

# Course Information

Math 3354–01

Fall 2008

September 8, 2008

**Instructor:** Prof. Lance D. Drager. Office: Math 236. Office Phone: 742–2580, Ext. 242. If you let the office phone ring long enough, you'll get me or a voice mail system you can leave a message on. My e-mail address is [lance.drager@ttu.edu](mailto:lance.drager@ttu.edu).

Course materials will sometimes be posted on my web page, which is <http://www.math.ttu.edu/~drager>.

**Office Hours:** MWF 10:00–12:00, TTh 1:30–2:20. I am often in my office at other times in the afternoon. You can come by outside of formal office hours; I'll usually have time to talk to you. Please feel free to come by if you need help.

**Other Sources of Help:** The Mathematics Department Office has a list of people who offer tutoring for pay. Forming informal study groups with other students can be very helpful.

**Text:** The Text is Stephen L. Cambell and Richard Haberman, **Introduction to Differential Equations with Dynamical Systems**, Princeton University Press, 2008. We'll cover the following sections: 1.1–1.9, 2.1–2.7, 2.9–2.10, 3.1–3.7, 4.1–4.3 and 6.1–6.2.

**Learning Outcomes:** The purpose of this course is to be able to identify and solve many types of ordinary differential equations using a variety of methods and techniques and to apply these techniques to solve important problems that arise in physics, chemistry, engineering, and biology. Students will learn techniques to solve first-order differential equations and to apply these techniques to solve applications related to growth, decay and mixtures. Students will learn methods to solve second- and higher-order linear differential equations and to apply these methods to solve classical problems in mechanical vibrations. Students will gain an understanding and appreciation of Laplace transform techniques for solving linear differential equations and their usefulness in solving problems with discontinuous or impulse forcing functions, and integral equations. Students will learn how to express higher-order differential equations as systems and to solve linear systems of differential equations. For a system consisting of two equations, students will apply phase plane techniques to study solution dynamics.

Projects using Maple and MatLab will expose students to current technology useful in graphing solutions, plotting solutions in the phase plane and solving differential equations using numerical methods.

**Calculator:** A symbolic calculator like the TI-89 or TI Voyage 200 is a necessity.

**Assessment of Learning Outcomes:** The assessment of student's mastery of the skills and concepts as specified in the expected learning outcomes will occur, with appropriate course grades assigned, as follows:

1. Three in-class exams.
2. The final exam.
3. Exam corrections.
4. Homework.

Homework assignments will be made in class, with a due date.

The in-class exams and the final exam will all be equally weighted. I will drop the lowest of these four scores (which could be the score on the final). If you are satisfied with your grades on the three in-class exams, you can skip the final and let that be the dropped exam grade.

The homework will count for 15% of the final grade and Exam corrections will count for 15% of the final grade.

Exams will be announced well in advance.

For each exam, I will determine a grade range for the A's, B's, C's, D's and F's. I will then linearly rescale the grades in the A range to the interval  $[90, 100]$ , the grades in the B range will be rescaled to the interval  $[80, 89]$ , and so forth.

At the end of the course, I will average the grades and assign letter grades with cutoffs 90% for A, 80% for B, 70% for C and 60% for D; I might lower these a little, but not much. Thus, with this system, you can determine your standing at any time.

For example, consider a *hypothetical* exam with the raw scores as in Table 1. The grade ranges might hypothetically be chosen as indicated. The numerical scores would then be rescaled as indicated in the table, using the formulas on the right and then rounding to the nearest point. The grade rescaling function would be as graphed in Figure 1.

A similar curve will be applied to the homework average at the end of the course.

**Final Exam:** The final is Tuesday, December 9, from 4:30pm to 7:00pm, in our usual classroom. It will be a comprehensive exam.

**Makeups:** If you miss an exam you can, at your option, take that as the exam score to be dropped. If you are absent from an exam and convince me that your reason was legitimate, I will give a makeup exam. Late homework will only be accepted with a serious, legitimate excuse.

**Homework on the Web:** Much of the homework will be done on the world wide web using the Webworks system. I'll give you the URL and make a link

	Raw (x)	Rescaled (y)	
A	95	96	$y = \frac{100 - 90}{100 - 86}(x - 86) + 90$
	92	94	
	<b>86</b>	90	
B	83	86	$y = \frac{90 - 80}{86 - 78}(x - 78) + 80$
	82	85	
	<b>78</b>	80	
C	75	76	$y = \frac{80 - 70}{78 - 70}(x - 70) + 70$
	73	74	
	72	73	
(cut off at <b>70</b> )			
D	66	67	$y = \frac{70 - 60}{70 - 55}(x - 55) + 60$
	64	66	
	61	64	
	58	62	
F	<b>55</b>	60	$y = \frac{60}{55}x$
	50	48	
	48	52	
	47	45	
	40	44	

Table 1: Grade rescaling

from my website to the homework site. Your username is your eraider name. The initial password is the last five digits of your SSN, but you'll have to change the password.

