McMaster University | SCIENCE Department of Mathematics & Statistics

We recognize and acknowledge that McMaster University meets and learns on the traditional territories of the Mississauga and Haudenosaunee nations, and within the lands protected by the "Dish With One Spoon" wampum, an agreement amongst all allied Nations to peaceably share and care for the resources around the Great Lakes.

MATH 1A03 – Calculus for Science I
MATH 1ZA3 - Engineering Mathematics I
2024 Fall Term

MATH 1A03 – Section 1 - (C01)

Instructor: Anastasis Kratsios | **E-mail:** kratsioa@mcmaster.ca | **Office hours:** TBA

MATH 1A03 – Section 2 - (C02)

Instructor: Carlos Cordoba | **Email:** cordobac@mcmaster.ca | **Office hours:**

MATH 1ZA3 – Section 1 - (C01)

Instructor: Aaron Childs | **Email:** childsa@mcmaster.ca | **Office hours:**

MATH 1ZA3 – Section 2 - (C02)

Instructor: Fabian Bleitner | **Email:** bleitnef@mcmaster.ca | **Office hours:**

MATH 1ZA3 – Section 3 - (C03)

Instructor: Homayun Karimi| **Email:** karimih@mcmaster.ca | **Office hours:**

Course Description: Math 1A03 - Calculus for Science 1

For students in science: geared towards applications, with attention to underlying concepts. Functions: limits, continuity, derivatives, optimization, curve sketching. Antiderivative, definite integral, techniques of integration. Three lectures, one tutorial; one term

Prerequisite(s): Grade 12 Calculus and Vectors U or MATH 1F03

Antirequisite(s): ARTSSCI 1D06 A/B, MATH 1LS3, 1N03, 1X03, 1Z04, 1ZA3

- Not open to students who have achieved a grade of at least B- in MATH 1M03.
- Not open to students in Mathematics and Statistics I or an Engineering program or with credit or registration in ISCI 1A24 A/B.

Course Description: Math 1ZA3 – Engineering Mathematics 1

Functions: limits, continuity, derivatives, optimization, curve sketching. Antiderivative, definite integral, techniques of integration, with applications. Three lectures, one tutorial, one lab; one term

Prerequisite(s): Registration in a program in Engineering

Antirequisite(s): ARTSSCI 1D06 A/B, MATH 1A03, 1LS3, 1N03, 1NN3, 1X03, 1Z04

- Not open to students with credit or registration in ISCI 1A24 A/B.

Course and Learning Objectives

Learning Objectives

1.Functions: Recognize and algebraically manipulate trigonometric, hyperbolic and exponential functions and their inverses. **2.Limits & Continuity:** Know and understand the concept of limits and continuity. **3.Limit Computation:** Calculate limits both simple and of indeterminate form. **4.Definition of the Derivative:** Understand the definition of the derivative and its relation to tangent lines and slopes. **5.Differentiation:** Calculate the derivative of functions using differentiation rules. **6.Curve Sketching:** Use information from first and second derivatives to explore the behaviour of a given function and its graph **7. Derivative Applications:** Use differentiation in various elementary applications. **8.Definition of Integration:** Know and understand the definition of the definite integral and its relation to areas and net change. **9.Integration:** Know and understand techniques required to compute both indefinite and definite integrals. **10.Integration Applications:** Use integration techniques in various elementary applications.

Course Format

The course will consist of in-person lectures given during class time, as well as tutorials. The tutorials will likely include examples that expand upon the lectures as well as Q&A.

Course Website

- Consult the course webpage on childsmath for all announcements. Please check it regularly.

Class Times and Locations: Check Mosaic

Materials & Fees

Required Materials/ Resources

Textbook

- **Required:** *Calculus, Early Transcendentals, 9th Edition*, Stewart, Clegg, and Watson, Cengage. (Note: Older editions can be used, as long as you have access to the exercises in the 9th edition.)
- **Optional:**
    - Student Solutions Manual for Single Variable Calculus, Early Transcendentals

Calculators

- Only the McMaster standard calculators (the Casio fx 991 MS or fx 991 MS Plus) is allowed on the tests and exam. No other versions of the Casio fx-991 are allowed.

Virtual Course Delivery

This course will run fully in-person in accordance with university directives and strict health and safety guidelines. It is the expectation that students be prepared to attend all lectures, labs/tutorials, tests, exams, and other evaluations in-person. However, students must be prepared to move to virtual learning should there be a change to health regulations and restrictions as issued by the Province or University.

To follow and participate in virtual classes it is expected that you have reliable access to the following:

- A computer that meets performance requirements found here.
- An internet connection that is fast enough to stream video.
- Computer accessories that enable class participation, such as a microphone, speakers and webcam when needed.

