

<b>Fiscal Unit/Academic Org</b>	Mathematics - D0671
<b>Administering College/Academic Group</b>	Mathematical And Physical Sci
<b>Co-administering College/Academic Group</b>	
<b>Semester Conversion Designation</b>	Re-envisioned with significant changes to program goals and/or curricular requirements (e.g., degree/major name changes, changes in program goals, changes in core requirements, structural changes to tracks/options/courses)
<b>Current Program/Plan Name</b>	Actuarial Science
<b>Proposed Program/Plan Name</b>	Actuarial Science
<b>Program/Plan Code Abbreviation</b>	ACTSCI-BA
<b>Current Degree Title</b>	Bachelor of Arts

## Credit Hour Explanation

Program credit hour requirements		A) Number of credit hours in current program (Quarter credit hours)	B) Calculated result for 2/3rds of current (Semester credit hours)	C) Number of credit hours required for proposed program (Semester credit hours)	D) Change in credit hours
Total minimum credit hours required for completion of program		53	35.3	32	3.3
Required credit hours offered by the unit	Minimum	34	22.7	22	0.7
	Maximum	34	22.7	25	2.3
Required credit hours offered outside of the unit	Minimum	19	12.7	7	5.7
	Maximum	19	12.7	11	1.7
Required prerequisite credit hours not included above	Minimum	30	20.0	22	2.0
	Maximum	30	20.0	23	3.0

**Explain any change in credit hours if the difference is more than 4 semester credit hours between the values listed in columns B and C for any row in the above table**

Adequate knowledge of probability can now be obtained from either Math 4530 or Stat 4201. Formerly, both Math 530 and Stat 420 were required. (Semester versions have expanded.)

## Program Learning Goals

Note: these are required for all undergraduate degree programs and majors now, and will be required for all graduate and professional degree programs in 2012. Nonetheless, all programs are encouraged to complete these now.

- Program Learning Goals**
- Acquire a strong general background in mathematics, statistics, actuarial science, and business.
  - Develop analytical and problem solving skills.
  - Be prepared to pass national actuarial examinations administered by the Society of Actuaries and the Casualty Actuarial Society.

## Assessment

Assessment plan includes student learning goals, how those goals are evaluated, and how the information collected is used to improve student learning. An assessment plan is required for undergraduate majors and degrees. Graduate and professional degree programs are encouraged to complete this now, but will not be required to do so until 2012.

**Is this a degree program (undergraduate, graduate, or professional) or major proposal? Yes**

**Does the degree program or major have an assessment plan on file with the university Office of Academic Affairs? Yes**

**Summarize how the program's current quarter-based assessment practices will be modified, if necessary, to fit the semester calendar.**

Assessment practices will involve minimal changes.

## Program Specializations/Sub-Plans

If you do not specify a program specialization/sub-plan it will be assumed you are submitting this program for all program specializations/sub-plans.

## Pre-Major

Does this Program have a Pre-Major? Yes

To be admitted as an Actuarial Science major, a student must (1) have a cumulative GPA (for courses at Ohio State) of at least 3.0; and (2) either earn a B- or better in a Probability course taken at Ohio State (Math 4530, Stat 4201, or Math 5530H); or pass one of the actuarial exams administered by SOA/CAS.

## Attachments

- Actuarial Science BS and BA cover letter.doc: NMS Division of Arts and Sciences cover letter

*(Letter from the College to OAA. Owner: Andereck,Claude David)*

- CCI Subcommittee Chair Letter.doc: CCI Subcommittee Chair Letter

*(Other Supporting Documentation. Owner: Vankeerbergen,Bernadette Chantal)*

- ActSci\_BA\_6.pdf: program details

*(Program Rationale Statement. Owner: Shapiro,Daniel B)*

## Comments

- When I combine the documents into a single pdf, the one labeled ActSci BA comes out blank except for the last two pages.

