MATH 215 201/202 2022W2 Elementary Differential Equations I

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This is the common Canvas site for MATH 215 and is the source of all central course information, including the course outline, course policies, course study materials, access to online homework, course grades, and general announcements.

Purpose: This course is an introduction to ordinary differential equations (ODEs) and models that involve ODEs in several areas of application including physics, chemistry, biology, ecology, and engineering. It is expected that a successful student passing this course will:

- understand the background theory of first order ODEs and linear systems of ODEs,
- be able to solve analytically a range of first order ODEs and linear second order ODEs,
- be able to understand the qualitative behaviour of some nonlinear ODEs and systems, through the phase plane and methods such as linearization, and
- have familiarity with the concept of numerical solution of an ODE, and have experience solving various ODEs using MATLAB.

Instructor-in-Charge: Professor Tai-Peng Tsai.

List of Math 215 Sections:

Section	Instructor	Location	Time	Section Page
201	Dr. Masoud Daneshi	LSK 200	10-10:50am MWF	**Section 201 (https://canvas.ubc.ca/courses/109046/pages/section-201?wrap=1)**
202	Prof. Tai-Peng Tsai	Hennings 202	12-12:50pm MWF	**Section 202 (https://canvas.ubc.ca/courses/109046/pages/section-202?wrap=1)**

Textbook: [Notes on Diffy Qs: Differential Equations for Engineers](https://www.jirka.org/diffyqs/) (https://www.jirka.org/diffyqs/), by Jiri Lebl, (online and free, there is a link to affordable paperback)

Course Topics: See **[Topics](https://canvas.ubc.ca/courses/109046/pages/topics) (https://canvas.ubc.ca/courses/109046/pages/topics)** for a list of topics in the order (roughly) that they will be covered.

Pre-reqs and Co-reqs:

- Pre-reqs: Calculus II: (one of MATH 101, MATH 103, MATH 105, MATH 121, SCIE 001) and Linear Algebra: (one of MATH 152, MATH 221, MATH 223).
- Co-reqs: Multivariable Calculus: (one of MATH 200, MATH 217, MATH 226, MATH 253, MATH 263).

Important Dates:

- First day of class: Monday, Jan. 9
- Last day for withdrawal without record: Friday, Jan. 20
- Midterm exam 1: Wednesday, Feb. 15
- midterm break: Feb. 20-25
- Last day for withdrawal (with record) using the Student Service Centre: Friday, Mar. 3
- Midterm exam 2: Wednesday, Mar. 29
- Last day of class: Wednesday, Apr. 12
- Final exam: TBD

Course Evaluation:

- Homework: 14% (due Wednesdays Jan. 25, Feb 1, 8, Mar. 1, 8, 15, 22, and Apr. 5, 12 at 11:59pm. The lowest mark will be dropped.)
- Midterm 1: 18% (Feb 15, 50-minute exam to be taken in class)
- Midterm 2: 18% (Mar 29, 50-minute exam to be taken in class, non-accumulative)
- Final exam: 50% (150-minute exam, accumulative, time and location TBD)

Homework:

Homework will have written components as well as MATLAB, both of which should be submitted electronically. Please follow carefully the submission instructions for each assignment. Homework solutions will be posted in Canvas.

Practice homework and exams: See **this link** **(https://canvas.ubc.ca/courses/109046/pages/practice-homework-and-exams)** .

Homework and exam solutions: See **this link** **(https://canvas.ubc.ca/courses/109046/pages/homework-and-exams)** .

Policies on homework and midterms:

1. No calculators or notes are allowed in the midterm and final exams.
2. Homework assignments are due 11:59pm at Canvas on Wednesdays. Solutions will be posted on Canvas. A selection of the problems will be graded. If you submit homework late, a 25% penalty will be applied for each day late.

3. Permission to shift the weight of your missed midterms to other exams, or to ignore missed assignments, may be granted only in the following circumstances:
   i. prior notice of a valid, documented absence on the scheduled date (e.g. out-of-town varsity athletic commitment with a letter from a coach), or
   ii. notification to the instructor of absence due to a medical condition with a doctor's note.

   Otherwise, a score of 0 will be given for the missed midterms/assignments. However, the **UBC policy on Academic Concession (http://www.calendar.ubc.ca/vancouver /index.cfm?tree=3,329,0,0)** allows students to request academic concession without documentations ONCE per course. For such request please fill the **form (https://owncloud.math.ubc.ca/index.php/s/mumsWsljdjR1idJ#pdfviewer)** .
4. The period for final exams is April 17-28, 2023 inclusive. The exact time will be announced by the University in the middle of the term. Students should not make early travel plans that overlap with the scheduled exam period.

