Template F

New Minor, Track or Certificate Template

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Minor or Track Title	Bachelor of Science – Mathematics /Actuarial Science Track
Narrative Catalog Description:	The Department of Mathematics prepares students for work in industry, graduate school mathematics, and teaching. Degree programs offered by the department are the bachelor of science degree program in mathematics and the bachelor of science in education degree program in mathematics education. The first degree program is offered within the College of Natural Sciences and Mathematics and the second is in conjunction with the College of Education and Educational Technology. The department also offers a Mathematics minor, Applied Statistics minor, and Elementary and Middle School Mathematics minor. *<larger font below highlights section changed in the catalog description>* The program for a mathematics major in the College of Natural Sciences and Mathematics has three options. A student may pursue a degree in mathematics or a degree in mathematics with a concentration in either applied mathematics or actuarial science. Those completing a degree in mathematics will be prepared to continue their studies in mathematics in graduate school, though some may enter business, industry, or government service. Students receiving a mathematics degree with a concentration in applied mathematics will be primarily prepared to enter business, industry, or government service in an area where mathematics or computer science is used, or to continue their studies in applied mathematics or computer science in graduate school. Students in the actuarial science concentration take additional coursework in finance and economics, preparing them to complete the first two professional actuarial exams and to pursue employment in the areas of insurance and investment. The program leading to the BSEd degree in mathematics education prepares the student for teaching mathematics in grades 7-12. Many graduates, however, continue their formal education in mathematics at the graduate level or work in government or industry. Students interested in the BSEd—Middle-Level Education 4-8/Mathematics specialization should refer to the College of Education and Educational Technology, Department of Professional Studies in Education, section of the catalog.
List of Program Requirements in	Bachelor of Science – Mathematics /Actuarial Science Track

catalog layout – including course numbers, titles, credits and any footnotes. *(Note that PASSHE requires a minimum of 6 credits in a minor be advanced standing (300 and above).*	**Curriculum:** **Liberal Studies:** As outlined in Liberal Studies section (49-50 credits) including ECON 121 **Mathematics:** MATH 125 **Liberal Studies Electives:** ECON 122 **Required Courses (33 credits)** MATH 126: Calculus II for Physics, Chemistry, Mathematics (3 credits) MATH 171: Introduction to Linear Algebra (3 credits) MATH 216: Probability and Statistics for Natural Sciences (3 credits) MATH 225: Calculus III for Physics, Chemistry, Mathematics (3 credits) MATH 241: Differential Equations (3 credits) MATH 271: Introduction to Mathematical Proofs I (3 credits) MATH 272: Introduction to Mathematical Proofs II (3 credits) MATH 363: Mathematical Statistics I (3 credits) MATH 364: Mathematical Statistics II (3 credits) MATH 448: Introduction to Financial Mathematics (3 credits) (For Exam FM) MATH 450: Topics in Applied Computational Mathematics (3 credits) **Controlled Electives (12 credits)** One course must be taken from each of the following sections: MATH 371, 421,or 423 MATH 416 MATH 445 or 446 MATH 480 or 493 **Computer Science (3 credits)** COSC/MATH 250: Introduction to Numerical Methods (3 credits) **Other Requirements: (6-10 credits)** Foreign Language intermediate level FIN 320 ECON 356 (FIN 320 & ECON 356 must be B or higher) **Electives: (13-17 credits)** **Other Requirements** 1. Pass SOA Exam P or Exam FM 2. B or higher grades in coursework that carries Validation by Educational Experience (VEE) from the Society of Actuaries (required for SOA credential).
Student Learning Outcomes for Minor or Track	Students will be able to: 1. Effectively communicate mathematics, both orally and in writing. 2. Write a clearly understandable mathematical proof. 3. Apply a combination of mathematics, probability and statistics to measure, model, and develop plans to manage risks for future events. 4. Work effectively as a member of a group while utilizing problem solving skills and organizational team management techniques.

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5. Develop the conceptual framework necessary to be successful on the first two Society of Actuaries exams (P/1 and FM/2).
6. Apply the mathematical theory associated with financial transactions and the time-value of money to solve investment strategy problems.
7. Apply mathematical methods to synthesize the theory of interest and its applications.
8. Apply problem solving and interest theory to the field of financial economics.

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Rationale for Proposal

Why is this track/minor being proposed?	Actuarial science is a high demand and rapidly growing career field. Actuaries are business professionals who measure and manage the financial implications of future events—pro and con, certain and uncertain, probable and improbable. This career requires employees to have aptitude and interest across areas of mathematics, finance, and economics, and will provide a new capacity to recruit students into the mathematics major. Alumni of the Mathematics Department who continued into this career area have provided feedback that additional preparation would be effective in allowing graduates access to actuarial employment opportunities.
What role, if any, does it serve the college/university above and beyond the role it serves in the department?	This new track re-builds connections to the finance and economics departments that were severed when the Mathematics/Economics major was put into moratorium. The program offers coursework that will enhance the degrees of students in these areas by enticing them to understand underlying mathematical theories, pursue additional upper-level mathematics courses, and consider a minor in mathematics.