

Instructor: Ed Bueler

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Essentials

Course Information	number: MATH F302 title: Differential Equations section: UX1 credits: 3.0 CRN: 34998	
Prerequisite	A grade of C- or better in MATH 253 Calculus III or equivalent is required.	
Detailed Schedule	bueler.github.io/math302/schedule.pdf	
Websites	bueler.github.io/math302 piazza.com/uaf/spring2019/math302ux1/home webassign.net ← class key: uaf 3982 1786 classes.alaska.edu (Blackboard)	main course page course communication homework only for grades
Required Text	<i>A First Course in Differential Equations with Modeling Applications</i> , 11th ed., Dennis G. Zill, 2018 (ISBN-13: 978-1337604994)	
Optional Text	<i>Student Solutions Manual for Zill's A First Course in Differential Equations with Modeling Applications</i> , 11th ed. (ISBN-13: 978-1305965737) (Solutions to selected odd-numbered exercises; available on Amazon)	
Course Materials	<ul style="list-style-type: none"> • Reliable internet access is required for any online course. • Your UA e-mail address (yourname@alaska.edu) must work. • A WebAssign Access Code is required. (Bundled with required text.) • A scanner/tablet/smartphone with software/app for scanning documents and making PDFs out of them and/or writing on PDFs. • A printer may be useful to print assignments or lecture notes, but it is <i>not</i> required. 	

Description, Course Goals & Student Learning Outcomes

Most laws of nature used in science take the form of differential equations. So do many of the models used in engineering, finance, and the social sciences. In fact, differential equations are the most-important single reason why students in technical majors are expected to learn calculus.

Differential equations describe smoothly-changing functions (solutions) using either ordinary or partial derivatives. This course is about *ordinary differential equations*. Partial differential equations are covered in MATH 421 Applied Analysis, which is a sequel to this course.

We will mostly use the derivatives, integrals, and series covered in calculus I (MATH 251) and II (MATH 252). Some multivariable visualization from calculus III (MATH 253) is also used.

Here is the catalog description:

Nature and origin of differential equations, first order equations and solutions, linear differential equations with constant coefficients, systems of equations, power series solutions, operational methods, and applications.

A passing grade from this course indicates that you are able to:

- understand the language of ordinary differential equation (ODE) initial value problems,
- verify that a given function solves a differential equation,
- use and construct basic models based on differential equations,
- use well-known methods for generating solutions to common first-order ODEs,
- use series and Laplace transform methods to solve certain linear ODEs,
- understand and apply well-known numerical methods to solve initial value problems,
- describe and understand linear systems of ODEs and their matrix exponential solution.

Detailed Schedule

The schedule of due dates will be kept up-to-date at

bueler.github.io/math302/schedule.pdf

You should consult this detailed schedule frequently and routinely. The schedule is tentative but warning of significant changes will be given well in advance.

In order to allow you flexibility in your own schedule, all homework assignments will be available well in advance, with due dates each week. However, the quizzes and exams will only be available on the dates indicated on the schedule.

Course Communication

We will use Piazza for public communication including announcements, questions, and discussions between students and the instructor. Go here to sign up and get started:

piazza.com/uaf/spring2019/math302ux1

When you sign up you will provide an email address. It should be an address you check frequently; I expect you to receive all such messages in a timely manner. Your UA-provided email address will also be used for all private communication, for instance when I return graded work.

Online Instructional Methods

This is an online course but it is neither independent study nor self-paced. There will be regular due dates for completing online WebAssign homework, written mini-project homework, taking proctored weekly quizzes, and taking proctored exams (two midterms and a final).

Videos, links, and other material are posted in weekly modules at

bueler.github.io/math302

The videos by the instructor, and links to videos elsewhere, attempt to substitute for interactive in-person lecture. Thoughtful viewing of this material is essential for success, and students must take an active role in finding explanations and examples for the challenging material in this course.

Evaluation and Grades

Grades are determined as follows. (Each component of the grade is discussed below.)

Webassign homework	20%
Mini-project homework	10%
Quizzes	20%
Midterm 1	15%
Midterm 2	15%
Final Exam	20%
<i>total</i>	100%

Letter grades will be assigned on this scale, which is a guarantee; I reserve the right to lower thresholds.

A+	97–100%	C+	77–79%	F	< 60%
A	93–96%	C	70–76%		
A-	90–92%	C-	not given		
B+	87–89%	D+	67–69%		
B	83–86%	D	63–66%		
B-	80–82%	D-	60–62%		

WebAssign homework

Online WebAssign homework will be assigned multiple times each week. These problems generally are routine exercises. They allow you to receive immediate feedback on correctness and understanding. You are encouraged to use your text and a calculator to help solve these problems, and *you will certainly need to write-out calculations on paper*. Use of more sophisticated tools (e.g., Wolfram Alpha) will often undermine the benefit of the homework, and may leave you unprepared for the quizzes and exams.

