

MATH 1005 B - Fall 2022

Differential Equations and Infinite Series for Engineering and Physics

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Office hours: By email appointment

Feedback: Please tell me what you think about my teaching at [RateMyProfessor.com](https://www.ratemyprofessor.com)

References: Ordinary Differential Equations and Infinite Series, 2nd edition, by Sam Melkonian. Hard copies available at the Carleton University Bookstore. ebook

at <https://campusebookstore.com/EBooks/Book.aspx?ID=9689094>

Course Description: First-order differential equations. Second-order linear equations with constant coefficients, undetermined coefficients, variation of parameters. Sequences and series, convergence tests, estimation of sums. Power series, Taylor series, remainders. Fourier series.

Classes: Tuesday and Thursday at 2:35PM - 3:55 PM.

Classes begin: September 8th, 2022.

Classes end: December 9th, 2022.

Tutorials: Begin on or after September 16th. Tuesday at 8:35 AM -9:25 AM.

Withdrawals with fee adjustment: September 30th.

Last day for withdrawal: November 15th, 2022.

Evaluation Summary

Evaluation Components

45% Term Tests

55% Final Examination

Term Tests

There will be four 50-minute tests in the tutorial sessions on October 4, November 1, November 15, and November 29. The best three out of four will be counted for 15% each towards your final grade. **IF** you are absent for a test, that will count as your dropped test. There will be no make up tests. Non-graphic, non-programmable calculators are permitted during the tests and the final exam.

It is the student's responsibility to pick up their test during the following tutorial session. Any discrepancy between the test and cuLearn will be dealt with up to two weeks after the test date.

After that point, the mark is final.

Final Examination

This is a 3-hour exam scheduled by the University. The exam is taking place during the period of December 10 to 22 (including Saturday and Sundays). It is each student's responsibility to be available at the time of the examination. In particular, no travel plans should be made until the examination schedule is published. It is each student responsibility to find out the correct date and time of the exam. After the exam is written, the students are allowed to see their exam papers up until three weeks after the exam date. This examination review is for the educational purpose only and NOT for negotiation of the grade with the instructor. Please remember that we do not change grades on the basis of students' needs (such as scholarships, etc.).

University Policies

Student Academic Responsibilities

Each student is responsible for:

- Knowing the due dates of in-tutorial marked problem sets and tests.
- Maintaining a folder of all work done in the course during the semester for validation claims in cases of disagreement with faculty.
- Keeping both paper and electronic copies of all assignments, marked and unmarked, in case papers are lost or go missing.
- Regularly checking both Brightspace announcements as well as one's Carleton e-mail account for important messages from both professor and university administration
- Participating in tutorial exercises and activities as required.

Class Conduct

To ensure an optimum-learning environment, students are expected to behave in a professional manner at all times. Disrupting a class is considered to be an Instructional Offence (see University Calendar). If a student exhibits disruptive behavior in class and chooses not to refrain from such behavior at the request of the instructor, the student will be asked to leave the class. The student's behavior will be reported to Campus Security and the Office of the Associate Dean of Student Affairs.

Student Academic Integrity Policy

Every student should be familiar with the Carleton University student academic integrity policy. A student found in violation of academic integrity standards may be awarded penalties, which range from a reprimand to receiving a grade of F in the course or even being expelled from the program or University. Some examples of offences are: plagiarism and unauthorized co-operation or collaboration. Information on this policy may be found in the Undergraduate Calendar.

Plagiarism

As defined by Senate, "plagiarism is presenting, whether intentional or not, the ideas, expression of ideas or work of others as one's own". The office of the Dean of Science will review such reported offences.

Unauthorized Co-operation or Collaboration

Senate policy states that "to ensure fairness and equity in assessment of term work, students shall not co-operate or collaborate in the completion of an academic assignment, in whole or in part, when the instructor has indicated that the assignment is to be completed on an individual basis". Please refer to the course outline statement or the instructor concerning this issue.

Academic Accommodations for Students with Disabilities

The Paul Menton Centre for Students with Disabilities (PMC) provides services to students with Learning Disabilities (LD), psychiatric/mental health disabilities, Attention Deficit Hyperactivity Disorder (ADHD), Autism Spectrum Disorders (ASD), chronic medical conditions, and impairments in mobility, hearing, and vision. If you have a disability requiring academic accommodations in this course, please contact PMC at 613-520-6608 or pmc@carleton.ca for a formal evaluation. If you are already registered with the PMC, contact your PMC coordinator to send me your *Letter of Accommodation* at the beginning of the term, and no later than two weeks before the first in-class scheduled test or exam requiring accommodation (*if applicable*). After requesting accommodation from PMC, meet with me to ensure accommodation arrangements are made. Please consult the PMC website (www.carleton.ca/pmc) for the deadline to request accommodations for the formally scheduled exam (*if applicable*).