MATLAB:

- The homework and exams contain problems using MATLAB.
- Use MATLAB Online for free or download MATLAB to your own machine. See **Getting started with MATLAB (https://canvas.ubc.ca/courses/109046/pages/getting-started-with-matlab)** .
- See **MATLAB Resources (https://canvas.ubc.ca/courses/109046/pages/matlab-resources)** for examples and tutorials.
- MATLAB TAs are available in the **Math Learning Center (https://www.math.ubc.ca/~MLC/)** .

Piazza:

We will have a forum at Piazza for all sections of MATH 215 (see Piazza link on the sidebar; you can also sign up at **this link ⤷ (https://piazza.com/ubc.ca/winterterm22023/math2152012022022w2)**). You can ask and answer questions there. It is more efficient than emailing questions to the instructors since many students will have similar questions, the answers from your classmates may be easier to understand, and the process of discussion is also beneficial. Instructors and TAs will frequently check if there are questions unanswered.

Additional Resources:

- Math Learning Centre (MLC): Teaching Assistants are available to answer MATH215 related questions at the **Math Learning Center (https://www.math.ubc.ca/~MLC/)** located in LSK 301/302.
- Other textbooks and resources: textbooks such as Boyce and DiPrima (any recent edition) or Edwards and Penney.
- Math department **past exams (https://secure.math.ubc.ca/Ugrad/pastExams/)** .

Statement on UBC's Policies and Resources to Support Student Success:

UBC provides resources to support student learning and to maintain healthy lifestyles but recognizes

that sometimes crises arise and so there are additional resources to access including those for survivors of sexual violence. UBC values respect for the person and ideas of all members of the academic community. Harassment and discrimination are not tolerated nor is suppression of academic freedom. UBC provides appropriate accommodation for students with disabilities and for religious and cultural observances. UBC values academic honesty and students are expected to acknowledge the ideas generated by others and to uphold the highest academic standards in all of their actions. Details of the policies and how to access support are available **here (https://senate.ubc.ca/policies-resources-support-student-success)** .

Course Summary:

Date	Details	Due
Wed Jan 25, 2023	📝 **Homework 1 (https://canvas.ubc.ca/courses /109046/assignments/1446794)**	due by 11:59pm
Wed Feb 1, 2023	📝 **Homework 2 (https://canvas.ubc.ca/courses /109046/assignments/1446797)**	due by 11:59pm
Wed Feb 8, 2023	📝 **Homework 3 (https://canvas.ubc.ca/courses /109046/assignments/1446799)**	due by 11:59pm
Wed Mar 1, 2023	📝 **Homework 4 (https://canvas.ubc.ca/courses /109046/assignments/1446801)**	due by 11:59pm
Wed Mar 8, 2023	📝 **Homework 5 (https://canvas.ubc.ca/courses /109046/assignments/1446802)**	due by 11:59pm
Wed Mar 15, 2023	📝 **Homework 6 (https://canvas.ubc.ca/courses /109046/assignments/1446804)**	due by 11:59pm
Wed Mar 22, 2023	📝 **Homework 7 (https://canvas.ubc.ca/courses /109046/assignments/1446805)**	due by 11:59pm

Date	Details	Due
Wed Apr 5, 2023	📝 **Homework 8 (https://canvas.ubc.ca/courses /109046/assignments/1446806)**	due by 11:59pm
Wed Apr 12, 2023	📝 **Homework 9 (https://canvas.ubc.ca/courses /109046/assignments/1446808)**	due by 11:59pm
	📝 **Homework 1M (https://canvas.ubc.ca/courses /109046/assignments/1446796)**	
	📝 **Homework 2M (https://canvas.ubc.ca/courses /109046/assignments/1446798)**	
	📝 **Homework 3M (https://canvas.ubc.ca/courses /109046/assignments/1446800)**	
	📝 **Homework 5M (https://canvas.ubc.ca/courses /109046/assignments/1446803)**	
	📝 **Homework 7M (https://canvas.ubc.ca/courses /109046/assignments/1446807)**	
	📝 **MT1 (https://canvas.ubc.ca /courses/109046/assignments /1446810)**	
	📝 **MT2 (https://canvas.ubc.ca /courses/109046/assignments /1446811)**	