UNIVERSITY OF ILLINOIS
AT URBANA-CHAMPAIGN

Office of the Provost and Vice Chancellor
for Academic Affairs

Swanlund Administration Building
601 East John Street
Champaign, IL 61820

February 14, 2001

Susan A. Lamb, Chair
Senate Committee on Educational Policy
Office of the Senate
228 English Building, MC-461

Dear Professor Lamb:

Enclosed are copies of a proposal from the College of Liberal Arts and Sciences to revise the Major in Actuarial Science.

This proposal has been approved by the LAS Courses and Curricula, Academic Affairs and Executive committees; it now requires Senate review.

Sincerely,

Keith A. Marshall
Staff Associate

KAM/ab

c: A. Mester
J. Rosenblatt

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Revised program for B.S. in actuarial science (2/29/00)

Sponsor: Department of Mathematics

Brief Description:

The changes add one mathematics course and one finance or economics course to requirements, and make some adjustments in the lists of courses that meet the requirements. One 4-hour course is being replaced by a 3-hour course. The net result is to increase the "minimum required major and supporting course work" to 57-59 hours, including 29 hours of mathematics and statistics beyond calculus.

Justification:

Most students in this curriculum are preparing for professional actuarial work, and the ability to pass professional examinations is an important factor in their success. The actuarial examinations are changing dramatically in 2000, with some material (such as operations research) being omitted and other material added, or included on an earlier exam, or tested at a more demanding level. A significant feature is the increased emphasis on finance and economics in the first and second examinations. We have been revising courses to include more of the new material, and have recently received LAS approval for two new courses, Math 377 and 378 (formalizing work we have been offering under the rubric Math 351, Applied Mathematics).

Budgetary and staff implications:

a. Additional staff and dollars needed: None in Mathematics. The Mathematics Department currently has two Ph.D. actuarial fellows on faculty, having hired Richard Gorvett for Fall 1999. In addition, Professor Donald Sherbert, who plans to retire in May 2000 after teaching and advising in the program for nine years, will be available to teach one course per year for a few years. These faculty members will be able to teach the technical courses; a tentative schedule is attached. Questions concerning Statistics and Finance are addressed in c) below.

b. Internal reallocations. The addition of one mathematics course to graduation requirements will presumably increase enrollments in the actuarial courses; but our largest course this semester is Math 371 (at 46), with most courses having 20 to 30 students. Graders and tutors are available to help instructors of these courses, as in the past, with no new allocation of funds. Because we have been staffing numerous exam-review sessions (meeting weekly on an informal basis), and the number of these is expected to decrease, the work load for actuarial faculty will not change significantly. Staffing responsibility for one course (Math/Stat 308) will shift from Statistics to Mathematics, but that apparently will happen with or without the program change.

c. Effect on other departments. The Statistics Department has been teaching approximately three courses per year for actuarial students: Math 308-309 as a fall/spring sequence, and Math 369 (Stat 320), not solely for actuarial students but with a predominantly actuarial enrollment in the spring. The revision makes *less* demands on Statistics, shifting from Math 308 to Math 361 (which will be staffed by Mathematics).

Nevertheless, actuarial students have experienced difficulty registering for Finance classes. We continue to work with Finance to secure places for actuarial undergraduates and graduate students. Enclosed is a supporting letter from the Finance Department.] Currently, few actuarial students take the intermediate Micro- and Macro-Economic (Econ 300, 301); that number can be expected to increase.

d. Impact on library should be minimal; there are a few newly required texts, but about half of them are already on hand. The inclusion of simulation as a topic to be interwoven into several courses, instead of concentrated in Math 370, Numerical Methods (which is being dropped), will cause little net change in demand on computer resources.

Guidelines for undergraduate education:

Communication skills and clear thinking. The skill of clear, critical and creative thinking, especially in quantitative matters, is of course central to any mathematical enterprise, not only actuarial work. We have always emphasized to students the fact that actuarial work is not only quantitative, but requires an appreciation for political, cultural and psychological factors that affect the economy and in particular the insurance industry. We know (and remind students) that communications skills are essential in actuarial work. In many of our courses, we require students to prepare papers that are not wholly mathematical, and require or encourage them to present their papers in class. This has been true of the program in the past, and the proposed changes will not lessen our commitment.

Heterogeneous culture. We have been successful in the past two years in obtaining significant scholarship support from the Allstate Foundation for minority (African-American and Hispanic) students in actuarial science. This is the culmination of efforts over several years, which have increased our minority (African-American and Hispanic) representation to approximately 15% of majors. Moreover, the presence in our classes of numerous international students provides the opportunity to examine the different solutions that various countries and cultures have found for some common economic problems. This happens more in advanced courses such as survival analysis (which we now expect more undergraduates will take). Professor Portnoy also incorporates into some of these courses her research in the area of gender and racial differences in mortality rates.

Professional preparation is very much in the forefront of our efforts. The changing professional examinations will give students who come out of a program like ours an even greater advantage over the general mathematics or finance student than they have had in the past. And our students are in demand: we have been graduating approximately 30 students per year, with one-fourth or more of the seniors beginning their final year with a job offer already in hand. Although most of the students do go into actuarial positions, some follow other paths, from investment banking to elementary and secondary education.

Statement for the bulletin:

Actuarial Science
This major is sponsored by the Department of Mathematics and is designed to prepare students to enter the actuarial profession.

MAJOR IN SCIENCES AND LETTERS CURRICULUM

(Changes are underlined)
Minimum required major and supporting course work normally equates to 57-59 hours including 29-30 hours of mathematics beyond calculus.

