

Instructor: Dr. Michael Bice

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Web Page: <http://www.csustan.edu/math/bice/4330-f09/4330index.html>

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Office Hours

M 9:05 – 10:00 a.m., T 10:15 – 11:30 a.m., W 11:15 a.m. – 12:00 p.m., F 9:05 – 10:00 a.m., and by appointment.

Prerequisites

Math 2410 (*Multivariate Calculus*), Math 2460 (*Intro to Differential Equations*), Math 2530 (*Linear Algebra*), and CS 1500 (*Computer Programming I*) with grades of C– or better, or consent of instructor.

General Education

This course does not satisfy any General Education requirement.

Textbook

Numerical Methods (3rd edition) by J. Douglas Faires and Richard Burden. This is the same book that was used in 2005 and 2007. Be sure to get the correct book: there is a numerical *analysis* text by the same authors. We will cover many sections from Chapters 1 – 6, and additional topics as time permits.

Student Learning Objectives

By the time this course is finished, students will . . .

- (1) Work with floating point arithmetic and the different types of error that arise in numerical computation.
- (2) Learn how to approximate complicated functions with special types of polynomials.
- (3) Develop ways for approximating solutions of single variable equations, systems of linear equations, and differential equations, as time permits.
- (4) Examine ways of approximating integrals and derivatives of various functions.
- (5) Analyze the effectiveness of different approximation methods by looking at the computational time needed and the sizes of approximation errors.
- (6) Develop an ability to write computer programs for accomplishing many of the objectives listed above.

Attendance Policy and In-Class Expectations

I have no compulsory attendance policy, but I strongly urge you to attend each class. If you miss a day, it is solely your responsibility to seek out another student or myself to find out what you missed. If you arrive to class late, please feel free to come in but do not be disruptive, out of courtesy to your fellow students.

Written Homework

Typically, homework will be assigned on Fridays and collected at the beginning of class on the following Friday. The first assignment will be due on Friday, September 18. See the attached course schedule for the due dates. Late homework will not be accepted, except at the instructor's discretion.

Assignments will be given in class and posted on the course web site. Homework will have three components:

- (1) *Reading:* I expect you to read the text as assigned. It is important to keep up with the reading throughout the semester, but I realize that reading math is sometimes frustrating. Try to work through your struggles, and see me if you need help.
- (2) *Practice Problems:* For each homework set, I will assign some exercises as practice. I encourage you to work on these problems, as some might appear on tests.
- (3) *Problems to Turn In:* Each assignment will contain a short list of problems that will be collected.

One goal of the homework is to develop an ability to clearly and effectively communicate to me that you know how to solve the problem. I expect your homework to be well-organized, clear, and legible. Do not assume that I can guess what you are doing. If I cannot follow what you are doing, I cannot give credit for it, even if your answers are correct.

I encourage you to work with your peers on class material. Working with others allows you to bounce ideas off of your classmates, which can lead to a better understanding of the topics. But I expect you to submit your own work (unless I specify otherwise). Don't copy other people's work, as that is academically dishonest.

Programming and Computer Projects

This course will have a significant programming component, as you can see in the homework. You may use C++, C, Java, Fortran, Pascal, Mathematica programming, or Maple programming, and you must include all of your code and its output for all assignments involving programming. If you wish to use a different programming language, you must clear this with me beforehand. Without such clearance, I will not grade your computer programs.

Within your written homework, you may be asked to write a small program to solve a given problem. In addition to the homework, you will have five computer projects to complete. See the attached schedule for the due dates of these projects. You will be required to work in groups of two or three. More project details will be given in a separate handout in a few days.

Exam Schedule

Two in-class midterms and a final exam will be given. The final exam will have a take-home component. See the attached schedule for the exam days. For the midterms and the in-class portion of the final exam, no notes or books are allowed, but you may use a scientific, non-programmable calculator. For the take-home part of the final exam, you may use your textbook, notes, and calculator and/or computer, but no other resources are allowed and you may not work with anyone else unless the exam specifies otherwise.

If you know in advance that you must miss a test, discuss this with me immediately. Otherwise, I do not give make-up exams unless extraordinary and compelling reasons arise. If you miss an exam for a legitimate emergency reason (which is for me to decide), I may reassign that portion of your grade to the final exam.

Grading Scheme and Policies

The following grading scheme will be used:

15% Low Midterm	15% Weekly Homework (lowest score dropped)
20% High Midterm	20% Computer Projects
30% Final Exam	

I will use the plus/minus grading system. For the final course grades, if you score at least 90%/80%/70%, you are guaranteed at least an A-/B-/C- grade. If you decide to change your grading option for this course, you must do so by the date specified on the attached schedule. I will not consider option changes after the given date.

