

MICHIGAN STATE UNIVERSITY

February 1, 2016

MEMORANDUM

TO: Dr. Douglas Estry, Associate Provost for Undergraduate Education
and Dean of Undergraduate Studies

FROM: Dr. John Gaboury, Associate Provost for Academic Services
and Enrollment Management

RE: Request to Add an Admission Requirement to the Bachelor of Science
Degree in Actuarial Science

For Transmittal to the University Committee on Undergraduate
Education (UCUE)

The request referenced above is being sent to the University Committee on Undergraduate Education (UCUE) in accordance with the *Bylaws for Academic Governance*, 4.4.

UCUE Response Requested:

Please ask the UCUE to consider the request referenced above and provide consultative commentary prior to the March 3, 2016 Full Committee, UCC meeting. Please mail the related materials referenced under the heading Attachments at the end of this memorandum to the UCUE members.

The academic program and course requests referenced above will be included on the agenda for the February 18, 2016 meeting of Subcommittee A, University Committee on Curriculum (UCC). Requests that are approved by Subcommittee A on February 18 will be before the Full Committee, UCC, for action on March 3, 2016. Requests that are approved by the Full Committee on March 3 will be included in the March 15, 2016, Report of the UCC to the Faculty Senate.

If you have any questions, please call Joy Speas, University Curriculum Administrator at 5-8420.

Thank you for your help.

Attachments:

1. Request for Changes in an Academic Program form dated November 9, 2015: Bachelor of Science Degree in Actuarial Science and attachments.



University Curriculum and Catalog

Hannah Admin. Building
426 Auditorium Road
Room 151
East Lansing, MI 48824

517-355-8420
Fax: 517-353-1935

COLLEGE OF NATURAL SCIENCE

1. Request to change the requirements for the **Bachelor of Science** degree in **Actuarial Science** in the Department of Mathematics. The University Committee on Undergraduate Education (UCUE) will consider this request.

- a. Add the following **Admission to the Major** statement:

To be considered for admission to the major, the student must have:

1. a cumulative grade-point average of at least 3.0 in all courses taken at MSU.
2. a minimum grade of 3.0 in both MTH 132 and MTH 133 or equivalent for transfer students.
3. an average of 3.0 in the grades in MTH 360 and STT 441.

Students who declare the major in actuarial science are automatically reviewed at the end of every semester and are either admitted or informed of their progress. Students must be admitted to a degree-granting college at the time they have completed 56 credits. Those who do not meet the criteria may consider a major in either Mathematics or in Statistics and Probability.

Effective Fall 2016.



Michigan State University - Office of the Registrar

View a Program		Main Menu
Joy Speas, RO		Tuesday, 11/17/2015
Program Name: Actuarial Science Degree: BS Sequence Number: 3		Program Request ID: 3053
Effective Dates: Fall 2016 - Open Status: Interim Initial Action: Change		
Requested Date: 9/8/2015 1:58:49 PM		
<p>1. Department/School/College: 32574 Department of Mathematics</p> <p>2. Name of Program: Actuarial Science</p> <p>3. Name of Degree: BS</p> <p>4. Type of Program: Major</p> <p>5. Effective Start Semester: Prev: Fall 2015 New: Fall 2016</p> <p>6. Target student audience for the program: Students desiring careers as actuaries.</p> <p>7. Enrollment: What is the expected enrollment per year: Prev: 60 New: 35 What is the minimum enrollment acceptable: Prev: 40 New: 20</p> <p>8. Source of budget for the program: To align academic planning and curricular change, ALL requests for NEW funds must be included in the College's annual planning letter. Provost approval of new funds and the effective date for the new program must align. If funding is not approved, then the program request will not be forwarded to Faculty Senate. Prev: Internal reallocation, College reallocation New: Internal reallocation If new funds, was this request included in the College's annual planning letter? Indicate yes or no. If no, then this is a department or college fund reallocation (If the program is implemented, no additional resources are required.). Prev: New: No new funds are needed for this change.</p> <p>9. Projected Costs as compared to other programs in unit: Same</p> <p>10. Staff requirement: How many additional staff will be required: 0 Who will provide the primary instruction. Describe any external linkages(Industry, government, etc.): Prev: current faculty New: All of the following are current faculty: Albert Cohen (Mathematics), Gabor Francsics (Mathematics), Jacob Geyer (Industry), Hyokyoung Hong (Statistics and Probability), Shlomo Leventhal (Statistics and Probability), Darren Mason (Mathematics), Tom McCollum (Mathematics), Mark Schroder (Finance), Yimin Xiao (Statistics and Probability) External professional linkages: City of East Lansing, City of Lansing, Accident Fund Holdings, Auto-Owners Insurance, Farm Bureau Insurance, Jackson National Life, Towers Watson</p> <p>11. Will additional equipment be required: Approximate cost: 0</p>		

Source of funding:

12. Will additional library materials be required:

Approximate cost: 0

Source of funding: None needed

13. Will additional space be required:

Type:

Approximate amount:

14. If the program requirements contain a named concentration, do you wish for the concentration to be noted on the student's transcript?:

No

15. Detailed Description:

There are no changes to the current degree requirements nor the existing assessment plan.

