

Changing Math Admission Requirements For Lambton College Advanced Diploma Technology Programs

THERE AND BACK AGAIN

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Grade 12 Math Courses

- University Stream

- MCV4U Calculus and Vectors
- MHF4U Advanced Functions
- MDM4U Mathematics of Data Management

- College Stream

- MCT4C Mathematics for College Technology
- MAP4C Foundations for College Mathematics
 - Previously called College and Apprenticeship Mathematics

Background

- Three year advanced diploma technology programs at Lambton
 - Chemical Production & Power Engineering Technology (CPET)
 - Instrumentation & Control Engineering Technology (ICET)
 - Power Engineering Technology (PETC)
- Admission Requirements:

O.S.S.D. or equivalent with:

Grade 12 Mathematics C or U

Grade 12 English C or U

Grade 11 or 12 Chemistry C or U or Grade 11 or 12 Physics C or U (both recommended, only one is required)

Please Note: Grade 12 Mathematics for College Technology or any grade 12U mathematics is recommended; Grade 12 Foundations for College Mathematics (MAP4C) minimum final grade is 60%. If the program is oversubscribed, students with Grade 12 Mathematics for College Technology or any Grade 12U mathematics will be given preference.

- 2007 - now
- MAP4C previously had not been included as an option

Math Courses

| MTH1105 Term 1 - all | MTH2105 Term 2 - all | MTH3103 Term 3/4 – ICET & PETC | MTH4404 Term 7 - ICET |
|---|---|--|---|
| <ul style="list-style-type: none"> • Arithmetic of Real Numbers • Unit Conversions • Ratios, Proportions, and Variation • Linear and Polynomial Functions • Systems of Equations • Exponents, Radicals, and Logarithms • Trigonometric Functions • Vectors • Complex Numbers | <ul style="list-style-type: none"> • Exponential and Logarithmic Functions • Graphing Functions • Derivatives of Polynomial, Power, and Rational Functions • Derivatives of Trigonometric, Exponential, and Logarithmic Functions • Derivative Applications (related rates, optimization, etc.) • Partial Derivatives • Statistics and Probability • Regression | <ul style="list-style-type: none"> • Integration of Polynomial Functions • Methods of Integration (algebraic substitution, partial fractions, etc.) • Integration of Trigonometric, Exponential, and Logarithmic Functions • Integration Applications • Binomial Distributions • Normal Distributions • Sampling Distributions and Confidence Intervals • Hypothesis Testing | <ul style="list-style-type: none"> • Sequences and Series • Maclaurin/Taylor Series • Fourier Series • Differential Equations • Forecasting • Statistical Process Control • System Reliability |

Note: Pre-2015, all programs took MTH3103. Above curriculum is being revised.

College Math Project (CMP) Findings

- Began in 2006 as joint venture between York University and Seneca College
- Studied college students' high school math courses and their achievement in their first term college math course
- Became the College Student Achievement Project (CSAP), studying math and language achievement at all 24 colleges
- Annual reports consistently showed MAP4C did not adequately prepare many students for success in college math
 - Technology students in particular

Fall 2011 College Achievement by Entry Course and Grade (All Programs)

COLLEGE STUDENT ACHIEVEMENT PROJECT

Final Report 2013

Good Grades – 60% (C-) or above

At Risk – below 60% (D, F, or W) and considered to be “at risk” of completing their college program

