

Course Syllabus

 Edit

MATH 376 | Differential Equations I

Winter 2022

General Information

Section A01 -- Class Time: Tu W F, 10:00am – 10:50am

Location: Zoom

[https://cwu.zoom.us/j/83708185499?](https://cwu.zoom.us/j/83708185499?pwd=SjduUzIOenZzQVNkS21Jd2pCNIF5Zz09)

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Meeting ID: 837 0818 5499

Passcode: 206113

Instructor: Dr. Emilie Hancock (Please refer to me as Emilie or Dr. Hancock)

Office: Samuelson 218C

Phone: 509.963.2402

Email: emilie.hancock@cwu.edu

Office Hours*: M - F 11am-12pm and by appointment

*Refer to the [course calendar](#) for any planned changes to office hours

Office hours held on Zoom: <https://cwu.zoom.us/j/84757917477?pwd=dm5seIBTOG9CSWU1R2JQUWMxL3czZz09>

<https://cwu.zoom.us/j/84757917477?pwd=dm5seIBTOG9CSWU1R2JQUWMxL3czZz09>

Meeting ID: 847 5791 7477 Passcode: 731004

Required Materials

- **Canvas Access:** I will update the course site on Canvas frequently with announcements, assignments, handouts, and due dates. Check Canvas daily.
- **Textbook:** None Required. I will use the following textbooks as references throughout the course:
 - Bryan, K. (2021). *Differential equations: A toolbox for modeling the world*. SIMIODE, Cornwall NY.
 - Boyce, W. E., & DiPrima, R. (2005). *Elementary Differential Equations and Boundary Value Problems* (8th Edition). John Wiley & Sons, Inc.

Disability Support Services

Central Washington University is committed to creating a learning environment that meets the needs of its diverse student body.

Disability Services (<https://www.cwu.edu/disability-services/>) serves students with permanent and temporary disabilities attending Central on the Ellensburg campus, online or at any of our eight University Centers. Their mission is to make university life accessible to students with disabilities. They work individually with students identifying barriers, and providing accommodations to ensure equal access. Students with disabilities should contact Disability Services to discuss a range of options to removing barriers, including accommodations: Hogue Hall 126, 509.963.2214, DS@cwu.edu. (<mailto:DS@cwu.edu>).

Course Description and Learning Objectives¹

Ordinary Differential Equations (ODEs) really form the primary basis for the study of calculus and so this course strives to bring together many of the previously covered concepts in a way that confirms their usefulness and necessity. There are major applications

involving differential equations in all areas of science and engineering, and so many of these will be included in this ODE course to show you the relevance and importance of this topic. Some applications include mass-spring systems, forced, damped, and undamped pendulum equations, and Newton's Laws (physics), electrical circuits (engineering), enzymatic reactions (chemistry), population models (biology), and compound interest models (economics). Upon successful completion of this course, you should be able to:

- Apply existence and uniqueness theorems to initial value problems.
- Formulate initial value problems.
- Solve differential equations using analytic methods.
- Analyze differential equations using numerical software.
- Describe both analytic and approximate solutions clearly using appropriate mathematical notation and language.

Exploration of these topics will follow the outline:

- Unit 1:** Analytic Methods for First-Order ODEs
- Unit 2:** Qualitative and Graphical Insights of ODEs
- Unit 3:** Numerical Methods for ODEs
- Unit 4:** Second-Order ODEs

Grading Scale and Method of Evaluation

Final letter grades will be determined based on your weighted percent grade, rounded to the nearest whole percent.

Letter Grade	F	D	D+	C-	C	C+	B-	B	B+	A-	A
Percent	0-59	60-66	67-69	70-72	73-76	77-79	80-82	83-86	87-89	90-92	93-100

Overall grades will be determined as a weighted average:

- 45% Modeling Labs
- 45% Standards-Based Mastery Exams
- 10% Attendance and Professional Participation

Modeling Labs

These projects will be started in class and a lab report will be submitted the following week.