Unless I state otherwise, you must show your work to receive full credit for a correct answer. **No work = no credit.** If you wish to contest the grading of a problem or assignment, please ask me. I am always happy to review a graded problem and provide clarification on how something is graded.

Points from different categories are like different currencies. Just as a Canadian dollar is not worth the same as an Australian dollar, a homework point is not worth the same as a midterm point. You are welcome to ask me about your current course score, but I do not implement curves until the end of the term. I have found that my students benefit more from a curve on the entire course than individual curves on every assignment and test.

Cheating Policy

I consider cheating to be a serious offense. It is a blatant disregard for the rules and a show of disrespect for me and your fellow students. Academic dishonesty of any kind deprives you of the education that you (or someone else) are paying a lot of money to get. If you are caught cheating, you will automatically receive a zero score for that assignment or exam, and it is then counted as either your higher test score in the grading policy or as an undropped assignment. Cheating incidents are reported to the Coordinator of University Discipline for further action, and you might also receive an "F" for your course grade. The consequences for cheating are severe, so don't do it!

Please keep in mind that cheating can take on various forms. Use of the Complete Solutions Manual is one form of academic dishonesty, as that manual is intended for instructors only. Something as simple as one person telling someone who is scheduled to take a test later that the exam was hard/easy is academically dishonest. Any action that gives an individual any kind of unfair, unethical advantage is considered academically dishonest, whether done intentionally or not.

Cell Phones, Computer Laptops, and Classroom Behavior

Please turn off and put away your cell phone and computer laptops during all class time. Any unauthorized use of a cell phone or computer laptop during class will result in its confiscation until class has ended or your dismissal from class for the day. If you must use your cell phone or laptop, leave the classroom without becoming a distraction to your fellow classmates. If you need to leave your cell phone on during class time for an emergency reason, please speak with me about it as soon as possible so that special arrangements can be made.

If you attempt to use your cell phone or if it rings during a test, I will assume that you have finished your test, and I will collect your exam immediately. The same policy holds for computer laptops. Two violations of this policy during exams will constitute cheating and will be subject to the actions listed above. To avoid problems, consider leaving your cell phone and laptop elsewhere on exam days.

Any disruptive behavior that interferes with the learning environment of others will not be tolerated and may lead to disciplinary action and/or removal from class.

Students with Disabilities

Upon identifying themselves to the University, students with disabilities will receive necessary accommodations for learning and evaluation. I cannot make accommodations until the student has filed all appropriate paperwork and Disability Resource Services has notified me of the appropriate accommodations.

Students in Athletics

If you are a student athlete, it is your responsibility to provide me with a letter from your coach that lists all days in which you will be absent. Accommodations will be only be made if I receive the letter from your coach at least 7 business days in advance, with appropriate exceptions for the first week of class. Only written notices from your coach will be accepted. Take care of this at the beginning of the semester.

Syllabus Changes

If changes to this syllabus are necessary, I will provide them in writing during class and post them on the web site. If you miss class on a day in which I announce changes, it is your responsibility to obtain them.

Furlough Dates

Due to massive cutbacks in state support for the CSU system, all CSU instructors are required to take eight furlough days during the Fall 2009 semester. My furlough days are listed on the attached schedule. These days vary from instructor to instructor, so if we do not have class on a given day, it does not mean your other classes are also canceled. These days may also be different from the campus furlough days for staff and office workers.

Please keep in mind that I am required to not work during those days – if I perform any job-related activities, I could be subject to discipline. On instruction days, that means we will not meet as a class, but you may be required to complete an out-of-class assignment or worksheet. On all furlough days, I will not be responding to any student email, phone calls, or other contact of any kind. I apologize for the inconveniences these days will cause.

Other Comments

Numerical analysis is one of my favorite branches of mathematics. It is incredibly powerful, as it provides ways of “solving” difficult mathematical problems through approximation and algorithms. The topics covered in this field are used in many places through industry, government, and academia. The pace of this course will be fast, as we will cover many approximation methods. I strongly recommend attending class regularly and keeping up with the material as much as possible, so please organize your work and travel schedules accordingly. If you get stuck or fall behind, come see me immediately so I can help you in getting caught up – don’t wait until the last minute to get help. I really want to see everybody succeed, so please ask questions when they arise. Don’t be afraid to come see me. . . I don’t bite, and I’ve had my shots. ☺ Good luck this term!