Math 271 - Differential Equations

Spring 2014

Basic Info:

Instructor:	Dr. Nathan Reff
Email:	reff@alfred.edu
Office:	Myers Hall 109C
Phone:	607.871.2818
Course Web Page:	http://people.alfred.edu/~reff/MATH271/
Course Meetings:	Section 1: MW 8:00-9:15 in Seidlin Hall 114
	Section 2: MWF 10:20-11:10 in Seidlin Hall 114
Text:	*Differential Equations with Boundary-Value Problems,* 8^{th} *Ed.* by D. Zill and W. Wright (ISBN: 9781111827069)

Prerequisite: Math 253 (Calculus III) or equivalent.

Course Goals: In this course we will study ordinary differential equations and their applications. We will build on the tools and techniques from Calculus to solve a variety of differential equations. After completing this course students should be able to:

- Classify and solve a variety of first-order differential equations (separable, linear, exact, solutions by substitutions, etc.).
- Construct, solve and interpret a variety of linear and nonlinear differential equations that commonly appear in applications and mathematical models.
- Classify and solve a variety of higher-order differential equations (linear, reduction of order, undetermined coefficients, variation of parameters, Cauchy-Euler, etc.).
- Find series solutions of some special linear differential equations.
- Construct and solve higher-order linear initial-value and boundary-value problems.

Technology: A graphing calculator may be used in this course. The TI-84 is recommended, but other calculators may be suitable. You may not use a calculator with a computer algebra system (CAS), such as TI models 89 and above, TI Nspire CAS and higher, HP models 48 and above, etc (Please see me if you have questions about your calculator). If you want to use a calculator, please bring it to every class. You must have your own calculator.

Grade Distribution: Your final grade will be determined as follows:

Classwork, Projects, Labs and Participation	8%
Homework	20%
Quizzes	10%
Test 1	13%
Test 2	13%
Test 3	13%
Comprehensive Final Exam	23%

Participation points can be earned by answering questions, asking relevant questions, working well with your group, etc. Coming to class is expected and will not get you these participation points alone. I would like everyone to be a part of the classroom discussions.

Borderline cases can be adjusted up or down based on your attendance, class participation, homework, and trends. For example, a pattern of steady improvement is good, but a weak final exam is bad.

Grade Conversion:

A	93−100	C	73−76
A−	90−92	C−	70−72
B+	87−89	D+	67−69
B	83−86	D	63−66
B−	80−82	F	0−62
C+	77−79		

Homework: Homework problems will be assigned daily/weekly and posted

on the course website: `http://people.alfred.edu/~reff/MATH271/`.

Homework problems will come in 3 forms:

1) **WeBWork problems**: This is an open-source online homework system where you will login and answer questions. The link to all webwork problems will be provided through the homework link above. To login to WeBWork use your Alfred ID and password (the alternative password is your AU number). The purpose of using WeBWork is to give you instant feedback on homework problems. You will usually have infinitely many opportunities to answer a problem correctly. Even though you will not turn in a physical copy of your work I highly recommend generating a pdf of each of your assignments and writing out your solutions carefully as if they are book problems.

2) **Book problems**: These problems will come right out of your text. You must complete these problems and bring your solutions to the next class day. Homework quizzes will come from these problems (see quizzes below). Every week you will turn in these problems to be graded. The purpose of the book problems is to make sure you are writing out clear step-by-step solutions to prepare you for answering questions on quizzes and tests.

3) **Addition problems**: I will write and assign problems which will generally be more challenging. These problems will be collected with the book problems.

No late homework will be accepted!

Please make sure your homework is *neat* (legible, not torn out of a spiral bound notebook, etc.) and *stapled* when you turn it in. Treat your homework as if it is a professional document that you would submit in a future workplace. It is *very* important that you keep working on problems throughout the course. There is an old saying that "math is not a spectator sport" and there is definitely a lot of truth to this. I recommend working individually and also with other classmates (but make sure you are turning in

your own work!). If you are working on a problem and get stuck, make a note of it, bring your work and **ask questions**. I encourage *everyone* to come to office hours!

Other than assigned problems you should be reading the text every day and keeping up with the pace of the course. Keep in mind that it your responsibility to read each section before an exam.

Quizzes: There will at least one quiz each week (except when there is an exam). Quizzes may be announced or unannounced. There will be no make up quizzes. The lowest two quizzes will be dropped if you are present and attempt every quiz.

Quizzes will come in 2 forms:

1) **Standard Quiz**: Standard quizzes will usually cover lecture material and homework problems. The questions may even be taken directly from the homework set, or minor perturbations of the homework problems.

2) **Homework Quiz**: A homework quiz is where you will just copy exactly what your have written as a homework solution. These will be 5 minute quizzes of just copying. You may not look at the problem in the text or have a sheet with the problems written on them. **Please bring all of your written homework to every class**.

Class Work: Occasionally worksheets, lab projects and other classwork will be assigned. Generally these assignments will carry the same weight as a homework or quiz for the course.

