Computer Science Technology
John Abbott College

201-803-AB
COURSE OUTLINE

GENERAL INFORMATION

Program	Computer Science Technology (Programmer/Analyst)
Course Title	**Mathematics I**
Course Number	**201-803-AB**
Pondération	3 hours lecture and exercises + 2 hours homework (2-1-2)
Number of Credits	1.66
Competencies	Solve computer-related mathematical and statistical problems. 016P.2, 016P.3, 016P.4
Prerequisites	Same as program entry requirements
Semester	**Fall 2018**
Days and Time	

Teacher Information
  Name
  Office
  Phone
  Email
  Website	

Office Hours	

INTRODUCTION

Designed for students of Computer Science Technology, this course covers Boolean algebra, set theory and linear algebra. Topics include Boolean valued expressions, truth tables, induction, set relationships, set operations, matrix operations, and solving systems of linear equations.

COURSE OBJECTIVES

Competency 016P. Solve computer-related mathematical and statistical problems.

Achievement Context
- **Based on situations specific to the computer science field**

Elements of competency		Performance criteria	
016P.2	Perform logic operations.	2.1	Formulation of propositions appropriate for different situations.
		2.2	Construction of a truth table for a proposition.
		2.3	Correct simplification of a proposition.
		2.4	Proper use of the proof-by-induction method.
016P.3	Organize and process data.	3.1	Construction of sets and subsets for different situations.
		3.2	Proper performance of all set operations.
		3.3	Establishment of the proper relations between sets.
		3.4	Formulation of appropriate set expressions reduced to their simplest forms in order to process the data in a given situation.
		3.5	Translation of propositions into set-theory language.
016P.4	Solve linear algebra problems.	4.1	Appropriate representation of a situation as a system of linear equations.
		4.2	Correct performance of matrix operations.
		4.3	Accurate representation of a system of linear equations in a matrix.
		4.4	Application of the correct methods for solving a system of linear equations.

REQUIRED TEXT

 Mathematics for Computer Technology (3rd ed.), Robert N. McCullough, Morton Publishing Co. Cost: Approximately $150

COURSE CONTENT WITH SELECTED EXERCISES

Text: Mathematics for Computer Technology: 3rd edition

The exercises listed below should help you practice and learn the material taught in this course; they form a good basis for homework. Your teacher may supplement this list during the semester. Regular work done as the course progresses should make it easier for you to master the course.

COURSE CONTENT	SELECTED EXERCISES
Counting Principles (14.1 only of Chapter 14)	14.1 1-28 even, 29-38
Introduction to Permutations and Combinations	
Sets (Chap. 8)	8.1 1-6, 17, 21, 23, 25
Set notation	8.2 5-9, 13-15, 19, 23-26, 27-33 odd
Operations on sets	8.3 2, 3, 6, 7, 9, 10, 12, 20, 21-30, 47, 48
Venn diagrams	8.4 5, 6, 7, 8, 9, 13, 14, 21, 23, 24, 38, 40
Basic properties of sets	8.5 1-25 odd, 26-40
Logic and Boolean Algebra (Chaps. 9 &10)	9.1 1-13 odd, 16-42 even
Propositions	9.2 2-18 even, 23, 26, 31, 34-48
Logical connectives and truth tables	9.3 4, 6, 10, 12, 16, 18, 28, 32, 34, 39, 40
Properties of logic and inference	9.4 2, 4, 6, 8, 12, 14, 16, 18, 21-25, 31, 33, 35-40
	9.5 1-6, 9-11, 13-15, 18, 22, 24-40
	9.6 1, 2, 4, 5, 8, 12, 14, 19, 21-26, 27, 28, 33, 34
Boolean algebra and networks	
Simplification of networks	10.1 1-5, 8, 10, 12-20 even, 21-24, 26, 28, 30
	10.2 1-10, 12, 16, 18, 20-30 even
	10.3 2, 3, 5, 6, 9, 12, 14, 15, 22-30 even, 39, 41, 42
	10.4 1-16, 17- 20, 22, 30, 31, 43-46
	10.5 1-12, 17, 18, 21, 22, 29, 30, 34, 35
Matrices and systems of linear equations (Chaps. 3 &12)	3.1 2, 4, 7, 9, 10, 11, 13, 27, 29, 31
Examples of systems of linear equations	3.2 5, 7, 11, 16
Gaussian elimination	3.3 4, 9, 10, 17
Matrix operations: scalar multiplication, addition,	3.4 2-10 even, 19, 24, 26, 28
multiplication, transposition, inverse matrices	12.1 2-18 even, 19, 20, 22, 30
	12.2 2-30 even, 31-36
	12.3 2-32 even, 35, 37
	12.4 3, 4, 5, 7, 13, 16, 17, 21-30, 33
	12.5 13, 16, 21, 22, 24, 25, 27
Mathematical Induction (Teacher's notes)	supplementary exercises will be provided

In addition, formal class assignments will be given at regular intervals. These will be graded and will make up part of the class mark.