CSAP/PREC

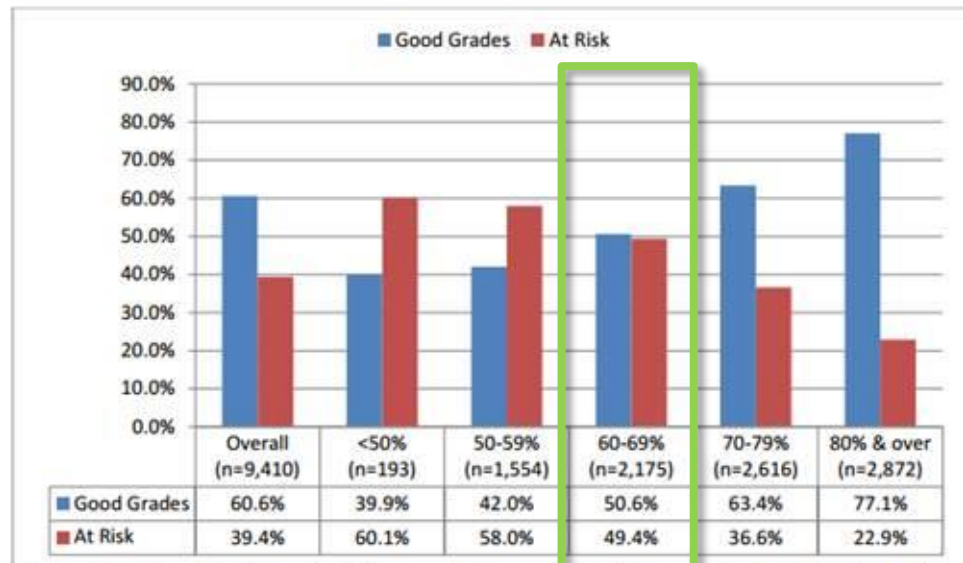


Figure 2.8: College Mathematics Achievement by Level of Achievement in MAP4C, Fall 2011²⁰

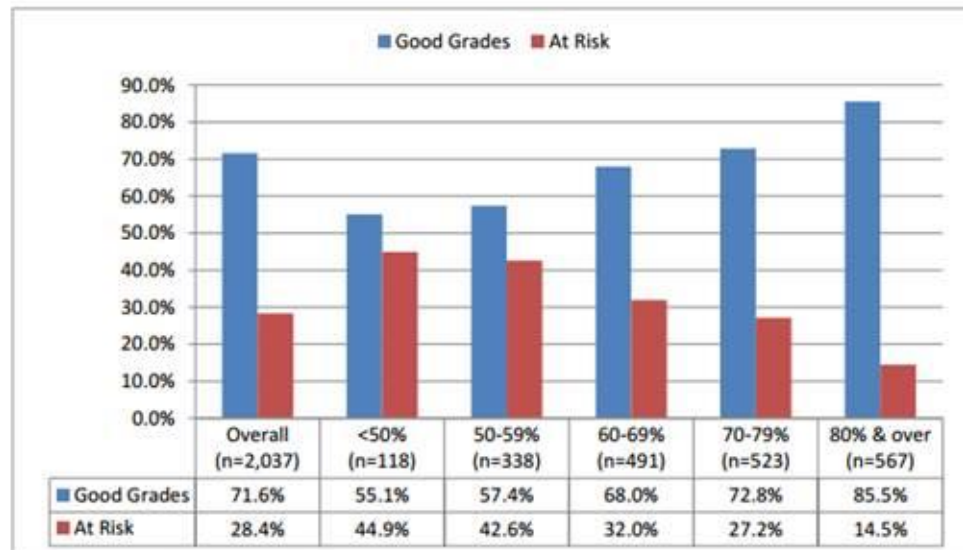
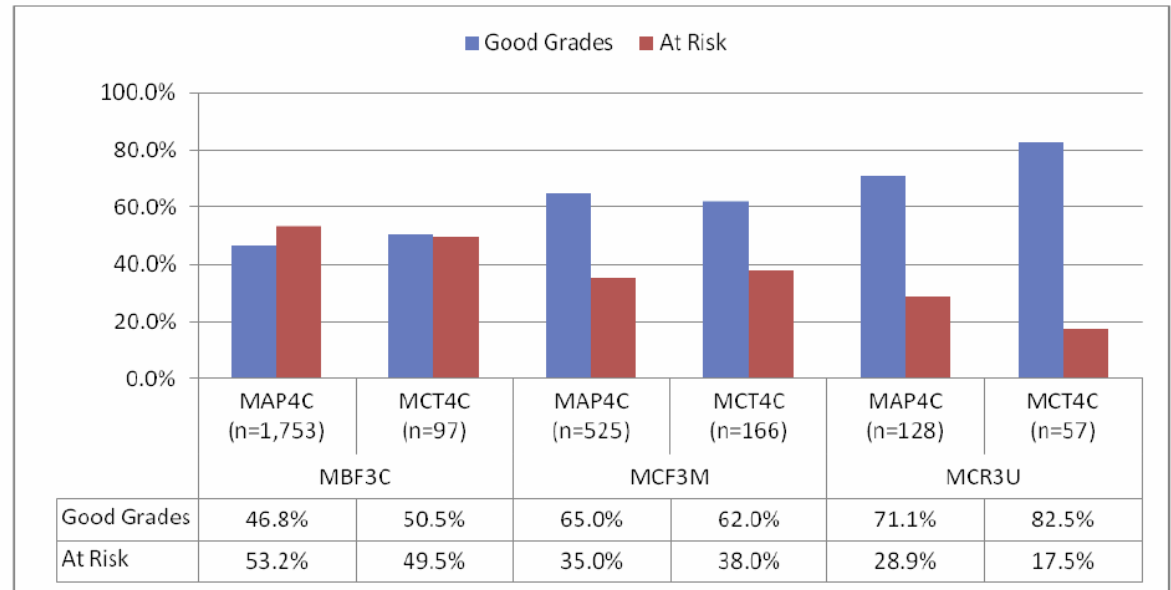


