

**General Information.**

*Discipline:* Mathematics      *Course code:* 201-DBC-AB  
*Ponderation:* 2-1-3      *Credits:* 2      *Prerequisite:* None  
*Program:* This course is open to all programs.  
*Days and Time:* T/R 10:00 - 11:30      *Classroom:* H-028  
*Teacher:* Philippe Delage      *Office:* H-201  
*Phone:* #5843      *E-mail:* philippe.delage@johnabbott.qc.ca  
*Office Hours:* TBD

*Students are strongly advised to seek help from their instructor as soon as they encounter difficulties in the course.*

**Introduction.** This complementary course will delve into the world of logic, sets and numbers by asking intriguing questions such as, “What does it take for an argument to be valid?”, “Do all infinite sets have the same size?” and “What is a number?” Students will learn about propositional logic, predicates, sets, relations, cardinality, binary numbers, and much more. Several paradoxes from logic and set theory will be analyzed. This course requires only a knowledge of basic high school math and is open to all students interested in mathematics and logic.

**Teaching Methods.** This course will be 45 hours, meeting two times per week for a total of three hours per week. The course will rely mainly on the lecture method and problem-solving sessions. The following methods may also be used: question-and-answer sessions, class discussions, and assigned reading for independent study.

**Evaluation.** A student’s Final Grade for this course is a combination of the following components.

3 Tests: 60%  
6 Labs: 40%

Labs are in-class assignments and are done in small groups. The three tests combined compose the final evaluation.

**Required Text.** There is no textbook for this course.

**Course Costs.** There are no course costs.

**Other Resources.**

*Math Website.*

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

*Math Study Area.* Located in H-200A and H-200B; the common area is usually open from 8:30 to 17:30 on weekdays as a quiet study space. Computers and printers are available for math-related assignments. It is also possible to borrow course materials when the attendant is present.

**Statement of the Competency.** 0012: To use various mathematical concepts and procedures for common tasks.

**Elements of the Competency.**

1. To demonstrate the acquisition of basic functional knowledge in mathematics.
2. To select mathematical procedures on the basis of specific needs.
3. To use mathematical procedures to carry out tasks and solve problems.
4. To interpret the results obtained using mathematical procedures.

Each of the above elements will be assessed in each of the tests and each of the labs.

**Missed Evaluation Policy.** A missed evaluation can be made up only if the instructor is informed before the evaluation, the excuse for the absence is justified and verifiable.

**Classroom Policy.** The use of cell phones, laptops, or similar technology for any purpose that is not directly related to the course is not permitted.

**Departmental Attendance Policy.** Regular attendance is expected. Missing six classes is grounds for automatic failure in this course.

**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 acknowledgment of its source. Plagiarism can be from any source including books, magazines, electronic or photographic media or another student's paper or work.

**Learning Objectives.** ("A student is expected to ...")

**Logic**

- 1.1 Recognize different types of paradoxes.
- 1.2 Formulate propositions using logical connectives.
- 1.3 Construct a truth table for a proposition.
- 1.4 Determine if a given argument is valid.
- 1.5 Recognize and use logical arguments.
- 1.6 Simplify propositions.
- 1.7 Formulate propositions using predicates and quantifiers.

**Set Theory**

- 2.1 Perform operations on sets.
- 2.2 Use algebraic properties of sets to simplify expressions.
- 2.3 Describe relations using n-tuples.
- 2.4 Determine if a relation is an equivalence relation.
- 2.5 Determine if a relation is an order relation.
- 2.6 Determine if a function is injective, surjective or bijective.
- 2.7 Compare the cardinality of different sets of numbers.

**Number Systems**

- 3.1 Convert numbers between decimal and binary notation.
- 3.2 Perform arithmetic operations in binary notation.

**Tentative Timetable.**

| <i>Day</i> | <i>Content</i> | <i>Learning Objective(s)</i> |
|------------|----------------|------------------------------|
| 1          | Lecture        | 1.1                          |
| 2          | Lecture        | 1.1                          |
| 3          | Lecture        | 1.2                          |
| 4          | <b>Lab 1</b>   | 1.1                          |
| 5          | Lecture        | 1.3                          |
| 6          | Lecture        | 1.4                          |
| 7          | Lecture        | 1.5                          |
| 8          | <b>Lab 2</b>   | 1.2 - 1.5                    |
| 9          | Lecture        | 1.6                          |
| 10         | <b>Test 1</b>  | 1.1 - 1.5                    |
| 11         | Lecture        | 1.6                          |
| 12         | Lecture        | 1.7                          |
| 13         | Lecture        | 2.1                          |
| 14         | <b>Lab 3</b>   | 1.5 - 1.7                    |
| 15         | Lecture        | 2.2                          |
| 16         | Lecture        | 2.3                          |
| 17         | Lecture        | 2.4                          |
| 18         | <b>Lab 4</b>   | 2.1, 2.2                     |
| 19         | Lecture        | 2.4                          |
| 20         | <b>Test 2</b>  | 1.5 - 1.7, 2.1, 2.2          |
| 21         | Lecture        | 2.5                          |
| 22         | Lecture        | 2.6                          |
| 23         | Lecture        | 3.1                          |
| 24         | <b>Lab 5</b>   | 2.3 - 2.6                    |
| 25         | Lecture        | 3.2                          |
| 26         | Lecture        | 2.7                          |
| 27         | Lecture        | 2.7                          |
| 28         | <b>Lab 6</b>   | 2.7, 3.1, 3.2                |
| 29         | Lecture        | 2.7                          |
| 30         | <b>Test 3</b>  | 2.3 - 2.7, 3.1, 3.2          |