

# MICHIGAN STATE UNIVERSITY

March 29, 2023

## MEMORANDUM

TO: Dr. Mark Largent, Associate Provost for Undergraduate Education and  
Dean of Undergraduate Studies

FROM: Joy Speas, University Curriculum Administrator

RE: Request to Delete the Admission Requirement for 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 you for action by the University  
Committee on Undergraduate Education (UCUE).

### UCUE Response Requested:

Please ask the UCUE to consider the request referenced above. Please mail the  
related materials referenced under the heading Attachments at the end of this  
memorandum to the members of the UCUE.

The academic program and course requests referenced above will be included on the  
agenda for the April 18, 2023 meeting of Subcommittee A, University Committee on  
Curriculum (UCC). Requests that are approved by Subcommittee A on April 18 will be  
before the Full Committee, UCC, for action on April 27, 2023. Requests that are  
approved by the Full Committee on April 27 will be included in the September, 2023,  
Report of the UCC to the Faculty Senate.

If you have any questions about this memorandum or the attached materials, please call  
me at 5-8420.

Thank you for your help.

### Attachments:

1. Entry for the April 18, 2023 meeting of Subcommittee A.
2. Request for Changes in an Academic Program forms dated March 8,  
2023: Bachelor of Science Degree in Actuarial Science and  
attachments.
3. Draft, of the work copy for the Academic Programs section of the University  
catalog: Actuarial Science, Bachelor of Science, pages 1 – 2 .

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## University Curriculum and Catalog

Hannah Admin. Building  
426 Auditorium Road  
Suite 430  
East Lansing, MI 48824

517-355-8420  
Fax: 517-355-9601

**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 at its April 6, 2023 meeting.

a. Delete the section **Admission**.

b. Under the heading **Requirements for the Bachelor of Science Degree in Actuarial Science** make the following changes:

(1) Add the following new item 3. I.:

One of the following courses (4 credits):

CSE	231	Introduction to Programming I	4
CMSE	201	Computational Modeling and Data Analysis I	4
STT	180	Introduction to Data Science	4

Effective Fall 2023.



### View a Program

Joy Speas, Office of the Registrar

Monday, 3/20/2023

Program Name: Actuarial Science  
Degree: BS      Sequence Number: 7

Program Request ID: 4848

Effective Dates: Fall 2023 - Open      Status: Interim      Initial Action: Change

Requested Date: 11/8/2022 1:27:00 PM

**1. Department/School/College:**

10032574 .... Department of Mathematics

**2. Name of Program:**

Actuarial Science

**3. Name of Degree:**

BS

**4. Type of Program:**

Major

**5. Effective Start Semester:**

Prev: Fall 2022

New: Fall 2023

**6. Target student audience for the program:**

Undergraduate students in the College of Natural Science

**7. Enrollment:**

What is the expected enrollment per year: 15

What is the minimum enrollment acceptable: 10

**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.

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.).  
No new funds will be necessary for the implementation of this change

**9. Projected Costs as compared to other programs in unit:**

Same

**10. Staff requirement:**

How many additional staff will be required: 0

Who will provide the primary instruction. Describe any external linkages(industry, government, etc.):

**11. Will additional equipment be required:**

Approximate cost: 0

Source of funding:

**12. Will additional library materials be required:**

Approximate cost: 0

Source of funding: N/A

**13. Will additional space be required:**

Type: N/A

Approximate amount: N/A

**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:**

**Admission to the Major**

- ~~1. To be considered for admission to the major, the student must have a cumulative grade-point average of at least 3.0 in all courses taken at MSU.~~
- ~~2. a minimum grade-point average of 3.0 in MTH 132, MTH 133, and MTH 234 or equivalent courses.~~
- ~~3. a minimum average of 3.0 in the grades in MTH 360 and STT 441.~~

~~Additional criteria for admission includes the following:~~

- ~~1. Passing a Society of Actuaries exam in one of the following ways:
  - ~~a. Passing the Society of Actuaries Exam P (Probability), or the Casualty Actuary Society Exam 1 (Probability) before August of the year of admission into the degree program.~~
  - ~~b. Passing the Society of Actuaries Exam FM (Financial Mathematics), or the Casualty Actuary Society Exam 2 (Financial Mathematics) before August of the year of admission into the degree program.~~~~
- ~~2. Passing an MSU screening which involves satisfactory performance in an interview with the Director of the Actuarial Science Program or their delegate.~~

~~Students wishing to major in actuarial science need to make a request to the Actuarial Science program director or delegate when they are eligible and ready to be considered for the major. The Actuarial Science program director approves acceptance into the major. The Director of the Actuarial Science program, or their delegate, could admit students into the program who do not satisfy both of these criteria under exceptional circumstances. A student denied access to the actuarial science major could become an actuary by successfully taking Actuarial Science Exams.~~

~~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, Quantitative Risk Analytics, or in Statistics and Probability.~~

(No Changes in Curriculum requirements for Degree)

### **Requirements for the Bachelor of Science Degree in Actuarial Science**

1. The University requirements for bachelor's degrees as described in the [Undergraduate Education](https://reg.msu.edu/AcademicPrograms/Text.aspx?Section=110) (<https://reg.msu.edu/AcademicPrograms/Text.aspx?Section=110>) 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.

