UNIVERSITY FACULTY SENATE FORMS
UGS0251 3-4-13
Academic Program Approval

This form is a routing document for the approval of new and revised academic programs. Proposing department should complete this form. For more information, call the Faculty Senate Office at 831-2921.

Submitted by: __Louis Rossi_____ phone number_____ x1880 ___

Department: ___Mathematical Sciences_email ___ rossi@math.udel.edu
_____

Date: _____ October 10, 2012 _____

Action: _____ Add Major _____
<div style="margin-left:2em">(Example: add major/minor/concentration, delete major/minor/concentration, revise major/minor/concentration, academic unit name change, request for permanent status, policy change, etc.)</div>

Effective term_____13F_____
<div style="margin-left:2em">(use format 04F, 05W)</div>

Current degree_____ n/a _____
<div style="margin-left:2em">(Example: BA, BACH, BACJ, HBA, EDD, MA, MBA, etc.)</div>

Proposed change leads to the degree of: _____BS_____
<div style="margin-left:2em">(Example: BA, BACH, BACJ, HBA, EDD, MA, MBA, etc.)</div>

Proposed name:_____ Actuarial Sciences (MASC)_____
<div style="margin-left:2em">Proposed new name for revised or new major / minor / concentration / academic unit
(if applicable)</div>

Revising or Deleting:

> **Undergraduate major / Concentration:**_____
> <div style="margin-left:2em">(Example: Applied Music – Instrumental degree BMAS)</div>

> **Undergraduate minor:**_____
> <div style="margin-left:2em">(Example: African Studies, Business Administration, English, Leadership, etc.)</div>

> **Graduate Program Policy statement change:**_____
> <div style="margin-left:2em">(**Must attach** your Graduate Program Policy Statement)</div>

> **Graduate Program of Study:**_____
> <div style="margin-left:2em">(Example: Animal Science: MS Animal Science: PHD Economics: MA Economics: PHD)</div>

> **Graduate minor / concentration:**_____

Note: all graduate studies proposals must include an electronic copy of the Graduate Program Policy Document, highlighting the changes made to the original policy document.

List new courses required for the new or revised curriculum. How do they support the overall program objectives of the major/minor/concentrations)?
(Be aware that approval of the curriculum is dependent upon these courses successfully passing through the Course Challenge list. If there are no new courses enter "None")

None

Explain, when appropriate, how this new/revised curriculum supports the 10 goals of undergraduate education: http://www.ugs.udel.edu/gened/

Goal 1: Students in the major will attain effective skills in quantitative reasoning and information technology skills through their

normal coursework in MATH, STAT, CISC, and MISY.

Goal 3: Students will work and learn both independently and collaboratively as they complete the curriculum.

Goal 6: The actuarial profession requires lifelong learning through a series of examinations and research needed to progress professionally. By starting them on this process, this major will develop the necessary intellectual curiosity, confidence, and engagement.

Goal 7: Through internships in the GET program or with employers, students will develop the ability to integrate academic knowledge with experiences that extend the boundaries of the classroom, in particular the businesses that will soon employ them.

Identify other units affected by the proposed changes:
(Attach permission from the affected units. If no other unit is affected, enter "None")

ECON, FREC, FINC, MISY

Describe the rationale for the proposed program change(s):
(Explain your reasons for creating, revising, or deleting the curriculum or program.)

During recruiting events, students regularly approach the math table to ask about preparation for actuarial careers. And no wonder: according to a 2010 Georgetown University study, the unemployment rate for actuaries was 0%!

Currently, students who are interested in actuarial sciences normally complete a BS in Mathematics and Economics (MAEC). However, this is suboptimal for several reasons:

- The actuarial profession relies on a combination of standardized examinations and specific completed coursework in hiring and promotion decisions. Hence a program tailored to those requirements will provide better preparation.
- The MAEC degree was designed for students wishing to attend graduate school in economics. Removing actuarial students from this major will benefit them as well as allowing the MAEC curriculum to be focused on the students for whom it was originally designed.
- Most of our comparator institutions have either a major or minor specifically designated as "actuarial science". Potential students know it, and question the department about UD's commitment to this area. Having a program specifically designated as "actuarial science" will allow UD to compete more strongly for the best students interested in this area.

Therefore, the Department is proposing a new Bachelor of Science in Actuarial Sciences (MASC). This program is recommended for students whose goals are to enter into the actuarial profession, risk management, or the financial sector in general. This program provides a strong foundation in mathematics, statistics and finance, and will prepare students to pass their initial professional actuarial exams and to compete in the marketplace.