Figure 2.9: College Mathematics Achievement by Level of Achievement in MCT4C, Fall 2011²¹

(Full report available at <http://csap.senecacollege.ca>)

Achievement of Students with Different Grade 11 and 12 Course Combinations (Technology Programs)

COLLEGE MATHEMATICS
PROJECT 2008 FINAL
REPORT



Mathematics Grades at Secondary School and College (Technology Programs)

| Course | SCHOOL MATH ACHIEVEMENT | | COLLEGE MATH ACHIEVEMENT (TECHNOLOGY PROGRAMS) | | | |
|--------|-------------------------|---------------|--|-------|---------|-------|
| | Course Marks | # of Students | GOOD GRADES | | AT RISK | |
| MAP4C | 80% and over | 859 | 622 | 72.4% | 237 | 27.6% |
| | 70-79% | 755 | 426 | 56.4% | 329 | 43.6% |
| | 60-69% | 732 | 333 | 45.5% | 399 | 54.5% |
| | 50-59% | 645 | 236 | 36.6% | 409 | 63.4% |
| | Overall | 3,159 | 1,687 | 53.4% | 1,472 | 46.6% |
| MCT4C | 80% and over | 156 | 122 | 78.2% | 34 | 21.8% |
| | 70-79% | 136 | 99 | 72.8% | 37 | 27.2% |
| | 60-69% | 104 | 60 | 57.7% | 44 | 42.3% |
| | 50-59% | 95 | 51 | 53.7% | 44 | 46.3% |
| | Overall | 547 | 361 | 66.0% | 186 | 34.0% |

(Full report available at <http://collegemathproject.senecac.on.ca/cmp/>)

Results at Lambton

Mean MTH1105 GPA by Entry Course Grade 2010-2012

- Includes data from approximately 450 students
- MAP4C – 29.6%
- MCT4C – 17.0%
- Does not include students who withdrew