If you think that you will not be able to meet these requirements, please contact uts@mcmaster.ca as soon as you can. Please visit the Technology Resources for Students page for detailed requirements. If you use assistive technology or believe that our platforms might be a barrier to participating, please contact Student Accessibility Services, sas@mcmaster.ca, for support.

Course Overview and Assessment

Material Covered:

- All sections covered in the suggested problems.
- **Major Topics:** Continuity and differentiability, with emphasis on theory (intermediate value theorem, mean value theorem), practice (how to differentiate) and applications (curve sketching, optimization), theory and techniques of integration, with emphasis on practice (how to integrate) and applications. See above for the learning objectives.

- **Approximate Schedule:** Review of Trigonometry, Inverse Functions and Logarithms (3 lectures), Continuity and Derivatives (8 lectures), Applications of Differentiation (10 lectures), Integrals (5 lectures), Applications of Integration (4 lectures), Techniques of Integration (6 lectures).

Assignment Information

- There will be 10 online assignments. See the Important Dates in childsmath for the due dates.

Test Information

- Only the McMaster standard calculator Casio fx-991 MS or MS Plus is allowed on the tests and exam. No other versions of the Casio fx-991 are allowed.
- Some sample tests and problem samplers are available under 'Content Groups' in childsmath.
- **Tentative Dates** (subject to change):
- **Test #1:** Evening of Monday October 21st
- **Test #2:** Evening of Monday November 18th
- Check the Announcements for room and time information, and for instructions on what to do if you have a conflict with the test time, on childsmath.

Course Evaluation

Grade Component	Weight
10 Assignments	- 1.5 % Each
2 Tests	- 20% Each
Final Exam	- 45%

- At the end of the course the grades may be adjusted, but this can only increase your grade and will be done uniformly. We will use the grade equivalence chart published in the Undergraduate Calendar to convert between percentages and letter grades.
- The instructor and university reserve the right to modify elements of the course during the term.
- The university may change the dates and deadlines for any or all courses in extreme circumstances. If either type of modification becomes necessary, reasonable notice and communication with the students will be given with explanation and the opportunity to comment

on changes. It is the responsibility of the student to check their McMaster email and course websites weekly during the term and to note any changes.

Requests for Relief for Missed Academic Term Work

McMaster Student Absence Form (MSAF): In the event of an absence for medical or other reasons, students should review and follow the Academic Regulation in the Undergraduate Calendar "Requests for Relief for Missed Academic Term Work".

Course Missed Work Policy

If you are absent from the university for a minor medical reason, lasting fewer than 3 days, you may report your absence, once per term, without documentation, using the McMaster Student Absence Form. Absences for a longer duration or for other reasons must be reported to your Faculty/Program office, with documentation, and relief from term work may not necessarily be granted. When using the MSAF, **do not report your absence to your professor**. Instead, follow the instructions below.

Please note that the MSAF may not be used for term work worth 25% or more, nor can it be used for the final examination. For more information look here.

If your MSAF form was received, then the word "note" will appear in place of your mark on the marks page in childsmath. This will show up within one week after you filled out the MSAF form. If you don't see the word "note" in place of your mark for the missed work **one week after** filling out the MSAF form, then contact Dr. Speissegger**.** If you do see the word "note" in place of your mark, then **no follow-up** is required.

- The percentage for a missed test will be added to your final exam.
- The percentage for a missed assignment will be distributed among your remaining assignments.

Academic Accommodation of Students with Disabilities

Students with disabilities who require academic accommodation must contact Student Accessibility Services (SAS) at 905-525-9140 ext. 28652 or sas@mcmaster.ca to make arrangements with a Program

Coordinator. For further information, consult McMaster University's *Academic Accommodation of Students with Disabilities* policy.

Academic Accommodation for Religious, Indigenous Or Spiritual Observances (Riso)

Students requiring academic accommodation based on religious, indigenous or spiritual observances should follow the procedures set out in the RISO policy. Students should submit their request to their Faculty Office ***normally within 10 working days*** of the beginning of term in which they anticipate a need for accommodation or to the Registrar's Office prior to their examinations. Students should also contact their instructors as soon as possible to make alternative arrangements for classes, assignments, and tests.

Courses with An On-Line Element

Some courses may use on-line elements (e.g. e-mail, Avenue to Learn (A2L), LearnLink, web pages, capa, Moodle, ThinkingCap, etc.). Students should be aware that, when they access the electronic components of a course using these elements, private information such as first and last names, user names for the McMaster e-mail accounts, and program affiliation may become apparent to all other students in the same course. The available information is dependent on the technology used. Continuation in a course that uses on-line elements will be deemed consent to this disclosure. If you have any questions or concerns about such disclosure, please discuss this with the course instructor.

