Course Outline

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.

Course Description

This is a first-year mathematics course in discrete mathematics. The course will deal with combinatorics, discrete probability, set theory, logic and Boolean algebra. Elementary number theory will also be covered.

Program Outcomes

N/A

Course Learning Outcomes

The student will reliably demonstrate the ability to:

1. Apply the concepts of set theory in solving problems.
2. Solve problems using modular arithmetic.
3. Solve combinatorial problems using lists, the fundamental counting principle, permutations and combinations.
4. Solve probability problems involving various events.
5. Translate statements and arguments into symbolic logic.
6. Use Truth tables to analyze arguments.
7. Simplify Boolean expressions using the properties of Boolean Algebra and De Morgan's laws.

Essential Employability Skills (EES)

The student will reliably demonstrate the ability to*:

3. Execute mathematical operations accurately.
4. Apply a systematic approach to solve problems.
5. Use a variety of thinking skills to anticipate and 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.

Global Citizenship and Equity (GC&E) Outcomes

N/A

Text and other Instructional/Learning Materials

Text Book(s):

Mathematical Ideas, 12th Edition, by Miller, Heeren & Hornsby. Addison-Wesley.

Note: Students may choose to purchase an e-text version with MyMathLab access

ISBN (Print): 0132849860   ISBN (E-text): 0132845571.

Online Resource(s):

MyMathLab Access (for Quizzes)

Material(s) required for completing this course:

Math185 Supplementary Problems (Available on eCentennial)

Recommended Calculator: Sharp EL 520

Evaluation Scheme

⇨ Test 1: 1.1, 1.2, 1.3, 2.1, 2.2, 2.3, 2.4
   4 ext, 5.1, 5.4, 5 ext

⇨ Test 2: 10.1, 10.2, 10.3, 10.5
   11.1, 11.2, 11.3, 11 Ext

⇨ Test 3: 3.1, 3.2, 3.3, 3.4, 3.6
   Boolean Algebra (Supplement)

⇨ Quizzes: 3 in-class quizzes (3@5% each)&
   10% for online quizzes

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

If students are unable to write a test they should immediately contact their professor or program Chair 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 Turnitin®. Students who do not wish to have their work submitted to Turnitin® 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 College photo identification or they may be refused the right to take the test or test results will be void.

Student Accommodation

It is College Policy to provide accommodation based on grounds defined in the Ontario Human Rights Code. Accommodation may include modifications to standard practices. Students with disabilities who require academic accommodations must register with the Centre for Students with Disabilities. Students requiring accommodation based on other human rights grounds should talk with their professors as early as possible. Please see the Student Accommodation Policy.

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.

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 within 5 business days of the date of the evaluation. A mark of zero will be recorded in all cases where no reason (supported by official documentation) acceptable to the professor is provided within 5 business days of the date of the evaluation.

f) All classroom instruction (that require calculators) will be based on the Sharp EL-520. 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 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 is integral to the learning process and a necessary ingredient of academic integrity. Academic dishonesty includes cheating, plagiarism, and impersonation. All of these occur when the work of others is presented by a student as their own and/or without citing sources of information. Breaches of academic honesty may result in a failing grade on the assignment/course, suspension or expulsion from

the college.

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.

This course outline and its associated weekly topical(s) may not be reproduced, in whole or in part, without the prior permission of Centennial College.

