Bow Valley College

# Course Outline

## MAT3791

Mathematics 30-1
Winter 2025 - Current

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# MAT3791 Mathematics 30-1

## COURSE DESCRIPTION

This is an Alberta Education diploma credit course. Topics include algebra and number sense, trigonometry, inverses of relations, logarithms, exponential and logarithmic functions, polynomial functions, and permutations. The -1 stream is designed for students who want to enter post-secondary programs that require the study of calculus.

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|---|---|
| REQUISITES | Earn a minimum grade of C in each of the following courses:<br>• MAT2791 - Mathematics 20-1 (5) |
| EQUIVALENTS | Complete at least 1 of the following courses:<br>• MATH0301 - Mathematics 030-1 (5) |
| CREDITS | 5 |
| HOURS | 100 |
| ELIGIBLE FOR PLAR | No |
| ZERO TEXTBOOK COST | No |

## COURSE LEARNING OUTCOMES

Bow Valley College is committed to ensuring our graduates can demonstrate their abilities in key areas that will make them effective citizens and encourage their development as lifelong learners. In addition to the discipline-specific skills that learners acquire in their programs, the College has identified ten learning outcomes.

**College-Wide Outcomes:**

1. Communication
2. Thinking Skills
3. Numeracy and Financial Literacy
4. Working with Others
5. Digital Literacy
6. Positive Attitudes and Behaviours
7. Continuous Learning
8. Health and Wellness Awareness
9. Citizenship and Intercultural Competence

10. Environmental Sustainability

| # | COURSE LEARNING OUTCOME(S) | COLLEGE WIDE OUTCOMES SUPPORTED |
|---|---|---|
| 1 | Demonstrate an understanding of angles in standard position, expressed in degrees and radians. | 1, 2, 3, 5, 7 |
| 2 | Develop and apply the equation of the unit circle. | 1, 2, 3, 5, 7 |
| 3 | Solve problems using the six trigonometric ratios for angles expressed in radians and degrees. | 1, 2, 3, 5, 7 |
| 4 | Graph and analyze the trigonometric functions sine, cosine and tangent to solve problems. | 1, 2, 3, 5, 7 |
| 5 | Solve, algebraically and graphically, first and second degree trigonometric equations with the domain expressed in degrees and radians. | 1, 2, 3, 5, 7 |
| 6 | Prove trigonometric identities. | 1, 2, 3, 5, 7 |
| 7 | Demonstrate an understanding of operations on, and compositions of, functions. | 1, 2, 3, 5, 7 |
| 8 | Demonstrate an understanding of the effects of horizontal and vertical translations on the graphs of functions and their related equations. | 1, 2, 3, 5, 7 |
| 9 | Demonstrate an understanding of the effects of horizontal and vertical stretches on the graphs of functions and their related equations. | 1, 2, 3, 5, 7 |
| 10 | Apply translations and stretches to the graphs and equations of functions. | 1, 2, 3, 5, 7 |
| 11 | Demonstrate an understanding of the effects of reflections on the graphs of functions and their related equations. | 1, 2, 3, 5, 7 |
| 12 | Demonstrate an understanding of inverses of relations. | 1, 2, 3, 5, 7 |
| 13 | Demonstrate an understanding of logarithms. | 1, 2, 3, 5, 7 |
| 14 | Demonstrate an understanding of the product, quotient and power laws of logarithms. | 1, 2, 3, 5, 7 |
| 15 | Graph and analyze exponential and logarithmic functions. | 1, 2, 3, 5, 7 |
| 16 | Solve problems that involve exponential and logarithmic equations. | 1, 2, 3, 5, 7 |
| 17 | Demonstrate an understanding of factoring polynomials of degree greater than 2 (limited to polynomials of degree ≤ 5 with integral coefficients). | 1, 2, 3, 5, 7 |
| 18 | Graph and analyze polynomial functions (limited to polynomial functions of degree ≤ 5). | 1, 2, 3, 5, 7 |
| 19 | Graph and analyze radical functions (limited to functions involving one radical). | 1, 2, 3, 5, 7 |
| 20 | Graph and analyze rational functions (limited to numerators and denominators that are monomials, binomials or trinomials). | 1, 2, 3, 5, 7 |
| 21 | Apply the fundamental counting principle to solve problems. | 1, 2, 3, 5, 7 |
| 22 | Determine the number of permutations of ☐☐ elements taken ☐ at a time to solve problems. | 1, 2, 3, 5, 7 |

| | | |
|---|---|---|
| 23 | Determine the number of combinations of ☐☐ different elements taken ☐☐ at a time to solve problems. | 1, 2, 3, 5, 7 |
| 24 | Expand powers of a binomial in a variety of ways, including using the binomial theorem (restricted to exponents that are natural numbers). | 1, 2, 3, 5, 7 |

## COURSE MODULES AND SCHEDULE

**Course schedule subject to change, depending on delivery mode and term of study. For exact dates, please consult the Course Offering Information in Brightspace.*

| WEEK/HOURS | MODULES |
|---|---|
| 4 Weeks | Functions, Relations, and Transformations |
| 4 Weeks | Exponential and Logarithmic Functions |
| 3 Weeks | Permutations and Combinations, Radical Functions, and Rational Functions |
| 4 Weeks | Trigonometry |

## ASSESSMENT

| COURSE LEARNING OUTCOME(S) | ASSESSMENT | WEIGHT |
|---|---|---|
| Course Grade Consists of: | | |
| 1 - 24 | Supervised Assessments (Unit Tests, Supervised Quizzes, etc.) | 75% |
| 1 - 24 | Other Assessments (Assignments, Projects, Labs, Online Quizzes, etc.) | 25% |

Important: For details on each assignment and exam, please see the Course Offering Information.

