MATH-101 – Finite Mathematics 1

University Arts and Science

Effective Term & Year: Fall 2022
Course Outline Review Date: 2025-04-01

Program Area: Math and Sciences

Description:

This course is intended for students who require an appreciation of higher mathematics, but don't require calculus. MATH 101 stresses a logical and critical thinking approach while investigating the following topics: an introduction to matrices and to linear algebra; linear programming and the Simplex method; set theory, counting techniques and probability; and introduction to statistics; and Markov Processes.

Program Information:

MATH 101 is often taken by students working towards a B.A. or a B.Ed. It can be used as the math credit in an Associate of Arts degree or an Arts certificate, or it can be used as elective credit towards a Science certificate or degree. Together with MATH 102, it fulfills the math requirement for the University of Victoria Teacher Education program. MATH 101 can be used as a math credit for a Business Administration certificate, diploma or degree and is considered to be very good preparation for the study of statistics (STAT 106) and/or quantitative methods (ACCT 369).

Delivery Methods: On-campus (Face-to-Face), Online

Credit Type: College of the Rockies Credits

Credits: 3

Course type/s: Sciences

Instructional Activity and Hours:

Activity	Hours
Classroom, Directed Studies or Online Instruction	45
Seminar/Tutorials	
Laboratory/Studio	
Practicum/Field Experience	
Co-op/Work Experience	
Other	
Total	45

Course Requisites:

- Complete 1 of the following
    - Earned a minimum grade of C+ (65%) in at least 1 of the following:
        - FOM 11 – Foundations of Mathematics 11
        - PREC 11 – Pre-Calculus 11
        - MATH080 – Mathematics – Advanced Level
    - Completed at least 1 of the following:
        - PREC 12 – Pre-Calculus 12
        - CALC 12 – Calculus 12
    - Or Foundations of Math 11 and 70% or higher in Foundations of Math 12.
    - Or 65% or higher in both Statistics 12 and Computer Science 12.

Flexible Assessment: Yes

In some cases students may be able to apply for recognition of prior learning outside the classroom. This flexible assessment process provides equivalent course credit. It is a rigorous process that may include external evaluation, worksite assessment, demonstration, standardized test, self-assessment, interview, products/portfolio, and challenge exam, or other measures as appropriate. Tuition fees apply. Contact an education advisor for more information.

Course Transfer Credit:

For information about receiving transfer credit for courses taken at either British Columbia or Alberta institutions, please see https://www.bctransferguide.ca/ or https://transferalberta.alberta.ca . For more transfer credit information, please visit https://www.cotr.bc.ca/Transfer

All requests for course transfer credit from institutions in British Columba or elsewhere should go to the College of the Rockies Enrolment Services office.

Textbook Resources:

Textbook selection varies by instructor and may change from year to year. At the Course Outline Effective Date the following textbooks were in use:

Required: Goldstein, Schneider and Siegel (2017), *Finite Mathematics & Its Applications*, 12TH Edition, New Jersey: Pearson Prentice Hall

Optional: Goldstein, Schneider and Siegel (2017) *Student Solution Manual,* 12TH Edition*,* New Jersey: Pearson Prentice Hall

Please see the instructor's syllabus or check COTR's online text calculator https://textbook.cotr.bc.ca/ *for a complete list of the currently required textbooks.*

Learning Outcomes:

Upon the successful completion of this course, students will be able to:

- employ a variety of formal problem solving methods and reflect on the usefulness of mathematics by reading about, interpreting and finding applications for the concepts studied;
- examine, strengthen and formalize your methods of approaching mathematical problem solving;
- be able to solve problems with and without the use of technology;
- solve systems of linear equations in any number of variables, using Gauss-Jordan elimination and matrix inverses;
- recognize dependent, inconsistent, and independent and consistent systems of equations;
- add, subtract, multiply, pivot and invert matrices;
- write, interpret, and solve matrix systems to represent input-output analysis problems;
- recognize the components of linear programming problems, and explain, using geometry, how the components all work together;
- find optimal solutions to linear programming problems using the Simplex method and Duality;
- utilize the laws of counting, question basic assumptions about numbers, use the language of sets, and be able to articulate and solve probability problems using these concepts;
- calculate the number of permutations, combinations and partitions of given objects, and understand the conceptual differences between these methods of counting;
- calculate probabilities & conditional probabilities;
- use tree diagrams and calculate conditional probabilities using Bayes' theorem;
- calculate and interpret very basic statistical data;
- identify, define characteristics of, and apply the Normal, Poisson, and Binomial probability distributions;
- understand the basic concepts of Markov Processes;
- find the stable distribution for both Regular and Absorbing Markov processes; and

- discover that math can be both enjoyable and useful! (optional, but strongly recommended).

Course Topics:

- Linear Equations and Systems of Linear Equations
- Simple Matrix Algebra
- Linear Programming, both geometric and using the Simplex method
- Marginal Analysis and Duality
- Set theory and Counting Techniques
- Probability
- A Brief Introduction to Statistics
- Regular and Absorbing Markov Processes

See instructor's syllabus for the detailed outline of weekly readings, activities and assignments.

Evaluation and Assessments

Assessment Type: On-Campus (face-to-face) and Online, or Hybrid

Assessment Type	% of Total Grade
Assignments	20%
Midterms	30%
Final Exam	50%
Total	100%

Grade Scheme

A+	A	A-	B+	B	B-	C+	C	C-	D	F
>=90	89-85	84-80	79-76	75-72	71-68	67-64	63-60	59-55	54-50	<50

Pass requirements: None

Evaluation Notes: A grade of "D" grants credit, but may not be sufficient as a prerequisite for sequential courses.

Exam Attendance:

Students must attend all scheduled exams at the appointed time and place. Instructors may approve an alternate exam to accommodate an illness or personal crisis. Department heads will consider other written requests. Any student who misses a scheduled exam without prior approval will receive a "0" on the exam.

Academic Policies:

College of the Rockies policies related to courses can be found at
https://cotr.bc.ca/about-us/college-policies/ and include the following:

- Policy 2.4.3 Students with Documented Disabilities
- Policy 2.4.4 Student Conduct (plagiarism, other cheating, behavioral misconduct)
- Policy 2.5.8 Academic Performance
- Policy 2.5.3 Grade Appeal
- Policy 2.4.9 Student Concerns Re Faculty

Course Changes:

The College of the Rockies updates course outlines regularly to meet changing educational, employment and marketing needs. The instructor will notify students in writing of any updates to this outline during the semester. The instructor reserves the right to revise, add or delete material while meeting the learning outcomes of this course outline.