NEW COURSE PROPOSAL

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 588 STOCHASTIC ANALYSIS (3)
Three hours lecture per week
Prerequisite: Admission to the Computer Science or Mathematics Graduate Program
Topics include: Brownian motion, stochastic integrals, conditional expectation, Kolmogorv's Theorem, applications of Lebesgue Dominated Convergence Theorem. Introduction to Stochastic Differential Equations will be given.

2. Mode of Instruction.

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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 Brownian motions and stochastic integrals and applications.
- Apply Kolmogorov’s theorem Theorems
- Perform stochastic analysis of problems from various fields (bioinformatics, finance, computer science)
- Demonstrate solution to stochastic differential equations

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]

   a) Brownian motion,
   b) stochastic integrals,
   c) conditional expectation and applications
   d) Kolmogorov's Theorem,
   e) applications of Lebesgue Dominated Convergence Theorem.
   f) Introduction to Stochastic Differential Equations.
   g) Further applications in finance, bioinformatics and computer science

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

1. Introduction to Stochastic Processes Thomas G. Kurtz 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.

____________________ Jorge Garcia __________________________ 10/31/03
Proposer of Course Date
Approvals

___________________________________________________
Program Coordinator    Date

___________________________________________________
GE Committee Chair
(If applicable)    Date

___________________________________________________
Curriculum Committee Chair    Date

___________________________________________________
Dean    Date

Effective Semester: ________________________________
1. Course prefix, number, title, and units: Math 588
2. Program Area: MATH

### Recommend Approval

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<tr>
<th>Program Area/Unit</th>
<th>Program/Unit Coordinator</th>
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<th>NO (attach objections)</th>
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