To be an Actuarial Associate, candidates must pass a battery of preliminary exams and receive Validation by Educational Experiences (VEE) in three areas:
- Applied Statistical Methods
- Corporate Finance
- Economics

Our new program will prepare students to pass the first two preliminary exams: P (probability) and FM (financial mathematics) and meet the requirements for all three VEE areas.

Ideally, these students will be connected to an internship in the summer of their sophomore or junior year through the GET program. The internship would meet the DLE requirement.

Currently we have about 15 MAEC majors per class who are interested in actuarial sciences. We would expect those students to shift to the MASC degree. In addition, we would expect having a program specifically designated as "actuarial sciences" would help recruitment of additional majors.

Program Requirements:
(Show the new or revised curriculum as it should appear in the Course Catalog. If this is a revision, be sure to indicate the changes being made to the current curriculum and **include a side-by-side comparison** of the credit distribution before and after the proposed change.)

DEGREE: BACHELOR OF SCIENCE
MAJOR: ACTUARIAL SCIENCES

CURRICULUM   CREDITS

UNIVERSITY REQUIREMENTS
ENGL 110   Critical Reading and Writing   3
(minimum grade C-)

First Year Experience (FYE)   0-4

University Breadth Requirement (minimum grade C-)   12

Discovery Learning Experience (DLE)   3

Multi-cultural Course   3

COLLEGE REQUIREMENTS
Writing: (minimum grade C-)   3
A second writing course involving significant writing experience including two papers with a combined minimum of 3,000 words to be submitted for extended faculty critique of both composition and content. This course must be taken after completion of 60 credit hours.

College of Arts and Sciences Breadth Requirements: (minimum grade C-)
The College Breadth Requirements are in addition to the University Breadth Requirement. Up to 3 credits from each of the University Breadth Requirement categories may be used to simultaneously satisfy these College of Arts and Sciences Breadth Requirements.

A total of eighteen credits from Groups A, B and C is required with six credits   18
from each group. The six credits from each group could be from the same area.

Group A:	Creative Arts and Humanities	6
Group B:	History and Cultural Change	6
Group C:	Social and Behavioral Sciences	6

MAJOR REQUIREMENTS

A grade of C- or better is required for major courses and related work. Students lacking adequate preparation for MATH 242 should begin with MATH 241.

Mathematics/Statistics Cluster

MATH 210	Discrete Mathematics I	3
MATH 242	Analytic Geometry and Calculus B	4
MATH 243	Analytic Geometry and Calculus C	4
MATH 302	Ordinary Differential Equations	3
MATH 349	Elementary Linear Algebra	3
MATH 426	Numerical Analysis and Algorithmic Computations	3
MATH 529	Fundamentals of Optimization	
MATH 530	Applications of Mathematics in Economics (capstone)	3
STAT 621	Survival Analysis	3
STAT 674	Applied Data Base Management	3

One of the following:		1
MATH 268	Perspectives on Mathematics	
or		
UNIV 101	First Year Experience I	

One of the following sequences:		6
Option A		
MATH 350	Probability Theory and Simulation Methods	
MATH 450	Mathematical Statistics	
Option B		
STAT 470	Introduction to Statistical Analysis I	
STAT 471	Introduction to Statistical Analysis II	

Economics Cluster

ECON 151	Introduction to Microeconomics: Prices and Markets	3
ECON 152	Introduction to Macroeconomics: The National Economy	3
ECON 301	Quantitative Microeconomic Theory	3
ECON 303	Intermediate Macroeconomic Theory	3
ECON 422	Econometric Methods and Models I	3
ECON 423	Econometric Methods and Models II	3

Accounting/Finance Cluster

ACCT 207	Accounting I	3
FINC 311	Principles of Finance	3
FINC 312	Intermediate Financial Management	3

Computational Cluster

CISC 106	General Computer Science for Engineers	3
CISC 181	Introduction to Computer Science II	3
MISY 330	Database Design and Implementation	3

Any substitutions must be approved by the department Undergraduate Studies Committee.

ELECTIVES

After required courses are completed, sufficient elective credits must be taken to meet the minimum credit requirement for the degree. See the department Web page for suggestions on particular electives useful for actuaries.

CREDITS TO TOTAL A MINIMUM OF   124

ROUTING AND AUTHORIZATION: (Please do not remove supporting documentation.)

Department Chairperson _____Date_____

Dean of College_____Date_____

Chairperson, College Curriculum Committee_____Date_____

Chairperson, Senate Com. on UG or GR Studies_____Date_____

Chairperson, Senate Coordinating Com._____Date_____

Secretary, Faculty Senate_____Date_____

Date of Senate Resolution_____Date to be Effective

Registrar _____Program Code_____Date_____

Vice Provost for Academic Affairs & International Programs_____Date_____

Provost _____Date_____

Board of Trustee Notification _____Date_____

Revised 02/09/2009   /khs