

## DOCUMENTS OF THE GENERAL FACULTY

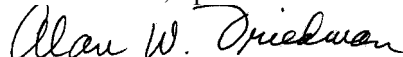
**PROPOSED CHANGES TO THE BACHELOR OF SCIENCE IN MATHEMATICS DEGREE PROGRAM IN THE COLLEGE OF NATURAL SCIENCES CHAPTER IN THE *UNDERGRADUATE CATALOG 2018-2020***

Dean Linda A. Hicke in the College of Natural Sciences has filed with the Secretary of the Faculty Council the following proposal to change the Bachelor of Science in Mathematics degree program in the College of Natural Sciences chapter in the *Undergraduate Catalog, 2018-2020*. The Mathematics Curriculum Committee approved the proposal on March 14, 2017; it was approved by the Dean's Scholars Steering Committee on May 10, 2017; and by the Course and Curriculum Committee and Associate Dean David Vanden Bout, on behalf of Dean Hicke, on September 27, 2017. The Secretary has classified this proposal as legislation of general interest to more than one college or school.

The Committee on Undergraduate Degree Program Review recommended approval of the proposal on February 2, 2018, and forwarded it to the Office of the General Faculty. The Faculty Council has the authority to approve this legislation on behalf of the General Faculty. The authority to grant final approval on this legislation resides with the Provost on behalf of the President.

If no objection is filed with the Office of the General Faculty by the date specified below, the legislation will be held to have been approved by the Faculty Council. If an objection is filed within the prescribed period, the legislation will be presented to the Faculty Council at its next meeting. The objection, with reasons, must be signed by a member of the Faculty Council.

To be counted, a protest must be received in the Office of the General Faculty by March 15, 2018.



Alan W. Friedman, Secretary of the General Faculty and Faculty Council  
The University of Texas at Austin  
Arthur J. Thaman and Wilhelmina Doré Thaman Professor of English and Comparative Literature

**PROPOSED CHANGES TO THE BACHELOR OF SCIENCE IN MATHEMATICS DEGREE  
PROGRAM IN THE COLLEGE OF NATURAL SCIENCES CHAPTER IN THE *UNDERGRADUATE  
CATALOG 2018-2020***

**Type of Change**       Academic Change  
 Degree Program Change (THECB form required)

**Proposed classification**     Exclusive     General     Major

**1. IF THE ANSWER TO ANY OF THE FOLLOWING QUESTIONS IS YES, THE COLLEGE MUST CONSULT LINDA DICKENS, DIRECTOR OF ACCREDITATION AND ASSESSMENT, TO DETERMINE IF SACSCOC APPROVAL IS REQUIRED.**

- |  |                              |  |
|--|------------------------------|--|
| • Is this a new degree program?                                  | Yes <input type="checkbox"/> | No <input checked="" type="checkbox"/> |
| • Is this program being deleted?                                 | Yes <input type="checkbox"/> | No <input checked="" type="checkbox"/> |
| • Does the program offer courses that will be taught off campus? | Yes <input type="checkbox"/> | No <input checked="" type="checkbox"/> |
| • Will courses in this program be delivered electronically?      | Yes <input type="checkbox"/> | No <input checked="" type="checkbox"/> |

**2. EXPLAIN CHANGE TO DEGREE PROGRAM AND GIVE A DETAILED RATIONALE FOR EACH INDIVIDUAL CHANGE:**

Option I (Actuarial Science) and VII (Mathematics)

Add statement that a mathematics independent inquiry flagged course may substitute for a course that is identified as containing an inquiry-based learning component.

**Reason:** Mathematics courses that have earned an independent inquiry flag is appropriate to meet the inquiry-based learning requirement.

Option V: Teaching

Update engineering courses under the mathematics, physical science, and engineering certification.

**Reason:** Engineering and UTeach reviewed and approved the new courses for teaching certifications in the College of Natural Sciences.

Option VI: Mathematics Honors

Replace an honors section of M 427K with an honors section of M 427J.

**Reason:** The Department of Mathematics is no longer teaching an honors section of M 427K.

Change six hours from Fine Arts or Liberal Arts to six hours from Fine Arts and Liberal Arts.

**Reason:** In practice, the Dean's Scholars Program allows students to take six hours from a single college or a mixture of six hours from both colleges. The change will synch catalog copy to advising practice and eliminate the need for petitions.

