

# Syllabus

**Instructor:** Ed Bueler

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## Essentials

<b>Course Information</b>	MATH F302 Differential Equations (3.0 credits) CRN: 72953 (section 901) time: 10:30–11:30am room: Gruening 408 ( <b>in person</b> )
<b>Prerequisite</b>	Grade of at least C- in MATH 253 Calculus III or equivalent.
<b>Websites</b>	<a href="https://bueler.github.io/math302">bueler.github.io/math302</a> main course page <a href="https://canvas.alaska.edu/courses/16214">canvas.alaska.edu/courses/16214</a> (Canvas) grades and solutions
<b>Required Text</b>	<i>A First Course in Differential Equations with Modeling Applications</i> , 11th ed., Dennis G. Zill, 2018 (ISBN-13: 978-1337604994)
<b><u>Optional Text</u></b>	<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.)

## Detailed Schedule

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

[bueler.github.io/math302/assets/general/F23/schedule.pdf](https://bueler.github.io/math302/assets/general/F23/schedule.pdf)

You should consult this schedule frequently and routinely. It is tentative and subject to change.

## Course Description

Most physical laws of nature take the form of differential equations. So do many of the models used in engineering, finance, and the social sciences. 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.

The need to understand differential equations is the single most important reason why students in technical majors are expected to learn calculus. We will mostly use the derivatives, integrals, and series from calculus I (MATH 251) and II (MATH 252), but some content from calculus III (MATH 253), especially visualization of functions in multiple variables, is also used.

**Course Goals and Outcomes**

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,
- use and construct basic models based on differential equations,
- use well-known methods for generating solutions to common first-order ODEs,
- find the exponential solutions of 1st- and 2nd-order homogeneous linear ODEs
- solve 2nd-order linear ODEs by methods including series and Laplace transforms
- understand linear systems of ODEs and their matrix-exponential solutions, and
- understand and apply well-known numerical methods to solve initial value problems.

**Assessments and Assignments**

Student performance is primarily assessed by six in-class Quizzes and two in-class Exams. Homework assignments are due more frequently. See the [Schedule](#).

**Quizzes (updated)**

Every other week there will be a 25 minute Quiz, at the start of class on Wednesday. It will cover the material taught in the previous two weeks. Quizzes are equally weighted, and are given under Exam testing conditions, and they are practice for the Exams. (Quiz performance is the best predictor of Exam performance.) Books, notes, and calculators are **not** allowed. The lowest Quiz grade will be dropped. Solutions to Quizzes will be handed out on paper immediately, and posted on the [Canvas site](#). Immediately after the Quiz will be a 15 minute de-brief, where we all talk through the solutions. Then the lecture for that day will resume.

**Exams**

There is a Midterm Exam on Wednesday 18 October and a Final Exam 10:15–12:15 on Wednesday 13 December. Books, notes, and calculators are **not** allowed. Solutions will be posted on the [Canvas site](#).

**Homework**

Each textbook section we cover will correspond to a Homework assignment, due through Gradescope at 11:59pm on the date indicated on the [Schedule](#). The Gradescope page is accessed through the [Canvas site](#). Homework assignments are designed to help you learn! Assessment is de-emphasized, but I will grade a few selected problems for completeness. The remaining problems are graded for completion only.

**Office Hours**

I will hold office hours in Chapman 306C as shown at

[bueler.github.io/OffHrs.htm](https://bueler.github.io/OffHrs.htm)

## Grades

Grades are determined as follows.

Homework	30% ( <i>updated</i> )
Quizzes	20% ( <i>updated</i> )
Midterm Exam	20%
Final Exam	30%
<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%
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%
		F	< 60%

## Tutoring and Resources

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

- Walk-in tutoring, with no appointment needed, at the Math and Stat Lab, Chapman Building Room 305. Only a subset of the tutors can help with MATH 302.
- Free online tutoring.
- Free one-on-one (or small group) tutoring in Chapman Building Room 201.

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
- repeatedly failing Quizzes or Exams

### 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](http://www.uaf.edu/handbook).

### Syllabus addendum

The [online Syllabus Addendum](#) is part of this syllabus.

**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 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.