1.- BASIC INFORMATION

i.- Prerequisites: Grade of C or better in MATH 325 (Linear Algebra), MATH 376 (Ordinary Differential Equations I) or MATH 245 (Elementary Differential Equations and Linear Algebra).


iii.- Bulletin Description: Deterministic and stochastic techniques used in mathematical modeling, illustrated and developed through problems originating in industry and applied research. Students work on individual or team projects.

iv.- Description:
We will start by learning the concepts and methods of mathematical modeling in the context of optimization on the Real line and extend them to functions of several variables. Next we will study how to model systems using differential equations and dynamical systems. We will end the course by reviewing some basic probability and statistic concepts and by introducing Markov chains, Markov processes and Monte-Carlo methods. Each topic covered above will contain a programming section. Some Programming in matlab and/or Mathematica will required. Examples from economy, physical and biological sciences will be used.
iv.- Course Goals:
Upon successful completion of the course, students should be able to do the following:

• Formulate word problems in mathematical form
• Solve problems using optimization, ordinary differential equations and stochastic methods.
• Implement algorithmically the methods described above using matlab and/or mathematica.

2.- GRADES AND TEST POLICIES:

i.- Exams and Grading
Grading will be based on quizzes (15% of the grade), Midterms and final (40% of the final grade), final project (40% of the grade), attendance and class participation (5% of the grade). Homework will be assigned but not collected. All problems in quizzes, midterms and final will be taken from the assigned homework.

Quizzes: There will be about one per chapter (this implies that there will be one per week or two weeks). A quiz will be 15 minutes long. Approximate dates: 02/05/08; 02/19/08; 03/04/08 (two quizzes on this date; see note below); 03/20/08; 04/17/08; 05/01/08

Important Notice: I will be away the week of March 4th and 6th. On March 4th there will be two quizzes (one for section 3 and one for section 4). On March 6th the first midterm will be given.

Midterms: There will be one for each topic:
1.- Optimization (03/06/08)
2.- Differential equations (04/01/08)
3.- Monte-Carlo (05/13/08)
Midterm grades can be transferred to the final grade as explained below in the “final test” section.

Project: A final project will be presented in front of the class on 05/15/08. The project will consist on a written and an oral presentation. Topics should be chosen (by the student) before the Spring Break Recess starts (04/25/08).

Final: The final will consist of three sections (one per covered topic). Students who scored C+ or more on a midterm may choose not to be re-examined on that topic in the final exam. In that case the grade from the midterm will be counted towards the final grade.
Students will be evaluated on their ability to devise, **organize and present complete solutions** to problems. Solutions need to be presented in a **neat and organized way**; cryptic answers or untidy assignments **will not be graded**.

**Complete answers** to all problems is required;

| A correct answer with no reasoning or with wrong reasoning will result in partial or no credit |

The grade distribution is as follows: A (90%-100%), B (80%-89%), C (70%-79%), D (60%-69%), F (0%-59%).

**ii.- Calculators:** will be permitted.

**iii.- CR/NCR Grading**
Most Mathematics classes allow CR/NCR grading, but many majors—including Mathematics—do not count CR/NCR grades towards the major. Mathematics majors should not take their Mathematics classes CR/NCR. All other majors should check with their academic advisors before deciding to take a Mathematics class CR/NCR.

If--after checking with your advisor--you want to apply for CR/NCR grading, you must log onto the web site [www.sfsu.edu/student](http://www.sfsu.edu/student) and sign up for CR/NCR grading before the March 19th deadline (see below-**Important dates**). Your instructor will not pass out a CR/NCR sheet in class.

**iv.- Incompletes**
The Incomplete grade (I) is assigned only to students doing satisfactory work until the last few weeks of a course, when events beyond the students’ control prevented them from completing the course. If this happens to you, discuss with your instructor the possibility of taking an Incomplete rather than withdrawing from a class that you cannot finish.

Incompletes must be made up within twelve months of the date they are assigned. Your instructor will tell you how to make up your incomplete. **Do not enroll in the same course again.** You can only take a course once.

**v.- Late and Retroactive Withdrawals**
Petitions for withdrawal from a class after the April 24 deadline, either before the end of the semester (late withdrawal) or after the semester ends (retroactive withdrawal) must be justified by events that occurred after the withdrawal deadline. In general, only petitions for withdrawal from all courses will be approved. Late withdrawal from your math course alone is usually not approved.
vi.- Policy on make-up exams and late assignments:
No make up exams. If you know you will be missing a quizz/exam, please arrange to take the quiz/exam early. If you miss an exam AND you have an excused absence (medical excuse), your Final Exam grade will determine your midterm exam grade. This replacement policy applies only to missing one exam.

vii.- Exam re-grades
If you wish to have an exam answer re-graded, you must attach a written statement explaining how your answer deserves a higher score and submit the note along with the exam to the instructor within one week of receipt of your graded exam. The re-grade procedure will result in an increase, decrease, or no change in the grade

3.- CLASS POLICIES

i.- Attendance:
Attendance will count towards the student’s grade. The SFSU student bulletin: “Students are expected to attend classes regularly because classroom work is one of the necessary and important means of learning and of attaining the educational objectives of the institution.” Please note that class BEGINS at 12:35pm attendance will be taken during the first 15 minutes. Missing a class, implies that it is the student’s responsibility to obtain lecture notes and find out about any missed announcements from the fellow class members.

ii.- Additional classroom policies:
Cell phone and pager sounds are disruptive to the class and will not be tolerated. While you are in class, your cell phone and/or pager must be silenced (turned off or set on vibrate mode). If you must answer your phone, please leave the lecture room before doing so.

iii.- E-mail etiquette
I welcome E-mail questions from students. Whenever e-mailing, each student must identify herself/himself by signing the message with his/her full name.

4.- IMPORTANT DATES:
Here is a short version of the University calendar for Spring, 2008. Note that the Mathematics Department strictly enforces the deadlines for CR/NCR grading and withdrawals.

<table>
<thead>
<tr>
<th>Date</th>
<th>Event</th>
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<tbody>
<tr>
<td>February 8 or 20</td>
<td>Last day for add permits- Last day for late permits</td>
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<tr>
<td>February 20</td>
<td>Last day to drop classes online</td>
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<tr>
<td>March 19</td>
<td>Last day to select CR/NCR grading</td>
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<tr>
<td>March 24-28</td>
<td>Spring Break</td>
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<tr>
<td>April 24</td>
<td>Last day to withdraw from a course</td>
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<tr>
<td>May 15</td>
<td>Last day of instruction</td>
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<tr>
<td>May 17-23</td>
<td>Final exams</td>
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<tr>
<td>June 2</td>
<td>Grades due from instructors</td>
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5.- REASONABLE ACCOMMODATIONS

i.- Students with Disabilities
Students with disabilities needing reasonable accommodations must bring an official written request to their instructor from the Disability Programs and Resource Center (Student Services Building, Room 110, (415) 338-1041, drc@sfsu.edu). The DPRC is available to facilitate the reasonable accommodations process.

ii.- Religious Holidays
Reasonable accommodations will be made for you to observe religious holidays when such observances require you to be absent from class activities. It is your responsibility to inform the instructor during the first two weeks of class, in writing, about such holidays.

6.- CHANGES IN SYLLABUS
The syllabus is subject to change upon agreement between students and instructor. If you are absent from class, it is your responsibility to check on announcements made while you were absent.