DH *(by Hanlin,Deborah Kay on 06/29/2011 03:13 PM)*

- Attached document fulfills several roles. *(by Shapiro,Daniel B on 01/14/2011 08:35 PM)*

## Workflow Information

Status	User(s)	Date/Time	Step
Submitted	Shapiro,Daniel B	01/14/2011 08:35 PM	Submitted for Approval
Approved	Shapiro,Daniel B	01/14/2011 08:39 PM	Unit Approval
Revision Requested	Andereck,Claude David	01/19/2011 03:12 PM	College Approval
Submitted	Shapiro,Daniel B	03/17/2011 08:21 PM	Submitted for Approval
Revision Requested	Shapiro,Daniel B	03/17/2011 10:20 PM	Unit Approval
Submitted	Shapiro,Daniel B	03/17/2011 10:27 PM	Submitted for Approval
Approved	Shapiro,Daniel B	03/17/2011 10:29 PM	Unit Approval
Approved	Andereck,Claude David	03/22/2011 11:08 AM	College Approval
Revision Requested	Vankeerbergen,Bernadette Chantal	04/08/2011 05:15 PM	ASCCAO Approval
Submitted	Shapiro,Daniel B	05/12/2011 04:03 PM	Submitted for Approval
Approved	Shapiro,Daniel B	05/12/2011 04:09 PM	Unit Approval
Revision Requested	Andereck,Claude David	05/20/2011 04:02 PM	College Approval
Submitted	Shapiro,Daniel B	06/28/2011 04:54 PM	Submitted for Approval
Approved	Shapiro,Daniel B	06/28/2011 05:00 PM	Unit Approval
Approved	Andereck,Claude David	06/29/2011 01:37 PM	College Approval
Revision Requested	Hanlin,Deborah Kay	06/29/2011 03:13 PM	ASCCAO Approval



**Department of English**

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Phone (614) 292-0695

TO: Larry Krissek, Committee on Curriculum and Instruction (CCI) Chair  
FROM: James Fredal, CCI Social, Behavioral, Biological, Mathematical and Physical Sciences  
Subcommittee Chair  
RE: Semester Conversion Proposal for Actuarial Science BA and BS.

April 6, 2011

Larry:

The Sciences subcommittee reviewed the proposal for the Actuarial BA and BS degrees at its meeting on March 28 and unanimously approved a motion to move both proposals forward to the full CCI with a number of contingencies.

The Actuarial Science BA and BS are identical except for differences in the GE requirement. The semester version of both have been changed in a few important ways. First, the math requirement has been dropped from two quarter courses to one semester course. Each of the probability courses (Math 4530 or Stat 4201) cover enough probability to prepare students for that portion of the Actuarial exam, so students will be required to take only one of the two.

Second, Math 532 had become devoted primarily to exam preparation but is no longer seen as necessary, and so its successor (3532) has been changed from a requirement to a free elective.

Third, a new course sequence (Math 5633 and 5634) was developed to cover an area (Construction and Evaluation of Models) not previously addressed through coursework but required on the Actuarial exam. This change will ensure that students have an opportunity to take coursework in all preliminary Actuarial exam areas.

Finally, the number of Actuarial majors has increased dramatically. This fact, coupled with a significant portion of students whose marginal performance limits their ability to gain internships and jobs, has led to the development of a pre-major. To enter the Actuarial program, students will now have to have a cumulative GPA (for courses at Ohio State) of at least 3.0 and either earn a B- or better in a Probability course taken at Ohio State (Math 4530, Stat 4201, or Math 5530H) or pass one of the actuarial exams administered by SOA/CAS. Pre-majors who do not complete these requirements would be urged to pursue the financial track of the Mathematics major.

The subcommittee had a few corrections and questions but found the proposal to be substantially sound and approved it unanimously with the understanding that Mathematics would address the following contingencies:

1. On the Pacer Credit Hour Explanation form, the total minimum semester hours required for completion of the program (first line, column c) should be 32 hours rather than 33.
2. The Semester Advising Sheet does not mention all of the choices available for the required courses (Math 5630 or 5633; 5631 or 5634). These should be included.
3. The committee wasn't sure whether students would be able to substitute (the more challenging) Econ 2001.02 and 2002.02 for the .01 versions. This options is not mentioned but seems possible. Perhaps this could be clarified.
4. The transition policy does not address the changes to Math 530 and Stat 420, and specifically the problem of students having one or the other (but not both) when semesters begin. If the intent is for students to take the courses simultaneously or complete both before semester (or simply take the one semester course after) this should be mentioned in proposal as an advising issue during transition. Otherwise, perhaps a bridge course will need to be developed for students with one or the other quarter class. Also, since Math 532 has been dropped as a requirement, a note might be included addressing whether students who have taken it can apply the course for another requirement in the major.
5. On the Curriculum map, the level of learning outcomes is indicated by asterisks: 0 asterisks for Beginning, 1 asterisk for Medium, 2 asterisks for Advanced. Starting with 0 might be confusing. Could the numbers be shifted up to start with 1?
6. The sample curricula, it would have been helpful to have total credits for the degree indicated. Indeed, credit hours are not given for the GEC's, so it is hard to say whether this is a large or small major. Could these numbers be added?
7. On the semester advising sheet, CCI usually requests personal info (such as a student's address) to be removed.

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March 22, 2011

Larry Krissek  
Chair, Arts and Sciences CCI

Dear Larry:

It is a pleasure to forward to you the proposal for the BS and BA major programs in Actuarial Science under semesters. The only difference between the two programs lies in the GE component. The major program itself has been modified from the quarter version largely in response to changes in the professional actuarial exams, and in the basic probability courses in mathematics and statistics. In addition, owing to greatly increased demand for this major, a pre-major has been introduced. Students unable to enter the Actuarial Science major will be able to move easily to the Financial Mathematics track in the Mathematics major program.

Beyond my own review of the documents, the proposal has been discussed by colleagues from other NMS units at a meeting on January 19, 2011. Feedback from these discussions has been incorporated in the proposal.

If you have any questions, I would be happy to address them.

Sincerely,



David Andereck  
Professor of Physics  
Associate Dean of Natural and Mathematical Sciences, College of Arts and Sciences

# **BA in Actuarial Science**

Department of Mathematics, OSU

Note: BA and BS documents are identical for this major, except for the change of name. The only differences are in details of General Education requirements.

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To: Office of Academic Affairs  
From: Luis Casian, Chair, Department of Mathematics  
Date: January 2011  
Re: Semester program proposals for degree programs in the Department of Mathematics

The following programs in the Department of Mathematics are being converted from the quarter system to the semester system, with minimal changes:

1. BS in Mathematics
2. BA in Mathematics
3. Minor in Mathematics
4. BS in Actuarial Science
5. BA in Actuarial Science
6. MS in Mathematics
7. MMS in Mathematics
8. PhD in Mathematics

During the past year, the Department's Undergraduate Committee and Graduate Studies Committee have worked on semester conversions of those programs. This process involved frequent consultations with faculty members involved with particular courses or course sequences, and involved repeated editing of the conversion documents.

Many changes will also be made to the structure and flow of freshman-level math courses. Since those courses do not involve students enrolled in those eight programs, their changes are not discussed in these program conversion documents.

These proposed conversion plans and transition policies were approved by the Undergraduate and Graduate Committees, and were discussed during a faculty meeting in December 2, 2010. The semester conversion plans were approved by the Department's tenure-track faculty, by a vote of 49 yes and 0 no.

A handwritten signature in blue ink, appearing to read "Luis Casian".

Luis Casian  
Professor and Chair

## 1. Program Learning Goals.

Students majoring in actuarial science will:

- (1) acquire a strong general background in mathematics, statistics, and relevant concepts from actuarial science and business;
- (2) develop analytical and problem solving skills;
- (3) be prepared to pass national actuarial examinations administered by the Society of Actuaries and the Casualty Actuarial Society.

## 2. Rationale for Changes in the Actuarial Sciences Major.

Changes to the actuarial science major can be summarized as follows:

- (a) *One required course in probability instead of two.*

Two probability courses (Math 530 and Stat 420) are currently required, but only one is required in the proposed semester program. The 3-credit course Math 530 alone does not provide enough preparation for students for the actuarial exam in probability, so an additional statistics course was required. Each of the semester courses Math 4530 and Stat 4201 will cover enough probability to prepare students for the actuarial exam, so the major requires students to take only one of those two courses.

- (b) *Change of one required course to elective.*

With changes in the curriculum of professional exams, the currently required Math 532 has become a course designed for exam preparation. We propose to drop the corresponding semester course Math 3532 as a requirement, and list it as an free elective course.