2. 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.

3. The following requirements for the major:

- a. One course of at least 3 credits in biological science, entomology, microbiology, physiology, plant biology, or integrative biology.
- b. One of the following groups of courses (8 or 10 credits):

(1)	CEM	141	General Chemistry	4
	CEM	142	General and Inorganic Chemistry	3

	CEM	161	Chemistry Laboratory I	1
(2)	CEM	151	General and Descriptive Chemistry	4
	CEM	152	Principles of Chemistry	3
	CEM	161	Chemistry Laboratory I	1
(3)	CEM	181H	Honors Chemistry I	4
	CEM	182H	Honors Chemistry II	4
	CEM	185H	Honors Chemistry Laboratory I	2
(4)	LB	171	Principles of Chemistry I	4
	LB	171L	Introductory Chemistry Laboratory I	1
	LB	172	Principles of Chemistry II	3

c. One of the following groups of courses (8 or 10 credits):

(1)	PHY	183	Physics for Scientists and Engineers I	4
	PHY	184	Physics for Scientists and Engineers II	4
(2)	PHY	193H	Honors Physics I – Mechanics	4
	PHY	294H	Honors Physics II – Electromagnetism	4
(3)	LB	273	Physics I	4
	LB	274	Physics II	4
(4)	PHY	173	Studio Physics for Scientists and Engineers I	5
	PHY	174	Studio Physics for Scientists and Engineers II	5

d. One of the following groups of courses (6 to 8 credits):

(1)	MTH	132	Calculus I	3
	MTH	133	Calculus II	4
(2)	LB	118	Calculus I	4
	LB	119	Calculus II	4

	(3)	MTH	152H	Honors Calculus I	3
		MTH	153H	Honors Calculus II	4
e.	One of the following courses (4 credits):				
	LB	220	Calculus III		4
	MTH	234	Multivariable Calculus		4
	MTH	254H	Honors Multivariable Calculus		4
f.	One of the following courses (3 credits):				
	MTH	235	Differential Equations		3
	MTH	340	Ordinary Differential Equations I		3
g.	One of the following courses (1 credit):				
	MTH	490	Directed Studies		1
	MTH	491B	Teamwork Experience		1
h.	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
i.	One of the following courses (3 credits):				
	MTH	457	Introduction to Financial Mathematics		3
	STT	442	Probability and Statistics II: Statistics		3

j. One of the following courses (3 credits):

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

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

CSE	231	Introduction to Programming I	4
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CMSE	201	Computational Modeling and Data Analysis I	4
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STT	180	Introduction to Data Science	4
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## 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: The current admission requirements for the BS in AS are: A. An average GPA of at least 3.0 in all courses taken. B. A minimum GPA of at least 3.0 in both MTH 132 and MTH 133 (or equivalent for transfer students). C. An average GPA of at least 3.0 in MTH 360 and STT 441. As stated in point 15, we wish to add the following admission requirement for the AS track: Students already admitted into the broad AS/QRA program before the end of their 2nd year on campus at MSU would need to be admitted into the AS track by decision of the Director of the Actuarial Science program and/or their delegate. This decision would be based on the following criteria: • Passing an SOA exam: o EITHER Passing the Society of Actuaries Exam P (Probability), or the Casualty Actuary Society Exam 1 (Probability) before August of the year of admission into the track. o OR Passing the Society of Actuaries Exam FM (Financial Mathematics), or the Casualty Actuary Society Exam 2 (Financial Mathematics) before August of the year of admission into the track. AND • Passing an MSU screening: Satisfactory



performance in an interview with the Director of the Actuarial Science Program and/or their delegate.

New: NEW: None

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

admission requirements

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

students intending 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:

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

Removal of admission requirements to program. To acknowledge more inclusivity at MSU and address a widening job market for skills earned in this major, we no longer will have admission requirements for students to select this major. **NEW UPDATE TO THIS SUBMISSION: STT 180 is being added also as additional option to meet the programming requirement for the major.**

there is currently no program requirement for this degree in the catalog. The 3 courses are a new addition.