We wish to add admission requirements to qualify for the BS in Actuarial Science. The following admission requirements would be added.

A. A cumulative GPA of at least 3.0 in all courses taken at MSU.

B. A minimum grade of 3.0 in both MTH 132 and MTH 133 (or equivalent for transfer students).

C. The average of the grades in MTH 360 and STT 441 must be at least 3.0 or better.

New students who declare the major in Actuarial Science are automatically reviewed at the end of every semester, and are either admitted or informed of their progress. Students must be admitted to a degree-granting college at the time they have completed 56 credits. Those who do not meet the criteria may consider a major in either Mathematics or Statistics and Probability.

16. Are there admissions requirements for this program?:

Grade or grade-point average requirements and if so in which course(s), portfolio requirement, audition, essay, etc. If there are not admission requirements other than those required by the University policy indicate "none".

Prev: No admissions requirements. Open to any MSU student.

New: The grade requirement in point "B" in #15 is to guarantee a certain minimum degree of proficiency with the basic mathematics skills needed for the degree. Similarly, point "C" is to make sure that the student does sufficiently well in two of the initial courses needed for actuaries to indicate aptitude for this area

17. Type(s) of change(s):

Academic program admission requirements

18. Students who will be affected by the proposed changes:

Students wishing to major in Actuarial Science

19. Will the proposed change(s) have a negative impact on students? If so, which ones?:

Describe impact and explain what accommodations will be made: Students denied entry would pursue a degree in Math or Statistics.

20. Reason(s) for change(s):

There is a glut of students seeking jobs in the actuarial profession, see <http://casact.org/press/index.cfm?fa=viewArticle&articleID=2874>. Because of the large supply, employers are setting a very high bar for hiring. Usually this includes an overall GPA of at least 3.2, 1-2 student internships of which there are a limited number available, and passing 1-2 actuarial exams. The actuarial program here at MSU needs to produce students who can live up to these expectations so that they can find employment. Adding admissions requirements will help ensure such high standards. Another reason for the change is the goal of the actuarial program to become a Center of Actuarial Excellence (CAE), a designation bestowed by the Society of Actuaries, <https://www.soa.org/cae/>. There are several benefits to becoming a CAE such as the prestige it bestows on the program and its students which will help them in their job searches. One of the criteria to be a CAE is that "the program produces high quality graduates who are in demand by employers." This has to be backed up by data about our students and graduates, placement for internships, success on actuarial exams, and employment records. Raising the admissions requirements will help us make this important step in the recognition of the MSU Actuarial Program.

DEPARTMENT LEVEL APPROVAL STATUS

Approved: Department of Mathematics

10/23/2015 2:07:37 PM by Teri Roache for Keith Promislow, Chairperson

Comments: additional edits were made after initial submission and form is re-routing for signoff approval

SIGNOFFS STATUS

Signed Off: Department of Accounting and Information Systems
10/26/2015 10:09:47 AM by Lynn Zelenski for Vallabh Sambamurthy, Chairperson

Signed Off: Department of Computer Science and Engineering
10/23/2015 2:21:26 PM by Abdol Esfahanian for Matt W. Mutka, Acting Chairperson

Signed Off: Department of Economics
10/23/2015 2:09:18 PM by Margaret Lynch for Carl Davidson, Chairperson

No Response by: Department of Finance

Signed Off: Department of Statistics and Probability
10/23/2015 2:25:57 PM by Suzanne Watson for Yimin Xiao, Acting Chairperson

Signed Off: Lyman Briggs College
10/28/2015 9:02:13 AM by Mark Largent for Elizabeth H. Simmons, Dean

COLLEGE LEVEL APPROVAL STATUS

Approved: College of Natural Science
11/9/2015 2:45:34 PM by Teri Roache for Gerard Mark Volt, Associate Dean



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Requirements for the Bachelor of Science Degree in Actuarial Science

- The University requirements for bachelor's degrees as described in the *Undergraduate Education* section of this catalog; 120 credits, including general elective credits, are required for the Bachelor of Science degree in Actuarial Science.

The University's Tier II writing requirement for the Actuarial Science major is met by completing Mathematics 309 or 496. Those courses are referenced in item 3. below.

