

## OFFICIAL UNDERGRADUATE COURSE OUTLINE FORM

Note: The University reserves the right to amend course outlines as needed without notice.

<b>Course Code and Number:</b> MATH 110		<b>Number of Credits:</b> 4 <a href="#">Course credit policy (105)</a>															
<b>Course Full Title:</b> Pre-Calculus Math <b>Course Short Title:</b> <i>(Transcripts only display 30 characters. Departments may recommend a short title if one is needed. If left blank, one will be assigned.)</i>																	
<b>Faculty:</b> Faculty of Science		<b>Department (or program if no department):</b> Mathematics & Statistics															
<b>Calendar Description:</b> Designed to prepare students for first-year calculus courses. Topics include basic algebraic skills, operations, and properties and graphs of functions including polynomial, rational, exponential, logarithmic, trigonometric, and inverse functions.																	
<b>Prerequisites (or NONE):</b>		One of the following: (C or better in one of Principles of Mathematics 12 or Pre-calculus 12) or (B or better in Calculus 12) or (both MATH 092 and MATH 093) or (both MATH 094 and MATH 095) or (MATH 096) or (C+ or better in Applications of Mathematics 12) or (at least 55% on the MDPT).															
<b>Corequisites (if applicable, or NONE):</b>		NONE															
<b>Pre/corequisites (if applicable, or NONE):</b>		NONE															
<b>Antirequisite Courses</b> <i>(Cannot be taken for additional credit.)</i> Former course code/number: Cross-listed with: Dual-listed with: Equivalent course(s): <i>(If offered in the previous five years, antirequisite course(s) will be included in the calendar description as a note that students with credit for the antirequisite course(s) cannot take this course for further credit.)</i>		<b>Special Topics</b> <i>(Double-click on boxes to select.)</i> This course is offered with different topics: <input checked="" type="checkbox"/> No <input type="checkbox"/> Yes <i>(If yes, topic will be recorded when offered.)</i>															
		<b>Independent Study</b> If offered as an Independent Study course, this course may be repeated for further credit: <i>(If yes, topic will be recorded.)</i> <input type="checkbox"/> No <input type="checkbox"/> Yes, repeat(s) <input type="checkbox"/> Yes, no limit															
<b>Typical Structure of Instructional Hours</b> <table border="1"> <tr> <td>Lecture/seminar hours</td> <td>60</td> </tr> <tr> <td>Tutorials/workshops</td> <td></td> </tr> <tr> <td>Supervised laboratory hours</td> <td></td> </tr> <tr> <td>Experiential (field experience, practicum, internship, etc.)</td> <td></td> </tr> <tr> <td>Supervised online activities</td> <td></td> </tr> <tr> <td>Other contact hours:</td> <td></td> </tr> <tr> <td><b>Total hours</b></td> <td><b>60</b></td> </tr> </table>		Lecture/seminar hours	60	Tutorials/workshops		Supervised laboratory hours		Experiential (field experience, practicum, internship, etc.)		Supervised online activities		Other contact hours:		<b>Total hours</b>	<b>60</b>	<b>Transfer Credit</b> Transfer credit already exists: <i>(See <a href="http://bctransferguide.ca">bctransferguide.ca</a>.)</i> <input type="checkbox"/> No <input checked="" type="checkbox"/> Yes Submit outline for (re)articulation: <input checked="" type="checkbox"/> No <input type="checkbox"/> Yes <i>(If yes, fill in transfer credit form.)</i>	
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		<b>Grading System</b> <input checked="" type="checkbox"/> Letter Grades <input type="checkbox"/> Credit/No Credit															
		<b>Maximum enrolment (for information only):</b> 36 <b>Expected Frequency of Course Offerings:</b> Fall and Winter <i>(Every semester, Fall only, annually, etc.)</i>															
<b>Department / Program Head or Director:</b> Ian Affleck		<b>Date approved:</b> August 2021															
<b>Faculty Council approval</b>		<b>Date approved:</b> August 27, 2021															
<b>Undergraduate Education Committee (UEC) approval</b>		<b>Date of meeting:</b> April 22, 2022															

