

DIFFERENTIAL EQUATIONS FOR ENGINEERS FALL 2022

MATH 218

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CLASS SCHEDULE

Section	Location	Time	Instructor(s)
MATH 218 001 [LEC]	RCH 110	Mondays, Wednesdays & Fridays 8:30 a.m. - 9:20 a.m.	Alison Cheeseman akcheese@uwaterloo.ca
MATH 218 101 [TUT]	DWE 3522	Fridays 12:30 p.m. - 1:20 p.m.	

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INSTRUCTOR / TA INFORMATION

Instructor: Alison Cheeseman

Email: alison.cheeseman@uwaterloo.ca

Office Hours: Mondays 3:30-4:30pm and Wednesdays 1:30-2:30pm in MC 6342

Teaching Assistant: Kieran Mastel

Tutorials: Fridays 12:30-1:20pm in DWE 3522

* Starting Friday September 9th.

PIAZZA

This term we will be using Piazza for class discussion. The system is highly catered to getting you help fast and efficiently from your peers and the instructor. If you have a question about the lecture material, practice questions, or anything you think might also be helpful to others in the class, please post it as a public question on Piazza so that everyone can see the answer. For administrative questions (enrollment changes, late submissions, technical problems etc...) please contact the instructor directly.

You can find our class page at: <https://piazza.com/uwaterloo.ca/fall2022/math218>

(<https://piazza.com/uwaterloo.ca/fall2022/math218>).

COURSE DESCRIPTION

Calendar Description for MATH 218

First order equations, second order linear equations with constant coefficients, series solutions, the Laplace transform method, systems of linear differential equations. Applications in engineering are emphasized. [Offered: F,S]

Prereq: One of MATH 118, 119, 128, 138, 148, SYDE 112; Engineering or Earth Science students only. Antireq: AMATH 250, 251, 350, 351, CIVE 222, ENVE 223, MATH 211/ECE 205, 228, MATH 212N/NE 217, ME 203, SYDE 211

NOTE: Series solutions are no longer covered in MATH 218, however they are presented in Appendix A of the course notes for your information.

LEARNING OUTCOMES

No explicit learning outcomes defined for this course.

TENTATIVE COURSE SCHEDULE

The schedule below is approximate and subject to change based on the progress of lectures during the term. Any major changes to the course schedule will be posted on Learn and the outline will be updated.

PX = Practice Questions Number

QX = Quiz Number X

Week Of	Week Number	Topic(s)	Relevant Section(s) from Course Notes	Events
Sept. 5	1	First-Order Differential Equations	1.1, 1.2	Submit P1, Q1
Sept. 12	2	First-Order Differential Equations	1.2	Submit P2, Q2
Sept. 19	3	First-Order Differential Equations	1.2, 1.3	Submit P3, Q3
Sept. 26	4	Second-Order Differential Equations	2.1, 2.2	Submit P4, Q4
Oct. 3	5	Second-Order Differential Equations	2.2	Submit P5, Q5
Oct. 10	READING WEEK			

Oct. 17	6	Second-Order Differential Equations	2.3	Submit P6, Q6
Oct. 24	7	Boundary Value Problems & Introduction to Laplace Transforms	Appendix B, 3.1	Midterm (no TUT)
Oct. 31	8	Laplace Transforms	3.2, 3.3	No Quiz (TUT still runs)
Nov. 7	9	Laplace Transforms	3.3, 3.5	Submit P7, Q7
Nov. 14	10	Systems of Linear Differential Equations	4.1, 4.2	Submit P8, Q8
Nov. 21	11	Systems of Linear Differential Equations	4.3	Submit P9, Q9
Nov. 28	12	Systems of Linear Differential Equations	4.4	Submit P10, Q10
Dec. 5	13	Review		

TEXTS / MATERIALS

Title / Name	Notes / Comments	Required
Differential Equations for Engineers, Course Notes for Math 218, J. Wainwright and J. West	Posted as a pdf on Learn, hardcopy available from the bookstore	No
A First Course in Differential Equations with Modeling Applications, D. Zill	Optional extra reference	No

STUDENT ASSESSMENT**Grading Scheme (Assuming Proctored Quizzes, Midterm and Final)**

Component	Value
Practice Questions	5%
Quizzes	25%
Midterm	20%
Final	50%

QUIZZES

Quizzes will be held during the weekly TUT time slot (Fridays 12:30-1:20pm in DWE 3522). Each quiz should take about 30-40 minutes to complete, however you will be given the entire 50 minutes of the tutorial. There will be 10 quizzes throughout the term. Your grade will be calculated from your best 8 quizzes in order to allow for missed quizzes for any reason. If you miss more than two quizzes for a legitimate (i.e. medical) reason, please speak with your instructor regarding accommodations.

PRACTICE QUESTIONS

Prior to each quiz, a set of related practice questions will be posted on Learn. **You will be expected to work through the practice questions in preparation for each quiz and submit your work on Crowdmark by 11:59pm the Thursday prior to each quiz.** Your solutions to the practice questions will be graded for completeness, not correctness (i.e. 0% for nothing submitted, 50% for an attempt at some questions, and 100% for a reasonable attempt at solving each question). Like the quizzes, your grade for the practice questions will be the average of your best 8 submissions in order to allow for missed submissions.

Full solutions to most of the problems below will be posted ahead of time. That being said, it is highly recommended that you try all of the problems first before looking at the solutions. If you read the solutions before or as you solve the problems, you are missing the point, and likely won't be prepared for quizzes and exams.

You are permitted (and encouraged) to work with other students and discuss how to solve the practice questions, however **the solutions you submit must be your own work and must be written up independently.** You are not permitted to copy solutions, in whole or in part, that you didn't write yourself or do not understand. This includes any posted solutions, solutions written by your peers and/or others on the internet.

