Course Outline

School:	Eng. Tech. & Applied Science
Department:	Mathematics and Physics
Course Title:	Functions & Number Systems
Course Code:	MATH 175
Course Hours/Credits:	42
Prerequisites:	N/A
Co-requisites:	N/A
Eligible for Prior Learning, Assessment and Recognition:	Yes
Originated by:	Kieh Wong, Tapan Rai
Creation Date:	Fall 2012
Revised by:	Najam Khaja
Revision Date:	Summer 2020
Current Semester:	Fall 2024
Approved by:	

Clarence Cheung, Associate Dean/Dean,
Eng. Tech. & Applied Science

Students are expected to review and understand all areas of the course outline.

Retain this course outline for future transfer credit applications. A fee may be charged for additional copies.

This course outline is available in alternative formats upon request.

Acknowledgement of Traditional Lands

Centennial is proud to be a part of a rich history of education in this province and in this city. We acknowledge that we are on the treaty lands and territory of the Mississaugas of the Credit First Nation and pay tribute to their legacy and the legacy of all First Peoples of Canada, as we strengthen ties with the communities we serve and build the future through learning and through our graduates. Today the traditional meeting place of Toronto is still home to many Indigenous People from across Turtle Island and we are grateful to have the opportunity to work in the communities that have grown in the treaty lands of the Mississaugas. We acknowledge that we are all treaty people and accept our responsibility to honor all our relations.

Course Description

This is a mathematics course dealing with number systems and functions. Students will learn about the fundamentals of algebra, matrices, solving systems of linear equations, and sequences and series. Student will also be familiarized with computer arithmetic involving binary, octal, and hexadecimal bases.

External Standard Information (ESI)

N/A

Program Outcomes

N/A

Course Learning Outcomes

The student will reliably demonstrate the ability to:

1. Perform operations on and with real, rational, and irrational numbers.
2. Perform arithmetic operations in the binary, octal, and hexadecimal systems.
3. Solve linear and quadratic equations using various methods.
4. Simplify algebraic expressions using the properties of exponents.
5. Factor algebraic expressions using common factors, trinomial factoring, differences of squares and grouping.
6. Solve systems of linear equations algebraically and with matrices
7. Evaluate and graph linear, trigonometric, exponential and logarithmic functions.
8. Find specific terms of sequences and the sums of series.

Essential Employability Skills (EES)

The student will reliably demonstrate the ability to*:

1. Communicate clearly, concisely and correctly in the written, spoken, and visual form that fulfills the purpose and meets the needs of the audience.
3. Execute mathematical operations accurately.
4. Apply a systematic approach to solve problems.

**There are 11 Essential Employability Skills outcomes as per the Ministry Program Standard. Of these 11 outcomes, the following will be assessed in this course.*

New Essential Skills (NES)

N/A

Global Citizenship and Equity (GC&E) Outcomes

N/A

Text and Other Instructional/Learning Materials

Text Book(s):

Mathematical Ideas, 15th edition by Miller, Heeren & Hornsby. Addison-Wesley.
Accessible through the LMS (access code will be distributed by the instructor).

Online Resource(s):

Math175 Supplementary Problems (Posted on the LMS)
MyMathLab Access (needed for Quizzes & Tests).

Evaluation Scheme

- Test 1: 6.1, 6.2, 6.3, 6.4, 4.4, Supplement - Computer Arithmetic
- Test 2: 7.1, 7.3, 7.5, 7.6, 7.7
- Test 3: 8.7, 8 Ext, 8.1, 8.4, 8.6, Supplement
- Quizzes: 3 major (3@5% each)
  & 10 weekly quizzes (10%)

Evaluation Name	CLO(s)	EES Outcome(s)	NES Outcome(s)	GCE Outcome(s)	Weight/ 100
Test 1	1, 2	1, 3, 4			25
Test 2	3, 4, 5	1, 3, 4			25
Test 3	6, 7, 8	1, 3, 4			25
Quizzes	1, 2, 3, 4, 5, 6, 7, 8	1, 3, 4			25
Total					100%

If students are unable to write a test they should immediately contact their professor or program Associate Dean for advice. In exceptional and well documented circumstances (e.g. unforeseen family problems, serious illness, or death of a close family member), students may be able to write a make-up test.

All submitted work may be reviewed for authenticity and originality utilizing College approved plagiarism prevention software. Students who do not wish to have their work submitted to College approved plagiarism prevention software must, by the end of the second week of class, communicate this in writing to the instructor and make mutually agreeable alternate arrangements.

When writing tests, students must be able to produce official Centennial College photo identification or they may be refused the right to take the test or test results will be void.