Attendance and Professional Participation

Your grade in this category is the percentage of class sessions you attend and participate professionally while present, recorded using Canvas [Roll Call Attendance](#). Regular attendance is essential for successful completion of this course. As a member of a peer learning community, a high degree of professionalism is necessary. CWU expects every member of the university community to contribute to an inclusive and respectful classroom culture. I measure professional participation based on the following criteria:

- **Required Zoom Etiquette:** Keep your camera on during class. (I cannot count you as 'present' without your camera on.) Please communicate with me if your circumstances prevent this.
- Arrive to class on time and stay for the entire class.
- Be present. Focus on learning by being an active participant. Limit side activities and put away cell phones. (If you are anticipating an emergency phone call, just let me know in advance.)
- Come to class prepared. You may need to finish up short activities between classes.
- Bring a positive and energetic attitude every day.
- Respect everyone, treat each other with dignity, and encourage all to participate.

- o Participate in group work by asking questions, communicating your understanding to your group mates, and completing the handouts.
- o Present your ideas to the class and ask questions when other students present.
- o Keep handouts, assignments, and notes organized to promptly access during class.

A lack of professional participation will result in a loss of attendance/participation credit for the day. Severe or repeated lapses in professional judgment may result in disciplinary action, up to and including removal from the course.

If you will miss class:

- Get information about what will happen/happened in class.
- Communicate with me as soon as possible. If you are not in communication with me, I will immediately reach out to the [Office of the Dean of Student Success](https://www.cwu.edu/student-success/) [\(https://www.cwu.edu/student-success/\)](https://www.cwu.edu/student-success/).

The [Office of the Dean of Student Success](https://www.cwu.edu/student-success/) [\(https://www.cwu.edu/student-success/\)](https://www.cwu.edu/student-success/) provides resources and services for students to better navigate the CWU Community, including:

- FREE [in-person counseling](https://www.cwu.edu/medical-counseling/counseling-clinic) [\(https://www.cwu.edu/medical-counseling/counseling-clinic\)](https://www.cwu.edu/medical-counseling/counseling-clinic) and 24/7 [virtual counseling](https://timely.md/schools/index.html?school=wildcatcare365&=#) [\(https://timely.md/schools/index.html?school=wildcatcare365&=#\)](https://timely.md/schools/index.html?school=wildcatcare365&=#)
- [On-campus health services](https://www.cwu.edu/health-services/welcome-student-health-services-shs) [\(https://www.cwu.edu/health-services/welcome-student-health-services-shs\)](https://www.cwu.edu/health-services/welcome-student-health-services-shs) (most services are free) and FREE 24/7 [tele-health services](https://timely.md/schools/index.html?school=wildcatcare365&=#) [\(https://timely.md/schools/index.html?school=wildcatcare365&=#\)](https://timely.md/schools/index.html?school=wildcatcare365&=#).
- [\(https://www.cwu.edu/disability-services/\)](https://www.cwu.edu/disability-services/) A [wellness center](https://www.cwu.edu/wellness/welcome) [\(https://www.cwu.edu/wellness/welcome\)](https://www.cwu.edu/wellness/welcome) providing support and education for life outside the classroom so you can maximize your time at CWU and build skills for the future (e.g., coaching related to stress/time management, alcohol and drugs, supporting others experiencing mental health challenges, violence prevention and response, sexual health and healthy relationships).
- See the [Student Success website](https://www.cwu.edu/student-success/) [\(https://www.cwu.edu/student-success/\)](https://www.cwu.edu/student-success/) for even more services, and [here is a list of o](https://www.cwu.edu/student-success/where-go) [ther services around campus](https://www.cwu.edu/student-success/where-go) [\(https://www.cwu.edu/student-success/where-go\)](https://www.cwu.edu/student-success/where-go) you may need.

University Policy [CWUP 5-90-040\(38\)](http://www.cwu.edu/resources-reports/cwup-5-90-040-academic-and-general-regulations#Class%20Attendance%20and%20Participation) [\(http://www.cwu.edu/resources-reports/cwup-5-90-040-academic-and-general-regulations#Class%20Attendance%20and%20Participation\)](http://www.cwu.edu/resources-reports/cwup-5-90-040-academic-and-general-regulations#Class%20Attendance%20and%20Participation) provides for reasonable accommodation of student absences for religious holidays in accordance with [RCW 28B.137.010](https://apps.leg.wa.gov/rcw/default.aspx?cite=28B.137.010) [\(https://apps.leg.wa.gov/rcw/default.aspx?cite=28B.137.010\)](https://apps.leg.wa.gov/rcw/default.aspx?cite=28B.137.010). Students seeking reasonable accommodations under this policy must provide written notice to their instructors within the first two weeks of class specifying the dates for which religious accommodations are requested. Contact the Dean of Student Success at (509) 963-1515 for further information.

