Mathematics (MATH) 309

Discrete Mathematics (Revision 8)

Status:	Replaced with new revision, see the **course listing** for the current revision
Delivery mode:	**Individualized study online**
Credits:	3
Area of study:	Science
Prerequisites:	**MATH 209** or **MATH 270**. (If MATH 270 is used as a prerequisite, **MATH 271** is recommended.)
Precluded:	None
Challenge:	MATH 309 is not available for challenge.
Faculty:	**Faculty of Science and Technology**

Notes:	**Mathematics Diagnostic Assessment** . This online test contains 70 questions that will help you assess your mathematical skills. Based on your score, we will recommend which Athabasca University mathematics course you are likely ready to take successfully.

Overview

The course covers integers, set theory, logic, relations, functions, Boolean algebra, divisibility, combinatorics, finite-state automata and formal languages.

Outline

The course consists of the following six units:

- Unit 1: Integers
- Unit 2: Formal Logic
- Unit 3: Set Theory
- Unit 4: Counting
- Unit 5: Relations and Functions
- Unit 6: Finite-state Automata

Learning outcomes

Upon successful completion of this course, you should be able to

- demonstrate a foundational understanding of discrete mathematics, with a focus on formal logic, set theory, counting, and Automata.
- use discrete mathematical methods for applied problem solving in computer science, counting both combinations and permutations,

identifying languages over alphabets, and creating finite-state automatons to model specific processes.

- apply background knowledge to pursue further learning in related advanced mathematics and computer science courses.
- apply foundational skills in the development of mathematical proofs.
- communicate mathematical ideas, and analyses in a clear and organized manner.

Evaluation

To **receive credit** for MATH 309, you must achieve a course composite grade of at least **D (50 percent)** and a grade of at least D (50 percent) on each of the midterm and final assessments. You must also submit all four assignments and complete them to the satisfaction of your tutor.

The weighting of the composite grade is as follows:

Activity	Weight
Assignment 1	12%
Assignment 2	12%
Midterm Assessment	25%
Assignment 3	11%
Assignment 4	10%
Final Assessment	30%
Total	**100%**

To learn more about assignments and examinations, please refer to Athabasca University's **online Calendar** .

Note: Athabasca University reserves the right to amend the assessments/exams in this course as the need arises. Students will be notified well in advance of any changes to the assessments/exams in MATH 309.

Materials

Digital course materials

Links to the following course materials will be made available in the course:

Epp, S. S. (2010). *Discrete mathematics with applications* (4th ed.). Cengage Learning.

Epp, S. S. (2012). *Student solutions manual and study guide for Epp's Discrete mathematics with applications* (4th ed.). Cengage Learning.

Other materials

All other materials are available online.

Important links

- **Academic advising**
- **Program planning**
- **Request assistance**
- **Support services**

Athabasca University reserves the right to amend course outlines occasionally and without notice. Courses offered by other delivery methods may vary from their individualized study counterparts.

Opened in Revision 8, June 7, 2023

Updated March 10, 2025

View **previous revision**