. Enough additional coursework to make a total of 126 semester hours.

Option V: Teaching

This option is designed to fulfill the course requirements for certification as a middle grades or secondary school mathematics teacher in Texas; the student chooses mathematics certification or mathematics, physical science, and engineering certification. However, completion of the course requirements does not guarantee the student’s certification. For information about additional certification requirements, students should consult the UTeach-Natural Sciences academic adviser.

Students are encouraged to become familiar with a variety of mathematical software relevant to middle grades or secondary teaching, such as computer geometry systems, spreadsheets, and statistical software. Whenever possible, the student should take courses and sections of courses that use these types of software.

5. History 329U or Philosophy 329U.

6. Mathematics 408C and 408D, or 408N, 408S, and 408M.
7. At least six semester hours of upper-division coursework must be outside mathematics. Philosophy courses in logic, computer science courses in discrete mathematics, and engineering courses may not be used to fulfill this requirement.

8. Mathematics 315C.

9. Biology 337 (Topic 2: Research Methods: UTeach), Chemistry 368 (Topic 1: Research Methods: UTeach) or Physics 341 (Topic 7: Research Methods: UTeach).

10. The requirements of one of the following certification areas:

   a. For mathematics certification: At least thirty-two semester hours of upper-division coursework in mathematics consisting of:
      i. Mathematics 340L or 341.
      ii. Mathematics 325K or 328K, 333L, 358K, and 362K.
      iii. Mathematics 360M or 375D (Topic: Discovery: Introduction to Advanced Study in Mathematics).
      iv. Mathematics 361K or 365C.
      v. Mathematics 343K or 373K.
      vi. Mathematics 427K or 378K.
      vii. Enough of the following coursework to provide a total of at least thirty-two semester hours: Mathematics 427K, 328K, 339J, 339U, 343K, 343L, 348, 360M, 361, 365C, 365D, 368K, 373K, 373L, 175T (Topic: Seminar for Prospective Teachers), 375D (Topic: Discovery: Introduction to Advanced Study in Mathematics), 378K. A course used to fulfill requirements 10i through 10vi may not also be counted toward requirement 10vii.

   b. For mathematics, physical science, and engineering certification:
      i. Mathematics 325K or 328K, 427K, 328K, 333L, 341, 358K, and 362K.
      ii. Mathematics 361K or 365C.
      iii. Mathematics 360M or 375D (Topic: Discovery: Introduction to Advanced Study in Mathematics).
      iv. Physics 301, 101L, 316, 116L, 315, and 115L.
      v. Chemistry 301 or 301H, 302 or 302H, and 204.
11. Eighteen semester hours of professional development coursework consisting of:
   a. Curriculum and Instruction 650S.
   b. Curriculum and Instruction 365C or UTeach-Natural Sciences 350.
   c. Curriculum and Instruction 365D or UTeach-Natural Sciences 355.
   d. Curriculum and Instruction 365E or UTeach-Natural Sciences 360.
   e. UTeach-Natural Sciences 101, 110, and 170.
12. Students seeking middle grades certification must complete the following courses:
   Educational Psychology 363M (Topic 3: Adolescent Development), or Psychology 301 and 304; and Curriculum and Instruction 339E.
13. Enough additional coursework to make a total of at least 126 semester hours.

Option VI: Mathematics Honors

5. Breadth requirement: An honors mathematics course; one of the following two-semester sequences: Biology 315H and 325H, Chemistry 301H and 302H, or Physics 301, 101L, 316, and 116L; and nine additional semester hours chosen from the preceding courses, Computer Science 315H, and Physics 315 and 115L. Credit earned by examination may not be counted toward this requirement.
6. An honors section of Mathematics 427K, and six semester hours of coursework chosen from Mathematics 365C, 367K, and 373K.
7. Twenty additional semester hours of upper-division coursework in mathematics approved by the departmental faculty adviser.
8. A section of Undergraduate Studies 302 or 303 that is approved by the departmental honors adviser.
9. A section of Rhetoric and Writing 309S that is restricted to Dean’s Scholars.
10. Mathematics 379H.
11. Thirty additional semester hours of coursework approved by the departmental honors adviser.
12. Six semester hours of coursework in the College of Liberal Arts or the College of Fine Arts.
13. Enough additional coursework to make a total of 120 semester hours.

Special Requirements

Students in all options must fulfill both the University's General Requirements for graduation and the college requirements. They must also earn a grade of at least C- in each mathematics and science course required for the degree, and a grade point average in these courses of at least 2.00. More information about grades and the grade point average is given in General Information available at http://registrar.utexas.edu/catalogs/.

To graduate and be recommended for certification, students who follow the teaching option must have a University grade point average of at least 2.50. They must earn a grade of at least C- in the supporting course in requirement 5 and in each of the professional development courses listed in requirement 11 and must pass the final teaching portfolio review; those seeking middle grades certification must also earn a grade of at least C- in each of the courses listed in requirement 12. For information about the portfolio review and additional teacher certification requirements, students should consult the UTeach-Natural Sciences academic adviser.
To graduate under option VI, students must remain in good standing in the Dean’s Scholars Honors Program, must submit an honors thesis approved by the departmental honors adviser, and must present their research in an approved public forum, such as the college’s annual Undergraduate Research Forum.