## PERFORMANCE STANDARDS

A minimum grade of D is required to pass this course. However, a program may require a higher grade in this course to progress in the program or to meet specific program completion requirements.

To receive a final grade in this course, students must write the Alberta Diploma Examination. Information concerning these examinations, including final grade calculation, examination schedules and procedures

for registering to write a Diploma Examination is found on the Alberta Education website at: Diploma Examinations.

Students enrolled in the equivalency version of this course (MATH0301) must write the Bow Valley College equivalency exam. This exam will be blended with the course mark in a 30/70 ratio to produce a final grade.

Please consult with the program area or contact the program chair for further details. A minimum Grade Point Average of 2.0 is required for graduation.

## GRADING SCHEME

| Grade | Percentage | Grade Point | Description |
|---|---|---|---|
| A+ | 95-100 | 4.0 | Exceptional: superior knowledge of subject matter |
| A | 90-94 | 4.0 | Excellent: outstanding knowledge of subject matter |
| A- | 85-89 | 3.67 | |
| B+ | 80-84 | 3.33 | |
| B | 75-79 | 3.0 | Very Good: knowledge of subject matter generally mastered |
| B- | 70-74 | 2.67 | |
| C+ | 67-69 | 2.33 | |
| C | 64-66 | 2.0 | Satisfactory/Acceptable: knowledge of subject matter adequately mastered |
| C- | 60-63 | 1.67 | |
| D+ | 57-59 | 1.33 | |
| D | 50-56 | 1.0 | Minimal Pass |
| F | Less than 50 | 0.0 | Fail: an unsatisfactory performance |

## REQUIRED LEARNING RESOURCES

A textbook/workbook may need to be purchased - consult the Bow Valley College Bookstore and the Course Offering Information Sheet provided by your instructor on the first day of classes for more information.

A scientific/graphing calculator may need to be purchased - consult the Course Offering Information Sheet provided by your instructor on the first day of classes for more information.

Additional learning resources may be found in the Course Offering Information or in Brightspace.

## ADDITIONAL INFORMATION

Additional information may be found in the Course Offering Information or in Brightspace.

## ACADEMIC ACCOMMODATIONS

Learners with a disability (learning, physical, and/or mental health) may qualify for academic and exam accommodations. For more information, or to apply for accommodations, learners should make an appointment with Accessibility Services in the Learner Success Services (LSS) Department. Accessibility Services can also assist learners who may be struggling with learning but do not have a formal diagnosis. To make an appointment visit LSS on the first floor of the south campus or call 403-410-1440. It is the learner's responsibility to contact Accessibility Services and request academic accommodations. For more information, please visit our website at http://www.bowvalleycollege.ca/accessibility.

## INSTITUTIONAL POLICIES

Bow Valley College is committed to the highest standards of academic integrity and honesty. Learners are urged to become familiar with and uphold the following policies: Academic Integrity (500-1-7), Learner Code of Conduct, Procedures and Guidelines (500-1-1), Learner Appeals (500-1-12), Attendance (500-1-10), Grading (500-1-6), Academic Continuance and Graduation (500-1-5), and Electronic Communications (300-2-13). Audio or video recording of lectures, labs, seminars, or any other teaching and learning environment by learners is allowed only with consent of the instructor as part of an approved accommodation plan. Recorded material is to be used solely for personal study and is not being used or distributed without prior written consent from the instructor.

**Turnitin:**

Students may be required to submit their course work to Turnitin, a third-party service provider engaged by BVC. Turnitin identifies plagiarism by checking databases of electronic books and articles, archived

webpages, and previously submitted student papers. Students acknowledge that any course work or essays submitted to Turnitin will be included as source documents in the Turnitin.com reference database, where it will be used solely to detect plagiarism. The terms that apply to a student's use of Turnitin are described on Turnitin.com.

**Online Exam Proctoring:**

Examinations for this course may require proctoring through an online proctoring service. Online proctoring enables online exam taking within a controlled and monitored environment, thereby enhancing academic integrity. Online proctoring may occur through a variety of methods, including but not limited to:

a. live online proctoring where a remote invigilator authenticates identity and observes completion of an exam using specialized software and recordings;
b. automated proctoring where the exam session is recorded and AI (artificial intelligence) analyzed;
c. browser lockdown that limits access to other applications, websites, copying, printing, screen capture and other functions; or
d. a combination of both live/automated proctoring and browser lockdown.

Course instructors will review recordings, analyses, and data obtained through online proctoring for academic integrity infractions. It is the student's responsibility to meet the technical, software, location, and identity verification requirements necessary to enable online proctoring.

Further details of these policies are available in the Academic Calendar and on the Bow Valley College website, bowvalleycollege.ca.

Learners are encouraged to keep a copy of this course outline for future reference.

**Collection of Personal Information:**

This course, including your image and voice, may be recorded and made available to you and other students taking the course section. By attending the class(es) online or in person, you consent to the collection of your personal information. If you do not wish to be recorded, please contact your instructor before starting the course/class to discuss alternative arrangements.

You may use the recordings only for educational purposes and you must not copy, share, or use the recordings for any other purpose without the instructor's express permission.

Your personal information is collected in accordance with section 33(c) of the Freedom of Information and Protection of Privacy Act (Alberta) to deliver academic programming, support learner flexibility, promote universal design for learning principles, and for purposes consistent with the course activities and outcomes. If you have any questions about the collection, disclosure, use, or protection of this information, please contact the College's Access and Privacy Officer at foip@bowvalleycollege.ca.