

The University of Western Ontario

Course Outline – AM2402A (FW 2020-2021)

1. Course Information

Course Name: Applied Mathematics 2402A, Ordinary Differential Equations

Time and Location: Lecture **online** (asynchronous); Lab class **online** (synchronous).

Lecture – Section 001

Lab – Section 002: Friday, 8:30 - 9:30 am, Room MC-110 (online)

Lab – Section 003: Thursday, 8:30 - 9:30 am, Room MC-110 (online)

Lab – Section 004: Friday 9:30 -10:30 am, Room UCC-146 (online)

Prerequisites: Cal1301A/B (Grade $\geq 60\%$) or Cal1501A/B (Grade $\geq 55\%$) or AM1413 (Grade $\geq 55\%$). Unless you have either the requisites for this course or written special permission from your Dean to enroll in it, you may be removed from this course and it will be deleted from your record. This decision may not be appealed. You will receive no adjustment to your fees in the event that you are dropped from a course for failing to have the necessary prerequisites.

2. Instructor and TA Information

Instructor: Dr. Pei Yu, Professor, Department of Applied Mathematics

Office: MC 283

Email: pyu@uwo.ca

Office hours: Tuesday & Thursday, 2:30 – 3:30 pm (Zoom)

TA: Miss Yanni Zeng

Office: MC 275G

Email: yzeng243@uwo.ca

TA will give extra help in teaching computer software Matlab and Maple.

3. Course Syllabus

Course Description: The theoretical tools covered will include first order linear and nonlinear equations, linear second and higher order equations, systems of first order linear equations, series solutions and approximation methods, phase portraits and Laplace transform.

Learning Outcomes: By the end of this course you will be able to

- establish a DE model (with other necessary physics or engineering background) for a given real problem;
- to analyse qualitative properties of solutions of the DEs;
- to find the solution of the DE either in a closed-form or in a numerical solution output using computer software;
- to explain the solutions or simulation results physically.

Lectures will be delivered online (Asynchronous), with Lecture notes and Screen capture videos to be posted on the OWL, and Zoom for office hours. Each week has 3 lectures, distributed in 3 Lecture notes and 3 Screen capture videos. Break-down practical problems (mainly taken from the textbook) are posted on the OWL for each week.

Lab section will be run by the TA online (via Zoom).

Classes begin: September 9, 2020

Reading Week: November 2-8, 2020

Classes end: December 9, 2020

4. Course Materials

Textbook: William F. Trench, “Elementary Differential Equations with Boundary Value Problems” (2013), Faculty Authored Books, 9. The e-copy of the textbook is free, available from <http://digitalcommons.trinity.edu/mono/9>

Notes:

- The main material of this course is the Lecture notes, and the textbook can be treated as additional material. If some topics are covered in the Lecture notes but not in the textbook, it is your responsibility not to miss them.
- Additional materials including the use of Matlab and Maple to solve Differential Equations will be provided by the TA and be taught during Lab hours. These material will be also posted on the OWL.
- You should check OWL (<http://owl.uwo.ca>) on a regular basis for news and updates.
- If you need assistance, you can contact the Western Technology Services Helpdesk. They can be reached by phone at 519-661-3800 or ext. 83800.

Technical Requirements: You need a computer installed with Matlab and Maple so that you can use them to solve problems. Also, you need stable internet connection, computer with working microphone and/or webcam, and the device/software to play the Screen capture videos.

5. Methods of Evaluation

Quizzes (5 in total) will be run in the Lab hours in-person (Check the OWL for the topics covered in each quiz). At least one quiz requires you to solve DEs using computer software (mainly Matlab and Maple).

Quiz 1: in the week of September 21 10%

Quiz 2: in the week of October 5 10%

Quiz 3: in the week of October 26 10%

Quiz 4: in the week of November 9 10%

Quiz 5: in the week of November 23 10%

Midterm Test: Thursday, October 22, 1:00-3:30 pm 25%

Final Examination: to be scheduled by the university registrar's office 25%

- All materials covered in lectures and assigned problems can be considered testable in the quizzes, midterm and final examination. The problem sets are designed to enhance understanding of the lecture and to develop problem solving skills, which will not be collected and marked.
- Midterm test and Final examination will be conducted using either Zoom or the remote proctoring service, such as Proctortrack.

Completion of this course will require you to have a reliable internet connection and a device that meets the system and technical requirements for both Zoom and Proctortrack. Information about the system and technical requirements are available at the following links:

<https://www.proctortrack.com/tech-requirements/>

<https://support.zoom.us/hc/en-us>

Proctortrack will require you to provide personal information (including some biometric data). The session will be recorded. By taking this course, you are consenting to the use of this software. More information about remote proctoring is available in the Online Proctoring Guidelines at the following link:

<https://www.uwo.ca/univsec/pdf/onlineproctorguidelines.pdf>

Academic Accommodation: Requests for academic accommodation for any evaluation that contribute 10% or more to the total course grade must be made through the Office of the Dean for the student's home faculty. Typically, accommodation requests are not handled directly by

the Dean, but are instead handled by the Academic Counsellors housed in the Dean's Office. The Academic Counsellors for students in the Faculty of Science can be found in NCB 280 (Tel. 519 661 3040, Email scibmasac@uwo.ca).