Tests: There will be 3 tests and a comprehensive final exam during the semester. The tentative tests dates are as follows:

Test 1	February 12.
Test 2	March 19.
Test 3	April 23.
Final Exam	May 8 (Section 2)/ May 9 (Section 1).

Please see the course website for more details. Tests will be more challenging than the quizzes so you need to study accordingly. However doing the homework and reviewing the quizzes is the best way to prepare yourself.

Quiz/Test/Final Exam Policy: Only your approved calculator may be used (when allowed). Hence, no cell phones, computers, mp3 players, slide rules, abaci, Addiators, Napier's bones, Difference/Analytical Engines, Pascalinas, Antikythera mechanisms, etc. may be used. In other words I want you to only use your brain, calculator and the hard work you put into this course to earn your grade. You may not talk to each other in the classroom while other students are working, even if you are done. Please keep your eyes on your own paper. Do not look at notes, books, etc. while working. Work through the problem on your own and you will do fine (and save us both a lot of trouble).

Cheating and Academic Dishonesty: Academic dishonesty of any kind will not be tolerated. It is disrespectful to the University, your classmates and to me. Any form of

academic dishonesty will be dealt with severely. Alfred University's policies on Academic Dishonesty (Unethical Practices) (see Policy 700) can be found at `http://my.alfred.edu/index.cfm/fuseaction/academic_policies.academic_regulation_ug.cfm`.

Attendance Policy: You are expected to attend and be a part of every class meeting. I will keep a record of your attendance, participation and preparation. I will allow a maximum of three unexcused absences without penalty. Excessive absences will noticeably affect your final grade. This course will move rather quickly so I suggest you only miss class for a good reason (meaning an excused absence). If you must miss a class it is your responsibility to learn the missed material quickly to keep up with the course.

Excused Absences: If you cannot attend one of the exams you should submit a written reason for your absence **in advance** of the exam date. I would appreciate letting me know at least 3 days in advance if you are going to miss a class. In emergency situations please send me an email or leave me a voice message. The decision to allow make-up exams will be made on a case by case basis, but proper documentation is always necessary. No make-up exams will be given without advance notice. If you miss a quiz, exam or final with an unexcused absence, you will receive a 0 for that particular assignment.

Students with Disabilities: Alfred University is committed to upholding and maintaining all aspects of the Federal Americans with Disabilities Act of 1990 (ADA) and Section 504 of the Rehabilitation Act of 1973. If you are a student with a disability and wish to request accommodations, please contact Dr. Aubrey Elmore at the Office of Special Academic Services located in Crandall Hall, or call (607) 871-2148. Any information regarding your disability will remain confidential. Many accommodations require early planning, therefore requests for accommodations should be made as early as possible. Any requests for accommodations will be reviewed in a timely manner to determine their appropriateness to this setting.

Tutor Services/Requests: The office of Special Academic Services offers personalized help in the form of individual and group tutoring. Please contact Beth Niles at (607) 871-2148 for more information. Also, please contact me for additional support.

Extra Credit: I will not be giving anyone extra credit. This way everyone has the same advantage in the course.

Tentative Schedule (Section 1):

Monday	Wednesday
Jan 20th **No Classes**	22nd **1**
27th **2**	29th **3**

Monday	Wednesday
Feb 3rd **4**	5th **5**
10th **6**	12th **7** **TEST 1**
17th **8**	19th **9**
24th **10**	26th **11**
Mar 3rd **12**	5th **13**
10th **No Classes**	12th **No Classes**
17th **14**	19th **15** **TEST 2**
24th **16** **Withdraw Deadline**	26th **17**
31st **18**	Apr 2nd **19**
7th **20**	9th **21**
14th **22**	16th **23**
21st **24**	23rd **25** **TEST 3**
28th **26**	30th **27**
May 5th **28**	7th

Tentative Schedule (Section 2):

Monday	Wednesday	Friday
Jan 20th **No Classes**	22nd **1**	24th **2**

Monday	Wednesday	Friday
27th **3**	29th **4**	31st **5**
Feb 3rd **6**	5th **7**	7th **8**
10th **9**	12th **10** **TEST 1**	14th **11**
17th **12**	19th **13**	21st **14**
24th **15**	26th **16**	28th **17**
Mar 3rd **18**	5th **19**	7th **20**
10th **No Classes**	12th **No Classes**	14th **No Classes**
17th **21**	19th **22** **TEST 2**	21st **23**
24th **24** **Withdraw Deadline**	26th **25**	28th **26**
31st **27**	Apr 2nd **28**	4th **29**
7th **30**	9th **31**	11th **32**
14th **33**	16th **34**	18th **35**
21st **36**	23rd **37** **TEST 3**	25th **38**
28th **39**	30th **40**	May 2nd **41**
5th **42**	7th	9th

Disclaimer: I reserve the right to make changes to this syllabus without prior notice.