MATH 1K03: Advanced Functions & Introductory Calculus for Humanities and the Social Sciences

Section 1 C01

Course Outline for Fall semester 2019

Welcome to Math 1K03! This course covers some of the functions and calculus portions of the two Grade 12 math courses Advanced Functions and Calculus & Vectors. It is intended for students who took neither of those courses, and need to take a University-level calculus course. We will have three lectures and one tutorial session per week, plus online assignments.

Lecture Information.

- Course schedule: Monday/Thursday 3:30pm - 4:20 pm, Tuesday 4:30pm - 5:20pm.
- Lecture classroom: ITB AB102 (ITB = Information Technology Building).
- Course Website: Course information will be posted on Avenue to Learn (Avenue):

  `http://avenue.mcmaster.ca`

- Tutorial times and classrooms: (LS = Life Sciences Building)
  - Section 1, Jana T.: Friday 11:30am - 12:20pm, LS B130E.
  - Section 2, Craig K.: Tuesday 1:30pm - 2:20pm, LS B130E.
  - Section 3, Craig K.: Thursday 12:30pm - 1:20pm, LS B130E.
  - Section 4, Jana T.: Friday 2:30pm - 3:20pm, LS B130E.

Instructor Information.

- Instructor: Dr. Andres Zuniga.
- Email: andres.zuniga@math.mcmaster.ca
- Office: Hamilton Hall 407.
- Phone: (905) 525 9140 x 26079
- Office hours: Tuesday/Thursday 9:30am - 10:30am.

Teaching Assistant Information.

- TA: Jana Taha.
- Email: tahaj@mcmaster.ca
- Office: Math Help Centre (HH 104).
- Office hours: Tue 5:30-6:30pm, and Thu 3:30-6:30pm

- TA: Craig Kohne.
- Email: kohnec@math.mcmaster.ca
- Office: Math Help Centre (HH 104).
- Office hours: Tue/Thu 2:30-3:30pm

Prerequisites. MCR3U or equivalent; normally not open to students who have completed Grade 12 Calculus and Vectors U, or Grade 12 Advanced Functions U.

If you plan to take Math 1M03 after this, you need to get a sufficiently high grade, as 1K cannot cover all the prerequisite material required. You may take Math 1F03 after Math 1K03 to improve your preparation for further math courses.

Textbook. (Required)

Applied Calculus for Business, Economics, and the Social and Life Sciences (11th Ed.).
Authors: Hoffman, Bradley, Sobecki, and Price. ISBN: 978-0-07-749136-9

An online version of the textbook is also available through Connect Math Hosted by ALEKS. Students should purchase a code at the McMaster Bookstore, which they can redeem in `http://www.connectmath.com`, by clicking in "Sign up now" and following the prompts:

Course Code: `9N4NC-KC93Q`. Course Name: `MATH 1K03`, CRN/Section#: `Fall2019`.

Course objectives. Math 1K03 covers topics from advanced functions and differential calculus, paying special attention to application in the Social Sciences; in particular, trigonometric functions *are not* included. By the end of the course, students should be able to:

- *perform calculations with polynomial and rational functions; solve systems of equations*
- *understand concept of a function; graph functions; work with functional models*
- *understand concept of a limit; compute limits (at a point, at infitnity)*
- *understand and interpret the concept of derivative; apply differentiation rules; perform marginal analysis; curve sketching; perform applied optimization*
- *work with exponential and logarithmic functions; solve continuous compounding problems, exponential models, etc.*
- *model basic real-life problems, and find solutions to them, using mathematics*

Topics. Our goal is to cover the following topics: In the first few weeks of classes, we will review basic algebra, contained in the Appendices A.1 and A.2 of the textbook, including: real numbers, inequalities, absolute value, exponents and roots; polynomials and rational functions; solving equations. In the remaining, we will go over Chapters 1 - 4 from the textbook, including: functions, graphs and limits; derivatives of functions and its properties; applications of derivatives; polynomials, rational, exponential and logarithmic functions.

Registration. Information about sessional dates and deadlines involving enrolling, the start of class, mid-term recesses and examination periods are determined annually and can be found in McMaster Undergraduate Academic Calendar 2019-2020.

Calculators. The only calculator allowed on quizzes, midterms, and the final exam is McMaster's standard calculator: **Casio fx-991 MS** (as well as the version **MS Plus**). Refer to `https://registrar.mcmaster.ca/exams-grades/exams/#tab-3` for use of calculators during examinations.

Homework. We will use an online homework system for homework assignments: ChildsMath

`https://www.childsmath.ca/childsa/forms/main_login.php`

The homework will be automatically graded if submitted before the deadline expires. A link to the assignments will be on the class webpage. There will be a total of 9 assignments. For homework due dates, please refer to the class schedule posted on Avenue, on a regular basis. Your lowest homework grade (based on %) will be dropped when calculating your overall homework grade at the end of the semester. However, *no make-up homework will be allowed.*

- Example: Student A has homework scores of 10/10, 9/10, 10/10, 5/10, 7/10, 9/10, 8/10, 8/10, and 6/10. Their final homework grade will be 67/80, or 83.75%.

Test Information. There will be three tests (duration 60 min), tentatively set as follows:

- Midterm 1: Wednesday evening, October 2, 2019 (7:00pm-8:00pm).
- Midterm 2: Wednesday evening, November 6, 2019 (7:00pm-8:00pm).
- Midterm 3: Wednesday evening, November 27, 2019 (7:00pm-8:00pm).

