DEPARTMENT OF MATHEMATICS AND STATISTICS

York University

<u>Course</u>: Mathematics for the Life Sciences, Math 1506 3.0, Sections A, B, C, D, E, F, G, H, I <u>Course Webpage</u>: Mathematics I for the Biological and Health Sciences (Fall 2022-2023) on eClass.

There is also the eClass page called SC/MATH1506 A, B, C, D, E, F, G, H, I - Mathematics I for the Biological and Health Sciences Tutorial, Assignment, and Test Page (Fall 2022)

These are different eClass pages.

<u>**Term</u>: Fall 2022**</u>

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Prerequisites / Co-requisites / Exclusions: Please consult

https://mathstats.info.yorku.ca/supplemental-calendar/ to ensure you have the required prerequisites for the course, and that getting a credit course does not exclude from another credit.

Real Prerequisites:

Before you take this course, you should know that it is expected that you have a decent foundation in working with functions and using algebra to solve multistep equations. These equations can involve algebraic expressions such as the quadratic formula, the square root, complex fractions, trigonometric, exponential, and logarithmic components. You should be comfortable using graphs of functions to answer questions. You should know how to determine if two algebraic expressions are equivalent. You should have a foundation in working with trigonometric functions and solving trigonometric equations. You should be able to work with exponential and logarithmic equations. You should know what a polynomial or rational function is. You should know what the root of a function is.

If your knowledge is lacking in some of the things mentioned above, you may find it difficult to succeed in this course.

Office Hours:

Office Hours: Please see the eClass page for details

Lecture Time and Location:

Please see the eClass page for details

Technical Requirements

There are technical requirements for students to be able to complete this course. You need a reliable high-speed internet connection to attend lectures via Zoom or take tests or exams using eClass.

For more information, see:

https://lthelp.yorku.ca/student-guide-to-moodle https://yorku.zoom.us/ (see the guides at the bottom) https://uit.yorku.ca/students-getting-started/

and Student Guide to eLearning

To check your internet connection, you can run tests like <u>Speedtest</u>.

Expectations:

Email: Use email for confidential matters, or to book an appointment with me. Make sure you start the subject line with **Math 1506 Section (whatever your section is)**. I will check email during normal business hours and will respond to every email I receive within four business days.

Office Hours:

If you have math- or course-related questions, please attend office hours, and I will answer them then.

Communications: Make sure you are subscribed to Course Announcements in eClass! You are responsible for being actively and regularly on eClass to ensure that you have the latest information about the course.

Time Management: For a 3-credit course (whether online or in a traditional classroom), the expected workload is 3 hours of in-class time each week with an additional 6 hours of work per week in preparation, practice problems, and assignments.

If you find you are working less than 5 hours a week, then you are probably not devoting enough time to the course. If you find you are working more than 10 hours a week, then you might be missing some prerequisites for the course.

Preparing for this Course

Students taking this course should ensure that their mathematical skills are adequate for the course. Some of the students who enrol in this course each year drop the course or fail. Many of these students are smart and hard-working. But they did not succeed because their preparation, mostly in the **Real Prerequisites** described earlier, was inadequate.

Students who are unprepared should go to the eClass page and go to the **Course Textbooks** section.

If you take the course without adequate preparation, you will waste your money and your time, you'll fail or get a low mark, and you will be frustrated and think you are "bad at math" - but really, you're just not prepared. Even if you're "bad at math", if you take the course after you are prepared, you'll get a good mark, learn something, even enjoy the course, and, when it's over, you won't be "bad at math" after all!

Expanded Course Description

This course consists of three online lectures each week, and roughly biweekly asynchronous tutorials.

Typically, the problems solved in high school are done mechanically or by mimicking solutions to similar problems in the textbook. In this course, you will develop the confidence and ability to approach and solve richer and more demanding problems.

Active participation in the lectures and tutorials, and completion of the assigned homework is expected of all students.

By the end of this course, you should be able to:

- 1. Construct systems of linear equations and how to solve them, by hand and by using a computational engine, in order to answer questions in various contexts.
- 2. Geometrically interpret the solutions of systems of linear equations, and how to characterize systems of linear equations with more than one solution.
- 3. Create polynomial, trigonometric, exponential, logarithmic, and piecewise functions to model abstract and applied phenomena.
- 4. Use limits to analyze the behaviour of a function for both finite and infinite values.
- 5. Use limits to find the derivative of polynomial, trigonometric, exponential, and logarithmic functions.
- 6. Use the rules for finding derivatives of polynomial, trigonometric, exponential, and logarithmic functions, and to interpret the meaning of the value of the derivative.
- 7. Use derivatives to analyze the properties of a function, including extreme points, regions where the function is increasing and decreasing, and finding the regions of concavity. You will apply these properties to describe the phenomenon a given function is representing.
- 8. Use derivatives to employ the technique of optimization in a variety of contexts, both abstract and applied.
- 9. Use derivatives to describe rates of change, solve related rates problems, and approximate functions.

