

## 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 587 MARKOV CHAINS AND MARKOV PROCESSES (3)**

Three hours lecture per week

Prerequisite: Admission to the Computer Science or Mathematics Graduate Program

Topics include: Central Limit Theorem, Law of Large Numbers, Convergence Theorems, Markov Chains and Markov Processes. Applications in other fields, such as bioinformatics and computer science.

### **2. Mode of Instruction.**

	<b>Units</b>	<b>Hours per Unit</b>	<b>Benchmark Enrollment</b>
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 an elective for MS in Applied Mathematics.

Through this course, students will be able to

- Discuss the consequences of Central Limit Theorem and applications.
- Apply Law of Large Numbers and Convergence Theorems
- Discuss and apply Markov Chains and Markov Processes
- Demonstrate the possible applications in various contexts, such as bioinformatics and computer science

- 4. Is this a General Education Course** **NO**

- 5. Course Content in Outline Form.** *[Be as brief as possible, but use as much space as necessary]*

- Central Limit Theorem,
- Law of Large Numbers,
- Convergence Theorems,
- Markov Chains and Markov Processes,
- Statistical/ information techniques for pattern recognition
- Genetic algorithms
- Further applications in bioinformatics and computer science

- 6. References.** *[Provide 3 - 5 references on which this course is based and/or support it.]*

- 1) Markov Chains, James R. Norris, Cambridge University Press; ISBN: 0521633966 (1998).
- 2) Bioinformatics: Sequence and Genome Analysis, David W. Mount, Cambridge Univ Pr; ISBN: 0521629713; (1999)
- 3) Bioinformatics: The Machine Learning Approach, by Pierre Baldi, Sren Brunak, MIT Press; ISBN: 026202506X; 2nd edition (2001)

**7. List Faculty Qualified to Teach This Course.**

All Mathematics faculty

## 8. Frequency.

a. Projected semesters to be offered: Fall   X   Spring   X   Summer     

## 9. New Resources Required.

a. Computer (data processing), audio visual, broadcasting needs, other equipment  
none

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.**

\_\_\_\_\_  
Proposer of Course

\_\_\_\_\_  
Date

## Approvals

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Program Coordinator	Date
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GE Committee Chair (If applicable)	Date
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Curriculum Committee Chair	Date
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Dean	Date
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Effective Semester: \_\_\_\_\_

**California State University Channel Islands**  
**New Course Proposal Consultation Sheet**

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1. Course prefix, number, title, and units: \_\_\_\_\_ **Math 587**  
2. Program Area: \_\_\_\_\_ MATH \_\_\_\_\_

**Recommend Approval**

<b>Program Area/Unit</b>	<b>Program/Unit Coordinator</b>	<b>YES</b>	<b>NO</b> (attach objections)	<b>Date</b>
Art				
Business & Economics				
Education				
ESRM				
Humanities				
Liberal Studies				
Mathematics & CS				
Sciences				
Library*				
Information Technology*				

\* If needed