

## 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 123		<b>Number of Credits:</b> 3																	
<b>Course Full Title:</b> Everyday Math and Stats																			
<b>Course Short Title (if title exceeds 30 characters):</b>																			
<b>Faculty:</b> Science		<b>Department (or program if no department):</b> Math & Stats																	
<b>Calendar Description:</b>																			
Designed for Arts and General Studies students, and anyone interested in the beauty and practical applications of mathematics and statistics in daily life. Critical thinking, problem solving, models of growth, everyday geometry, rates and percentages, normal distribution, linear regression, personal finance.																			
Note: Students with credit for MATH 105 cannot take this course for further credit.																			
<b>Prerequisites (or NONE):</b>		One of the following: (C or better in one of Principles of Mathematics 11, Applications of Mathematics 11, MATH 085, Foundations of Mathematics 11, or Pre-Calculus 11) or (B or better in Apprenticeship and Workplace Mathematics 12) or (one of Foundations of Mathematics 12, Pre-Calculus 12, Principles of Mathematics 12, or Applications of Mathematics 12) or (any MATH or STAT course numbered 094 or higher) or (45 university-level credits with department permission).																	
<b>Corequisites (if applicable, or NONE):</b>																			
<b>Pre/corequisites (if applicable, or NONE):</b>																			
<b>Equivalent Courses (cannot be taken for additional credit)</b>		<b>Transfer Credit</b>																	
Former course code/number:		Transfer credit already exists: <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No																	
Cross-listed with:		Transfer credit requested (OReg to submit to BCCAT):																	
Equivalent course(s):		<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No (if yes, fill in transfer credit form)																	
<i>Note: Equivalent course(s) should be included in the calendar description by way of a note that students with credit for the equivalent course(s) cannot take this course for further credit.</i>		Resubmit revised outline for articulation: <input type="checkbox"/> Yes <input type="checkbox"/> No																	
		To find out how this course transfers, see <a href="http://bctransferguide.ca">bctransferguide.ca</a> .																	
<b>Total Hours: 45</b>		<b>Special Topics</b>																	
<b>Typical structure of instructional hours:</b>		Will the course be offered with different topics?																	
<table border="1"> <tr> <td>Lecture hours</td> <td>40</td> </tr> <tr> <td>Seminars/tutorials/workshops</td> <td></td> </tr> <tr> <td>Laboratory hours</td> <td>5</td> </tr> <tr> <td>Field experience hours</td> <td></td> </tr> <tr> <td>Experiential (practicum, internship, etc.)</td> <td></td> </tr> <tr> <td>Online learning activities</td> <td></td> </tr> <tr> <td>Other contact hours:</td> <td></td> </tr> <tr> <td><b>Total</b></td> <td><b>45</b></td> </tr> </table>		Lecture hours	40	Seminars/tutorials/workshops		Laboratory hours	5	Field experience hours		Experiential (practicum, internship, etc.)		Online learning activities		Other contact hours:		<b>Total</b>	<b>45</b>	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	
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		If yes, different lettered courses may be taken for credit:																	
		<input type="checkbox"/> No <input type="checkbox"/> Yes, repeat(s) <input type="checkbox"/> Yes, no limit																	
		<i>Note: The specific topic will be recorded when offered.</i>																	
		<b>Maximum enrolment (for information only): 28</b>																	
		<b>Expected frequency of course offerings (every semester, annually, every other year, etc.): annually</b>																	
<b>Department / Program Head or Director:</b> Ian Affleck		<b>Date approved:</b> June 2016																	
<b>Faculty Council approval</b>		<b>Date approved:</b> June 2016																	
<b>Campus-Wide Consultation (CWC)</b>		<b>Date of posting:</b> July 29, 2016																	
<b>Dean/Associate VP:</b>		<b>Date approved:</b> June 2016																	
<b>Undergraduate Education Committee (UEC) approval</b>		<b>Date of meeting:</b> December 16, 2016																	