Labs to be scheduled independent of lecture hours: ☐ No ☐ Yes

**Learning Outcomes:**

Upon successful completion of this course, students will be able to:

1. Demonstrate basic algebraic skills most frequently required in the study of calculus (factoring, completing the square, rationalization, difference quotient, etc.).
2. Demonstrate proficiency with function notation, operations on functions, piecewise functions, and constructing inverses.
3. Define, construct, and analyze graphs of functions and their transformations.
4. Analyze the behavior and properties of algebraic functions used in calculus (polynomial, rational, and radical functions);
5. Define and apply the properties of exponential and logarithmic functions.
6. Evaluate trigonometric functions and their inverses using angles, right triangles, and unit circle, and apply trigonometric identities.
7. Solve equations and inequalities involving elementary functions.
8. Use elementary functions to model and solve practical problems.
9. Translate mathematical statements into everyday language and vice versa.
10. Demonstrate proficiency with the use of technology to explore mathematical concepts.

**Prior Learning Assessment and Recognition (PLAR)**

☒ Yes      ☐ No, PLAR cannot be awarded for this course because

**Typical Instructional Methods** (*Guest lecturers, presentations, online instruction, field trips, etc.; may vary at department's discretion.*)

Lectures and problem sessions; evaluation includes assignments, midterms, and a comprehensive final. Graphing calculators will be used throughout.

**NOTE: The following sections may vary by instructor. Please see course syllabus available from the instructor.**

**Typical Text(s) and Resource Materials** (*If more space is required, download Supplemental Texts and Resource Materials form.*)

The text is chosen by a departmental curriculum committee. Recent texts include:

Author (surname, initials)	Title (article, book, journal, etc.)	Current ed.	Publisher	Year
1. Ratti and McWaters	Precalculus Essentials	<input checked="" type="checkbox"/>	Pearson	2014
2.		<input type="checkbox"/>		

**Required Additional Supplies and Materials** (*Software, hardware, tools, specialized clothing, etc.*)

A graphing calculator (without a computer algebraic system) is required.

**Typical Evaluation Methods and Weighting**

Final exam:	40%	Assignments:	10%	Field experience:	%	Portfolio:	%
Midterm exam:	%	Project:	%	Practicum:	%	Other:	%
Quizzes/tests:	50%	Lab work:	%	Shop work:	%	Total:	100%

**Details (if necessary):** Students must achieve at least 40% on the final exam in order to receive credit for this course.

**Typical Course Content and Topics**

- I. Basic concepts of algebra:
  1. Brief review of real numbers and set and interval notations
  2. Exponential, radicals, and rational exponents
  3. Solving equations and inequalities
  4. System of 2 equations
- II. Graphs and functions:
  1. Basic definitions, function notation, domain, range
  2. Graphs of equations and functions
  3. Linear functions, equations, and inequalities
  4. Difference quotient and average rate of change
  5. Transformations of functions and graphs
  6. Combining and compositions of functions
  7. Inverse functions
- III. Polynomial and rational functions:
  1. Quadratic functions
  2. Polynomial functions
  3. Remainder and factor theorems
  4. Rational functions
- IV. Exponential and logarithmic functions:
  1. Exponential functions
  2. Logarithmic functions
  3. Rules of logarithms
  4. Exponential and logarithmic equations and inequalities
- V. Trigonometric functions:

1. Angles and their measure and relationship
  2. Unit circle and trigonometric functions
  3. Graphs of the trigonometric functions
  4. Inverse trigonometric functions
  5. Right-triangle trigonometry
  6. Trigonometric identities including sum, difference, and reduction formulas
- VI. Other topics, as time permits:
1. Applications of the above topics
  2. Sequences, series
  3. Introduction to instantaneous rate of change