GPA Breakdown

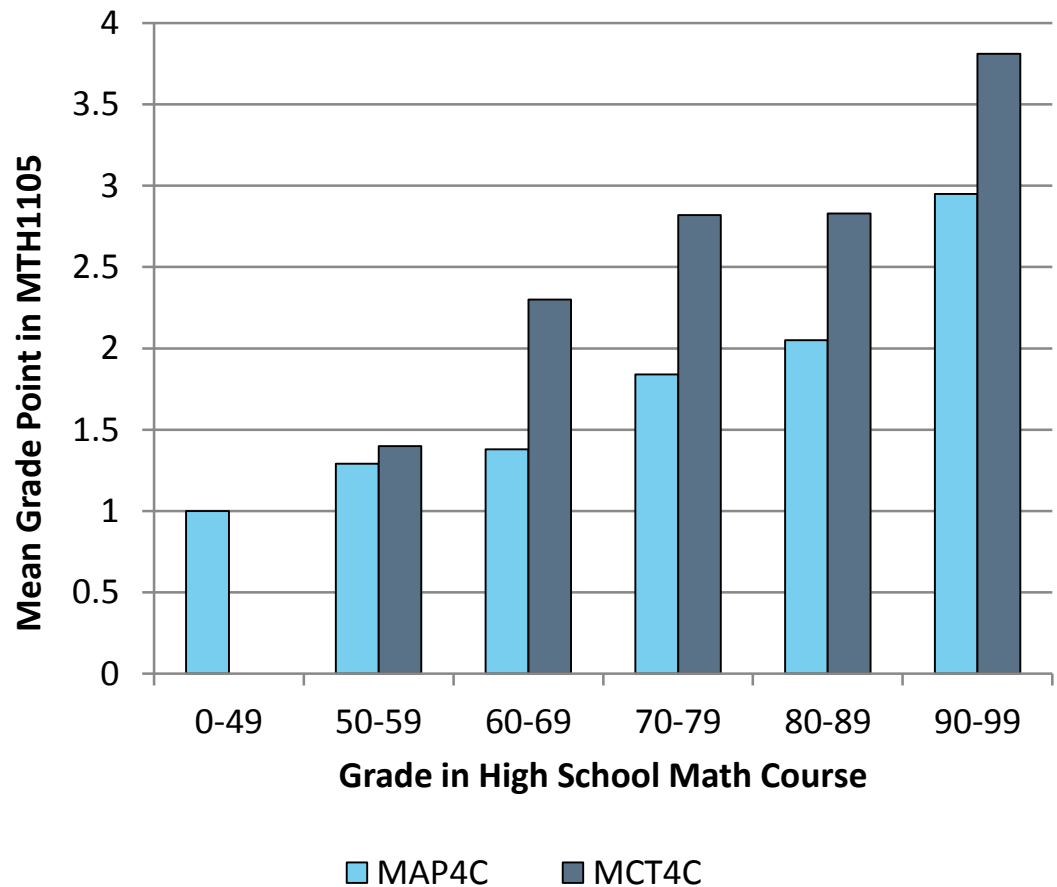
4.0 – A (86-100%)

3.0 – B (73-76%)

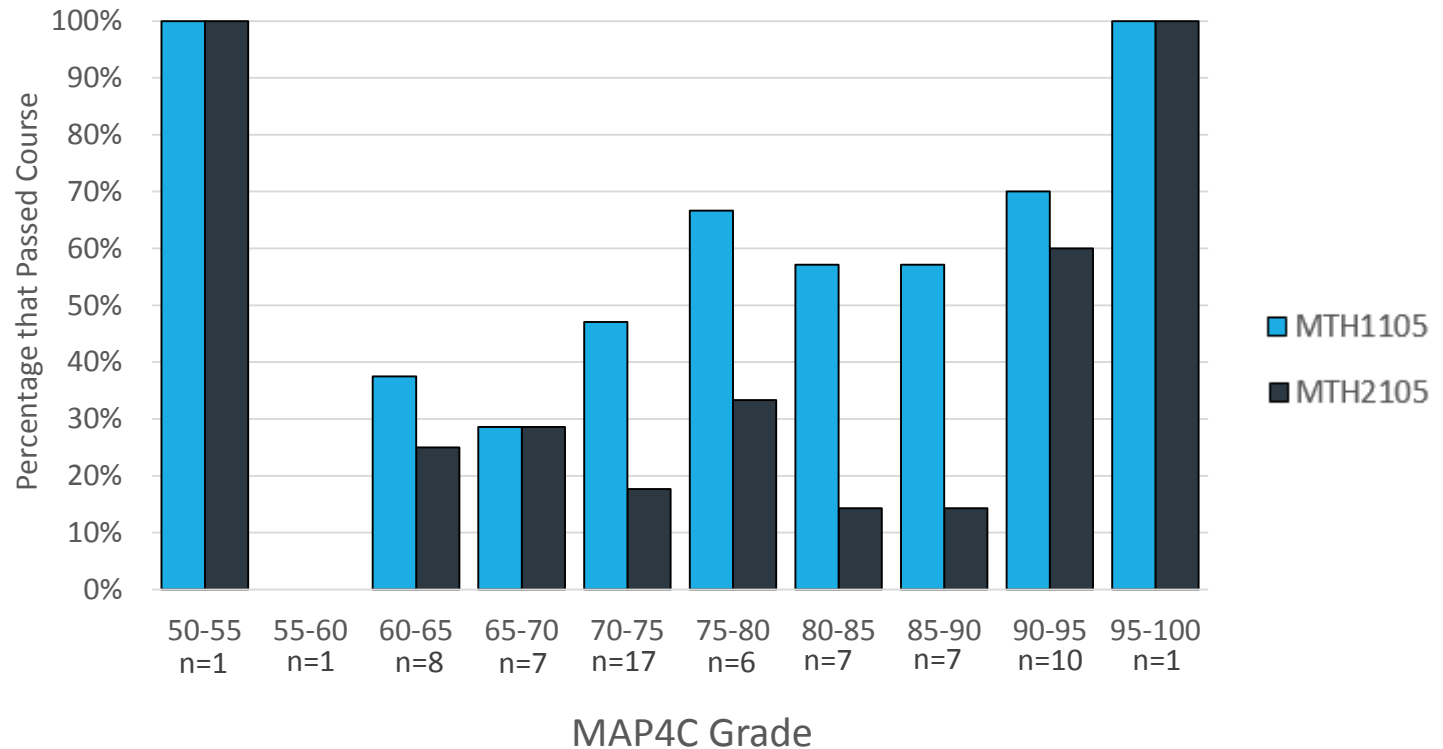
2.0 – C (63-66%)