More information about the midterms (including locations) will be available closer to each midterm. *All midterms are closed book with no notes allowed.* The Casio fx-991 MS - and the MS plus version- are the only calculators allowed during the tests. The midterms will be mostly multiple choice. *No make-up midterms will be given.* Each midterm is worth 20% of your final grade; in total, all of them are worth 60% of your final grade.

Final Examination Information. This is a comprehensive examination (will cover all the material from the course) that will be worth 30% of your final grade; details on topics covered will be announced on the course website. The final examination will be scheduled by the registrar. The registrar will publish more information on the exams at a later date.
Note: It is your responsibility to make sure you are able to attend the examination, and no permission will be given for make up exams (except extenuating circumstances, which do not include travel plans).

Marking Scheme Information. Your final mark will be determined by your performance on homework, midterms, and final exam. It will be computed as follows:

- Homework: 10%
- Midterms: 60%
- Final Exam: 30%

To do well in this class, it is *crucial to keep up with the lectures and homework*. If there is something you do not understand, please ask the professor or one of the TAs as soon as possible. You can check your grades in Avenue.

Course Support. In order to help you succeed in this course, the following services are available to you.

- **Practice Problems.** Suggested problems and practice tests/exams will be made available on the class website.
- **Tutorials.** There is a one hour tutorial each week, starting the second week of class. During tutorials, you will be working on worksheets in groups of about 4 people. The purpose of these sessions is to learn from and teach your peers in a supervised environment, as well as providing additional material to help learning the course contents. This is great instance to ask questions and seek help. **Although attendance in tutorials is not mandatory, it is strongly encouraged**. *Extra credit will be given counting towards the homework grade*, after the successful completion of the activities. Solutions to worksheets will be uploaded to Avenue at the end of each week. There are four tutorial sections:

  T01: Fr 11:30am - 12:20pm in LS B130E

  T02: Tu 1:30pm - 2:20pm in LS B130E

  T03: Th 12:30pm - 1:20pm in LS B130E

  T04: Fr 2:30pm - 3:20pm in LS B130E

- **Drop-in Centre.** More personalized assistance (free of charge) can be obtained by coming to the Math Help Centre, located in Hamilton Hall 104. Tutors are available to assist you with questions regarding this course, in particular. More detailed information is available on their website:

  `https://ms.mcmaster.ca/~mcleac3/Site/HelpCentreSite.html`

OFFICIAL McMASTER POLICIES

1. **Policy on Academic Ethics.** 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.

The McMaster Academic Integrity Policy defines academic dishonesty as "to knowingly act or fail to act in a way that results or could result in unearned academic credit or advantage." This behavior 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.

It is your responsibility to understand what constitutes academic dishonesty. The following illustrates only three forms of academic dishonesty: (1) plagiarism, e.g. the submission of work that is not one's own or for which other credit has been obtained. (2) improper collaboration in group work, and (3) copying or using unauthorized aids in tests and examinations. Appendix 3 of the McMaster Academic Integrity Policy gives full explanations of several different kinds of academic dishonesty.

Further information on the topic of academic integrity can be found in

`https://www.mcmaster.ca/academicintegrity/`

2. **Academic Accommodation of Students with Disabilities.** Students with disabilities who require academic accommodation must contact Student Accessibility Services (SAS) to make arrangements with a Program Coordinator. Student Accessibility Services can be contacted by phone 905-525-9140 ext. 28652 or e-mail: sas@mcmaster.ca. For further information, consult the McMaster University's Academic Accommodation of Students with Disabilities policy.

3. **Requests for Relief for Missed Academic Term Work.** If you have missed work, it is your responsibility to take action. Once per term, you may use the McMaster Student Absence Form (MSAF) to request relief from missed academic work, resulting from medical or personal situations lasting up to 3 days. MSAF is an online self-reporting tool; no documentation is needed. For more information about the MSAF, please visit

   `https://www.mcmaster.ca/msaf`

   It is your responsibility to email the professor as soon as possible (within three working days) about the absence. 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.

   Absences for a longer duration, or if the MSAF is not applicable to your situation, please contact your Associate Dean's Office (Faculty/Program Office), with documentation, and relief from term work may not necessarily be granted. *In Math 1K03, the percentages of the missed work - properly reported - will be transferred to the final examination.*

   - Example: Student B is sick and misses Midterm 2, and uses the MSAF to report the absence and follow up with the professor via email. Now Student B's final grade will now be calculated as follows:
     - Homework: 10%
     - Midterm 1: 20%
     - Midterm 3: 20%
     - Final Exam: 50%

   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". Please note these regulations have changed beginning Fall 2015.

4. **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 requiring a RISO accommodation 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.

5. **Undergraduate Examinations Policy:** The official document explaining the policies, procedures and guidelines regarding undergraduate examinations, can be found:

   `https://www.mcmaster.ca/policy/Students-AcademicStudies/UndergraduateExaminationsPolicy.pdf`

6. **Important Message:** The instructor and the 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.

7. **On-line Statement for Courses Requiring Online Access or Work.** In this course we will use ChildsMath, a local website hosted by the Department of Mathematics and Statitics at McMaster. Students should be aware that, when they access the electronic components of this course, 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 this course will be deemed consent to this disclosure. If you have any questions or concerns about such disclosure please discuss this with the course instructor.