

**MATH 1115A Elementary Calculus II***3 Credits, 16 weeks, 3 hours lecture*

This course is an extension of MATH 1115, involving a study of the elementary transcendental functions and of further techniques and applications of integration. Topics include exponential and logarithmic functions, trigonometric and inverse trigonometric and further applications of integration, L'Hopital's rule and improper integrals.

*Prerequisites: MATH 1113*

**Instructor**

Instructor Name: Matthew Morin

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**Office Hours**

Monday	10:00 – 11:00
Tuesday	10:00 – 11:00
Wednesday	10:00 – 11:00
Thursday	10:00 – 11:00
Friday	10:00 – 11:00

**Hours of Instruction**

Monday	14:00 – 15:00 S214
Thursday	14:00 – 15:00 S216
Friday	15:00 – 16:00 S207

**Required Resources**

**Calculus, Early Transcendentals**, James Stewart, 7<sup>th</sup> edition ISBN 978-1-111-42668-2.

Subscription to WebAssign (<http://webassign.net/>) is required for the completion of the online homework. The above textbook comes packaged with a paid subscription.

**Course Outcomes**

The student will be able to:

- Evaluate integrals using a variety of integration techniques including substitution, integration by parts, trigonometric substitution, partial fractions, and approximation via the Trapezoidal Rule/Simpson's Rule.
- Express and evaluate areas, volumes, surface area, arc length, work, and centroids using integrals.
- Recognize when a function is invertible and compute the derivative of the inverse function by relating it to the derivative of the function.
- Recognize indeterminate forms of limits and manipulate these expression to a form in which L'Hopital's rule can be used to evaluate the limit.

- Illustrate how differential equations model natural phenomena and predict the behavior of the model by solving (or approximating a solution to) these equations.
- Apply convergence/divergence tests to study sequences and series.
- Create a Taylor/Maclaurin series representation of a function and employ it to solve problems regarding the function.

**Evaluation**

Assignments	10% (5% Webassign, 5% Homework Sets)
Midterm Exams	40% (2 midterm exams, 20% each)
Final Exam	50%
Total	100%

A grade of C- is required for progression or transfer.

**Grading System**

Descriptor	Alpha Grade	4.0 Scale	Percent	Rubric for Letter Grades
Excellent	A+	4.0	> 92.9	Work shows in-depth and critical analysis, well developed ideas, creativity, excellent writing, clarity and proper format.
	A	4.0	85 – 92.9	
	A-	3.7	80 – 84.9	
Good	B+	3.3	77 – 79.9	Work is generally of high quality, well developed, well written, has clarity, and uses proper format.
	B	3.0	74 – 76.9	
	B-	2.7	70 – 73.9	
Satisfactory <b>Progression</b>	C+	2.3	67 – 69.9	Work has some developed ideas but needs more attention to clarity, style and formatting.
	C	2.0	64 – 66.9	
	C-	1.7	60 – 63.9	
Poor <b>Minimum Pass</b>	D+	1.3	55 – 59.9	Work is completed in a general way with minimal support, or is poorly written or did not use proper format.
	D	1.0	50 – 54.9	
Failure	F	0.0	< 50	Responses fail to demonstrate appropriate understanding or are fundamentally incomplete.

**Proposed Schedule of Topics**

Week	Dates	Topic	Chapter Sections
1	Jan. 5 - Jan. 9	Inverse Functions,	Notes
2	Jan. 12 - Jan. 16	Logarithmic Diff, Hyperbolic Functions, L'Hopital's Rule	3.11, 4.4
3	Jan. 19 - Jan. 23	Review of Integrals, Substitution, Area Between Curves,	Ch.5, 6.1
4	Jan. 26 - Jan. 30	Volumes, Volumes by Cylindrical Shells	6.2, 6.3
5	Feb. 2 - Feb. 6	Work, Ave. Value, Integration by Parts	6.4, 6.5, 7.1
6	Feb. 9 - Feb. 13	Trig. Integrals, Trig. Substitution, <b>Midterm 1</b>	7.2, 7.3
7	Feb. 16 - Feb. 20 (No Classes on Monday— <b>Family Day</b> )	Partial Fractions	7.3(cont.), 7.4