<u>Course Text / Resources</u>

Course Textbook: Three free electronic textbooks in pdf form are available under the Textbooks section on the eClass page.

A list of readings in the textbooks are given in the Lectures section on the eClass page. There, you will find a list of recommended background reading.

LECTURES:

You should attend lectures. Asking questions is essential to the learning experience, and you should ask questions during the lecture whenever you are not clear about something. Students who attend live do better than those who do not, on average.

HOMEWORK:

There is a homework section on the eClass page. It has all the details about where to find the problems, and more importantly, the weeks in which you should do them.

Evaluation

The final grade for the course will be based on the following items weighted as indicated:

- Assessment Quiz: 1% via eClass any time during the course.
- eClass Tutorials: 10% via eClass, roughly every two weeks.
- Online Assignments: 18% via eClass.
- In-person Midterm Exam: 30% on Sunday November 6th from 1:00 PM 2:30 PM.
- Final Exam: 41% in the final examination period, the date will be announced at some point during the semester.
- First Year Experience Modules: up to a 2% bonus added to your final grade.

The date and time of the exam in the Final Examination period is set by the Registrar and will be announced later. Final course grades may be adjusted to conform to Program or Faculty grades distribution profiles.

ASSESSMENT QUIZ

The assessment quiz is available on the eClass page SC/MATH1506 A, B, C, D, E, F, G, H, I - Mathematics I for the Biological and Health Sciences Tutorial, Assignment, and Test Page (Fall 2022).

The assessment quiz in this class is not mandatory, although it is does contribute 1 percent to your final grade. You get the 1 percent for completion. That means that you get 1 percent towards your final grade regardless of your performance on the quiz, as long as you complete it.

HOWEVER, if you get less than 80% on the assessment quiz, it really means you are not ready to succeed in Math 1506, or Math 1507. It is with the highest level of recommendation that you should drop this class and take Math 1510. Math 1510 is designed to bring students to a level where they will be able to succeed in their math courses at York.

If that option doesn't work for you, there is a list of suggested background reading and preparation you can do for this course, but it will mean that the time commitment to succeeding in this class will dramatically increase.

TUTORIALS:

Tutorials are available on the eClass page SC/MATH1506 A, B, C, D, E, F, G, H, I - Mathematics I for the Biological and Health Sciences Tutorial, Assignment, and Test Page (Fall 2022).

Each tutorial is worth 1% of your final grade.

Tutorials open at 00:01 EST (that is 12:01 AM) on the days listed below and are open for the duration of the course. They close at 23:59 EST (that is 11:59 PM) on the day before the final exam. **On the day of the final exam, tutorials are closed and no extensions will be granted, for any reason.**

Tutorials are designed to take you approximately 1 to 2 hours.

The following guideline is designed to keep you on track in this course. **These are not hard** deadlines, you have until the day of the final exam to finish all of the tutorials.

Tutorial Schedule Guideline:

Tutorial 1: Opens September 7, should be completed by September 29

Tutorial 2: Opens September 22 should be completed by October 13

Tutorial 3: Opens October 6 should be completed by October 28

Tutorial 4: Opens October 21 should be completed by November 10

Tutorial 5: Opens November 3 should be completed by November 24

The tutorials are **not** extra homework practice for things we've already covered in class. The listed homework for this class is the best way to fully learn the class material. The tutorials involve topics that are related to class material that are designed to expand and solidify your understanding of the learning outcomes in this course.

MIDTERM EXAMINATION:

There will be a 90-minute in-person midterm examination, worth 35% of your final grade.

It will take place on Sunday, November 6th, from 1:00 to 2:30 PM. Further details such as location will be announced in class and on the eClass page.

The midterm examination will consist of multiple-choice questions. Question content will be announced closer to the date. Examinations will be uploaded to the Crowdmark system, and you will receive an electronic copy of your test along with your grade once the grading is complete for the class.

If you miss the midterm for any reason, do not contact your instructor. The weight of your midterm will be transferred to your final exam. There are no make-up midterms.

FIRST YEAR EXPERIENCE MODULES

These modules are included as part of the eClass page SC/MATH1506 A, B, C, D, E, F, G, H, I - Mathematics I for the Biological and Health Sciences Tutorial, Assignment, and Test Page (Fall 2022). They are modules designed to help you succeed during your time at university. They are not graded, and are not on material directly related to any assessment in this course.