Tests or assignments conducted remotely may require the use of online proctoring technology where the

student’s identification is verified and their activity is monitored and/or recorded, both audibly and visually through remote access to the student's computer and web camera. Students must communicate in writing to the instructor as soon as possible and prior to the test or assignment due date if they require an alternate assessment format to explore mutually agreeable alternatives.

Student Accommodation

The Centre for Accessible Learning and Counselling Services (CALCS) (http://centennialcollege.ca/calcs) provides programs and services which empower students in meeting their wellness goals, accommodation and disability-related needs. Our team of professional psychotherapists, social workers, educators, and staff offer brief, solution-focused psychotherapy, accommodation planning, health and wellness education, group counselling, psycho-educational workshops, adaptive technology, and peer support. Walk in for your first intake session at one of our service locations (Ashtonbee Room L1-04, Morningside Room 190, Progress Room C1-03, The Story Arts Centre Room 285, Downsview Room 105) or contact us at calcs@centennialcollege.ca, 416-289-5000 ext. 3850 to learn more about accessing CALCS services.

Use of Dictionaries

- Dictionary use is not permitted in test or examination settings.

Program or School Policies

Testing:

a) No additional time will be allowed for any student who comes late to any test.

b) No student will be allowed to leave during the first half-hour of any test. No student will be allowed to write after the first half hour has elapsed.

c) Unless otherwise stated, no written or other aids may be used during tests. Any student who is found using or having used unauthorized aids will be given a mark of zero for that test. Furthermore, a final grade of “F” may be given in this course. Every incident of cheating will be reported to the Campus Inquiry Officer and may entail serious consequences.

d) There will be no rewrites of term tests (or exams where applicable).

e) If a particular test cannot be written because of documented medical or compassionate reasons, a makeup test will be scheduled. A mark of zero will be recorded in all cases where no reason (medical and other similar extenuating circumstances must be supported by official documentation) is provided within 5 business days of the date of the evaluation.

f) Tests or quizzes conducted remotely may require the use of online proctoring technology where the student’s identification is verified and their activity is monitored and/or recorded, both audibly and visually through remote access to the student's computer and web camera. Further details on remote testing will be provided by the professor prior to the evaluation.

g) All classroom instruction (that require calculators) will be based on the Sharp EL-520 or EL-531X. During tests and examinations, students may use an equivalent scientific calculator; however, programmable and/or graphing calculators are prohibited. No other electronic devices will be permitted.

Quizzes:

a) Quizzes can consist of online, in-class announced/unannounced quizzes and/or take home quizzes

(assignments).

b) Attendance for classes is mandatory since unannounced quizzes can be given.

c) Dates for announced quizzes will be communicated in class.

d) There are no makeups for quizzes/assignments missed or extension of deadlines for online quizzes.

Course Policies

N/A

College Policies

Students should familiarize themselves with all College Policies that cover academic matters and student conduct.

All students and employees have the right to study and work in an environment that is free from discrimination and harassment and promotes respect and equity. Centennial policies ensure all incidents of harassment, discrimination, bullying and violence will be addressed and responded to accordingly.

Academic Honesty

Academic honesty is integral to the learning process and a necessary ingredient of academic integrity. Forms of academic dishonesty include cheating, plagiarism, and impersonation, among others. Breaches of academic honesty may result in a failing grade on the assignment or course, suspension, or expulsion from the college. Students are bound to the College's AC100-11 Academic Honesty and Plagiarism policy.

To learn more, please visit the Libraries information page about Academic Integrity https://libraryguides.centennialcollege.ca/academicintegrity and review Centennial College's Academic Honesty Module: https://myappform.centennialcollege.ca/ecentennial/articulate/Centennial_College_Academic_Integrity_Module_%202/story.html

Use of Lecture/Course Materials

Materials used in Centennial College courses are subject to Intellectual Property and Copyright protection, and as such cannot be used and posted for public dissemination without prior permission from the original creator or copyright holder (e.g., student/professor/the College/or third-party source). This includes class/lecture recordings, course materials, and third-party copyright-protected materials (such as images, book chapters and articles). Copyright protections are automatic once an original work is created, and applies whether or not a copyright statement appears on the material. Students and employees are bound by College policies, including AC100-22 Intellectual Property, and SL100-02 Student Code of Conduct, and any student or employee found to be using or posting course materials or recordings for public dissemination without permission and/or inappropriately is in breach of these policies and may be sanctioned.

For more information on these and other policies, please visit www.centennialcollege.ca/about-

centennial/college-overview/college-policies.

Students enrolled in a joint or collaborative program are subject to the partner institution's academic policies.