Option VII: Mathematics

Break requirement 8 into requirements 8 through 12. Require a minimum of thirty-three upper-division hours in Mathematics.

**Reason:** This option was new in the 2016-18 catalog. For the 2016-18 catalog, the department wanted students to complete eleven upper-division math courses with semester credit values of three or four hours. The purpose was to prevent students from counting courses with variable credit hours of one or two hours toward the total hours of upper-division mathematics. The 2016-18 proposal was altered to require students to complete a minimum of thirty-three upper-division hours regardless of the courses chosen for requirement 8a. In practice, students who did not choose M 408M ended up taking more than thirty-three upper-division hours. The department began writing petitions

to reduce requirement 8d to seventeen hours for students in this situation. This 2018-20 revision is intended to resolve these issues without requiring individual petition approvals.

**3. THIS PROPOSAL INVOLVES (Please check all that apply)**

- |  |  |   |
|--|--|---|
| <input checked="" type="checkbox"/> Courses in other colleges                    | <input type="checkbox"/> Courses in proposer's college that are frequently taken by students in other colleges                                 | <input type="checkbox"/> Flags  |
| <input type="checkbox"/> Course in the core curriculum                           | <input type="checkbox"/> Change in course sequencing for an existing program   | <input type="checkbox"/> Courses that have to be added to the inventory |
| <input type="checkbox"/> Change in admission requirements (external or internal) | <input type="checkbox"/> Requirements not explicit in the catalog language (e.g., lists of acceptable courses maintained by department office) |   |

**4. SCOPE OF PROPOSED CHANGE**

- a. Does this proposal impact other colleges/schools? Yes  No   
If yes, then how would you do so?

Option V. Teaching

Very few students seek the mathematics, physical science, and engineering certification. The UTeach Program did not provide an estimate of the number of students who might take E S 301 and M E 377K. However, the additions are approved by UTeach Engineering.

Option VI. Mathematics Honors

The original legislation stated that Dean's Scholars must choose six hours from either the College of Liberal Arts (COLA) or the College of Fine Arts (COFA). In practice, students are allowed to count six hours from one of the colleges, or a mixture from the colleges. This change will eliminate the need for petitions in situations where students choose to take a mixture of COLA and COFA coursework. In a constant state, the Dean's Scholars Program has approximately 200 majors.

There is no way to predict how this change will impact the College of Fine Arts and the College of Liberal Arts. Specific courses are not prescribed and the change is to match catalog language to current advising practice. Making an estimate, perhaps ten seats per year distributed across all courses in both colleges may be impacted. Because the number of seats across both colleges is estimated to be so small, the College of Fine Arts and the College of Liberal Arts were not formally consulted for permission to make this change.

- b. Do you anticipate a net change in the number of students in your college? Yes  No   
If yes, how many more (or fewer) students do you expect?
- c. Do you anticipate a net increase (or decrease) in the number of students from outside of your college taking classes in your college? Yes  No   
If yes, please indicate the number of students and/or class seats involved.
- d. Do you anticipate a net increase (or decrease) in the number of students from your college taking courses in other colleges? Yes  No   
If yes, please indicate the number of students and/or class seats involved.

**If 4 a, b, c, or d was answered with yes, please answer the following questions. If the proposal has potential budgetary impacts for another college/school, such as requiring new sections or a non-negligible increase in the number of seats offered, at least one contact must be at the college-level.**

How many students do you expect to be impacted? Not provided by UTeach Engineering or UTeach Natural Sciences; minimal number.

Impacted schools must be contacted and their response(s) included: UTeach Engineering

Person communicated with: David Allen, director

Date of communication: September 22, 2017

Response: Suggested proposed changes.

- e. 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:

- f. Will this proposal change the number of hours required for degree completion? No.