- (c) *New course sequence in loss models.*

Courses in the current major program cover topics for all the initial actuarial exams except one, Exam C/4: Construction and Evaluation of Models. In the semester plan, two elective courses are proposed, Math 5633 and 5634. With the addition of this two-course sequence, the courses will cover all five preliminary exams administered by the Society of Actuaries (SOA) and Casualty Actuarial Society (CAS). Students can take this sequence instead of Math 5630 and 5631 to fulfill part of the major requirements, and students on fast track can take both sequences while at OSU. The addition of this new sequence gives our students a more flexible and complete actuarial education.



(d) *Enrollment control: Creation of a Pre-Major.*

In recent years the number of actuarial science majors has increased sharply, from about 80 students in 2005 to 300 students at the end of 2010. This increase causes several symptoms of stress:

- More than one-quarter of current majors have marginal performance and struggle to find internships and jobs as actuaries.
- Actuarial advisors and coordinators are seriously overburdened.
- All courses taken by actuarial science majors are full, with waiting lists.

By analyzing grades in various courses taken fairly early by actuarial science majors, we found that the probability course is a reliable indicator of success. Therefore we plan to create a pre-major program to provide an early warning to the weakest students that this major might not be fruitful for them.

To apply to be an Actuarial Science major, a student must

- (1) have a cumulative GPA (for courses at Ohio State) of at least 3.0; and
- (2) either earn a B- or better in a Probability course taken at Ohio State (Math 4530, Stat 4201, or Math 5530H)\*; or pass one of the actuarial exams administered by SOA/CAS.

The number of students admitted to the major will equal the Actuarial Science Program's enrollment capacity. If the number of qualified applicants exceeds that capacity, admission to the major will be based on the student's grade point average in relevant math courses.

Students have until the second Friday of each semester to file an application to enter the major. An Actuarial Science Committee will review the files and notify applicants of the Committee's decisions. Students who have not gained admission to the major may reapply in subsequent semesters. Students who want their application to be reconsidered may file an appeal with the Actuarial Science Committee.

With this plan, together with advising by the math counselors and faculty advisers, nearly all pre-majors in Actuarial Science will know early in their third year whether they will be able to enter the major. Pre-majors who are not admitted to this major will most naturally move toward the financial track of the mathematics major.

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\* May also use Math 530, Math 531H, or Stat 420 to fulfill this requirement.

### 3. List of semester courses used by majors in Actuarial Science.

- Required Prerequisites
  - (a) Math 1151: Calculus I (5 cr)
  - (b) Math 1152: Calculus II (5 cr)
  - (c) CSE 1113: Computer-Assisted Problem Solving for Business (4 cr); or  
CSE 1222, Intro to Programming in C++ (3 cr); or  
CSE 1223, Intro to Programming in Java (3 cr)
  - (d) Econ 2001.01: Microeconomics (3 cr)\*
  - (e) Econ 2002.01: Macroeconomics (3 cr)\*
  - (f) AcctMIS 2000: Foundations of Accounting (3 cr)
- Required Courses
  - (g) Math 2153: Calculus 3 (4 cr)
  - (h) Math 2568: Linear Algebra (3 cr)
  - (i) Math 3618: Theory of Interest (3 cr)
  - (j) Stat 4201: Introduction to Mathematical Statistics I (4 cr)  
or Math 4530: Probability (3 cr)
  - (k) Stat 4202: Introduction to Mathematical Statistics II (4 cr)
  - (l) Math 3588: Practicum in Actuarial Science (3 cr)
  - (m) Math 5630: Life Contingencies 1 (3 cr); or  
Math 5633: Loss Models 1 (3 cr)
  - (n) Math 5631: Life Contingencies 2 (3 cr); or  
Math 5634: Loss Models 2 (3 cr)
  - (o) Math 5632: Financial Economics (3 cr)
  - (p) Bus Fin 2220 or 3280: Business Finance (3 cr)
- Recommended Courses (if not taken as a required course)
  - (q) Math 3532: Mathematical Foundations of Actuarial Science (3 cr)
  - (r) Math 4530: Probability (3 cr)
  - (s) Math 5630: Life Contingencies 1 (3 cr)
  - (t) Math 5631: Life Contingencies 2 (3 cr)
  - (u) Math 5633: Loss Models 1 (3 cr)
  - (v) Math 5634: Loss Models 2 (3 cr)

Students can complete this major by taking at most 18 credit hours per semester.

