Andrew Vince
Department of Mathematics

Differential Equations

MAP 2302 – 2903
Spring 2020

Time: MWF period 4
Place: MAT 7
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Textbook: Fundamentals of Differential Equations (7th edition)
by Nagle, Saff, Snider

Office Hours: Monday, Wednesday, Friday period 6
(or by appointment)

Links

homework
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Homework

Page 5 #1-16 odd
Page 13 #3,9,15,23,25,27
Page 21 #2,3
due Monday 13 Jan

Page 46 #17-25 odd, 33,34
Page 54 #7-11 odd, 17-21 odd
Page 64 #9-19 odd, 21-25 odd
due Monday 20 Jan

Page 76 #9,11,13,17,19,21,23

Page 100 #3,19,21,25
Page 107 #2
Page 115 #1,6

Page 28 (1.4) #3,5
Page 130 #4,7

Page 164 (4.2) #1,5,13,17,26,37
Page 173 (4.3) #9,11,13,21,23,28,32,33
Page 220 (4.9) #1,3,9

Page 180 (4.4) #11,15,29,31
Page 185 (4.5) #7,19,27
Page 191 (4.6) #1,3,5

Page 360 (7.2) #9,17,18,23,24,29bcd
Page 365 (7.3) #1-20 (as many as you want)
Page 374 (7.4) #7,8,21,23,24

Page 390 (7.6) #3,9,21,23,27,29,30
Page 396 (7.7) #5,7
Page 404 (7.8) #1,2,8,9

Page 410 (7.9) #4,10,14,29

Page 271 (5.4) #1,5,7,13,28

Page 500 (9.1) #1,6
Page 513 (9.3) #21,27,35
Page 531 (9.5) #11,12,17,31,32

Topics

Introduction

- What is a differential equation
- Ordinary – partial; linear – nonlinear
- Order of a differential equation
- Exact vs numerical solutions to a differential equation
- Existence and uniqueness of first order ODEs
- Direction fields Euler's method

First Order Differential Equations

- Separable DEs
- Linear DEs
- Exact DEs
- Bernoulli equation
- Substitution

Modeling with First Order Equations

- Population models – logistic equation
- Mixing problems
- Newtonian mechanics
- Heating and cooling

Linear Second Order Equations

- Spring problems
- Constant coefficients – homogeneous
- Constant coefficients – non-homogeneous
- Variation of parameters

Variation of parameters
Undetermined coefficients

Laplace transform methods

Laplace transform and the inverse
Solving initial value problems
Laplace transform of discontinuous functions, periodic functions, Dirac Delta function
Convolutions

Systems of Equations

Phase plane, equilibrium solutions, trajectories
Classification of critical points
Matrix methods for linear systems

Messages

Welcome to Differential Equations

Free tutoring at the Teaching Center, SW Broward Hall. Check Teaching Center for the time schedule.

Students with disabilities requesting accommodations should first register with the Disability Resource Center (352-392-8565) by providing appropriate documentation. Once registered, students will receive an accommodation letter which must be presented to the instructor when requesting accommodation. Students with disabilities should follow this procedure as early as possible in the semester.

The course will be conducted in accordance with the academic honesty policy, and policy regarding the use of copyrighted material.

“Requirements for class attendance and make-up exams, assignments, and other work in this course are consistent with university policies that can be found at: attendance policies.

Information on current UF grading policies for assigning grade points may be found at: grades.

Students are expected to provide feedback on the quality of instruction in this course by completing a course evaluation online via GatorEvals. Guidance on how to give feedback is available at https://gatorevals.aa.ufl.edu/students/. Students will be notified when the evaluation period opens and can

complete evaluations through the email they receive from GatorEvals, in their Canvas course menu under GatorEvals, or via https://ufl.bluera.com/ufl/. Summaries of course evaluations results are available to students at https://gatorevals.aa.ufl.edu/public-results/.

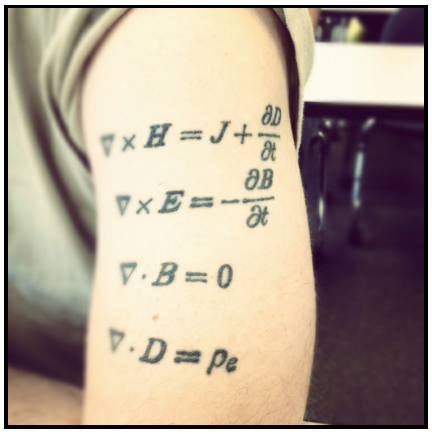
Grades

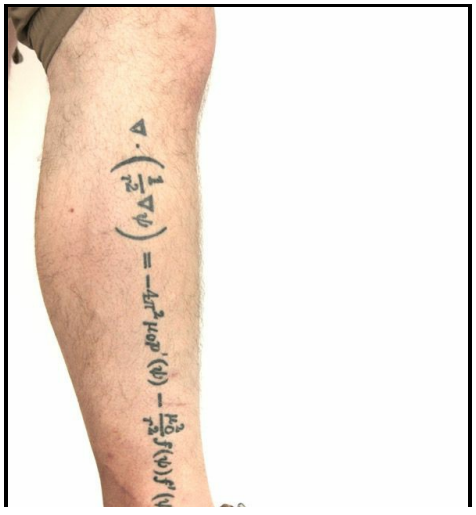
Three exams: 30% each

- Exam 1: Feb 5
- Exam 2: March 13
- Exam 3: April 20

Homework: 10%

(not the recommended method for remembering formulas)





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