MIDTERM & FINAL EXAM

The midterm and final exam will be proctored exams held in person, assuming that public health conditions allow.

The **midterm is scheduled for Wednesday October 26th from 4:00-5:20pm in MC 2054.**

The date and time of the final exam are TBA (to be scheduled by the Registrar).

LATE POLICY**Practice Questions**

Solutions to the practice questions are to be submitted through Crowdmark. Late submissions will not be accepted without valid reason.

If you have a valid reason for submitting your work late, you must email the instructor as soon as possible (preferably before the deadline). **Late submissions will not be accepted after the relevant quiz. Remember that only your best 8 out of 10 submissions will count towards your grade.**

REMARK REQUESTS

Once the quiz solutions have been posted on Learn you should review the solutions and your own graded quiz. If you notice an error in the grading, you should contact the instructor via email. Requests to have your grade changed must be specific (indicating the relevant question(s) and what error was made) or they will not be granted.

ASSIGNMENT SCREENING

No formal assignment screening will be used in this course, however the TA and/or instructor may compare your solutions with other students' solutions to screen for potential plagiarism and violations of academic integrity.

ADMINISTRATIVE POLICY

MISSED ASSESSMENTS DUE TO ILLNESS

Please do not come to campus when you are ill.

If you need to miss a quiz, no action is required, since only the best 8 out of 10 quizzes will be counted. If you miss more than two quizzes for a legitimate reason, please contact the instructor.

A missed midterm with a valid reason (and relevant documentation) will result in the weight of the midterm being shifted to the final exam.

A missed final exam with a valid reason AND adequate performance in the course will result in a deferred exam. Deferred exams are usually written during the following term when the course is offered, however during the pandemic efforts will be made to offer a make-up final exam during the current term.

COVID INFORMATION (I.E. WHAT HAPPENS IF WE ARE MOVED ONLINE)

If we are moved online at some point this term, here is what you can likely expect:

- **Lectures:** In-person lectures will be replaced with either live or pre-recorded video lectures posted on the same day as the in-person lectures are scheduled.
- **Assessments (quizzes, midterm, final exam):** Assessments which are moved online will be held at the time(s) originally scheduled, however the format may change to include randomized multiple choice questions and oral interview questions (either during the assessment or scheduled as a follow up to a written assessment).
- **Grading Scheme:** There may be adjustments to the grading scheme to reduce the weight of assessments which are moved online.

UNIVERSITY POLICY

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 [the Office of Academic Integrity](https://uwaterloo.ca/academic-integrity/) (<https://uwaterloo.ca/academic-integrity/>) for more information.]

Grievance: A student who believes that a decision affecting some aspect of their university life has been unfair or unreasonable may have grounds for initiating a grievance. Read [Policy 70, Student Petitions and Grievances, Section 4](https://uwaterloo.ca/secretariat/policies-procedures-guidelines/policy-70) (<https://uwaterloo.ca/secretariat/policies-procedures-guidelines/policy-70>) . 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 an academic offence, and to take responsibility for their actions. [Check [the Office of Academic Integrity](https://uwaterloo.ca/academic-integrity/) (<https://uwaterloo.ca/academic-integrity/>) for more information.] A student who is unsure whether an action constitutes an offence, or who needs help in learning how to avoid offences (e.g., plagiarism, cheating) or about “rules” for group work/collaboration should seek guidance from the course instructor, academic advisor, or the undergraduate associate dean. For information on categories of offences and types of penalties, students should refer to [Policy 71, Student Discipline](https://uwaterloo.ca/secretariat/policies-procedures-guidelines/policy-71) (<https://uwaterloo.ca/secretariat/policies-procedures-guidelines/policy-71>) . For typical penalties, check [Guidelines for the Assessment of Penalties](https://uwaterloo.ca/secretariat/guidelines/guidelines-assessment-penalties) (<https://uwaterloo.ca/secretariat/guidelines/guidelines-assessment-penalties>) .

Appeals: A decision made or penalty imposed under [Policy 70, Student Petitions and Grievances](https://uwaterloo.ca/secretariat/policies-procedures-guidelines/policy-70) (<https://uwaterloo.ca/secretariat/policies-procedures-guidelines/policy-70>) (other than a petition) or [Policy 71, Student Discipline](https://uwaterloo.ca/secretariat/policies-procedures-guidelines/policy-71) (<https://uwaterloo.ca/secretariat/policies-procedures-guidelines/policy-71>) may be appealed if there is a ground. A student who believes they have a ground for an appeal should refer to [Policy 72, Student Appeals](https://uwaterloo.ca/secretariat/policies-procedures-guidelines/policy-72) (<https://uwaterloo.ca/secretariat/policies-procedures-guidelines/policy-72>) .

Note for students with disabilities: [AccessAbility Services](https://uwaterloo.ca/disability-services/) (<https://uwaterloo.ca/disability-services/>) , located in Needles Hall, Room 1401, 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 AccessAbility Services at the beginning of each academic term.

Turnitin.com: Text matching software (Turnitin®) may be used to screen assignments in this course. Turnitin® is used to verify that all materials and sources in assignments are documented. Students' submissions are stored on a U.S. server, therefore students must be given an alternative (e.g., scaffolded assignment or annotated bibliography), if they are concerned about their privacy and/or security. Students will be given due notice, in the first week of the term and/or at the time assignment details are provided, about arrangements and alternatives for the use of Turnitin in this course.

It is the responsibility of the student to notify the instructor if they, in the first week of term or at the time assignment details are provided, wish to submit alternate assignment.