Semester:	Winter 2016	Professor Name:	Najam Khaja
Section Code:	001	Contact Information:	nkhaja@my.centennialcollege.ca
Meeting Time & Location:	Tues 430-620 C3-15/online	Last Date to Drop Course:	3/18/2016
	Thu 1130-1220 E3-18/online		
Delivery Method:	Hybrid-online		

Topical Outline (subject to change):

Week	Topics	Readings/Materials	Weekly Learning Outcome(s)	Instructional Strategies	Evaluation Name	Evaluation Date
1	Problem Solving Strategies - Inductive Reasoning - Strategies for Problem Solving	1.1, 1.2 1.3 2.1	Solve problems using a variety of methods including inductive and deductive reasoning. Identify the next number using inductive reasoning. Designate sets. Calculate cardinality.	Lecture, Examples, Practice		
2	- Venn Diagrams and Subsets - Set Operations - Cardinal Numbers and Surveys	2.2 2.3 2.4	Find the complement, intersection, union, and difference of sets. Find subsets and proper subsets. Represent sets with Venn diagrams. Fill in a Venn diagrams using cardinal numbers	Lecture, Examples, Practice		
3	- Cardinal Numbers and Surveys Mathematical Systems and Number Theory - Clock Arithmetic and Modular Systems - Prime and Composite Numbers - Greatest Common Factor, Least Common Multiple	2.4 4 ext 5.1 5.4	Fill in a Venn diagrams using cardinal numbers. Solve problems using modular arithmetic. Find the prime factorization of composite numbers. Find the greatest common factor and least common multiple of a group of numbers.	Lecture, Examples, Practice	Quiz 1 (5%)	1/28/2016
4	- Modern Cryptography (DHM, RSA)	5 ext	Find the residue. Find the key using the DHM scheme. Apply the RSA scheme in encryption and decryption.	Lecture, Examples, Practice		
5	Review for Test 1 Test 1	Supplement	Review for Test 1	Review Test 1	Test 1	2/11/2016

Week	Topics	Readings/Materials	Weekly Learning Outcome(s)	Instructional Strategies	Evaluation Name	Evaluation Date
6	Counting Methods - Counting by Systematic Listing - The Fundamental Counting Principle - Permutations and Combinations	10.1 10.2 10.3	Apply systematic listing to counting problems. Use the Fundamental Counting Principle. Use permutations and combinations in counting problems.	Lecture, Examples, Practice		
7	- Permutations and Combinations - Counting Problems using Not and Or Discrete Probability - Basic Concepts	10.3 10.5 11.1	Use permutations and combinations in counting problems. Solve counting problems involving "not" and "or." Calculate probability using the theoretical and empirical formula.	Lecture, Examples, Practice	Quiz 2 (5%)	3/3/2016
8	- Events Involving Not and Or - Events Involving And	11.2 11.3	Calculate probability for events involving "not" and "or." Calculate probability for events involving "and." Calculate conditional probability.	Lecture, Examples, Practice		
9	Review for test. Test 2	Supplement	Review for Test 1	Review Test 2	Test 2	3/17/2016
10	Estimating Probability by Simulation Logic and Boolean Algebra - Statements and Quantifiers - Truth Tables and Equivalent Statements	11 ext. 3.1 3.2	Estimate probabilities by simulation. Identify compound statements, logical connectives, and negations. Evaluate the truth value of statements involving conjunctions, disjunctions, and negations. Evaluate statements using truth tables.	Lecture, Examples, Practice		
11	- The Conditional and Circuits - More on The Conditional	3.3 3.4	Evaluate the truth value of conditional statements. Identify the converse, inverse, and contrapositive of a conditional statement. Evaluate the truth value of a biconditional statement.	Lecture, Examples, Practice		
12	- Analyzing Arguments with Truth Tables - Boolean Algebra	3.6 Supplement	Analyze arguments with truth tables and by comparing to the valid/invalid forms. Simplify expression using Boolean algebra.	Lecture, Examples, Practice	Quiz 3 (5%)	4/7/2016
13	Logic Gates	Supplement	Represent Boolean expressions with logic	Lecture, Examples,		

Week	Topics	Readings/Materials	Weekly Learning Outcome(s)	Instructional Strategies	Evaluation Name	Evaluation Date
			diagrams.	Practice		
14	Review for Test 3 Test 3	Supplement	Review for Test 3.	Review Test 3	Test 3	4/21/2016