Week	Dates	Topic	Chapter Sections
	Feb. 23 - Feb. 27	<b>Reading Week</b>	
8	Mar. 2 – Mar. 6	Approximating Integrals	7.4(cont.), 7.7
9	Mar. 9 – Mar. 13	Improper Integrals, Arc Length	7.8, 8.1
10	Mar. 16 – Mar. 20	Area of Surface of Revolution, Applications	8.2, 8.3, 8.4
11	Mar. 23 – Mar. 27	Modeling with D.E.'s, Directional Fields, Separable Equations	9.1, 9.2, 9.3
12	Mar. 30 – Apr. 3 (No Classes on Monday— <b>Good Friday</b> )	<b>Midterm 2</b> , Models for Population Growth, Linear Equations	9.4
13	Apr. 6 – Apr. 1 (No Classes on Monday— <b>Easter Day</b> )	Introduction to Series, Series Tests	11.1 – 11.8
14	Apr. 13 – Apr. 17	Taylor Series	11.9 – 11.10
	Apr. 21 – Apr. 29	Exam Period	

**Please Note:**

Date and time allotted to each topic is subject to change. It is your responsibility as a student to contact the Office of the Registrar to complete the forms for Withdrawal or Change of Registration, and any other forms. Please refer to the list of important dates as noted in the Academic Schedule in the Keyano College Credit Calendar.

**Performance Requirements****Assignments:**

In any mathematics course the best way “to learn” is “to do.” The instructor can teach you about the course ideas and demonstrate the mechanics of solving the problems—and can make it look very easy—but growing adept at solving these problems will take a lot of practice and can be a struggle. Although the assignments do not count for a large part of your final grade they are essential in preparing you for the types of problems you will be solving on the exams.

The assignments should be typed or written neatly, stapled, and handed in on the assigned due date. A cover page is not required, but the assignment should show the assignment number, the course number, and the student’s name (printed, not written). The problems should be solved in the order given. A late assignment may be accepted, or may incur a penalty.

Although you may work with other students while completing assignments, it is essential that the work you present is your own—see the section on academic misconduct below. Using other students solutions as your own may result in serious academic penalties. If you work with other students on assignment problems, be sure that you know how to solve the problems and that you write out your own solutions in your own words.

**Tests:**

All tests will be written and are closed-book. No calculators are allowed, nor should they be needed. The topics covered by each test will be described in advance in-class and these details will be posted on Moodle. These tests are meant to test how well you have “mastered” the subject matter. Satisfactory completion of the relevant assignment problems, reading the relevant textbook sections, and studying the course notes is the very minimum amount of work that should prepare you for the types of problems that could appear on a test. However, as tests are cumulative, you may be solving problems that require ideas that bridge across several sections of the course.

**Student Attendance**

Class attendance is useful for two reasons. First, class attendance maximizes a students’ learning experience. Second, attending class is a good way to keep informed of matters relating the

administration of the course (e.g., the timing of assignments and exams). Ultimately, you are responsible for your own learning and performance in this course.

It is the responsibility of each student to be prepared for all classes. Students who miss classes are responsible for the material covered in those classes and for ensuring that they are prepared for the next class, including the completion of any assignments and / or notes that may be due.

### **Academic Misconduct**

Students are considered to be responsible adults and should adhere to principles of intellectual integrity. Intellectual dishonesty may take many forms, such as:

- Plagiarism or the submission of another person's work as one's own
- The use of unauthorized aids in assignments or examinations (cheating)
- Collusion or the unauthorized collaboration with others in preparing work
- The deliberate misrepresentation of qualifications
- The willful distortion of results or data
- Substitution in an examination by another person
- Handing in the same unchanged work as submitted for another assignment

Penalties for academic offences range from a verbal reprimand to dismissal from the College, and in certain circumstances may involve legal action.

### **Specialized Supports**

#### **Counselling and Disability Services**

Counselling Services provides a wide range of specialized counselling services to prospective and registered students, including personal, career and academic counselling.

#### **SKILL Centre**

The SKILL Centre is a learning space in the Clearwater Campus at Keyano College where students can gather to share ideas, collaborate on projects and get new perspectives on learning from our tutorial staff.

The SKILL Centre, through a variety of delivery methods, provides assistance in skill development to Keyano students. Assistance is provided by instructors, staff and student tutors. Individuals wishing to improve their mathematics, writing, grammar, study, or other skills, can take advantage of this unique service.

**Authorization**

This course outline has been reviewed and approved by the Program Chair.

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Matthew Morin, Instructor

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Louis Dingley, Chair

Date Authorized

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Guy Harmer, Dean

Date Authorized

**Signed copies to be delivered to:**

Instructor

Registrar's Office