California State University Channel Islands
NEW COURSE PROPOSAL
**Courses must be submitted by October 15, 2014, and finalized by the end of that fall
semester for the next catalog (2015-16) production.
Use YELLOWED areas to enter data.**

DATE (*Change if modified and redate file with current date)*)	NOVEMBER 6, 2014; 12.03.14, 2/3/2015
PROGRAM AREA(S)	MATHEMATICS

1. Course Information. *[Follow accepted catalog format.]*
Prefix(es) (Add additional prefixes if cross-listed) **and Course No. MATH   428**
Title: ACTUARIAL MATHEMATICS   Units: 3

Prerequisites: Math 140 or 150; and one of the following statistics courses: MATH 201 or 202 or 329 or 352.
Corequisites
Consent of Instructor Required for Enrollment

Catalog Description (Do not use any symbols): Foundations of actuarial mathematics. Topics include the interest and mortality discount function and its role in the analysis of life annuities and life insurance; annuities and insurance funds; survival distributions and failure times; risk theory, compound distributions and Poisson processes. Analysis of real insurance problems using statistical software.

Grading Scheme:	**Repeatability:**	**Course Level Information:**
X A-F Grades	Repeatable for a maximum of ____ units	X Undergraduate
Credit/No Credit Optional (Student Choice)	Total Completions Allowed ____ Multiple Enrollment in Same Semester	Post-Baccalaureate/Credential Graduate

Mode of Instruction/Components (*Hours per Unit are determined by CSU policy*).

	Units	**Hours per Unit**	**Default Section Size**	**Graded Component**	**CS & HEGIS #** (Filled in by the Provost's Office)
Lecture	3	1	24	A-F	
Seminar		1			
Laboratory		3			
Activity		2			
Field					
Studies					
Indep Study					
Other Blank					

Leave the following hours per week areas blank. The hours per week will be filled out for you.
____ hours lecture per week
____ hours ____ per week

2. Course Attributes:

General Education Categories: All courses with GE category notations must be submitted to the GE website: http://summit.csuci.edu/geapproval. Upon completion, the GE Committee will forward your documents to the Curriculum Committee.
A (English Language, Communication, Critical Thinking)
    A-1 Oral Communication
    A-2 English Writing
    A-3 Critical Thinking
B (Mathematics, Sciences & Technology)
    B-1 Physical Sciences
    B-2 Life Sciences – Biology

B-3 Mathematics – Mathematics and Applications
B-4 Computers and Information Technology
C (Fine Arts, Literature, Languages & Cultures)
   C-1 Art
   C-2 Literature Courses
   C-3a Language
   C-3b Multicultural
   D (Social Perspectives)
   E (Human Psychological and Physiological Perspectives)
   UDIGE/INTD Interdisciplinary
   Meets University Writing Requirement (Graduation Writing Assessment Requirement)
   Meets University Language Requirement

American Institutions, Title V Section 40404:   Government   US Constitution   US History
Regarding Exec Order 405, for more information: http://senate.csuci.edu/comm/curriculum/resources.htm
Service Learning Course (Approval from the Center for Community Engagement must be received before you can request this course attribute).
Online Course (Answer YES if the course is ALWAYS delivered online).
Lab Fee Request – Lab fee requests should be directed to the Student Fee Committee.

3. **Justification and Requirements for the Course.** (Make a brief statement to justify the need for the course)
   A. Justification: Many students with a mathematics background are interested in pursuing careers in insurance or finance. Fundamental to these careers is an understanding of the role of mortality rates and/or interest rates in the analysis of cash flows of various types, and how to apply this knowledge to realistic problems using software. This course can be taken as an elective by any student, but especially business, economics, mathematics, sociology and psychology majors will be interested.

   B. Degree Requirement: Requirement for the Major/Minor   **Note: Submit Program Modification if**
                                 x Elective for the Major/Minor   **this course changes your program**.
                                 x Free Elective

4. **Student Learning Outcomes.** List in numerical order. Please refer to the Curriculum Committee's "Learning Outcomes" guideline for measurable outcomes that reflect elements of Bloom's Taxonomy:
   http://senate.csuci.edu/comm/curriculum/resources.htm. The committee recommends 4 to 8 student learning outcomes, unless governed by an external agency (e.g., Nursing).
   Upon completion of the course, the student will be able to:
      Apply statistical software to actuarial problems.
      Understand real life life annuities and life insurance issues.
      Calculate life annuity and life insurance premiums and reserves.
      Use survival distributions to analyse life annuities and life insurance.
      Understand the use of compound distributions and Poisson processes in actuarial work.
      Present the actuarial problem in written, visual and oral forms.