**Learning Outcomes**

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

1. Analyze arguments, test argument validity, and construct counterexamples to invalid arguments.
2. Apply problem solving strategies.
3. Estimate calculations to roughly judge the value of a quantity.
4. Evaluate rates, proportions and percentages.
5. Model data with linear, quadratic, exponential, and logarithmic functions.
6. Differentiate between basic geometric concepts (point, line, plane).
7. Identify geometric measures (length, area, volume, angle).
8. Calculate basic probabilities.
9. Display, summarize, analyze and interpret statistical data.
10. Calculate descriptive statistics.
11. Find correlation and apply linear regression model to a given set of data.
12. Calculate simple and compound interest on investments.
13. Calculate present and future values of investments.
14. Calculate monthly payments, mortgages and loans.
15. Apply the above skills and tools to model real-world situations and phenomena to make predictions and sound decisions.

**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, presentations, online text support; may be team-taught by a mathematician and statistician.

**Grading system:** Letter Grades:  Credit/No Credit:       Labs to be scheduled independent of lecture hours: Yes  No

**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)**

	Author (surname, initials)	Title (article, book, journal, etc.)	Current ed.	Publisher	Year
1.	K. Denley & M. Hall	Viewing Life Mathematically: A Pathway to Quantitative Literacy	<input checked="" type="checkbox"/>	Hawkes	2016
2.	J.I. Brown	Mathematics for the Liberal Arts	<input checked="" type="checkbox"/>	CRC Press	2015
3.			<input type="checkbox"/>		
4.			<input type="checkbox"/>		
5.			<input type="checkbox"/>		

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

Graphing calculator (eg, TI-84+), spreadsheet software (eg, Excel)

**Typical Evaluation Methods and Weighting**

Final exam	40% (or 30%)	Assignments:	20%	Midterm exam:	%	Practicum:	%
Quizzes/tests:	40%	Lab work:	%	Field experience:	%	Shop work:	%
Presentations (opt'l)	0% (or 10%)	:	%	:	%	Total:	100%

**Details (if necessary):** Optional essay and presentations in lieu of a portion of the final exam weighting. In order to pass the course, a student must achieve 40% or higher on the final exam or on the portion of the grade generated by the final exam and the presentation.

**Typical Course Content and Topics**

1. Critical thinking and problem solving
  - thinking mathematically
  - problem solving processes and techniques
  - estimating and evaluating
2. Rates, ratios, proportions and percentages
  - rates and unit rates
  - proportions, ratios
  - absolute and percentage changes
  - unit conversions (egs: currency, mileage, weight)
3. Mathematics of growth: models and predictions
  - the language of functions
  - linear growth

- quadratic models
  - exponential growth
  - logarithmic growth
4. Everyday geometry:
- lines, planes, angles
  - parallel and perpendicular lines
  - perimeters, areas, volumes
5. Probability and statistics:
- collecting and displaying data with graphs and charts
  - describing and analyzing data
  - calculating means, medians, and standard deviations
  - calculate basic probabilities
  - the normal distribution
  - linear regression and correlations
6. Personal finance:
- understanding personal finance
  - understanding simple and compound interest
  - savings and retirement funds
  - borrowing, mortgages and loans
7. As time permits, an optional topic to be chosen from the following:
- sports statistics
  - graph theory (trees, matchings, networks)
  - number theory (prime numbers, modular arithmetic, cryptography)
  - mathematics in art (planar symmetries, tilings, isometries)
  - voting and social choice (fairness, apportionment, weighted voting systems)

Students will have an option to write an essay and give a presentation on an interesting topic of their choice. Some examples of topics related to issues in Mathematics or Statistics include:

- Mathematics in architecture
- Mathematics in art (sculpture, textiles, different geometries)
- Game theory (probability, expectation)
- Famous math problems (math in the news)
- Logic games
- Mathematics in nature (fractal geometry, crystals)
- Mathematics and music (harmonies, ratios, logarithms and musical intervals)
- Opinion polls (margin of error, 19 times out of 20)
- Design of experiments (placebo effect, double-blind tests)
- Indigenous mathematics (patterns in art and weaving, 8way math, drum making)