

## MATH 308: Differential Equations, Spring 2012

Section: 503, CRN: 12703

M,W,F, 10:20 am-11:10 am, Blocker Building 128

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**Office:** Blocker Building, 641 C **Math Dept. Phone:** (979) 845-3261  
**Office Hours:** M,W,F, 9:15 am - 10:15 am, and by appointment

**Prerequisites:** MATH 251 or equivalent with a grade of C or better, basic knowledge of computers (e.g., using the mouse and keyboard, saving files, etc.). We will be using Matlab in this course; however, no prerequisite knowledge of programming or of Matlab is assumed.

**Textbooks:** *Elementary Differential Equations, 9<sup>th</sup> Edition.* W. Boyce, R. DiPrima. John Wiley and Sons, Inc, 2011. ISBN: 9781118133712. Note that there is a special edition made exclusively for Texas A&M, based on the 9<sup>th</sup> edition. It is also acceptable.

*Differential Equations with Matlab, 2nd Edition.* Wiley, B. Hunt, R. Lipsman, J. Osborn, J. Rosenberg. John Wiley and Sons, Inc, 2005. ISBN: 9780471718123.

**(Optional)** This book is not necessary, and I won't be lecturing directly out of it, but it may be a useful reference for you while you are learning Matlab.

**Contacting me:** The best way to get in contact with me is by email, [alarios@math.tamu.edu](mailto:alarios@math.tamu.edu). Please put MATH 308-503 somewhere in the subject and make sure to include your whole name with your email. Polite, courteous emails are appreciated. My office is in Blocker Building, 641 C, and my office hours are M,W,F 9:15 pm - 10:15 pm. Drop-ins are welcome during these times. If you want to meet me at a different time, please email me, and we will try to schedule a time to meet.

**Content:** Differential equations lie at the heart of an extremely large number of natural phenomena. Our understanding of these equations and their solutions has yielded a massive amount of progress for the human race. Furthermore, the unsolved problems are enormously varied, rich, and challenging. Research in differential equations is found at the cutting edge of nearly every discipline in science and mathematics, with recent progress requiring the most cutting-edge mathematical tools, and the fastest supercomputers in the world.

We will focus on the most basic differential equations, known as "ordinary differential equations" (ODEs). Even at this level, the equations involved are incredibly useful in modeling nature, and will require us to develop sophisticated and beautiful mathematics to handle them.

	Week of	Sections
1	Aug 27	1.1, 1.2, 1.3, 2.1
2	Sept 3	2.2, 2.3, 2.4
3	Sept 10	2.5, 2.6, 2.7, 8.1
4	Sept 17	8.2, 8.3, 8.4
5	Sept 24	7.2, 7.3
6	Oct 1	3.1, 3.2, Exam 1
7	Oct 8	3.3, 3.4, 3.5
8	Oct 15	3.6, 3.7, 3.8, 3.9
9	Oct 22	6.1, 6.2, 6.3
10	Oct 29	6.4, 6.5, 6.6
11	Nov 5	7.1, 7.4, Exam 2
12	Nov 12	7.5, 7.6, 7.8
13	Nov 19	5.1, 5.2, Holiday
14	Nov 26	5.3, 5.4, 5.5
15	Dec 3	5.6
16	Dec 11	Final Exam

The student learning objectives for this course involve classifying ODEs and developing techniques for finding all solutions of general equations in certain classes. Major topics covered will include: ordinary differential equations, solutions in series, solutions using Laplace transforms, and systems of differential equations.

*Tentative weekly schedule:* This schedule in the table above is a rough guide to the sections cover in the course, but is subject to change.