TENTATIVE SCHEDULE

Week 1	Introduction to Permutations and Combinations
Week 2	Set Notation, Operations on Sets, Venn Diagrams
Week 3	Basic Properties of Sets, Propositions
Week 4	Logical Connectives, Truth Tables
Week 5	Properties of Logic and Inference, **Test 1.**
Week 6	Boolean Algebra, Networks
Week 7	Simplification of Networks
Week 8	Systems of Linear Equations
Week 9	Matrices and Matrix Operations, **Test 2.**
Week 10	Matrix Operations, Inverse Matrices
Week 11	Inverse Matrices, Gaussian Elimination
Week 12	Gaussian Elimination
Week 13	Proofs, Mathematical Induction.
Week 14	Mathematical Induction, **Test 3**.
Week 15	Review

TEACHING METHODS

This course consists of 45 hours of scheduled lectures, with some problem solving in class at least once a week**.** In addition, each student will be required to do about 30 hours of personal study and homework.

DEPARTMENTAL ATTENDANCE POLICY

Six missed classes (without suitable justification) may result in automatic failure. If you must miss a class, let your teacher know as soon as possible. If you are sick, please bring a medical note. In any case, you are responsible for covering missed classes, and doing missed assignments, yourself, regardless of the reasons for missing the classes.

EVALUATION PLAN

The student's **Final Grade** is a combination of the **Class Mark** and the **Final Exam Mark**.
The breakdown of the **Class Mark** is:

    Quizzes and Assignments   25%
    Tests (3)   3 (25%)=75%

The **Final Grade** will be whichever is **the better of**:

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50% **Class Mark** and 50% **Final Exam Mark**
OR
25% **Class Mark** and 75% **Final Exam Mark**

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A student with a **Class Mark** of less than 50% MAY CHOOSE NOT TO WRITE the **Final Exam**, in which case the **Class Mark** ($< 50\%$) will be assigned as the **Final Grade**.

Students must be available until the end of the final examination period to write exams.

MATH DEPARTMENT WEBSITE

http://departments.johnabbott.qc.ca/departments/mathematics

COURSE COSTS

In addition to the cost of the text listed above (approx. $150), a scientific, non-graphing, non-programmable calculator (approx. $15 - $25) may be useful. The recommended model used in math classes: **SHARP EL-531.**

COLLEGE POLICIES

Policy No. 7 – IPESA, Institutional Policy on the Evaluation of Student Achievement: http://johnabbott.qc.ca/ipesa

Changes to Evaluation Plan in Course Outline (Article 5.3)
Changes require documented unanimous consent from regularly attending students and approval by the department and the program dean.

Religious Holidays (Article 3.2.13 and 4.1.6)
Students who wish to miss classes in order to observe religious holidays must inform their teacher of their intent in writing within the first two weeks of the semester.

Student Rights and Responsibilities: (Article 3.2.18)
It is the responsibility of students to keep all assessed material returned to them and/or all digital work submitted to the teacher in the event of a grade review. (The deadline for a Grade Review is 4 weeks after the start of the next regular semester.)

Student Rights and Responsibilities: (Article 3.3.6)
Students have the right to receive graded evaluations, for regular day division courses, within two weeks after the due date or exam/test date, except in extenuating circumstances. A maximum of three (3) weeks may apply in certain circumstances (ex. major essays) if approved by the department and stated on the course outline. For evaluations at the end of the semester/course, the results must be given to the student by the grade submission deadline (see current Academic Calendar). For intensive courses (i.e.: intersession, abridged courses) and AEC courses, timely feedback must be adjusted accordingly.

Academic Procedure: Academic Integrity, Cheating and Plagiarism (Article 9.1 and 9.2)
Cheating and plagiarism are unacceptable at John Abbott College. They represent infractions against academic integrity. Students are expected to conduct themselves accordingly and must be responsible for all of their actions.

College definition of Cheating:
Cheating means any dishonest or deceptive practice relative to examinations, tests, quizzes, lab assignments, research papers or other forms of evaluation tasks. Cheating includes, but is not restricted to, making use of or being in possession of unauthorized material or devices and/or obtaining or providing unauthorized assistance in writing examinations, papers or any other evaluation task and submitting the same work in more than one course without the teacher's permission. It is incumbent upon the department through the teacher to ensure students are forewarned about unauthorized material, devices or practices that are not permitted.

College definition of Plagiarism:
Plagiarism is a form of cheating. It includes copying or paraphrasing (expressing the ideas of someone else in one's own words), of another person's work or the use of another person's work or ideas without acknowledgement of its source. Plagiarism can be from any source including books, magazines, electronic or photographic media or another student's paper or work.