Fiscal Unit/Academic Org	Mathematics - D0671
Administering College/Academic Group	Mathematical And Physical Sci
Co-adminstering College/Academic Group	
Semester Conversion Designation	Converted with minimal changes to program goals and/or curricular requirements (e.g., sub- plan/specialization name changes, changes in electives and/or prerequisites, minimal changes in overall structure of program, minimal or no changes in program goals or content)
Current Program/Plan Name	Actuarial Science
Proposed Program/Plan Name	Actuarial Science
Program/Plan Code Abbreviation	ACTSCI-BS
Current Degree Title	Bachelor of Science

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	33	2.3
Required credit hours offered by the unit	Minimum	34	22.7	22	0.7
	Maximum	34	22.7	22	0.7
Required credit hours offered outside of the unit	Minimum	19	12.7	11	1.7
	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	22	2.0

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

• ActSci.BS.pdf: rationale etc.

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

Comments

• Attachment fulfills several roles. (by Shapiro, Daniel B on 01/14/2011 08:29 PM)

Workflow Information

Status	User(s)	Date/Time	Step
Submitted	Shapiro,Daniel B	01/14/2011 08:30 PM	Submitted for Approval
Approved	Shapiro,Daniel B	01/14/2011 08:38 PM	Unit Approval
Pending Approval	Andereck, Claude David	01/14/2011 08:38 PM	College Approval

BS in Actuarial Science

Department of Mathematics, OSU

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- 1. Program learning goals.
- **2.** Rationale for changes.
- **3.** List of semester courses.
- 4. Advising sheets for quarter system and semester system.
- **5.** Four-year plan of courses
- **6.** Application to enter the major.
- 7. Transition policies.
- 8. Curriculum map.





100 Mathematics Building 231 West 18th Avenue Columbus, OH 43210-1174

Phone (614) 292-4975

To: Office of Academic AffairsFrom: Luis Casian, Chair, Department of MathematicsDate: January 2011Re: 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.

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 twocourse 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 there has been a sharp increase in the number of actuarial science majors, from about 80 students in 2005 to 300 students now (January 2011). This increase causes several symptoms of stress:

- More than 25% of current majors have marginal performance with little hope of becoming actuaries.
- Actuarial advisors and coordinators are overburdened.
- All courses taken by actuarial science majors are crowded.
- The majors are finding it increasingly difficult to find internships and jobs.

To utilize departmental resources more efficiently, to better serve students in the major, and to prevent students unsuitable to this major from entering and wasting time and resources, we will limit enrollments by creating a pre-major:

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.

3. List of Semester Courses.

- Required Prerequisites
 - (a) Math 1151: Calculus I, 5 cr
 - (b) Math 1152: Calculus II, 5 cr
 - (c) CS&E 1113: Computer Assisted Problem Solving for Business, 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 3280: Business Finance, 3 cr
- Recommended Courses (if not taken as required)
 - (q) Math 4530: Probability, 3 cr
 - (r) Math 3532: Mathematical Foundations of Actuarial Science, 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

4. Comparison of Advising Sheets for Quarters and Semesters.

Current quarter-based advising sheet:

			Ċ	olleges of	f the Arts an	d Sci	ience			
							A	ctuarial Sci	ence	
Name: last	fir	st	mid	dle	Major					
SSN:					Degree Sough	nt:	BA	BS		
Local Address:				Zip	e-r	nail a	address			
Phone: reside	ence d e dogree en	nlication in the co	llogo offi	business	E E	lxpec	ted Date of	Graduation: qua	rter/yr	
(NOTE: This	form is NOT	a degree applicati	ion)	ce.						
If completing to		4 hoth holow and 4	51		yes r	10				
II completing to	vo majors, ns	t both below and i	ine a sepa	trate form	for each one:					
1)					2)					
Port A. Doquire	d Proroquisi	as (and / ar sunnly	montory	roquirom	onte)					
Courses	eu i rerequisi	les (anu / or supple	Hours	Grade	Courses				Hour	s Grade
Econ 200			5		Mat	h 1:	51		5	
Econ 201			5		Mat	h 1:	52		5	
Acct 310			5		Mat	h 1:	53		5	
Part B: Major I Core Requirem Courses	Program (Mir ents (Substitu	imum grade of "C itions are rarely if	-" requin ever per Hours	red. Minin mitted) Grade	num grade av Courses	erag	e of "C" (2.0	0)	Hour	Grade
Math 254			5		Ma	th (618		4	
Math 568			3		Ma	th (630		4	
Math 530			3		Ma	th (631		4	
Math 532			3		Ma	th (632		4	
Other Major C	ourses/Major	Electives								1
Stat 420			5							
Stat 421			5							
Math 588			4							
Bus Finan	ce 620		4							
CS&E 200			5							
				53						
			Т	otal of Part	B only					
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					Mathem	atics	5	1		

