DEPARTMENT OF MATHEMATICS AND STATISTICS

York University

<u>Course</u>: Mathematics for the Life Sciences, Math 1507 3.0, Section N <u>Course Webpage</u>: Found on eClass, titled Mathematics for the Life Sciences, Math 1507 3.0, Section N. There is also the eClass page Tutorials for Mathematics for the Life Sciences, Math 1507 3.0. These are different eClass pages.

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

Instructor Name and Email: Andrew McEachern, andrewm6@yorku.ca

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 a polynomial or rational function is. You should know what the root of a function is. You should be comfortable with derivatives, both the rules and the applications.

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:

Lectures are will be in the Stedman Lecture Hall, auditorium D.

Lectures are every Monday, Wednesday, and Friday, from 11:30 AM to 12:20 PM.

Technical Requirements

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

For more information, see:

https://lthelp.yorku.ca/student-guide-to-moodle

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. 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.

Forum:

There will be a forum for administrative questions. Please post all questions that are not of a sensitive nature about the course here. Students can answer each other's questions, and I and teaching assistants will periodically monitor the forum and answer questions too.

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.

Also see: <u>https://lss.info.yorku.ca/time-management-resources/</u>

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. Yet 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 in-class 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. Sketch a picture of a Riemann Sum.

- 2. Construct a Riemann sum to approximate the area under a curve and calculate it, by hand and by using a computational engine, in order to answer questions in various contexts.
- 3. Communicate in written form and in a mathematically precise way the concept of integration.
- 4. Apply integration to find the area between curves and average value of a function.
- 5. Use the substitution rule to find the integral of a function.
- 6. Use integration by parts to find the integral of a function.
- 7. Represent probability scenarios via sketches of Venn Diagrams.
- 8. Apply probability rules and concepts, such as conditional probability, dependence, multiplication rule, law of total probability and Bayes Rule, to solve probability scenarios.
- 9. Classify random variables and compute their mean and variance.
- 10. Draw and interpret histograms, probability density functions and cumulative probability functions.
- 11. Communicate in written form and in a mathematically precise way the concepts of how matrices and probability are related (if time).

<u>Course Text / Resources</u>

Course Textbook: 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 Textbooks section on the eClass page.

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 lecture 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.

<u>Evaluation</u>

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

- eClass Tutorials: 5% via eClass, roughly every two weeks.
- Test 1: 15% via eClass in Week 5.
- Test 2: 15% via eClass in Week 8.
- Test 3: 15% via eClass in Week 11.
- Final Exam: 50% in the final examination period, the date will be announced at some point during the semester.

The date and time of exams 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. If your course grade grants you an A or A+ before you take the final exam, you must achieve a grade of 80% or higher on the final examination. If you fail to achieve an 80% or higher on the final examination, you will receive a grade of B+.

TUTORIALS:

Tutorials are available on the eClass page Tutorials for Mathematics for the Life Sciences, Math 1507 3.0, not through Mathematics for the Life Sciences, Math 1507 3.0 Section N.

Each tutorial is worth 1% of your final grade, for a total of 5%.

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 of the final exam. After 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 January 17, should be completed by January 31 Tutorial 2: Opens January 31 should be completed by February 14 Tutorial 3: Opens February 14 should be completed by February 28 Tutorial 4: Opens February 28 should be completed by March 14 Tutorial 5: Opens March 14 should be completed by March 28

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.

TESTS:

There will be three tests in the class, each worth 15% of your final grade. Tests are taken through eClass page Tutorials for Mathematics for the Life Sciences, Math 1507 3.0, not the eClass page for this course.

Each test opens at 00:01 EST (that is 12:01 AM) on the days listed below and close at 23:59 EST

(that is 11:59 PM) on the listed days.

Test 1: Opens February 7th, and is closed on February 11th. Test 2: Opens March 7th, and is closed on March 11th. Test 3: Opens March 28th, and is closed on April 1st.

Notice that the tests are open for a five-day window.

Tests are true/false and multiple choice. Each test is randomly generated and automatically graded.

You can take a test as many times as you like within the given time window.

If you attempt a test more than once, the attempt with the highest grade will be used when calculating your final grade.

Once the window closes, the test is over and there will be no more opportunities to take the test. If you did not manage to take a test within the given time window, the weight of that test will be transferred to the final examination.

FINAL EXAM

The final exam will be held during the examination period given at <u>https://registrar.yorku.ca/enrol/dates/fw21</u>

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

Grading and Missed Tests or Exams

Grading: The grading scheme for the course conforms to

https://calendars.students.yorku.ca/2020-2021/grades-and-grading-schemes 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 Tests: A student who becomes ill, has a personal/family emergency, or a religious observance will have the weight of the test added to the final exam.

Missed 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/2020-</u> 2021/policies-and-regulations and information at <u>https://calendars.students.yorku.ca/2020-</u> 2021/academic-and-financial-information

RESPECT:

When using the eClass forum or when asking questions during a lecture, you must remain courteous and respectful. Remember that eClass is simply an electronic version of a regular classroom, so the University's <u>Student Code of Conduct</u> and the <u>Code of Rights and Responsibilities</u> apply.

Violation of the Student Code of Conduct 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:

• Technology requirements and FAQs for eClass can be found here – <u>http://www.yorku.ca/moodle/students/faq/index.html</u>

PROCTORING

This course may require the use of online proctoring for the final examination, in the event a final examination will be online. I may use an online proctoring service to deliver the exam, which would be administered through eClass. Students are required to have access to minimum technology requirements to complete the final examination. If an online proctoring service is used, students will need to become familiar with it at least five days before exam(s). For technology requirements, Frequently Asked Questions (FAQs) and details about the online proctoring service visit https://registrar.yorku.ca/proctortrack-faq Students are required to share any IT accommodation needs with the instructor as soon as they are able.

York University obtained legal advice on this issue and determined that Proctortrack fully complies with the privacy laws of Ontario and Canada. Some of the information on the internet about Proctortrack and privacy is inaccurate.

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/fw21</u>

See also: https://secretariat.info.yorku.ca/files/CourseInformationForStudentsAugust2012-.pdf

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.