1.0 – D (50-59%)

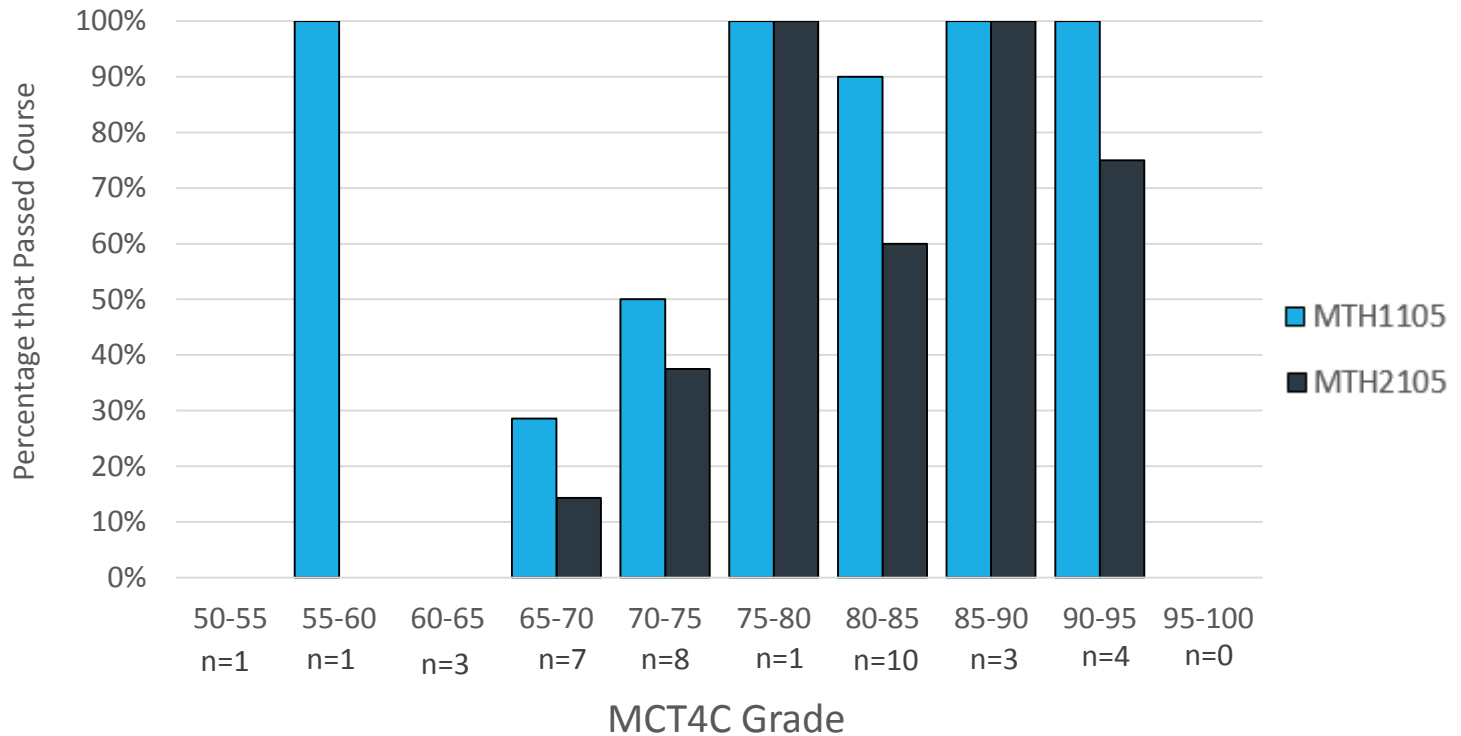
0.0 – F (0-49%)



