

**Objectives:** The course introduces the basic methods for solving and analyzing ordinary differential equations and gives a variety of applications in the sciences and in engineering.

<b>Contents:</b> (more detail on reverse)	<i>Topic</i>	<i>Approximate Duration</i>
	First-order differential equations	6 lectures
	Dimensional analysis	5 lectures
	Second-order linear differential equations	9 lectures
	Laplace transforms	6 lectures
	Systems of linear differential equations	9 lectures

**Text:** *Introduction to Differential Equations*, Course Notes for AMath 250, by J. Wainwright and J. West, available in the bookstore. One copy is on reserve in DC library, call number UWD 1564.

**Course Website:** <https://learn.uwaterloo.ca>  
The website will be used for the purpose of posting office hours, assignments, solutions, and for the occasional announcement such as test locations. It is also a good idea to have contact information for at least one of your classmates in case you miss a lecture, since some announcements made in the lecture might not be posted on the website.

**Assignments:** Weekly assignments won't be due in but will provide practice for the quiz.

**Quizzes:** Quizzes will be written during the weekly tutorial time, after which solutions will be discussed.

**Midterm Exam:** Tuesday, June 20th, 8:30-9:50am (yes, a.m.) in DC 1350/1351.

**Calculators:** Calculators are **not** allowed on the tests.

**Final grade:** **Final exam 60%, Midterm 25%, Quizzes 15%.** The lowest quiz mark will be dropped.

**Instructor:** Joe West, MC 6443, (519)888-4567x37207, jjwest@uwaterloo.ca.

**UW Email:** If you are corresponding with other members of the university community, it is expected that you use your University of Waterloo account (userid@uwaterloo.ca). See the "Official Student Email Address" link at uwaterloo.ca/email.

**Office Hours:** See my door or google "Joe West waterloo office hours". Please come prepared. If you do not attend the lectures and the tutorials, please do not ask for help.

**TA Office Hours:** Office hours for the Teaching Assistants will be posted.

## Course Schedule: (approximate)

Week	Dates	Section	Topics	Events
1	May 1-5	1.1, 1.2	Intro, 1st-Order Separable & Linear DEs, sketching	Quiz #1
2	May 8-12	1.2, 1.3	Undetermined Coeffs., Applications	Quiz #2
3	May 15-19	2.1, 2.2	Dimensional Analysis, Non-Dimensionalization	Quiz #3
4*	May 23*-26	2.2, 2.3	[ <i>Holiday 22nd*</i> ] Dimensional Analysis ctd. ('Pi' Thm.)	Quiz #4
5	May 29-2	3.1, 3.2	Second-Order Constant-Coeff. DEs	Quiz #5
6	June 5-9	3.2, 3.3	(continued), Analysis of Mechanical Oscillator	Quiz #6
7	June 12-16	3.3	Analysis of Oscillator cont'd, Resonance	Midterm Rev.
8	June 19-23	4.1, 4.2	Intro & Laplace Transforms, Solving DEs, Heaviside	Midterm 20th
9	June 26-30	4.3 - 4.5	Convolution, Transfer fun., Dirac Delta	Quiz #7
10	July 4-7	5.1, 5.2	[ <i>Holiday 3rd</i> ] Intro & Solving Vector DEs	Quiz #8
11	July 10-14	5.4, 5.3	Sketching Phase Portraits, Laplace revisited	Quiz #9
12	July 17-21	5.3, 5.5	The Fundamental Matrix and Variation of Parameters	Quiz #10
12+ $\epsilon$	July 24,25		Review and/or catch-up	Last lec. 24th

\* Note that Tuesday, May 23rd will follow a MONDAY schedule for all UW courses. So we'll have three lectures that week: Tuesday, Wednesday, and Friday.

**Academic Integrity:** In order to maintain a culture of academic integrity, members of the University of Waterloo community are expected to promote honesty, trust, fairness, respect and responsibility. [Check [www.uwaterloo.ca/academicintegrity/](http://www.uwaterloo.ca/academicintegrity/) for more information.]

**Grievance:** A student who believes that a decision affecting some aspect of his/her university life has been unfair or unreasonable may have grounds for initiating a grievance. Read Policy 70, Student Petitions and Grievances, Section 4, <http://www.adm.uwaterloo.ca/infosec/Policies/policy70.htm>. When in doubt please be certain to contact the department's administrative assistant who will provide further assistance.

**Discipline:** A student is expected to know what constitutes academic integrity to avoid committing academic offenses and to take responsibility for his/her actions. A student who is unsure whether an action constitutes an offense, or who needs help in learning how to avoid offenses (e.g., plagiarism, cheating) or about rules for group work/collaboration should seek guidance from the course professor, academic advisor, or the undergraduate associate dean. For information on categories of offenses and types of penalties, students should refer to Policy 71, Student Discipline, <http://www.adm.uwaterloo.ca/infosec/Policies/policy71.htm>. For typical penalties check Guidelines for the Assessment of Penalties, <http://www.adm.uwaterloo.ca/infosec/guidelines/penaltyguidelines.htm>.

**Appeals:** A decision made or penalty imposed under Policy 70, Student Petitions and Grievances (other than a petition) or Policy 71, Student Discipline may be appealed if there is a ground. A student who believes he/she has a ground for an appeal should refer to Policy 72, Student Appeals, <http://www.adm.uwaterloo.ca/infosec/Policies/policy72.htm>.

**Note for students with disabilities:** AccessAbility Services (AAS), located in Needles Hall, Room 1132, collaborates with all academic departments to arrange appropriate accommodations for students with disabilities without compromising the academic integrity of the curriculum. If you require academic accommodations to lessen the impact of your disability, please register with AAS at the beginning of each academic term.

**Privacy and Shredding:** If you object to your unclaimed assignment being left (for up to two weeks) in a public location such as a box in the hallway, please notify your instructor. Unclaimed

assignments will be kept for a limited time, then shredded one month after the term is over.

**Intellectual Property:** Students should be aware that this course contains the intellectual property of their instructor, TA, and/or the University of Waterloo. Intellectual property includes items such as:

- Lecture content, spoken and written (and any audio/video recording thereof);
- Lecture handouts, presentations, and other materials prepared for the course; and
- Questions or solution sets from various types of assessments (e.g., assignments, quizzes, tests, final exams)

Course materials and the intellectual property contained therein are used to enhance a student's educational experience. However, **sharing this intellectual property without the intellectual property owner's permission is a violation of intellectual property rights.** For this reason, it is necessary to ask the instructor, TA and/or the University of Waterloo for permission before uploading and sharing the intellectual property of others online.

Permission from an instructor, TA or the University is also necessary before sharing the intellectual property of others from completed courses with students taking the same/similar courses in subsequent terms/years. In many cases, instructors might be happy to allow distribution of certain materials. However, doing so without expressed permission is considered a violation of intellectual property rights.

Please alert the instructor if you become aware of intellectual property belonging to others (past or present) circulating, either through the student body or online. The intellectual property rights owner deserves to know (and may have already given their consent).

See policy 73 – Intellectual property rights (<https://uwaterloo.ca/secretariat-general-counsel/policies-procedures-guidelines/policy-73-intellectual-property-rights>)

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