Syllabus - Math 448 - Scientific Computing - Spring 2014

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Office hours: T 3:00-5:00 or by appt.

Course meetings: Tuesday and Thursday 1:30PM-2:45PM in Del Norte 2555
Texts: (all free ebooks and on Blackboard)
"Mathematica programming: an advanced introduction", Leonid Shifrin
"Mathematica: A problem centered approach", Roozbeh Hazrat
"Mathematica in Action", Stan Wagon
An Introduction to Modern Mathematica Computing", Borwein and Skerritt
Course website is on Blackboard

Why I like this course
I like this course because it pull back the veil and exposes something we all take for granted: computers give us the correct answers to mathematical calculations. In this class, we explore the questions: How can we make computers to mathematic accurately, and how can me make computers to mathematics efficiently? As society struggles with larger and larger data sets, these questions come to the fore.

How to contact me
The best way to get in touch with me is in-person or by email. In general, if you have any difficulties with the material, schedule, or anything else, get in touch with me. I'm here to help, and it's much easier help if you are proactive.

Course Description
Prerequisite: Prerequisite: (Math 350 or Comp 151) and Math 151

Examines the challenges of programming computers to perform mathematical computations accurately and efficiently. Students learn how ideas from calculus are used to create algorithms to solve mathematical problems numerically.

Goals
Upon successful completion of this course, students will be able to:

- Solve problems using mathematical methods and relevant technology.
- Write effectively in various forms.
- Integrate content, ideas, and approaches from integrative perspectives across disciplines.
- Apply scientific computing methods to the solution of mathematical problems using computers.
- Discuss the errors involving numerical methods.

Course Workload
This is a 3 credit hour course, which means that students should be prepared to spend a **minimum**

of 9 hours a week on work related to this class. In order to be successful students should budget 2.5 hours of time in class, 1 hour of reading, and 5.5 hours on homework each week. Often, students will need to budget more time than this to earn a high grade in this course.

Grading Structure
Course grades are based on your performance on a midterm, 11 homework assignments, and a final exam. Details about homework assignments and projects are available on CI Learn.

Final Course Project	TBD
Assignments	TBD
Mini-Assignments	TBD
Presentations (at least 3)	TBD
In-class work	TBD
Total	600

$A \in (540, 600]$	$B \in (480, 540]$	$C \in (420, 480]$
$D \in (360, 420]$	$F \in [0, 360]$	

The above table indicates what number of total points is needed for each grade. I will assign + and - grades in this course at my discretion.

Colaboration Policy
Working in group on the homework assignment is strongly encouraged. However each person should individually write up their solutions, relying only on their notes about the problem. On each homework assignment, please indicate which students you worked with. An important part of mathematical culture and work is acknowledging the people that helped you understand and solve a problem.

Other Helpful Resources
There are three ways to receive additional help with learning course material outside of the classroom in addition to the Math 399 course. These resources are office hours, tutoring at the LRC, and tutoring at STEM Center. You can come to my office hours which are posted at the top of the syllabus. Office hours is a time when you can come to my office and ask me questions about course material. Students who make use of office house tend to do better in college courses. There is tutoring available in the Learning Resource Center (LRC) in the Library. (Google: csuci learning resource center.) At the LRC you can drop in for tutoring help. There is also drop in tutoring available at the STEM Center in El Dorado Hall. At both of these sites, there are math tutors that will work with you to help you learn course material.

Accomodations
Cal State Channel Islands is committed to equal educational opportunities for qualified students with disabilities in compliance with Section 504 of the Federal Rehabilitation Act of 1973 and the Americans with Disabilities Act (ADA) of 1990. The mission of Disability Accommodation Services is to assist students with disabilities to realize their academic and personal potential. Students with physical, learning, or other disabilities are encouraged to contact the Education Access Center (EAC) office at (805) 437-3331 for personal assistance and accommodations.

Incomplete Policy
A grade of an incomplete will be assigned if a signifiant event or series of events prevents a student from completed course work on time. A grade of incomplete will be assigned only if a student submits the requesting in writing with a list of the work that will not be completed by the close of the semester and also includes a detailed plan of completing the missing work by the the end of the subsequent **semester**.

Disclaimer on syllabus changes
Information on this syllabus is subject to change. I will make such changes known in class.

Academic Honesty
From the course catalog:

Academic dishonesty includes such things as cheating, inventing false information or citations, plagiarism and helping someone else commit an act of academic dishonesty. It usually involves an attempt by a student to show possession of a level of knowledge or skill that he/she does not possess.

Basically what this boils down to is: the work that you submit for credit should be your own work and reflect your understanding of the course material. Group work, collaborations, and the free exchange of ideas are fundamental aspects of an academic environment. I encourage you all to talk and work with others in the class, as it will enhance your understanding of the material. You must write up your assignment individually and explain solutions in your own words. It is also important to cite resources you used in work, these may include other students, books, websites, and instructors.

Schedule

This course schedule may change as the semester progress. I will mention all changes in class and change the schedule on Blackboard.

Week	Date	Topics	Sections	Work Due	Notes
1	1/21 1/23	Course introduction Workshop: "Getting Started"			
2	1/28 1/30	Lists and Functions Workshop: Lists and Functions			
3	2/4 2/6	Importing/Accessing/Vizualizing Data Workshop: Data			
4	2/11 2/13	Rules and Patterns Workshop: Solving, Rules, Patterns			
5	2/18 2/20	Linear Algebra Workshop: Matrices			
6	2/25 2/27	Linear Least Squares Workshop:SVD			
7	3/4 3/6	Singular Value Decompositon Workshop: MDS			
8	3/11 3/13	Multidimensional Scaling Workshop			
9	3/18 3/20	Curve Fitting Workshop			
10	4/1 4/3	 Workshop			
11	4/8 4/10	Project Conferences Workshop: Project			
12	4/15 4/17	Project Conferences Workshop: Project			
13	4/22 4/24	Project Conferences Workshop: Project			
14	4/29 5/1	Project Conferences Workshop: Project			
15	5/6 5/8	Project Presentations Project Presentations			
	5/13	**Project Presentations - 1:00PM-3:00PM**			