- Go to WebAssign www.webassign.net and sign in with the class key: uaf 3982 1786
- You will need a WebAssign Access Code. Texts purchased from the UAF bookstore include one. WebAssign can be used in a short “trial” period.
- You get 5 chances to get a problem correct.
- Each assignment is due at 11 pm on the date stated on the course [schedule](#).
- Each assignment is equally weighted. No scores are dropped.

Mini-project homework

Roughly every two weeks there will be a Mini-project. The first of these is a review assignment about some high points in calculus, and you will need to turn that in during the first week, but the others will generally be about real situations modeled by differential equations.

Each Mini-project will be found in that week's module on the [main course page](#). They will be distributed as a PDF, and you will also get a link to a Google Form to which you will attach (add) and submit your solution. Your solution also needs to be a PDF.

This written homework is based on more-challenging or interesting exercises. You are encouraged to use your text and a calculator, and you are encouraged to work with others if that is possible, but the solution you submit needs to be your own. Because your solution will be read by another human being, presentation matters. Your writing should be legible and you must show all relevant work; points will be deducted for poor presentation. Generally you should prepare a first draft of your solutions, and then submit a final version for grading, but this is probably unnecessary for the first week's Mini-project

Quizzes

Each quiz will cover the material taught in the the previous week. Quizzes are equally weighted, and are given under testing conditions; a proctor is needed and books, notes, and calculators are **not** allowed. Performance on the quizzes is a better indicator of exam performance, and how well you are learning the course material, than the WebAssign or mini-project homework. *The lowest quiz grade will be dropped.* Solutions to quizzes will be posted on the course webpage.

The quizzes will be held on the dates on the [schedule](#). For each quiz there will be a two-day period in which the exam can be scheduled with a proctor. Quizzes cannot be made up except with a documented excused absence.

Exams

There are two midterm exams and a final exam. These will be held on the dates on the [schedule](#). There will be a three-day period in which the exam can be scheduled with a proctor. Solutions to the exams will be posted on the course webpage.

Office Hours

I will have office hours on the schedule at

bueler.github.io/OffHrs.htm

These office hours will be both in-person and using Piazza. That is, if you are on campus you can meet me in my office. Otherwise I will be watching my computer for notifications.

Blackboard

Only *grades* for this course will be available on BlackBoard (classes.alaska.edu). There is a link to Blackboard on the [main course page](#).

Tutoring and Resources

UAF Math Services (uaf.edu/dms/mathlab) offers the following tutoring:

- Free online tutoring. Schedule an appointment at fairbanks.go-redrock.com.
- Walk-in tutoring, with no appointment needed, at the Math and Stat Lab, Chapman Building Room 305. See [the schedule at uaf.edu/dms/mathlab](https://uaf.edu/dms/mathlab) for times and availability. Only a subset of the tutors can help with MATH 302.
- Free one-on-one (or small group) tutoring in Chapman Building Room 201. Schedule an appointment at fairbanks.go-redrock.com.

Additional services:

- Student Support Services may offer free tutoring to students who qualify for their program.

- ASUAF may offer private tutoring for a small fee (based on student income).

Rules and Policies

Participation

Class participation is mandatory. Students who stop participating in the course will be withdrawn. Examples of inadequate participation include, but are not limited to:

- not completing or not turning in **three** homework assignments (WebAssign or written)
- repeatedly failing quizzes or exams with no attempt at remediation

Disability Services

The Office of Disability Services (ODS) implements the Americans with Disabilities Act to ensure that UAF students have equal access to the campus and course materials. I will work with ODS (208 Whitaker, 474-5655) to provide reasonable accommodations to students with disabilities.

Student Protections and Services

Every qualified student is welcome in this class. I am happy to work with you, ODS, Military and Veteran Services, Rural Student Services, etc. to find reasonable accommodations. Students at this university are protected against sexual harassment and discrimination (Title IX), and minors have additional protections. *As required*, if I notice or am informed of *certain types* of misconduct, then I am required to report it to the appropriate authorities. For more information on your rights as a student and the resources available to you, please go to www.uaf.edu/handbook.

Incomplete Grade

An incomplete (I) grade will only be given in DMS courses if the student has completed the majority (normally all but the last three weeks) of a course with a grade of C or better, but for personal reasons beyond his/her control has been unable to complete the course during the regular term. Negligence or indifference are not acceptable reasons for the granting of an incomplete grade.

Late Withdrawals

A withdrawal after the deadline (currently 9 weeks into the semester) from a DMS course will normally be granted only in cases where the student is performing satisfactorily (i.e., C or better) in a course, but has exceptional reasons, beyond his/her control, for being unable to complete the course. These exceptional reasons should be detailed in writing to the instructor, department head and dean.

No Early Final Examinations

Final examinations for DMS courses shall not be held earlier than the date and time published in the official term schedule. Normally, a student will not be allowed to take a final exam early. Exceptions can be made by individual instructors, but should only be allowed in exceptional circumstances and in a manner which doesn't endanger the security of the exam.

Academic Dishonesty

Academic dishonesty, including cheating and plagiarism, will not be tolerated. It is a violation of the Student Code of Conduct and will be punished according to UAF procedures.