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\*Econ 2001.02 & 2002.02 are intended for economics majors. Those courses can substitute for the .01 courses .

4. Comparison of Advising Sheets for Quarters and Semesters.

Current advising form for quarters:

**MAJOR PROGRAM FORM (QUARTERS)**  
College of Arts and Sciences

			Actuarial Science
Name: last	first	middle	Major

OSU email address (name.n):	Student number:
Degree Sought (circle one): <b>BS</b> <b>BA</b>	Expected date of graduation (qtr/yr):

Have you filed a degree application in the college office? (circle one):      YES      NO
---

(NOTE: This form is NOT a degree application)

If completing two majors, list both of them below, and file a separate form for each one:

--	--

Part A: Required Prerequisites (and / or supplementary requirements)

Courses	Hours	Grade	Courses	Hours	Grade
Econ 200	5		Math 151	5	
Econ 201	5		Math 152	5	
Acct 310	5		Math 153	5	

Part B: Major Program (Minimum grade of "C-", and minimum grade average of "C" (2.00) required.)  
Core Requirements (Substitutions are rarely permitted)

Courses	Hours	Grade	Courses	Hours	Grade
Math 254	5		Math 618	4	
Math 568	3		Math 630	4	
Math 530	3		Math 631	4	
Math 532	3		Math 632	4	
Stat 420	5		Math 588	4	
Stat 421	5		Bus Fin 620	4	
CSE 200, 201, or 221	5				

53

Total of Part B only

Check whether this is:	x	
------------------------	---	--

See back for information about major programs.      original      revision

Distribution: One copy each - Faculty adviser, Student, College Office, 130 Denney Hall

Signature of faculty adviser	
Name of adviser (please print)	
Mathematics	292-
Department	Campus phone
Date:	

Proposed advising form for semesters:

**MAJOR PROGRAM FORM (SEMESTERS)**  
College of Arts and Sciences

			Actuarial Science
Name: last	first	middle	Major

OSU email address (name.n):	Student number:
Degree Sought (circle one): <b>BS</b> <b>BA</b>	Expected date of graduation (sem/yr):

Have you filed a degree application in the college office? (circle one): <b>YES</b> <b>NO</b>
---

(NOTE: This form is NOT a degree application)

If completing two majors, list both of them below, and file a separate form for each one:

--	--

Part A: Required Prerequisites (and / or supplementary requirements)

Courses	Hours	Grade	Courses	Hours	Grade
Econ 2001.01	3		Math 1151	5	
Econ 2002.01	3		Math 1152	5	
Acct 2000	3		CSE 1113, 1222, or 1223	4 or 3	

Part B: Major Program (Minimum grade of "C-", and minimum grade average of "C" (2.00) required.)  
Core Requirements (Substitutions are rarely permitted)

NOTE: Honors math courses may substitute for corresponding non-honors courses.

Courses	Hours	Grade	Courses	Hours	Grade
Math 2153	4		Math 3588	3	
Math 2568	3		Math 3618	3	
Math 4530 or Stat 4201	3 or 4		Math 5630 & 5631 or Math 5633 & 5634	3 & 3	
Stat 4202	4				
Bus Fin 2220 or 3280	3 or 3		Math 5632	3	

32 or 33

Total of Part B only

Check whether this is:	<input checked="" type="checkbox"/>	
------------------------	-------------------------------------	--

See back for information about major programs.     original     revision

Distribution: One copy each - Faculty adviser, Student, College Office, 130 Denney Hall

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Signature of faculty adviser

--

Name of adviser (please print)

Mathematics	292-
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Department

Campus phone

	Date:
--	-------

5. Four year plans.

**SAMPLE FOUR-YEAR PLAN**

Note. *Italic* indicates prerequisite courses, not counted in the major.

