### CALIFORNIA STATE UNIVERSITY CHANNEL ISLANDS

# **NEW COURSE PROPOSAL**

#### PROGRAM AREA

**1. Catalog Description of the Course.** [Include the course prefix, number, full title, and units. Provide a course narrative including prerequisites and corequisites. If any of the following apply, include in the description: Repeatability (May be repeated to a maximum of \_\_\_\_\_ units); time distribution (Lecture \_\_\_\_ hours, laboratory \_\_\_\_ hours); non-traditional grading system (Graded CR/NC, ABC/NC). Follow accepted catalog format.]

#### MATH 352, PROBABILITY AND STATISTICS (3)

Three hours of lecture per week.

Prerequisite: MATH 151.

Topic include: data gathering, analysis and display. Validity of sampling methods and statistical conclusions. Probability, conditional probability, Bayes' Theorem, discrete and continuous random variables and their distribution (e.g., binomial, Poisson, hypergeometric, negative binomial, normal, exponential, gamma), moments, bivariate distributions, transformations of random variables, central and other limit theorems. Bayesian estimates, tests of hypotheses, nonparametric tests, decision theory. Modern computer software applications in statistics.

### 2. Mode of Instruction.

	Units	Hours per Unit	Benchmark Enrollment
Lecture	3	1	24
Seminar			
Laboratory			
Activity			

**3.** Justification and Learning Objectives for the Course. (Indicate whether required or elective, and whether it meets University Writing, and/or Language requirements) [Use as much space as necessary]

This course is required for Mathematics major students according to accreditation guidelines.

Through this course, students will be able to

- Discuss the essential concepts of probability and statistics.
- Analyze a theoretical basis of probability theory and mathematical statistics
- Demonstrate the possible applications of this theory to applied models in various contexts
- Formulate real world statistics and probability problems in the language of mathematics.
- Prove, estimate and explain the essential concepts of probability and statistics

1.	Is this a General Education Course NO	
	If Yes, indicate GE category:	
	A (English Language, Communication, Critical Thinking)	
	B (Mathematics & Sciences)	
	C (Fine Arts, Literature, Languages & Cultures)	
	D (Social Perspectives)	
	E (Human Psychological and Physiological Perspectives)	

**5.** Course Content in Outline Form. [Be as brief as possible, but use as much space as necessary] Discrete and continuous probability distributions Combinatorics

Sampling methods Conditional probability Important distributions andf their densities Expected value and variance Convolutions of probability density functions Law of large numbers Central Limit Theorem Hypothesis Testing Generating functions Markov chains

- 6. **References.** [Provide 3 5 references on which this course is based and/or support it.] Introduction to Probability, Charles M. Grinstead, J. Laurie Snell
- 7. List Faculty Qualified to Teach This Course. All Mathematics faculty
- 8. Frequency.
  - a. Projected semesters to be offered: Fall X\_\_\_ Spring X\_\_ Summer X\_\_\_

## 9. New Resources Required.

a. Computer (data processing), audio visual, broadcasting needs, other equipment

Computer Lab

- b. Library needs none
- c. Facility/space needs none

#### 10. Consultation.

Attach consultation sheet from all program areas, Library, and others (if necessary)

11. If this new course will alter any degree, credential, certificate, or minor in your program, attach a program modification.

Ivona Grzegorczyk

1/8/03

Proposer of Course

Date