**DEPARTMENT LEVEL APPROVAL STATUS**

Approved: Department of Mathematics  
2/21/2023 9:49:44 AM by Brian Chadwick for Keith Promislow, Chairperson

**SIGNOFFS STATUS**

Signed Off: College of Natural Science  
2/21/2023 10:02:37 AM by Lynmarie Posey for Phillip M. Duxbury, Dean

Comments: Approved at NatSci Curriculum Committee meeting on 2/20/23.

No Response by: Department of Computer Science and Engineering

Signed Off: Department of Finance  
2/21/2023 11:03:05 AM by Andrei Simonov for Andrew Simonov, Chairperson

No Response by: Department of Mathematics

No Response by: Department of Statistics and Probability

**COLLEGE LEVEL APPROVAL STATUS**

Approved: College of Natural Science  
3/8/2023 8:28:57 AM by Estrella Starn for LynnMarie Posey, Associate Dean

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## **ACTUARIAL SCIENCE**

### **Admission**

~~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 point average of 3.0 in MTH 132, MTH 133, and MTH 234 or equivalent courses.~~
- ~~3. a minimum average of 3.0 in the grades in MTH 360 and STT 441.~~

~~Additional criteria for admission includes the following:~~

- ~~1. Passing a Society of Actuaries exam in one of the following ways:
  - ~~a. Passing the Society of Actuaries Exam P (Probability), or the Casualty Actuary Society Exam 1 (Probability) before August of the year of admission into the degree program.~~
  - ~~b. Passing the Society of Actuaries Exam FM (Financial Mathematics), or the Casualty Actuary Society Exam 2 (Financial Mathematics) before August of the year of admission into the degree program.~~~~
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### **Requirements for the Bachelor of Science Degree in Actuarial Science**

- ~~1. 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.

2. 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.

3. The following requirements for the major.

**CREDITS**

- a. One course of at least 3 credits in biological science, entomology, microbiology, physiology, plant biology, or integrative biology.

- b. One of the following groups of courses (8 or 10 credits):

(1)	CEM 141 General Chemistry	4
	CEM 142 General and Inorganic Chemistry	3
	CEM 161 Chemistry Laboratory I	1
(2)	CEM 151 General and Descriptive Chemistry	4
	CEM 152 Principles of Chemistry	3
	CEM 161 Chemistry Laboratory I	1
(3)	CEM 181H Honors Chemistry I	4
	CEM 182H Honors Chemistry II	4
	CEM 185H Honors Chemistry Laboratory I	2
(4)	LB 171 Principles of Chemistry I	4
	LB 171L Introductory Chemistry Laboratory I	1
	LB 172 Principles of Chemistry II	3

- c. One of the following groups of courses (8 or 10 credits):

(1)	PHY 183 Physics for Scientists and Engineers I	4
	PHY 184 Physics for Scientists and Engineers II	4
(2)	PHY 193H Honors Physics I – Mechanics	4
	PHY 294H Honors Physics II – Electromagnetism	4
(3)	LB 273 Physics I	4
	LB 274 Physics II	4
(4)	PHY 173 Studio Physics for Scientists and Engineers I	5
	PHY 174 Studio Physics for Scientists and Engineers II	5

- d. One of the following groups of courses (6 to 8 credits):

(1)	MTH 132 Calculus I	3
	MTH 133 Calculus II	4
(2)	LB 118 Calculus I	4
	LB 119 Calculus II	4
(3)	MTH 152H Honors Calculus I	3
	MTH 153H Honors Calculus II	4

- e. One of the following courses (4 credits):

LB 220	Calculus III	4
MTH 234	Multivariable Calculus	4
MTH 254H	Honors Multivariable Calculus	4

- f. One of the following courses (3 credits):

MTH 235	Differential Equations	3
MTH 340	Ordinary Differential Equations I	3

- g. One of the following courses (1 credit):

MTH 490	Directed Studies	1
MTH 491B	Teamwork Experience	1

- h. 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

- i. One of the following courses (3 credits):

MTH 457	Introduction to Financial Mathematics	3
STT 442	Probability and Statistics II: Statistics	3

- j. One of the following courses (3 credits):

MTH 491A	Actuarial Internship	3
MTH 496	Capstone in Mathematics (W)	3

- k. All of the following courses (15 credits):

ACC 230	Survey of Accounting Concepts	3
CSE 231	Introduction to Programming I	4
EC 201	Introduction to Microeconomics	3
EC 202	Introduction to Macroeconomics	3
FI 311	Financial Management	3
FI 321	Theory of Investments	3

**l. One of the following courses (4 credits):**  
**CSE 231 Introduction to Programming I 4**  
**CMSE 201 Computational Modeling and Data Analysis I 4**  
**STT 180 Introduction to Data Science 4**

