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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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):

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>CSE 231</td>
<td>Introduction to Programming I</td>
<td>4</td>
</tr>
<tr>
<td>CMSE 201</td>
<td>Computational Modeling and Data Analysis I</td>
<td>4</td>
</tr>
<tr>
<td>STT 180</td>
<td>Introduction to Data Science</td>
<td>4</td>
</tr>
</tbody>
</table>

Effective Fall 2023.
**View a Program**

<table>
<thead>
<tr>
<th>Joy Speas, Office of the Registrar</th>
<th>Monday, 3/20/2023</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Program Name:</strong> Actuarial Science</td>
<td><strong>Degree:</strong> BS  <strong>Sequence Number:</strong> 7</td>
</tr>
<tr>
<td><strong>Effective Dates:</strong> Fall 2023 - Open</td>
<td><strong>Status:</strong> Interim  <strong>Initial Action:</strong> Change</td>
</tr>
<tr>
<td><strong>Requested Date:</strong> 11/8/2022 1:27:00 PM</td>
<td></td>
</tr>
</tbody>
</table>

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) 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
<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>CEM 161</td>
<td>Chemistry Laboratory I</td>
<td>1</td>
</tr>
<tr>
<td>CEM 151</td>
<td>General and Descriptive Chemistry</td>
<td>4</td>
</tr>
<tr>
<td>CEM 152</td>
<td>Principles of Chemistry</td>
<td>3</td>
</tr>
<tr>
<td>CEM 161</td>
<td>Chemistry Laboratory I</td>
<td>1</td>
</tr>
<tr>
<td>CEM 181H</td>
<td>Honors Chemistry I</td>
<td>4</td>
</tr>
<tr>
<td>CEM 182H</td>
<td>Honors Chemistry II</td>
<td>4</td>
</tr>
<tr>
<td>CEM 185H</td>
<td>Honors Chemistry Laboratory I</td>
<td>2</td>
</tr>
<tr>
<td>LB 171</td>
<td>Principles of Chemistry I</td>
<td>4</td>
</tr>
<tr>
<td>LB 171L</td>
<td>Introductory Chemistry Laboratory I</td>
<td>1</td>
</tr>
<tr>
<td>LB 172</td>
<td>Principles of Chemistry II</td>
<td>3</td>
</tr>
</tbody>
</table>

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

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

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
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.

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CREDITS

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   (2) CEM 151 General and Descriptive Chemistry 4
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   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
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   (1) PHY 183 Physics for Scientists and Engineers I 4
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   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):
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   (2) LB 118 Calculus I 4
   LB 119 Calculus II 4
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   FI 311 Financial Management 3
   FI 421 Theory of Investments 3

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