Academic Accommodation

Carleton University is committed to providing access to the educational experience in order to promote academic accessibility for all individuals.

Academic accommodation refers to educational practices, systems and support mechanisms designed to accommodate diversity and difference. The purpose of accommodation is to enable students to perform the essential requirements of their academic programs. At no time does academic accommodation undermine or compromise the learning objectives that are established by the academic authorities of the University.

<https://students.carleton.ca/course-outline/>

Student with Religious Obligations

1. As soon as you receive your course syllabus, identify any potential conflicts between your religious obligations and course requirements.

NOTE: Contact Equity Services if you are unclear if your religious observance requires accommodation under the Policy

2. Make a formal written request to your instructor indicating the nature of the religious obligation and suggest possible alternative dates and/or means of satisfying the academic requirements.

NOTE: Such request should be made during the first two weeks of the term, or as soon as possible after a need for accommodation is known to exist, but in no case later than the second last week of classes for that term. Even if you are unclear as to the exact date of the obligation (e.g., when waiting for a moon sighting) you are still expected to notify your instructor of the potential conflict and explore accommodation options.

3. If your request for accommodation is denied you may contact Equity Services and request assistance in an informal review of the decision.

http://www.carleton.ca/equity/accommodation/student_guide.htm

A note from Carleton about COVID:

It is important to remember that COVID is still present in Ottawa. The situation can change at any time and the risks of new variants and outbreaks are very real. There are [a number of actions you can](#)

[take](#) to lower your risk and the risk you pose to those around you including being vaccinated, wearing a mask, staying home when you're sick, washing your hands and maintaining proper respiratory and cough etiquette.

Feeling sick? Remaining vigilant and not attending work or school when sick or with symptoms is critically important. If you feel ill or exhibit COVID-19 symptoms do not come to class or campus. If you feel ill or exhibit symptoms while on campus or in class, please leave campus immediately. In all situations, you must follow Carleton's [symptom reporting protocols](#).

Masks: Carleton has paused the [COVID-19 Mask Policy](#), but continues to strongly recommend masking when indoors, particularly if physical distancing cannot be maintained. It may become necessary to quickly reinstate the mask requirement if pandemic circumstances were to change.

Vaccines: Further, while proof of vaccination is no longer required as of May 1 to attend campus or in-person activity, it may become necessary for the University to bring back proof of vaccination requirements on short notice if the situation and public health advice changes. Students are strongly encouraged to get a full course of vaccination, including booster doses as soon as they are eligible, and submit their booster dose information in [cuScreen](#) as soon as possible. Please note that Carleton cannot guarantee that it will be able to offer virtual or hybrid learning options for those who are unable to attend the campus.

All members of the Carleton community are required to follow requirements and guidelines regarding health and safety which may change from time to time. For the most recent information about Carleton's COVID-19 response and health and safety requirements please see the [University's COVID-19 website](#) and review the [Frequently Asked Questions \(FAQs\)](#). Should you have additional questions after reviewing, please contact covidinfo@carleton.ca.

Tentative Weekly Schedule

Week	Date	Topics
1	September 8	Basic Concepts, First-Order Equations Separable Equations, Orthogonal Trajectories
2	September 13 September 15	Homogeneous and Linear Equations Bernoulli Equation, Functions of Two Variables , Partial Derivatives, The Chain Rule
3	September 20 September 20 September 22	Tutorial 1 Exact Equations, Integrating Factors Second-Order Equations, Linear Homogenous Equations
4	September 27 September 27 September 29	Tutorial 2 Equations with Constant Coefficients Cauchy-Euler Equations
5	October 4 October 4 October 6	Tutorial 3 – Test 1 Linear Nonhomogeneous Equations, Undetermined Coefficients Variation of Parameters
6	October 11 October 11 October 13	Tutorial 4 Linear Systems (2x2 systems only), Homogeneous Systems General Theory, Systems with Constant Coefficients, Complex Eigenvalues, Generalized Eigenvectors
7	October 18 October 18 October 20	Tutorial 5 Sequences Series, Integral Test
8	October 25 October 27	Winter Break Winter Break
9	November 1 November 1 November 3	Tutorial 6 – Test 2 Approximations of Series, Comparison Test Alternating Series and Approximations
10	November 8 November 8 November 10	Tutorial 7 Absolute and Conditional Convergence Taylor Series, Power Series
11	November 15 November 15 November 17	Tutorial 8 – Test 3 Representations of Functions by Power Series Binominal Series
12	November 22 November 22 November 24	Tutorial 9 Taylor Polynomials and Approximations Fourier Series
13	November 29 November 29 December 1	Tutorial 10 – Test 4 Periodic Functions Functions on Finite Intervals
14	December 6 December 6 December 8	Tutorial 11 Review.

Please treat the above as a guide only as it may vary considerable from what transpires!