5. **Course Content in Outline Form.** *[Be as brief as possible, but use as much space as necessary]*
   I. Deterministic Model
         1. Discount Functions
         2. Life Tables
         3. Life Annuities
         4. Life Insurance
         5. Annuity and Insurance Reserves
         6. Fractional Durations
         7. Continuous Payments
   II. Stochastic Model
         1. Survival Distributions and Failure Times
         2. Annuities/Insurance/Reserves
   III. Risk Theory
         1. Compound Distributions
         2. Poisson Processes

Does this course content overlap with a course offered in your academic program? **Yes** ▮   **No** x
If YES, what course(s) and provide a justification of the overlap. ▮

Does this course content overlap a course offered in another academic area? **Yes** ▮   **No** x
If YES, what course(s) and provide a justification of the overlap. ▮

Overlapping courses require Chairs' signatures.

6. **Cross-listed Courses** (*Please note each prefix in item No. 1) Beyond three disciplines consult with the Curriculum Committee.*
   A. List Cross-listed Courses (Signature of Academic Chair(s) of the other academic area(s) is required).
   List each cross-listed prefix for the course: ▮

   B. Program responsible for staffing: Mathematics

7. **References.** *[Provide 3 - 5 references. For references more than 10 years old, provide a one-sentence explanation of relevance.]*
   Fundamentals of Actuarial Mathematics 3rd edition by S. David Promislow (Wiley, 2014)
   Loss Models: From Data to Decisions 4th edition by Stuart A. Klugman, et al. (Wiley, 2012)
   Actuarial Mathematics for Life Contingent Risks 2nd edition by David C. M. Dickson, et al. (Cambridge University Press, 2013)

8. **Tenure Track Faculty Qualified to Teach This Course.**

   Math faculty

9. **Requested Effective Date:**
   First semester to be offered: Fall 2015

10. **New Resources Requested. Yes** ▮   **No** x
    If YES, list the resources needed.

    A. Computer Needs (data processing, audio visual, broadcasting, other equipment, etc.)
           Existing computer labs will be sufficient.

    B. Library Needs (streaming media, video hosting, databases, exhibit space, etc.)
    ▮

    C. Facility/Space/Transportation Needs
    ▮

    D. Lab Fee Requested **Yes** ▮   **No** ▮   **(Lab fee requests should be directed to the Student Fee Committee)**

    E. Other
    ▮

11. **Will this new course alter any degree, credential, certificate, or minor in your program? Yes** X   **No**
    If, YES attach a program update or program modification form for all programs affected.
    Deadline for New Minors and Programs: October 1, 2014.
    Priority deadline for Course Proposals and Modifications, and for Program Modifications: October 15, 2014.
    Last day to submit forms to be considered during the current academic year: April 1, 2015.

    Ivona Grzegorczyk, Matthew Wiers   Oct 14th, 2014

    _____

    Proposer of Course (Type in name(s). Signatures will be collected after Curriculum approval)   Date

Approval Sheet

Course Prefix and number:

If your course has a General Education Component or involves Center affiliation, the Center will also sign off during the approval process.

Multiple Chair fields are available for cross-listed courses.

The CI program review process includes a report from the respective department/program on its progress toward accessibility requirement compliance. By signing below, I acknowledge the importance of incorporating accessibility in course design.

Program Chair		
	Signature	Date

Program Chair		
	Signature	Date

Program Chair		
	Signature	Date

General Education Chair		
	Signature	Date

Center for International Affairs Director		
	Signature	Date

Center for Integrative Studies Director		
	Signature	Date

Center for Multicultural Engagement Director		
	Signature	Date

Center for Civic Engagement Director		
	Signature	Date

Curriculum Chair		
	Signature	Date

AVP		
	Signature	Date