

Course: MATH 3020 A
Differential Equations

Instructor: Dr. John C. Sligar
Office: Allgood Hall N332
Office Hours: 1:30-2:30 PM MWF
10-11AM TR
Phone No.: (706)667-4486

Textbook: Zill, "A First Course in Differential Equations", The Classic 5th edition

Catalog Course Description: A study of ordinary differential equations with applications to topics including mechanics and electricity. A study of methods of solving first order, nth order linear, and simultaneous solutions of systems of differential equations. Solution methods include Laplace transforms, Euler methods, and the method of Runge-Kutta.

Course Format: The lecture-demonstration method will be the method most often employed.

Methods of evaluation: The majority of the grade in the course will come from four major examinations and a final. You may be given the opportunity to pick up optional extra credit by handing computer assignments throughout the semester. A schedule of the exam dates is attached.

Attendance: You are expected at all classes, review sessions, quizzes, and examinations. Attendance will be taken on a daily basis starting after the drop-add period. Lack of attendance will not necessarily lead to withdrawal. The main purpose of taking attendance is to facilitate the proper reporting of the last date of attendance on students who have stopped attending and are receiving Title IV funds. However, the registrar has asked instructors to be vigilant of attendance, as prompt attendance is often a requirement in certain financial aid situations. Therefore, repeated and unexplained absence **may** lead to withdrawal. I reserve the right to administratively withdraw any student for excessive absence. Do not assume, however that I will automatically withdraw you for lack of attendance. If it is your desire to withdraw, **you** must initiate the withdrawal. Only in special circumstances may a student receive a grade of W after midterm. Please consult your student manual for these criteria. It is your responsibility to be present for all exams and quizzes. No makeups will be given. If you feel that you have an exceptional case, I will be willing to discuss it with you. However, I claim no unilateral policy, nor do I make any guarantees, either expressly or implied, concerning the giving of a makeup.

Grading:

3 major exams	70%
Final exam	30%
Optional computer assignments	TBA

No exam grades will be dropped

Study suggestions: In order to succeed in this course you **must** regularly do your homework. Read your textbook. You cannot possibly hope to succeed if you do not know the basic definitions and theorems. Be

prepared to take good notes, and regularly compare these notes to the material in the textbook. If you find any apparent contradictions, seek to resolve them with me. The main point is for you to learn and understand, so ask questions whenever you have the opportunity. I will always be willing to stop and answer your questions.

Homework: Homework will not be collected. I will reiterate, though, that you can expect almost no success in the course if you do not do your homework.. You may certainly do more of the problems if you like, and I will definitely be willing to answer questions on more than just the following problems.

Additional Information: The administration has asked all instructors to stress the importance of the building rules in Allgood Hall and University Hall. This includes no food or drink in the classrooms, no students gathering in classrooms except during class times, etc. Consult public safety if you want to receive a formal copy of the building rules. I as an instructor expect you to abide by these rules.

As a matter of courtesy, please turn off or sound-disable any cell-phones, blackberries, blue-tooths, etc.,etc.etc. (in general any device whatsoever that is capable of making NOISE) during class. None of the aforementioned technologies are allowed during exams. The only device that will be allowed during exams will be your calculator.

Furthermore, as a matter of courtesy, only get up and leave the classroom during class if you have a pressing need. If you must leave early or come in late, try to sit near the door, and let me know in advance if possible.

Sect.	
1.1	Definitions and Terminology 1-39 odd
1.2	Some Mathematical Models 1,3,5,7,9,11,17,20
2.1	Preliminary Theory 1-17 odd
2.2	Separable Variables 1-39 odd,41,43,45,49,53,55,57,61
2.3	Homogeneous Equations 11-43 odd
2.4	Exact Equations 1-23 odd,25,27,29,33,37,39
2.5	Linear Equations 1-39 odd, 41,45,47,53
2.6	Bernoulli, Ricatti, and Clairaut Equations (Bernoulli only) 1-9 odd
2.7	Substitutions 1-25 odd
3.1	Orthogonal Trajectories 1-25 odd
3.2	Linear Equations (Applications) 1,3,5,7,11,13,15,17,19,21,23,25
3.3	Applications of Nonlinear Equations 1,3,5,7,9,11
4.1	Differential Equations of Higher Order Preliminary Theory: Linear Equations 1-29 odd
4.2	Reduction of Order 1-29 every other odd
4.3	Homogeneous Linear Equations with constant coefficients 1-59 odd
4.4	Undetermined Coefficients-Superposition Approach 1-39 every other odd
4.5	Differential Operators 1-39 odd
4.6	Undetermined Coefficients - Annihilator Approach 1-63 odd, 65,67,69
4.7	Variation of Parameters 1-23 every other odd
5.1	Simple Harmonic Motion 9,11,13,15,17,19,21
5.2	Damped Motion 7,9,11,13,15
5.3	Forced Motion 3,5,9,13,15,19

- 6.1 Cauchy-Euler Equations
1-21 odd,23,25,31,37
- 6.2 Power Series Solutions About Ordinary Points
1,5,11
- 6.3* Power Series Solutions About Singular Points (The Method of Frobenius)
1-9 odd, 11,15
- 6.4* Two Special Equations (Bessel functions and Legendre Polynomials)

- 7.1 Definition of the Laplace Transform
3-39 odd
- 7.2 The Inverse Laplace Transform
1-33 odd
- 7.3* Translation Theorems; Derivatives of Transforms
1-43 odd
- 7.4* Transforms of Derivatives, Integrals, Periodic Functions
3-27 odd,31,33
- 7.5 Applications
3,7,11,13,17,19
- 9.1 Direction Fields
5,9
- 9.2 Euler Methods
3,5,9,11
- 9.3 Runge-Kutta Methods
3,5,7

Course: **MATH 3020A**

Instructor: **Sligar**

Rm/Days/Time: **AH E362/MWF/1200-1250**

FALL 2009

M	T	W	R	F
Aug 17 Classes begin	18	19	20	21
24	25	26	27	28
31	Sep 1	2	3	4
7 Labor Day Holiday	8 Student Holiday	9	10	11
14	15	16 Review	17	18 Exam 1
21	22	23	24	25
28	29	30	Oct 1	2
5	6	7	8	9
12 Midpoint	13	14	15	16
19	20	21 Review	22	23 Exam 2
26	27	28	29	30
Nov 2	3	4	5	6
9	10	11	12	13
16	17	18	19	20
23 Review	24	25 Holiday	26 Holiday	27 Holiday
30 Exam 3	Dec 1	2	3 Classes end	4
7 Exams	8 Exams	9 Exams	10 Exams	11
14 Grades viewable	15	16	17	18

Final Exam Date/Time: Wednesday, December 9, 1-3PM