Online Proctoring

This course may use proctoring software (TBD) for tests/exams. This software may require students to turn on their video camera, present identification, monitor and record their computer activities, and/or lock/restrict their browser or other applications/software during tests or exams. This software may be required to be installed before the test/exam begins. If you have questions about whether this software will be used, or concerns about the use of this software, please contact your instructor.

Academic Integrity

You are expected to exhibit honesty and use ethical behaviour in all aspects of the learning process. Academic credentials you earn are rooted in principles of honesty and academic integrity.

It is your responsibility to understand what constitutes academic dishonesty.

Academic dishonesty is to knowingly act or fail to act in a way that results or could result in unearned academic credit or advantage. This behaviour can result in serious consequences, e.g. the grade of zero

on an assignment, loss of credit with a notation on the transcript (notation reads: "Grade of F assigned for academic dishonesty"), and/or suspension or expulsion from the university. For information on the various types of academic dishonesty please refer to the *Academic Integrity Policy*, located at https://secretariat.mcmaster.ca/university-policies-procedures- guidelines/

The following illustrates only three forms of academic dishonesty:

- plagiarism, e.g. the submission of work that is not one's own or for which other credit has been obtained.
- improper collaboration in group work.
- copying or using unauthorized aids in tests and examinations.

Authenticity / Plagiarism Detection

Some courses may use a web-based service (Turnitin.com) to reveal authenticity and ownership of student submitted work. For courses using such software, students will be expected to submit their work electronically either directly to Turnitin.com or via an online learning platform (e.g. A2L, etc.) using plagiarism detection (a service supported by Turnitin.com) so it can be checked for academic dishonesty.

Students who do not wish their work to be submitted through the plagiarism detection software must inform the Instructor before the assignment is due. No penalty will be assigned to a student who does not submit work to the plagiarism detection software. **All submitted work is subject to normal verification that standards of academic integrity have been upheld** (e.g., on-line search, other software, etc.). For more details about McMaster's use of Turnitin.com please go to the McMaster Office of Academic Integrity's webpage.

Conduct Expectations

As a McMaster student, you have the right to experience, and the responsibility to demonstrate, respectful and dignified interactions within all our living, learning and working communities. These expectations are described in the *Code of Student Rights & Responsibilities* (the "Code"). All students share the responsibility of maintaining a positive environment for the academic and personal growth of all McMaster community members, **whether in person or online**.

It is essential that students be mindful of their interactions online, as the Code remains in effect in virtual learning environments. The Code applies to any interactions that adversely affect, disrupt, or interfere

with reasonable participation in University activities. Student disruptions or behaviours that interfere with university functions on online platforms (e.g. use of Avenue 2 Learn, WebEx or Zoom for delivery), will be taken very seriously and will be investigated. Outcomes may include restriction or removal of the involved students' access to these platforms.

Additional information about the Code and netiquette can be found here.

Online Conduct

McMaster is committed to an inclusive and respectful community. These principles and expectations extend to online activities including electronic chat groups, video calls and other learning platforms. If you are concerned about your virtual classroom experiences, the Equity and Inclusion Office (EIO) is available to advise and assist students who may be experiencing any equity, accessibility, inclusion, harassment, discrimination or sexual violence concerns. You can reach the EIO at equity@mcmaster.ca. Thank you for joining us in ensuring that our McMaster online communities are spaces where no one feels excluded and everyone is able to enjoy learning together.

Copyright and Recording

Students are advised that lectures, demonstrations, performances, and any other course material provided by an instructor include copyright protected works. The Copyright Act and copyright law protect every original literary, dramatic, musical and artistic work, **including lectures** by University instructors.

The recording of lectures, tutorials, or other methods of instruction may occur during a course. Recording may be done by either the instructor for the purpose of authorized distribution, or by a student for the purpose of personal study. Students should be aware that their voice and/or image may be recorded by others during the class. Please speak with the instructor if this is a concern for you.

Electronic Content

Students who have access to authorized recorded lectures in a course may use these recordings only for personal or group study and should not reproduce, share or upload the recording to any publicly accessible web environment. Similarly, notes, slides, evaluations and tests are for personal use and should not be shared with others outside of a course.

Research Ethics -NA

Extreme Circumstances

The University reserves the right to change the dates and deadlines for any or all courses in extreme circumstances (e.g., severe weather, labour disruptions, etc.). Changes will be communicated through regular McMaster communication channels, such as McMaster Daily News, A2L and/or McMaster email.