MATH 592C: Topics in Applied Mathematics, Spring 2014

Section: 01, Class Number: 18390
(Syllabus)

Disclaimer: This syllabus is provisional and the instructor reserves the right to make changes.

Instructor: Dr. Jing Li
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Office hours: Mondays & Wednesdays 14:00pm -15:00pm or by appointment (email).
I will be happy to address your questions regarding the course and its contents. You are advised to make use of office hours.

Prerequisites: Prerequisite: MATH552 Real Analysis or consent of instructor.

Lectures: Mondays & Wednesdays 15:30pm-16:45pm in Chaparral Hall 5117

Course textbook: There will no textbook for this course. However, I will make sure of the following reference list:

- Essential Mathematical Biology, by Nicholas F. Britton
- Mathematical Biology I: An Introduction and Mathematical Biology II: Spatial Models and Biomedical Applications, by J.D. Murray
- Mathematical Physiology I and II, by James Keener & James Sneyd
- Elements of Mathematical Ecology, by Mark Kot
- Mathematical Epidemiology, by Fred Brauer, Pauline van den Driessche, and Jianhong Wu (Eds.)
- Dynamic Models in Biology, by Stephen P Ellner & John Guckenheimer
- An Introduction to Stochastic Processes with Applications to Biology, by Linda J.S. Allen.

Course topics: This course is devoted to a variety of important topics in mathematical biology. More precisely, this course is a study of mathematical models used in biological sciences and medicine. The course material covers the building and using of mathematical models to help us understand biological systems.

- Single species population dynamics
- Population dynamics of interacting species
- Dynamics of infectious diseases
- Population genetics and evolution
- Biological motion
- Molecular and cellular biology
- Pattern formation
- Tumour Modeling
The above list will be subjected to changes. Other topics of interests to the class may be added.

**Course webpage:** http://www.csun.edu/~jingli/courses/MATH592C_S14.html

**Assessment:** There will be regular homework assignments, one 75-minute midterm exam, one midterm course project and final course project. These will be weighted as follows:

- **Homework:** 15% (total)
- **Midterm exam:** 20%
- **Midterm course project:** 30% (total)
  - in-class presentation: (50%)
  - project report: (50%)
- **Final course project:** 35% (total)
  - in-class presentation: (50%)
  - project report: (50%)

Note that +/- grading system will be used. The percentages are to be translated into letter grades using the following scale: 90-100% A; 80-89% B, 70-79% C, 60-69% D, 0-59% F. The cutoff numbers for the grades may be modified (in the direction of decreasing only!) at the end of the term, based on the overall performance of the class.

**Homework assignments:** Homework will be assigned on a regular basis on the class webpage. Homework assignments will be due at the beginning of the class on due dates. Late assignments will NOT be accepted. Please staple your assignments and verify that your name and student number are clearly visible on the front page.

**Midterm:** There is a tentative date on the course webpage for the midterm. This date may be adjusted and the changes will be announced in class and on the course webpage.

**Make-up exams:** Make-up midterm exam will be given to students with legitimate excuses such as verified illness, university sponsored events, etc. Written documentation is required. In such case you should let me know about it before the exam (by email).

**Midterm course project:** Early in the semester, you will be given a list of references from which each student will select one research paper to do the midterm course project. Each student will be required to understand the paper, and be asked to reproduce the results presented in the paper. The assessment for this project consists of two part. One is the oral in-class presentation, which will be evaluated by your classmates and the instructor. The other part is the review report, which will be evaluated by the instructor.

**Final course project:** In the middle of the semester, each student will be given a list of topics from which each student will select one to do your final course project. Each student will be expected to complete a research-and-modeling project. Project topics should involve the modeling of a biological system, along with a review of recent scientific research concerning this system. Project work will consist of an oral in-class presentations and a written paper. The oral presentations will be the final exam week of May 14. The written paper is due on May 14.

**General Comments:** for your information, please read carefully.
1. **Attendance:** Class attendance is strongly suggested for successful course completion. There is a high correlation between students who miss class and students who fail. Should one miss a class, he/she is still responsible for the work covered and any announcements made. Attendance will be taken routinely at the start of the class.

2. **Scholastic misconduct:** Students are required to fully comply with the University Code of Conduct. Any disturbance during lectures or cheating during exams will have severe consequences. I assume that you are familiar with this document:

   http://www.csun.edu/a&r/soc/studentconduct.html

3. **Students with Disabilities:** If you have a disability and need accommodations, please register with the Disability Resources and Educational Services (DRES) office or the National Center on Deafness (NCOD). The DRES office is located in Bayramian Hall, room 110 and can be reached at 818.677.2684. NCOD is located on Bertrand Street in Jeanne Chisholm Hall and can be reached at 818.677.2611. If you would like to discuss your need for accommodations with me, please contact me to set up an appointment.

4. **E-mail Communication:** In accordance with the University’s policy, this class will use your university email address to communicate with you about all course-related matters.

5. **Calculators:** Graphing calculator or computer software such as Maple or Mathematica may be useful for obtaining solutions of some of the homework problems. However, graphing calculators will not be allowed on midterm or final exam. A basic scientific calculator is OK (for example, TI-30XII, or similar).

6. **Electronic Devices:** Students are required to turn off all electronic devices such as cell phones, iPods, and blackberries. If you need your cell phone on because you have children or need to remain in contact with someone because of a medical emergency, please inform the professor at the beginning of the class and please leave the cell phone on vibrate.

7. **Course webpage:** The table on the course website gives you information about what was covered in class together with a list of suggested exercises. It also gives you the assignments. Please check the website frequently as it will be updated regularly.

8. Learning mathematics requires solitary work and group efforts. Get together in small groups to discuss the material but solve and write your assignments on your own! This will pay off in the end.

9. It is a sign of strength (not weakness) to ask for help if you need it: Identify your difficulty, identify who can help you, go and ask for help.

10. If you have suggestions for me to improve our teaching, please tell me right away. Do not wait until the course evaluation at the end of the term, because then only the students after you will benefit from your suggestion.

11. Start working on the material right away. Check your understanding after every class. It will pay off later.