If you complete half of the modules, a 1% bonus will be added to your final grade. If you complete all of the modules, a 2% bonus will be added to your final grade.

These must be completed by the end of the day before the final exam.

FINAL EXAMINATION

The final exam will be held during the examination period given at <u>https://registrar.yorku.ca/enrol/dates/2022-2023/fall-winter</u>

More details about the final examination, date, structure, etc, will be released at some point during the semester.

Grading and Missed Tests or Exams

Grading: With the exception of the final exam rule, the grading scheme for the course conforms to <u>https://calendars.students.yorku.ca/2022-2023/grades-and-grading-schemes</u> Each assignment, test, or exam will bear a number grade which will be scaled according to its weight in the final grade in the course. For example, if your midterm is worth 20% of the final grade and you get 32/40 on the midterm, then this will be scaled to 16/20 for calculation of the final grade.

Missed Midterm: A student who becomes ill, has a personal/family emergency, or a religious observance will have the weight of the midterm added to the final exam. You do not need to contact your instructors if you miss the midterm, and there is no need for a doctor's note or other kinds of proof.

Missed Final Exam: A student who becomes ill, has a personal/family emergency, or a religious observance may ask for a later date for their final exam or to submit their outstanding coursework. To do this, students must request deferred standing, no later than one week after the missed examination or the last day of classes. For details, please see http://myacademicrecord.students.yorku.ca/deferred-standing.

IMPORTANT COURSE INFORMATION FOR STUDENTS

Please see the Policies and Regulations at <u>https://calendars.students.yorku.ca/2022-</u> 2023/policies-and-regulations and information at <u>https://calendars.students.yorku.ca/2022-</u> 2023/academic-and-financial-information

RESPECT:

When participating in this course, you must remain courteous and respectful. The University's <u>Code of Rights and Responsibilities</u> apply to all forms of communication and interaction.

Violation of the Code will result in a complaint of a breach of community standards, and sanctions could include fines, restrictions, and suspension.

ACADEMIC INTEGRITY

I am proud of honest students who work hard to get a good grade and I support them by asking for severe penalties on cheating. Cheating is the attempt to gain an improper advantage in an academic evaluation.

Forms of cheating include:

1. Copying another person's answer to a test question (for example, via texting or chat);

2. Consulting or getting help from another person

3. Using an unsanctioned online source during a test (for example, Chegg, Course Hero etc.);

4. Helping others to cheat.

The Math and Stats Department has people who are expert in the detection of cheating in this online environment. If you are found to have cheated, they can seek the most severe penalties available. According to the Senate, these penalties could include failure of the course, notation on your transcript, or suspension from the University. If you cheat, you may need to plan for a job where your employer doesn't care that there is a notation on your university transcript indicating that you cannot be trusted.

For more details, see <u>York's Academic Honesty Policy</u> and information on <u>Academic Integrity for</u> <u>Students</u>.

Academic integrity benefits everyone in our community. It not only helps you reach the real goal of this class-learning, but also allows for the university and program to be perceived positively by others. When students are dishonest, they lose out on valuable learning that will help them perform well in their career.

TECHNOLOGY USE AND PRIVACY

Several platforms will be used in this course (e.g., eClass, Canvas, Zoom, etc.) through which students will interact with the course materials, the course director and TAs, as well as with one another.

Students shall note the following:

- Zoom is hosted on servers in the U.S. This includes recordings done through Zoom.
- If you have privacy concerns about your data, provide only your first name or a nickname when you join a session.
- The system is configured in a way that all participants are automatically notified when a session is being recorded. In other words, a session cannot be recorded without you knowing about it.

IMPORTANT DATES

The term start and end dates, holidays, exam periods, and add/drop deadlines, are posted at <u>https://registrar.yorku.ca/enrol/dates/2022-2023/fall-winter</u>

STUDENT ACCESSIBILITY SERVICES:

It is the student's right to request and receive academic accommodations on the basis of a disability. Student Accessibility Services provides academic accommodation and support to students with disabilities in accordance with the Ontario Human Rights Commission's Policy on accessible education for students with disabilities and York University Senate Policy on Academic Accommodation for Students with Disabilities. Contact <u>Student Accessibility Services</u> for more information.

RESOURCES

LEARNING SKILLS SERVICES

Learning skills are about learning how to learn and improving your effectiveness and efficiency as a learner. See <u>https://lss.info.yorku.ca</u> for details and a calendar of events. These workshops are for everyone and I highly recommend them.

COUNSELLING SERVICES

Many students face a variety of personal challenges throughout the term which may have a negative effect on their academic performance. In such cases, students can make use of York's <u>Student Counselling and Development</u> services. A Personal Counselor can help manage a student's coursework under difficult circumstances.