**Actuarial Science, Quarters**

	Au	Wi	Sp	Hours in major
YR 1.	<i>Math 151 (5)</i> CSE 200 (5) GECs	<i>Math 152 (5)</i> <i>Econ 200 (5)</i> GECs	<i>Math 153 (5)</i> <i>Econ 201 (5)</i> GECs	0
YR 2.	Math 254 (5) <i>Acct 310 (5)</i> GECs	Math 568 (3) GECs	GECs	13
YR 3.	Math 618 (4) Math 530 (3) GECs	Stat 420 (5) Bus Fin 620 (4) GECs	Math 588 (4) Math 532 (3) GECs SOA Exam P	21
YR 4.	Math 630 (4) SOA Exam FM	Math 631 (4) GECs	Math 632 (4) Stat 421 (5) GECs	17

**Actuarial Science, Semesters**

	Au	Sp	Hours in major
YR 1.	<i>Math 1151 (5)</i> CSE 1113, 1222, 1223 (3 or 4) <i>Econ 2001.01 (3)</i> GEs	<i>Math 1152 (5)</i> <i>Acct 2000 (3)</i> <i>Econ 2002.01 (3)</i> GEs	0
YR 2.	Math 2153 (4) Math 3618 (3) GEs	Math 2568 (3) Math 4530 (3) or Stat 4201 (4) SOA Exam FM	13 or 14
YR 3.	Stat 4202 (4) Math 5632 (3) SOA Exam P	Math 3588 (3) Bus Fin 2220 or 3280 (3) GEs	13
YR 4.	Math 5630* (3) GEs	Math 5631* (3) SOA Exam MFE	6

\* 5630-5631 may be replaced by 5633-5634.

**6. Application to enter the major.**

**Application to enter the Actuarial Sciences Undergraduate Major**

**The Ohio State University  
College of the Arts and Sciences**

**Full Name** \_\_\_\_\_

**OSU ID** \_\_\_\_\_

**OSU E-Mail (name.n)** \_\_\_\_\_

This completed and signed form should be submitted to your college office.

To be admitted as an Actuarial Science major, a student must

(1) have a cumulative GPA (for courses at Ohio State) of at least 3.0; **and**

(2) either

(i) earn B- or better in Math 4530, Stat 4201, or Math 5530H, taken at Ohio State; or

(ii) pass one of the actuarial exams administered by SOA/CAS.

**(1) Total hours of courses taken at OSU** \_\_\_\_\_ **GPA in those courses** \_\_\_\_\_

**(2):**

(i) (circle one) **Math 4530, Math 3330H, or Stat 4201** **Final Grade** \_\_\_\_\_

OR

(ii) **Actuarial Exam:** \_\_\_\_\_ **Date** \_\_\_\_\_

Attach a copy of official notice from SOA/CAS showing your passing of the exam.

**APPROVED BY:** \_\_\_\_\_

Signature of Math Dept. Representative

Date

\_\_\_\_\_  
Print Name of Math Dept. Representative

\_\_\_\_\_  
Academic Unit

\_\_\_\_\_  
Campus phone and/or e-mail

## 7. Transition Policies.

Except for probability, all courses and course sequences required by this major have simple and direct correspondences between quarter versions and semester versions. Further details of those correspondences appear on the Curriculum Map in Section 8 below.

Actuarial science majors will not have their graduation delayed because of the University's conversion to semesters.

### **Probability requirement.**

Rules are changing for Math 530 and Stat 420. In the quarter system, majors in actuarial science were required to have credit for both of those courses. With semesters, majors need credit for only one of the corresponding courses, Math 4530 or Stat 4201. In addition, for a student who has not passed one of the actuarial exams, the pre-major requires that student to take either Math 4530 or Stat 4201 at Ohio State, and to earn a grade of B- or better.

The pre-major requirements will apply to students who declare an Actuarial Science major in Autumn 2012 or later. Students who declare the major before Au12 are allowed to fulfill this requirement in two different ways:

- (1) pass both Math 530 and Stat 420, or
- (2) earn B- or better in one of Math 530 or Stat 420.

Transition plans and policies for all freshman and sophomore math courses are described in separate documents posted at the Math Department's web page

<http://www.math.ohio-state.edu/semesters>.