Note: THECB Semester Credit Hour Change Form required, download from URL:

<http://www.thecb.state.tx.us/reports/DocFetch.cfm?DocID=2419&format=doc>

If yes, explain:

## 5. COLLEGE/SCHOOL APPROVAL PROCESS

Department approval date:	March 14, 2017	Mathematics Curriculum Committee
Dean's Scholars approval:	May 10, 2017	Dean's Scholars Steering Committee
UTeach Program:	September 22, 2017	David Allen, UTeach Program, director
College approval date:	April 6, 2017	Course and Curriculum Committee
	September 27, 2017	
Dean approval date:	September 27, 2017	David Vanden Bout, Associate Dean for Undergraduate Education

## PROPOSED NEW CATALOG TEXT:

### BACHELOR OF SCIENCE IN MATHEMATICS

{no change}

#### Prescribed Work Common to All Options

{no change}

#### Additional Prescribed Work for Each Option

##### Option I: Actuarial Science

5. Eight semester hours of majors-level coursework in one of the following areas: astronomy, biology, chemistry, geological sciences, and physics.
6. Complete one of the following:
  - a. Mathematics 408C\*, 408D, and 427L
  - b. Mathematics 408N, 408S, and 408M
  - c. Mathematics 408K, 408L, and 408M

\*Mathematics 408N, and 408S, or 408K and 408L, may substitute for 408C

7. Economics 304K and 304L
8. Accounting 310F or both 311 and 312
9. Finance 357
10. Computer Science 303E
11. Upper-division mathematics courses, including:
  - a. Mathematics 325K or 328K. Mathematics 328K is recommended for students with substantial experience in writing proofs.
  - b. Mathematics 341. Mathematics 340L may be substituted for 341 if the course was completed prior to entry into the mathematics entry-level major.
  - c. Mathematics 362K, and either 358K or 378K
  - d. Mathematics 329F, 339D, 339J, and 339U
  - e. Two courses from the following: Mathematics 339V, 339W, 349P

- f. One additional course chosen from the following: Mathematics 339C, 339V, 339W, 349P, 349R, 378K

One of the courses fulfilling requirement 11a through 11f must be taught in the inquiry based learning (IBL) format or with an independent inquiry flag. IBL courses are identified each semester through a notation under the unique number in the course schedule and through a list maintained in the mathematics advising office in Robert Lee Moore Hall, room 4.101. Courses with an independent inquiry flag are identified in the Course Schedule.

12. At least six semester hours of upper-division coursework must be outside both mathematics and the fields of study listed in requirement 1. Philosophy courses in logic, computer science courses in discrete mathematics, engineering courses, and actuarial foundation courses may not be used to fulfill this requirement.
13. Enough additional coursework to make a total of 120 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. One of the following sequences:
  - a. Mathematics 408C\* and 408D
  - b. Mathematics 408N and 408S
  - c. Mathematics 408K and 408L

\*Mathematics 408N and 408S, or 408K and 408L, may substitute for 408C
7. Mathematics 315C
8. Biology 337 (Topic 2: *Research Methods: Uteach*), Chemistry 368 (Topic 1: *Research Methods: Uteach*) or Physics 341 (Topic 7: *Research Methods: Uteach*)
9. The requirements of one of the following certification areas:
  - a. For mathematics certification:
    - i. Mathematics 340L or 341
    - ii. Mathematics 325K or 328K, 333L, 358K, and 362K. Mathematics 328K is recommended for students with substantial experience in writing proofs.
    - iii. Mathematics 375D
    - iv. Mathematics 361K or 365C
    - v. Mathematics 343K or 373K
    - vi. Mathematics 427J.
    - vii. Two courses chosen from: Mathematics 328K, 339J, 339U, 343K, 343L, 348, 361, 365C, 365D, 368K, 373K, 373L, 378K. A course used to fulfill requirements 9ai through 9avi may not also be counted toward requirement 9avii
    - viii. A three-semester-hour supporting course that uses mathematics but is in a field other than mathematics. The following courses may be used to fulfill this requirement: Accounting 310F or 311, Architectural Engineering 323K, Astronomy 307, 352K, 352L, 358, 367M, Chemistry 301 or 301H, 303, Civil Engineering 321, 341, Computer Science 303E, 313E, Economics 420K, Electrical Engineering 302, 366, 366L, Geological Sciences 346C, 354, 476K, Geography 360L, Government 341M, Human Development and Family Sciences 322, Mechanical Engineering 320, 326, 366L, 366Q, 366R, Petroleum and Geosystems Engineering 310, Physics 301, 303K, 303L, Psychology 325K, 332, Sociology 369L
  - b. For mathematics, physical science, and engineering certification:

- i. Mathematics 325K or 328K, 427J, 333L, 341, 358K, and 362K. Mathematics 328K is recommended for students with substantial experience in writing proofs
  - ii. Mathematics 361K or 365C
  - iii. Mathematics 375D
  - iv. Physics 301, 101L, 316, 116L, 315, and 115L
  - v. Chemistry 301 or 301H, 302 or 302H, and 204
  - ~~vi. Chemical Engineering 379 (Topic: *Fundamentals of Engineering and Design*), 379 (Topic: *Engineering Energy Systems*), and Mechanical Engineering 379M (Topic: *Design of Machines and Systems*)~~ Engineering Studies 301; and Mechanical Engineering 377K upon approval of the project by the UTeach Program.
10. [~~18~~] Eighteen semester hours of professional development coursework consisting of:
    - a. Curriculum and Instruction 651S
    - 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
  11. 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. Students seeking mathematics, physical science, and engineering certification may not seek middle grade certification.
  12. Enough additional coursework to make a total of at least 120 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, Physics 315 and 115L. Credit earned by examination may not be counted toward this requirement
6. An honors section of Mathematics 427J [~~427K~~], and six semester hours of coursework chosen from Mathematics 365C, 367K, and 373K
7. Twenty [~~20~~] 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 students in the Dean Scholars Honors Program
10. Mathematics 379H
11. Thirty [~~30~~] additional semester hours of coursework approved by the departmental honors adviser
12. Six semester hours of coursework [~~in~~] from the College of Liberal Arts [~~or~~] and the College of Fine Arts
13. Enough additional coursework to make a total of 120 semester hours.

#### Option VII: Mathematics

5. Eight semester hours of majors-level coursework in one of the following areas: astronomy, biology, chemistry, geological sciences, and physics
6. Computer Science 303E
7. One of the following sequences:
  - a. Mathematics 408C\* and 408D
  - b. Mathematics 408N and 408S
  - c. Mathematics 408K and 408L

\*Mathematics 408N and 408S, or 408K and 408L, may substitute for 408C
8. [~~Additional mathematics including:~~]
  - ~~a.~~ Three of the following: Mathematics 408M or 427L, 427J, 341, 362K. Mathematics 340L may be substituted for 341 if the course was taken prior to entry into the mathematics entry-level major
9. [~~b.~~] Mathematics 325K or 328K. Mathematics 328K is recommended for students with substantial experience in writing proofs
10. [~~c.~~] One of the following: Mathematics 343K, 361K, 365C, 367K, 373K

11. [~~d. 21 additional~~] Complete thirty-three hours of upper-division mathematics, chosen from requirements 8, 9, 10, and the following courses: Mathematics 325K, 427J or 427K, 427L, 328K, 329F, 333L, 339C, 339D, 339J, 339U, 339V, 339W, 340L or 341, 343 K, 343L, 344K, 346, 348, 349P, 349R, 358K, 361, 361K, 362K, 362M, 365C, 365D, 365G, 367K, 367L, 368 K, 372K, 373K, 373L, 374G, 374M, 375D, 378K, [and] 379H, and 375T. [Mathematics 375, 375C, and 375T may be applied toward this requirement with prior approval of the faculty adviser] Mathematics 374M may not count toward both requirement 11 and 13
12. [~~e.~~] One upper-division mathematics course identified as taught in the inquiry based learning (IBL) format or with an independent inquiry flag. IBL courses are identified each semester through a notation under the unique number in the Course Schedule and through a list maintained in the mathematics advising office in Robert Lee Moore Hall, room 4.101. Courses with an independent inquiry flag are identified in the Course Schedule. Courses counted toward requirements 8, 9, 10, and 11 may also count toward this requirement.

[Mathematics courses listed in requirements 8a through 8d may only be applied toward one requirement.]

13. [~~9.~~] Mathematics in context. One course chosen from:
- Mathematics 374M
  - Chemistry 353, 354
  - Computer Science 341, 342, 345, 346, 353, 367
  - Electrical Engineering 411, 325, 360C, 362K
  - Physics 329, 336K, 352K

Courses in requirements [~~9b through 9d~~] 13b through 13e may require additional prerequisites. Mathematics 374M may not count toward both requirement [~~8 and 9~~] 11 and 13.

14. [~~10.~~] 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, and actuarial foundation courses may not be used to fulfill this requirement.
15. [~~11.~~] Enough additional coursework to make a total of 120 semester hours

### Special Requirements

{no change}