Hours	Requirements
10-11	Calculus through Math 242, 243 or 245
3	CS 101 or 105 or 125
3	Math 210
3-4	Math 308 or 361
4	Math/Stat 309
3	Math 369
3	Math 315 [383 no longer an alternative]
4	Math 371
6	Two of the following: Math 372, 376, 377, 378
3	A third course from the list above, or Math 366, or an approved section of Math 351 (eg financial mathematics)
15	Finance 254, 300, 321 and two additional courses chosen in consultation with an adviser, from Econ 300 or 301; Fin 260, 341, 343, 360.

Total: 57-59 hours, including 29-30 hours post-calculus math/stat

CLEARANCES:

Department/Unit Head	Date 8/29/00
School Approval (if applicable)	Date
Asst. Dean, College of Liberal Arts and Sciences	Date 11/7/00
Assoc. Dean, Graduate College	Date
Assoc. Provost	Date

PROPOSED EFFECTIVE DATE: Fall 2001

Some typical student programs:

I. For the student entering without calculus, foreign language or AP credit:

Freshman year:		Sophomore year:	
Math 120, 130	8	Math 242, 361	6
Foreign language	8	Math 270	
Rhetoric	4	Foreign language	8
Computer science	3	Finance 260	3
General education,		Gen ed / Comp II	9
incl Econ 102/103	9	Electives	3
	32		30
Junior year:		Senior year:	
Math 309, 315, 369, 210	13	Math 371, 372	7
Finance 254, 300	6	Two more math courses	6
General education	6	Finance 321	3
Electives	6	Finance or economics	3
	31	Math 270	1
		Electives	10
			30

II. For students entering with some calculus and AP credit:

Freshman year:		Sophomore year:	
Math 242, 210	6	Math 361, 309, 315	10
Finance 260	3	Math 270	
Foreign language	8	Finance 254, 300	6
Computer science	3	Gen ed / Comp II	9
General education,		Electives	6
incl Econ 102/103	9		32
Electives	3		
	32		
Junior year:		Senior year:	
Math 369, 371, 372	10	Two more math courses	6
Math 270	1	Math 270	1
Finance 321	3	Finance or economics	3
General education	6	Electives	20
Electives	10		30
	30		

This program has the flexibility to allow a second major, a semester abroad or early graduation.

III: For the community-college transfer who has completed calculus:

Junior year:		Senior year:	
Math 270, 315, 210, 361	10	Math 270, 309, 369, 371	12
Additional math course	3	Two more math courses	6
Finance 260, 254, 300	9	Finance 321	3
Gen ed / Comp II	6	Finance or economics	3
Electives	3	Electives	6
	31		30

UNIVERSITY OF ILLINOIS
AT URBANA-CHAMPAIGN

Department of Finance

College of Commerce and Business Administration
340 Commerce West Building
1206 South Sixth Street
Champaign, IL 61820-6980

Morgan J. Lynge
Chair

March 9, 2000

Professor Esther Portnoy
Director of Actuarial Program
361 Altgeld Hall, MC-382

Dear Professor Portnoy:

The Department of Finance Educational Policies Committee and Executive Committee have discussed the proposed change in requirements for the B.S. degree in Actuarial Science. In particular our focus has been the change from requiring four courses in Finance, with no specific courses listed, to five courses from a list of mostly Finance classes with specific requirements to take Finance 254, 300, and 321.

We note the fact that an Actuarial Science student who takes all five classes in Finance will have taken enough Finance courses to have qualified for an LAS B.A. degree in Finance, if other appropriate non-Finance courses have been taken.

Until recently most Actuarial Science students would take most of their required Finance course work by choosing from the six courses we offer with a focus on aspects of insurance. More recently, as you have noted, Actuarial Science students have been advised to take Finance 254 and 300 as part of their work in Finance. And, starting this year, the material covered in Finance 321 has become essential for students to pass the second professional exam. What has happened recently is that the demand for courses from Actuarial Science students has shifted from courses that, for the most part, had not been experiencing excess demand to courses where demand is frequently greater than the Department's ability to supply seats.

Notwithstanding the demand management difficulties that Finance faces in the courses you now wish to require Actuarial Science students to take from the Department of Finance, we accept our responsibility to assist your students in preparing for their professional exams. Therefore we support the changes relating to Finance courses in your revised program for the B.S. in Actuarial Science.

Sincerely,

Morgan J. Lynge, Chair
Department of Finance
Professor of Finance

Finance Executive Committee

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X-Authentication-Warning: symcom.math.uiuc.edu: portnoy owned process doing -bs
Date: Tue, 29 Feb 2000 14:06:42 -0600 (CST)
From: Esther Portnoy <portnoy@math.uiuc.edu>
To: mester@uiuc.edu
Subject: Act Sci changes

I have submitted the Actuarial Science program changes to the Math Department, and I think the Finance Department will be ready to support the proposal.

You asked whether I had understated the necessary preparation, noting that some courses (Fin 254 in particular) have prerequisites that are not listed in our program description. The prereqs are Econ 173 and Accy 202. Econ 173 is a statistics course, at a level considerably below that of the Math 308 (or 361)-309 sequence, which is required of our students. Many actuarial students find it quite reasonable to bypass the Accy courses, and have been doing so for some time. If they want to double-major in Finance then of course they need it; but the lack doesn't really seem to have hurt them in Fin 254. The actuarial students tend to pick up the vocabulary and other basics in other ways, for example in our exam-review sessions. I used to recommend the one-semester survey course (Accy 200?) but that seems to have disappeared.

Professor Esther Portnoy
Director of Actuarial Science Program
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