No Make-up for missed quizzes will be arranged. If for a reason to receive an accommodation from the Dean's office, the instructor will give a mark for your missed quiz based on the class average of that quiz.

6. Additional Statements

Accessibility Statement: Please contact the course instructor if you require material in an alternate format or if you require any other arrangements to make this course more accessible to you. You may also wish to contact Services for Students with Disabilities (SSD) at 661-2111 x82147 for any specific questions regarding an accommodation. The policy can be found in http://www.uwo.ca/univsec/pdf/academic_policies/appeals/accommodation_disabilities.pdf

Accommodation for Illness: A student requiring academic accommodation due to illness should use the Student Medical Certificate when visiting an off-campus medical facility or request a Records Release Form (located in the Dean's Office) for visits to Students Health Services. A link to the Student Medical Certificate is here:

http://www.uwo.ca/univsec/pdf/academic_policies/appeals/medicalform.pdf

and the poly can be found in

http://www.uwo.ca/univsec/pdf/academic_policies/appeals/accommodation_illness.pdf

If you are unable to meet a course requirement due to illness or other serious circumstances, you must provide valid medical or other supporting documentation to your faculty's Dean's Office as soon as possible and contact your instructor immediately. It is the student's responsibility to make alternative arrangements with their instructor once the accommodation has been approved and the instructor has been informed. In the event of a missed final exam, a "Recommendation of Special Examination" form must be obtained from your faculty's Dean's Office immediately. For further information please see: http://www.uwo.ca/sci/academic_counselling.

A student requiring academic accommodation due to illness should use the Student Medical Certificate when visiting an off-campus medical facility or request a Records Release Form (located in the Dean's Office) for visits to Students Health Services. The form can be found here: <https://studentservices.uwo.ca/secure>.

Accommodation for Religious Holidays: When scheduling unavoidably conflicts with religious holidays which a) require an absence from the University or b) prohibit or require certain activities (i.e., activities that would make it impossible for the student to satisfy the academic requirements scheduled on the day(s) involved), no student will be penalized for absence because of religious reasons, and alternative means will be sought for satisfying the academic

requirements involved. The poly can be found in

http://www.uwo.ca/univsec/pdf/academic_policies/appeals/accommodation_religious.pdf

Statement on services for students in emotional/mental health distress: Students who are in emotional/mental distress should refer to Mental Health@Western

<http://www.uwo.ca/uwocom/mentalhealth/> for a complete list of options about how to obtain help.

Statement on Remote Learning and Recording: Remote learning recordings will capture students' personal information through direct (video, audio, chat logs) and indirect (online identifier, such as name, student number or telephone number) methods. If recording is necessary, then prior to recording, instructors should confirm that recording is necessary and determine that the purpose and function for the remote learning activity cannot be met in the absence of recording (i.e. the objectives of the activity cannot be met solely in real-time). Provide all participants with a Notice of Recording at the earliest possible opportunity and prior to the start of the recorded session. Participants in this course are not permitted to record the sessions, except where recording is an approved accommodation, or the participant has the prior written permission of the instructor.

Statement on Use of Electronic Devices: Calculators, computers, cellphones or any electronic devices which can be used for communication, are not allowed to be used in the quizzes, midterm test and final exam., except for the quiz which asks to use the lab compute.

Statement concerning online etiquette: To ensure the best experience for both you and your classmates, please honour the following rules of etiquette:

- use your computer and/or laptop if possible (as opposed to a cell phone or tablet)
- ensure that you are in a private location to protect the confidentiality of discussions in the event that a class discussion deals with sensitive or personal material
- to minimize background noise, mute your microphone for the entire class until you are invited to speak, unless directed otherwise
- In order to give us optimum bandwidth and web quality, turn off your video camera for the entire class unless you are invited to speak
- please be prepared to turn your video camera off at the instructor's request if the internet connection becomes unstable
- unless invited by your instructor, do not share your screen in the meeting
- If you wish to speak, use the "raise hand" function and wait for the instructor to acknowledge you before beginning your comment or question.
- Please remember to unmute your microphone and turn on your video camera before speaking.
- Self-identify when speaking.

- Please remember to mute your mic and turn off your video camera after speaking (unless directed otherwise).
- Keep in mind the different cultural and linguistic backgrounds of the students in the course.
- Be courteous toward the instructor, your colleagues, and authors whose work you are discussing.
- Be respectful of the diversity of viewpoints that you will encounter in the class and in your readings. The exchange of diverse ideas and opinions is part of the scholarly environment. “Flaming” is never appropriate.
- Be professional and scholarly in all online postings. Use proper grammar and spelling. Cite the ideas of others appropriately.

Use of cheating-analysis software: Quizzes using lab computers may be subject to submission for similarity review by software that will check for unusual coincidences in answer patterns that may indicate cheating. **Scholastic offences** are taken seriously and you are directed to read the appropriate policy, specifically, the definition of what constitutes a Scholastic Offence, at the following Web site:

http://www.uwo.ca/univsec/pdf/academic_policies/appeals/scholastic_discipline_undergrad.pdf.

Information regarding registration can be found in <http://www.registrar.uwo.ca>