PLAR Process

This course is eligible for Prior Learning Assessment and Recognition (PLAR). PLAR is a process by which course credit may be granted for past learning acquired through work or other life experiences. The PLAR process involves completing an assessment (portfolio, test, assignment, etc.) that reliably demonstrates achievement of the course learning outcomes. Contact the academic school to obtain information on the PLAR process and the required assessment.

Semester:	Fall 2024	Professor(s) Name:	Samir Mansur
Section Code:	002, 402, 403	Contact Information:	smansur1@my.centennialcollege.ca
Meeting Time & Location:	Section 002: Monday 8:30 am - 9:20 am, Tuesday 12:30 pm - 2:20 pm Section 402: Tuesday 10:30 am - 11:20 am, Thursday 10:30 am - 12:20 pm Section 403: Wednesday 10:30 am - 12:20 pm, Friday 11:30 am - 12:20 pm	Office Hours:	To be announced in class
Last Date to Drop Course:	11/8/2024	Delivery Method:	Online Synchronous

Topical Outline (subject to change):

ORIGINAL TOPICAL

Week	Topics	Readings/Materials	Weekly Learning Outcome(s)	Instructional Strategies	Evaluation Name and Weight	Evaluation Date
1	Real Numbers, Order & Absolute Value Operations and properties of Real Numbers	6.1 6.2	Perform operations on and with real numbers.	Lecture, Sample problems,Practice		
2	Rational Numbers and their Decimal Representation Irrational Numbers and their Decimal Representation	6.3 6.4	Perform operations on and with rational numbers. Perform operations on and with irrational numbers.	Lecture, Sample problems, Practice	Weekly Quiz (1%)	
3	The binary, octal, and hexadecimal systems; Conversion between bases	4.4	Convert between different Number bases.	Lecture, Sample problems, Practice	Major Quiz 1 (5%) Weekly Quiz (1%)	9/20/2024
4	Addition and subtraction in binary,Binary Coded Decimals (BCD)	Supplement	Perform arithmetic operations in the binary. Convert between Decimals and Binary Coded Decimals	Lecture, Sample problems, Practice Review for Test 1	Weekly Quiz (1%)	
5	Review for Test 1	Supplement	Review all the topics for Test 1	Lecture, Sample problems, Practice	Test 1 (25%)	10/4/2024
6	Linear Equation. Ratio and Proportion	7.1 7.3	Solve linear equations by algebraic method. Solve problems with ratio and proportion.	Lecture, Sample problems, Practice	Weekly Quiz (1%)	

Week	Topics	Readings/Materials	Weekly Learning Outcome(s)	Instructional Strategies	Evaluation Name and Weight	Evaluation Date
	Properties of Exponents	7.5	Apply the properties of exponents.			
7	Scientific Notation. Polynomials; Common factoring & factoring quadratic binomials	7.5 7.6	Convert between scientific and standard notation. Perform operations on and with polynomials. Factor polynomial expressions using a variety of methods (common factoring, grouping, difference of squares)	Lecture, Sample problems, Practice	Major Quiz 2 (5%) Weekly Quiz (1%)	10/18/2024
8	Factoring quadratic trinomials. Quadratic Equations	7.6 7.7	Factor quadratic trinomials. Solve quadratic equations by factoring, and by using the quadratic formula.	Lecture, Sample problems,Practice	Weekly Quiz (1%)	
9	Review for Test 2	Supplement	Review all the topics for Test 2	Problem solving, Class Discussion	Test 2 (25%)	11/8/2024
10	Systems of Linear Equations. Matrices and Solving Systems of Equations	8.7 Ch 8 Extension	Solve two-variable systems of linear equations algebraically. Solve 2- and 3- variable systems of linear equations using matrices (Gauss-Jordan method).	Lecture, Sample problems,Practice	Weekly Quiz (1%)	
11	The Rectangular Coordinate System; Circles; Distance; Midpoint Introduction to Functions and Relations; Domain and Range; Function Notation; Linear Functions	8.1 8.4	Calculate distance between 2 points. Calculate the midpoint between 2 points. Write an equation of a circle. Identify relations and functions. Identify the domain and range of a linear function. Evaluate a function.	Lecture, Sample problems,Practice	Weekly Quiz (1%)	
12	Exponential and Logarithmic Functions Basic Trigonometric Functions: Sine and Cosine	8.6 Supplement	Solve logarithmic and exponential equations. Graph sine and cosine functions.	Lecture, Sample problems,Practice	Major Quiz 3 (5%) Weekly Quiz (1%)	11/29/2024
13	Sequences and Series	Supplement	Find the term and sum of sequences and series, respectively.	Lecture, Sample problems,Practice	Weekly Quiz (1%)	
14	Review for test 3	Supplement	Review all the topics for Test 3.	Problem solving, Class Discussion	Test 3	12/13/2024