### Actuarial Science Major

Sample curricula for students at different stages of the semester transition

Graduating ≤ Sp12	Graduating Sp13	Graduating Sp14	Graduating Sp15	Graduating ≥ Sp16
(Au08)	(Au09)	(Au10)	(Au11)	(Au12)
Math 151 (Calc I) 5	Math 151 (Calc I) 5	Math 151 (Calc I) 5	Math 151 (Calc I) 5	Math 1151 (Calc 1) 5
Math 152 (Calc II) 5	Math 152 (Calc II) 5	Math 152 (Calc II) 5	Math 152 (Calc II) 5	Math 1152 (Calc 2) 5
Math 153 (Calc III) 5	Math 153 (Calc III) 5	Math 153 (Calc III) 5	Math 153 (Calc III) 5	CSE 1113 (Prob Solv) 4
CSE 200 (Prob Solv) 5	CSE 200 (Prob Solv) 5	CSE 200 (Prob Solv) 5	CSE 200 (Prob Solv) 5	Econ 2001.01 (Micro) 3
Econ 201 (Micro) 5	Econ 201 (Micro) 5	Econ 201 (Micro) 5	Econ 201 (Micro) 5	Econ 2002.01 (Macro) 3
Econ 202 (Macro) 5	Econ 202 (Macro) 5	Econ 202 (Macro) 5	Econ 202 (Macro) 5	GECs
GECs	GECs	GECs	GECs	
Math 254 (Cal IV) 5	Math 254 (Calc IV) 5	Math 254 (Calc IV) 5	Math 2153 (Calc 3) 4	Math 2153 (Calc 3) 4
Math 568 (Lin Alg) 3	Math 568 (Lin Alg) 3	Math 568 (Lin Alg) 3	Math 2568 (Lin Alg) 3	Math 2568 (Lin Alg) 3
Acct 310 (Fdn of Acct) 5	Acct 310 (Fdn of Acct) 5	Acct 310 (Fdn of Acct) 5	Acct 2000 (Fdn of Acct) 3	Acct 2000 (Fdn of Acct) 3
GECs	GECs	GECs	GECs	GECs
Math 618 (Thy of Int) 4	Math 618 (Thy of Int) 4	Math 3618 (Thy of Int) 3	Math 3618 (Thy of Int) 3	Math 3618 (Thy of Int) 3
Math 530 (Prob) 3	Math 530 (Prob) 3	Math 4530 (Prob) 3	Math 4530 (Prob) 3	Math 4530 (Prob) 3
Stat 420 (Math Stat I) 5	Stat 420 (Math Stat I) 5	Stat 4202 (Stat 2) 4	Stat 4202 (Stat 2) 4	Stat 4202 (Stat 2) 4
Bus Fin 620 (Finance) 4	Bus Fin 620 (Finance) 4	Bus Fin 2220 (Finance) 3	Bus Fin 2220 (Finance) 3	Bus Fin 2220 (Finance) 3
Math 588 (Practicum) 4	Math 588 (Practicum) 4	Math 3588 (Practicum) 3	Math 3588 (Practicum) 3	Math 3588 (Practicum) 3
Math 532 (Math Fdns) 3	Math 532 (Math Fdns) 3	GECs	GECs	GECs
GECs	GECs			
Math 630 (Act Math I) 4	Math 5630 (Life Ctg 1) 3	Math 5630 (Life Ctg 1) 3	Math 5630 (Life Ctg 1) 3	Math 5630 (Life Ctg 1) 3
Math 631 (Act Math II) 4	Math 5631 (Life Ctg 2) 3	Math 5631 (Life Ctg 2) 3	Math 5631 (Life Ctg 2) 3	Math 5631 (Life Ctg 2) 3
Math 632 (Act Math III) 4	Math 5632 (Fin Econ) 3	Math 5632 (Fin Econ) 3	Math 5632 (Fin Econ) 3	Math 5632 (Fin Econ) 3
Stat 421 (Math Stat II) 5	Stat 4202 (Stat 2) 4	GECs	GECs	GECs
GECs	GECs			