MAJOR PROGRAM FORM

Department

Date:

Campus phone

Proposed semester-based advising sheet:

		N	AJOK	FROGRAM	FORM			
	1		oneges o	i the Ai ts and	A	ctuarial Scien	ce	
ame: last	first	mid	dle	Major				
SSN:				Degree Sought:	BA	BS		
Local Address	:		Zip	e-ma	il address			
Phone: resid	ence		business	Ex	pected Date of G	Fraduation: semest	ter/yr	
Have you file	ed a degree applicat	ion in the college offi	ce?					
(NOTE: Thi	s form is NOT a deg	gree application)						
If completing t	two majore list both	helow and file a con-	arata forn	yes no				
In completing (two majors, list both	i below and the a sepa	ii att 101 li	i ioi cacii onc.				
1)				2)				
Part A. Requi	rad Praraquisitas (ar	nd / ar sunnlamantary	requirem	(ante)				
Courses	ieu i rerequisites (al	Hours	Grade	Courses			Hou	rs Grade
Econ 2001	.01	3		Math	1151		5	
Econ 2002	2.01	3		Math	1152		5	
Acct 2000		3		CS&F	C 1113		3	1
Core Requiren Courses Math 2152	nents (Substitutions	are rarely if ever per Hours 4	mitted) Grade	Courses	1 3588		Hour 3	s Grade
Math 256	8	3		Mat	3618		3	
Stat /201	0	3		Mat	1 5610 1 5630		3	+
Stat 4201		4		Mat	5631		3	
Stat 4202	200	4		Mati	5(22			
Bus Fin 3	280	3		Mati	1 5632		3	
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				Mathama	tion			

Department
Date:

Campus phone

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.	Math 151 (5) CSE 200 (5) GEC	Math 152 (5) Econ 200 GEC	Math 153 (5) Econ 201 GEC	0
YR 2.	Math 254 (5) Acct 310 (5) GEC	Math 568 (3) GEC	Elective GEC	13
YR 3.	Math 618 (4) Math 530 (3) GEC	Stat 420 (53) Bus Fin 620 (4) GEC	Math 588 (4) Math 532 (3) GEC SOA Exam P	21
YR 4.	Math 630 (4) SOA Exam FM	Math 631 (4) Elective GEC	Math 632 (4) Stat 421 (5) GEC	17

Actuarial Science, Semesters

	Au	Sp	Hours in major
YR 1.	Math 1151 (5) CSE 1113, 1222, 1223 (3 or 4) GE	Math 1152 (5) Acct 2000 (3) GE	0
YR 2.	Math 2153 (4) <i>Econ 2001 (3)</i> GE	Math 2568 (3) <i>Econ 2002 (3)</i> GE	7
YR 3.	Math 3618 (3) Math 4530 (3) or Stat 4201 (4) Bus Fin 2220 or 3280 (3)	Math 3588 (3) Stat 4202 (4) SOA Exam P	16 or 17
YR 4.	Math 5630* (3) SOA Exam FM	Math 5631* (3) Math 5632 (3) GE	9

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

Application to enter the Actuarial Sciences Undergraduate Major

The Ohio State University College of the Arts and Sciences

Name	
OSU ID	Phone
Local Address	
E-Mail	
This form should be submitted to you	ur college office.
To be admitted as an Actuarial Science (1) have a cumulative GPA (for co (2) either (i) earn B- or better in Math (ii) pass one of the actuarial	ce major, a student must ourses at Ohio State) of at least 3.0; and 4530, Stat 4201, or Math 5530H, taken at Ohio State; or exams administered by SOA/CAS.
(1) Total hours of courses taken a	t OSU GPA in those courses
(2): (i) Probability Course:	Final Grade
(ii) Actuarial Exam: Provide a co (A score of at least 6 is need	opy of official documents showing your grade on the exam. ded for a passing grade.)
Signature of Faculty Advisor	Date
Print Name of Faculty Advisor	
Academic Unit	Campus phone and/or e-mail

7. Transition Policies.

The transition from quarters to semesters will be straightforward because few sequences of courses are involved in this major. All courses and course sequences after Calculus have a simple and direct correspondence between their quarter versions and semester versions. Consequently, actuarial science majors will not have their graduation delayed because of this conversion to semesters.

Further details of this correspondence are presented on the Curriculum Map page below.

Transition plans of the calculus sequence (Math 151 - 152 - 153 - 254) are described in the documents for the conversion of the Math Major and won't be repeated here.