**Formative Assessment:** Continuous formative assessment of the progress of the course will occur via ongoing communication between the instructor and the students. To this end, all students are encouraged to ask questions during class and to seek the instructor's help out of class when needed. Other activities in support of student-instructor communication will include: practice exams and quizzes, review of homework, and personal interviews with students doing poorly on work assigned at the beginning of the course.

**Class Attendance:** Experience and many studies show that it is important for students to attend class! Initially, I will not count attendance for the grade, but, if I feel too many people are skipping class, I will institute an attendance system! If that happens, I will post the attendance policy on my website.

Remember, you are responsible for all material covered in class and all announcements made in class. If you have to miss a class, you should check with me or a classmate to see what happened.

**Identification:** You should be prepared to show your Texas Tech picture ID at any quiz or exam.

**Accommodations for Disabilities:** Any student who, because of a disability, may require special arrangements in order to meet course requirements should contact the instructor as soon as possible to make necessary accommoda-

tions. Students should present appropriate verification from Disabled Student Services, Dean of Students Office (AccessTECH). No requirement exists that accommodations be made prior to completion of this approved University process.

**Religious Holy Days:** Which days are “religious holy days” is defined by Texas Law. A student who intends to observe a religious holy day should make that intention known to the instructor prior to the absence. A student who is absent from classes for the observance of a religious holy day shall be allowed to take an examination or complete an assignment scheduled for that day within a reasonable time after the absence. A student excused for a religious holy day may not be penalized for the absence; however, the instructor may respond appropriately if the student fails to complete the assignment satisfactorily. See <http://www.depts.ttu.edu/opmanual/OP34.19.pdf>.

**Academic Misconduct:** It is the aim of the faculty of Texas Tech University to foster a spirit of complete honesty and a high standard of integrity. The attempt of students to present as their own work any work that they have not honestly preformed is regarded by the faculty and administration as a serious offense and renders the offenders liable to serious consequences, possibly suspension.

For more information, and a description of what is considered to be misconduct, see <http://www.depts.ttu.edu/officalpublications/catalog/AcademicsRegulations.html>

**Civility in the Classroom:** Students are expected to assist in maintaining a classroom environment that is conducive to learning. In order to assure that all students have the opportunity to gain from time spent in class, unless otherwise approved by the instructor, students are prohibited from engaging in any other form of distraction. Inappropriate behavior in the classroom shall result, minimally, in a request to leave class.

For more information, see <http://www.studentaffairs.ttu.edu/vpsa/publications/civility.htm>

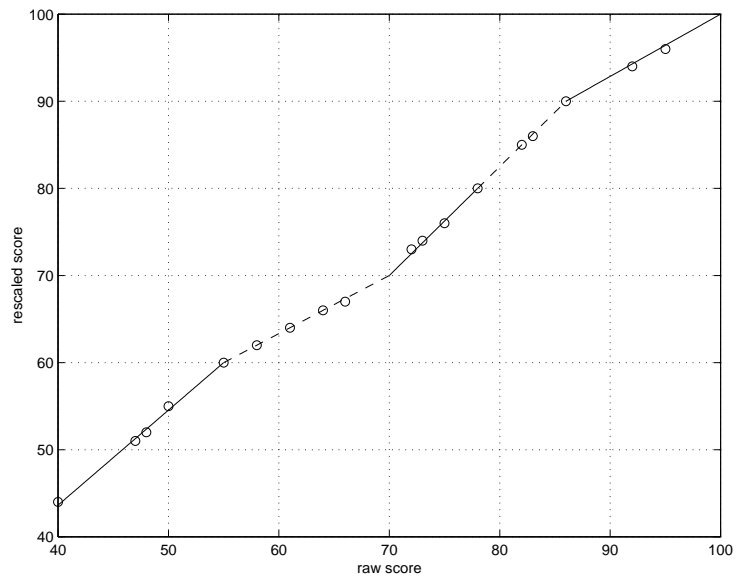


Figure 1: Graph of the grade rescaling function