<b>Actuarial Science Major</b> 45 or 48 quarter credit hrs become 32 or 33 semester credit hrs.									
Segment of major program	Quarter course #	Quarter course name	Credit hours	Semester course #	Semester course name	Units	Learning outcome	Nature of conversion	
<b>Prerequisites (30 quarter credit hours become 22 or 23 semester credit hours; some may double-count in GEC)</b>									
	Math 151	Calculus and Analytic Geometry I	5	Math 1151	Calculus 1	5	1, 2, 3	Math 1151-1152 replace 151-152-153	
	Math 152	Calculus and Analytic Geometry II	5	Math 1152	Calculus 2	5	1, 2, 3		
	Math 153	Calculus and Analytic Geometry III	5						
	Acct 310	Foundations of Accounting	5	Acct 2000	Foundations of Accounting	3	1	Acct 2000 replaces Acct 310	
	Econ 200	Principles of Microeconomics	5	Econ 2001.01	Principles of Microeconomics	3	1	Econ 2001.01 replaces Econ 200	
	Econ 201	Principles of Macroeconomics	5	Econ 2002.01	Principles of Macroeconomics	3	1	Econ 2002.01 replaces Econ 200	
				CSE 1113, CSE 1223, or CSE 1222	Computer Assisted Problem Solving for Business, or Intro to Computer Prog. in Java, or Intro to Computer Prog. in C++	4 3 3	1, 2*	replaces CSE 200, replaces CSE 201, replaces CSE 202	
<b>Major requirements (45 or 48 quarter credit hours become 32 or 33 semester credit hours)</b>									
	Math 254	Calculus and Analytic Geometry IV	5	Math 2153	Calculus 3	4	1*, 2*, 3	expands on 254	
	Math 568	Linear Algebra	3	Math 2568	Linear Algebra	3	1*, 2, 3	expands on 568 or 571	
	Math 530 or Stat 420	Probability Introduction to Mathematical Statistics I	3 or 5	Math 4530 or Stat 4201	Probability Introduction to Mathematical Statistics 1	3 or 4	1**, 2*, 3**	expands on Math 530, expands on Stat 420	
	Stat 421	Introduction to Mathematical Statistics II	5	Stat 4202	Introduction to Mathematical Statistics 2	4	1**, 2**, 3**	replaces Stat 421	
	Math 588	Practicum in Actuarial Science	4	Math 3588	Practicum in Actuarial Science	3	2*, 3**	replaces 588	
	Math 618	Theory of Interest	4	Math 3618	Theory of Interest	3	1*, 2**, 3**	expands on 618	
				<b>One of the following two-course sequences:</b>					
	Math 630	Actuarial Mathematics I	4	Math 5630	Life Contingencies 1	3	1*, 2**, 3**	replaces 630	
	Math 631	Actuarial Mathematics II	4	Math 5631	Life Contingencies 2	3	1*, 2**, 3**	replaces 631	
				Math 5633 Math 5634	Loss Models 1 Loss Models 2	3 3	1*, 2**, 3** 1*, 2**, 3**	New courses.	
	Math 632	Actuarial Mathematics III	4	Math 5632	Financial Economics	3	1*, 2**, 3**	expands on 632	
	Bus 420 or Bus 620	Foundations of Finance or Business Finance	4	Bus 2220 or Bus 3280	Business Finance	3 or 3	1*, 2, 3	replaces Bus 420, replaces Bus 620	
	Math 532	Mathematical Foundations of Actuarial Science	3					Semester version listed below: recommended.	
	CSE 200, 201, or 202	Computer Assisted Problem Solving for Business, Elementary Computer Programming, or Intro. To Programming & Algorithms for Engineers & Scientists	5 4 4					Semester versions are at 1000 level; listed above as prerequisites.	
<b>Recommended extra courses</b>									
				Math 3532	Mathematical Foundations of Actuarial Science	3	1*, 2*, 3**	3532 replaces 532; No longer required	
<b>Major program learning outcomes</b>									
Students will:	<b>1</b>	Acquire a strong general background in mathematics, statistics, and relevant concepts from actuarial science and business.							
	<b>2</b>	Develop analytical and problem solving skills.							
	<b>3</b>	Be prepared to pass national actuarial examinations administered by the Society of Actuaries and the Casualty Actuarial Society.							
* Learning outcomes are indicated for each course listed. Number of asterisks indicates level: none indicates beginning level, one is intermediate, two is advanced.									