Students who are enrolled in the College of Natural Science may complete the alternative track to Integrative Studies in Biological and Physical Sciences that is described in item 1. under the heading *Graduation Requirements* in the College statement. Certain courses referenced in requirement 3. below may be used to satisfy the alternative track.

- The requirements of the College of Natural Science for the Bachelor of Science degree.

The credits earned in certain courses referenced in requirement 3. below may be counted toward College requirements as appropriate.

- The following requirements for the major.

CREDITS

- One course of at least 3 credits in biological science, entomology, microbiology, physiology, plant biology, or zoology.
- One of the following groups of courses (8 or 10 credits):
 - | | | |
|---------|---------------------------------|---|
| CEM 141 | General Chemistry | 4 |
| CEM 142 | General and Inorganic Chemistry | 3 |
| CEM 161 | Chemistry Laboratory I | 1 |
 - | | | |
|---------|-----------------------------------|---|
| CEM 151 | General and Descriptive Chemistry | 4 |
| CEM 152 | Principles of Chemistry | 3 |
| CEM 161 | Chemistry Laboratory I | 1 |
 - | | | |
|----------|-------------------------------|---|
| CEM 181H | Honors Chemistry I | 4 |
| CEM 182H | Honors Chemistry II | 4 |
| CEM 185H | Honors Chemistry Laboratory I | 2 |
 - | | | |
|---------|-------------------------------------|---|
| LB 171 | Principles of Chemistry I | 4 |
| LB 171L | Introductory Chemistry Laboratory I | 1 |
| LB 172 | Principles of Chemistry II | 3 |
- One of the following groups of courses (8 credits):
 - | | | |
|---------|---|---|
| PHY 183 | Physics for Scientists and Engineers I | 4 |
| PHY 184 | Physics for Scientists and Engineers II | 4 |
 - | | | |
|----------|--------------------------------------|---|
| PHY 193H | Honors Physics I – Mechanics | 4 |
| PHY 294H | Honors Physics II – Electromagnetism | 4 |
 - | | | |
|--------|------------|---|
| LB 273 | Physics I | 4 |
| LB 274 | Physics II | 4 |
- One of the following groups of courses (6 to 8 credits):
 - | | | |
|---------|-------------|---|
| MTH 132 | Calculus I | 3 |
| MTH 133 | Calculus II | 4 |
 - | | | |
|--------|-------------|---|
| LB 118 | Calculus I | 4 |
| LB 119 | Calculus II | 4 |
 - | | | |
|----------|--------------------|---|
| MTH 152H | Honors Calculus I | 3 |
| MTH 153H | Honors Calculus II | 4 |
- One of the following courses (4 credits):

LB 220	Calculus III	4
MTH 234	Multivariable Calculus	4
MTH 254H	Honors Multivariable Calculus	4
- One of the following courses (3 credits):

MTH 235	Differential Equations	3
MTH 255H	Honors Differential Equations	3
MTH 340	Ordinary Differential Equations I	3
- One of the following courses (1 credit):

MTH 490	Directed Studies	1
MTH 491B	Teamwork Experience	1
- All of the following courses (24 credits):

MTH 309	Linear Algebra I	3
MTH 360	Theory of Mathematical Interest	3
MTH 361	Financial Mathematics for Actuaries I	3
MTH 458	Financial Mathematics for Actuaries II	3
STT 441	Probability and Statistics I: Probability	3
STT 455	Actuarial Models I	3
STT 456	Actuarial Models II	3
STT 459	Construction and Evaluation of Actuarial Models	3
- One of the following courses (3 credits):

MTH 457	Introduction to Financial Mathematics	3
STT 442	Probability and Statistics II: Statistics	3
- One of the following courses (3 credits):

MTH 491A	Actuarial Internship	3
MTH 496	Capstone in Mathematics (W)	3
- All of the following courses (15 credits):

ACC 230	Survey of Accounting Concepts	3
EC 201	Introduction to Microeconomics	3
EC 202	Introduction to Macroeconomics	3
FI 311	Financial Management	3
FI 321	Theory of Investments	3
- One of the following courses (3 or 4 credits):

CSE 131	Technical Computing and Problem Solving	3
CSE 231	Introduction to Programming I	4

Admission to the Major

To be considered for admission to the major, the student must have:

1. a cumulative grade-point average of at least 3.0 in all courses taken at MSU.
2. a minimum grade of 3.0 in both MTH 132 and MTH 133 or equivalent for transfer students.
3. an average of 3.0 in the grades in MTH 360 and STT 441.

Students who declare the major in actuarial science are automatically reviewed at the end of every semester and are either admitted or informed of their progress. Students must be admitted to a degree-granting college at the time they have completed 56 credits. Those who do not meet the criteria may consider a major in either Mathematics or in Statistics and Probability.