Standards-Based Mastery Exams

The purpose of this evaluation component is for you to demonstrate mastery of course content standards. Each mastery exam will assess a set of performance standards. Your final grade in this evaluation category is determined by the total number of standards for which you have demonstrated mastery. This means you will not receive a numerical score for each exam question, but a list of standards mastered and standards to-be mastered.

M	Mastered	Demonstrates understanding of the relevant target. May include some errors, but no additional study or review is needed. Correct, complete, convincing, and clear.
P	Progressing	Demonstrates partial understanding, but with a fundamental error, misunderstanding, or is incomplete. Needs review and revision.
X	Not Assessable	Not enough work to determine mastery: An insubstantial attempt, too many errors to correct each individually, or uses an inappropriate method or tool.

Learning happens over time, as we revisit ideas and reflect on them. Your final grade in this evaluation component will reflect how well you *eventually understand* each topic. This grading system rewards **growth**; you can make mistakes without penalty, as long as you

eventually demonstrate mastery of the topic. See the [course calendar](#) for this quarter's exam schedule.

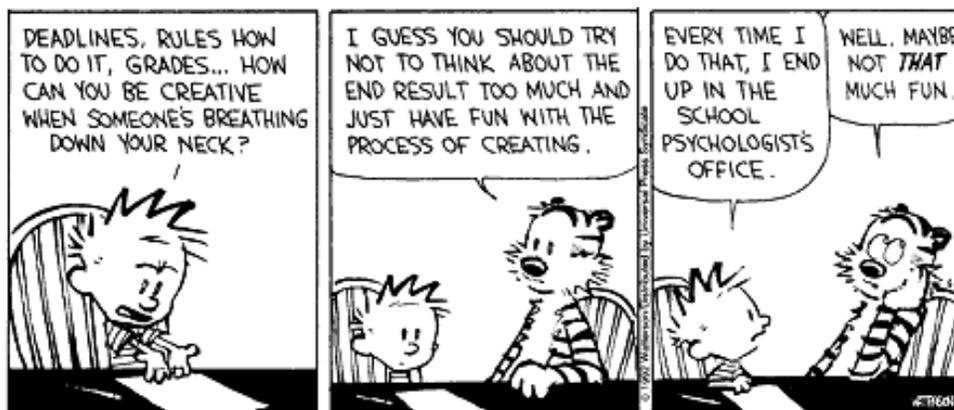
Academic Honesty and Student Conduct

Consult university policies [CWUP 5-90-040\(25\)](http://www.cwu.edu/resources-reports/cwup-5-90-040-academic-and-general-regulations#Class%20Attendance%20and%20Participation), [CWUR 2-90-040\(24\)](http://www.cwu.edu/resources-reports/cwur-2-90-040-academic-and-general-regulations#Academic%20Dishonesty), and [WAC 106-125-020](https://apps.leg.wa.gov/WAC/default.aspx?cite=106-125-020) for student conduct, cheating, plagiarism, and other academic expectations. CWU's policies and recommendations for academic misconduct will be followed, leading to disciplinary action up to and including failing the course.

Central Washington University is committed to providing all community members with a learning and work environment that is free from sexual harassment and assault. Students have options for getting help if they have experienced sexual assault, relationship violence, and sexual harassment, or stalking. Information can be found at <http://www.cwu.edu/wecare> and in [CWUP 2-35-050](http://www.cwu.edu/resources-reports/cwup-2-35-equal-opportunity-policies-and-programs#Harassment). Sexual Harassment. Faculty are required to report information regarding sexual misconduct or related crimes. Students may speak to someone confidentially by contacting the CWU Wellness Center, 509-963-3213, or the CWU Student Counseling Clinic, 509-963-1391.

Changes

I reserve the right to amend, adjust, or otherwise modify the syllabus at any time during the course.



Footnotes

1. Taken/adapted from 2015 CUPM Curriculum Guide to Majors in the Mathematical Sciences: Course Report for Differential Equations. Devany, Borelli, Abell, & Washington. (2015). Mathematical Association of America.

<https://www.maa.org/sites/default/files/OrdDiffEq.pdf> (<https://www.maa.org/sites/default/files/OrdDiffEq.pdf>).