- Homework:** Homework is designed to help students understand the material and to prepare them for the exams. Late homework is not accepted; however, to balance this, your lowest three homework scores will be dropped. The homework problems for each section can be found at <http://www.math.tamu.edu/courses/math308/308currenthw.html>. The starred problems will not be collected unless otherwise noted, but you are highly encouraged to challenge yourself with them.
- Collaboration:** Collaboration is encouraged in this course. However, copying someone else's work and submitting it as your own is not acceptable. This act of academic dishonesty will be prosecuted in accordance with University policy.
- Projects:** Projects will be assigned as announced in class. For some projects, you may be put into groups. In these cases, you will be asked to collaborate on and turn in a single assignment, which will receive a single grade. Each member of the group is responsible for 100% of each assignment, so if one or more group members do not fully contribute for any reason, it is still the responsibility of the other group members to turn in a completed assignment by the due date. It is your responsibility to contact your group members, and to contact me well in advance if problems arise.
- Quizzes:** There will be weekly (or almost weekly) quizzes administered in class. **No make-up quizzes will be given; however, the lowest two quiz scores will be dropped.** You are required to bring and possibly present your Aggie Card or a government issued ID card when taking exams.
- Exams:** There will be 2 midterm exams and a comprehensive final exam. **No exam scores will be dropped.**  
Exam schedule:
- Exam 1: Friday, October 5<sup>th</sup>, in class. Material from weeks 1-5.  
(Note: The Q-drop deadline is Friday, November 2, at 5:00 p.m.)
  - Exam 2: Friday, November 9<sup>th</sup>, in class. Material from weeks 6-10.
  - Final exam: December 11<sup>th</sup>, Tuesday 8:00 a.m.-10:00 a.m.
- You are required to bring and possibly present your Aggie Card or a government issued ID card when taking exams, as well as standard writing materials.
- Calculators:** There will be no calculators (or other electronic devices) allowed on exams and quizzes, unless otherwise stated.
- Laptops, Cell Phones, etc.:** Laptops, cell phones, and other electronic devices, are not allowed to be used during class, unless otherwise stated. Cell phones must be set on vibrate or off. If you need to take a call, send a text message, or something similar, please quietly leave the classroom to do so, so that you do not distract other students. You are welcome to return to class quietly when you are finished. If you wish to take notes using an electronic device, you must first demonstrate to me that you can type or write fast enough to do so properly, and that you can do it without distracting others, before the privilege to use such devices may be granted. If you are found to be abusing this privilege, you risk forfeiting it.

**Grading:** The final course grade will be computed minimally as follows.

Homework:	15%	A	90%-100%
Projects:	15%	B	80%-89.99%
Quizzes:	10%	C	70%-79.99%
Midterms:	40%	D	60%-69.99%
Final Exam:	20%	F	0%-59.99%

**Attendance:** Daily attendance for class lectures is expected and is extremely important. While attendance is not recorded, missing even one class will put you behind. Note that there is a strong correlation between class absences and poor grades. You are responsible for all material and announcements in class regardless of whether or not you attended. **You are also responsible for making arrangements with another classmate to find out what you missed. You should not ask me to go over material that you missed (due to tardiness or absences) during office hours or over email.**

**Make-up exams:** Make-up exams will only be given with written evidence of an official University excused absence. Section 7.3 of the University Student Rules states that for an absence: “to be excused the student must notify his or her instructor in writing (acknowledged email message is acceptable) prior to the date of absence if such notification is feasible. In cases where advance notification is not feasible (e.g., accident or emergency) the student must provide notification by the end of the second working day after the absence. This notification should include an explanation of why notice could not be sent prior to the class.”

**Incompletes:** A grade of “incomplete” may be considered if all but a small portion of the class has been successfully completed, but the student in question is prevented from completing the course by a severe, unexpected, and documented event. Students who are simply behind in their work should consider dropping the course.

**Special Services:** The American with Disabilities Act (ADA) is a federal anti-discrimination statute that provides comprehensive civil rights protections for persons with disabilities. Among other things, this legislation provides that all students with disabilities be guaranteed a learning environment that provides for reasonable accommodation of their disabilities. If you believe you have a disability requiring an accommodation, please contact Disability Services, Cain Hall, Room B118, (979) 845-1637. For additional information, visit: <http://disability.tamu.edu>

**Copyright policy:** Printed materials disseminated in class or on the web are protected by copyright laws. One Xerox copy (or download from the web) is allowed for personal use. Multiple copies or sale of any of these materials is strictly prohibited.

**Honor Code:** Academic dishonesty is taken extremely seriously, and will be dealt with according to university policy. Always abide by the Aggie Code of Honor: “An Aggie does not lie, cheat or steal, or tolerate those who do.” For additional information, please visit: <http://www.tamu.edu/aggiehonor>

**Useful Websites:** Course Website: <http://www.math.tamu.edu/courses/math308/>  
My Website: <http://www.math.tamu.edu/~alarios>  
Department of Mathematics: <http://www.math.tamu.edu>  
Campus emergency: <http://studentaffairs.tamu.edu/emergency>  
Student Rules: <http://student-rules.tamu.edu>