MAP4C Success Rates in MTH1105 and MTH2105 for F14/W15



MCT4C Success Rates in MTH1105 and MTH2105 for F14/W15



Taking Action

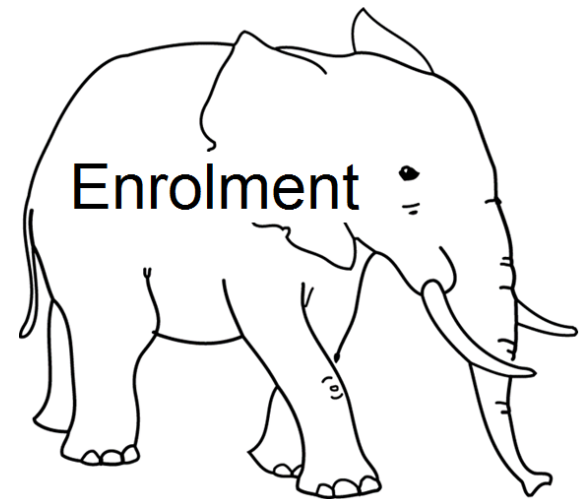
- 2008 - Discussed CMP results with the Dean of Technology and program coordinators
- May 2009 - Ontario College Mathematics Council (OCMC – formerly Heads of Math) recommendation to Heads of Technology
 - - “...that all Ontario colleges adopt MCT4C as the minimum mathematics entrance requirement for all technology programs.”
- 2013 – collected and analyzed historical grade data
- 2014 – collected and analyzed recent grade data
- January 2015 – program coordinators unanimously agreed to raise MAP4C and MDM4U admission requirement to 70% minimum
 - To be brought to Program Advisory Councils
- May 2015 - collected and analyzed even more recent grade data
- January 2016 – compiled admission requirements at other colleges

Math Admission Requirements at Other Colleges

- Looked at 16 Ontario colleges with similar programs
- Eight accept MAP4C unconditionally
- One does not accept MAP4C
- Variety of conditions at the other seven colleges
 - grade of 60% or higher (same as Lambton)
 - grade of 60% or higher with an additional prep math course
 - grade of 65% or higher
 - grade of 80% or higher, and students with a lower grade can write a pre-admission assessment test
 - post-admission assessment test and may need to complete an upgrading math course
 - MAP4C applicants considered after they complete a math admission test
 - May receive alternate offer to a pre-technology program
 - “minimum grade required” but not stipulated

Challenges

- MAP4C is the easier path to college
- Not all high schools offer MCT4C
- Perception that students going to college don't need a strong math background
- Gathering relevant data
- Turnover in administration and program coordinators
 - 5 Deans, and 4 VP Academics since 2008
- Time required to make a change
 - Administrative processes
 - Sufficient lead time for current H.S. students



Questions?

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