



COURSE OUTLINE		
TERM: Fall 2024	COURSE NAME: BMTH 053	
INSTRUCTOR(S):	COURSE TITLE: Precalculus I	
CONTACT INFORMATION:	SECTION NO(S):	CREDITS: 1.00
OFFICE HOURS:		
COURSE WEBSITE:		

Capilano University acknowledges with respect the Lilwat7úl (Lil'wat), x^wmə 7̄ θk^wəyəm (Musqueam), shíshálh (Sechelt), Sk̓wx̓wú7mesh (Squamish), and Səlílwətaʔ/Selilwitulh (Tseil-Waututh) people on whose territories our campuses are located.

COURSE FORMAT

There are 3 hours/week of scheduled instructor contact time and 2.5 hours/week of ad hoc instructor availability that may be scheduled at times mutually agreed upon by the instructor and the student. The scheduled time may be either classroom, online, or mixed-mode. Online assistance from the instructor is done via Zoom. Please see the course eLearn page for a Zoom link, days, and times.

For paced classes, students follow the class material at a pace set by the instructor. Students have the option of switching to self-paced at any point during the semester.

For self-paced classes, students work at their own pace. Self-paced classes allow students to either progress more quickly (finishing multiple levels in a subject during the semester) or more slowly (students may take up to 2 semesters to finish a level in a subject).

This course has content available on <https://elearn.capu.ca/> and students may use eLearn asynchronously (at any time that is convenient for them). If there are any synchronous (paced) activities, such as lectures or workshops, they will be recorded and will be available on eLearn if you are unable to attend at the designated time.

Students should expect to log in 3-4 times per week and to spend 6-8 hours per week on course readings, assignments, labs, quizzes and tests.

The Fall and Spring semesters are 15 weeks long. The two Summer semesters are 7 weeks long and have double the amount of scheduled and ad hoc instructor contact time.

COURSE PREREQUISITES:

BMTH 044 (B-) or ABE Math Assessment (053)

CALENDAR COURSE DESCRIPTION

This course covers functions, graphs, transformations, exponential and logarithmic functions.

COURSE NOTE

This is the first of the two courses required for an ABE provincial level in mathematics.

RECOMMENDED FOLLOW-UP COURSES:

BMTH 054 (the second half of ABE Precalculus)

COURSE STUDENT LEARNING OUTCOMES

On successful completion of this course, students will be able to do the following:

1. Algebra Review

- a) recognize subsets and identify properties of real numbers
- b) use interval notation to write a set of numbers
- c) evaluate absolute value of a real number and find the distance between two real numbers
- d) use rules for order of operations and properties of exponents to simplify expressions
- e) add, subtract, and multiply polynomials and factor a polynomial completely
- f) determine the domain of a rational expression, simplify rational expressions, perform operations with rational expressions and simplify complex rational expressions
- g) use properties of exponents to simplify radical expressions
- h) rationalize the denominator or numerator in a rational expression
- i) use properties of radicals to simplify and combine radicals
- j) define imaginary and complex numbers, express them in standard form, and perform operations with complex numbers
- k) solve linear equations, equations with absolute value, quadratic equations, radical equations, and equations reducible to a quadratic form
- l) solve linear inequalities, combined inequalities, and absolute value inequalities and graph the solutions on a number line
- m) solve applied problems using linear and quadratic equations
- n) solve equations of variation and applied problems involving variation
- o) solve systems of linear equations in two variables and in three variables
- p) distinguish between consistent/inconsistent and dependent/independent systems
- q) use systems of linear equations to solve applied problems

2. Functions and Graphs

- a) find the distance between two points in the plane and find the midpoint of a segment
- b) apply the distance formula and mid-point formula to solve problems
- c) recognize graphs of common functions: linear, constant, quadratic, cubic, square root, absolute value, reciprocal
- d) use the vertical line test to identify functions
- e) graph functions and analyze graphs of functions, identifying: domain and range; intervals on which the function is increasing, decreasing or constant
- f) write formulas or functions to model real life applications

- g) determine whether a graph is symmetric with respect to the x-axis, y-axis, and the origin
- h) identify even or odd functions and recognize their symmetries
- i) graph transformations of functions: translations, reflections, stretchings and shrinkings
- j) graph functions defined piecewise
- k) find the sum, difference, product and quotient of two functions and determine their domains
- l) find the composition of two functions f and g , finding formulas for $f(g(x))$ and $g(f(x))$, identifying the domain of the composition and evaluating the composite function
- m) given an equation defining a relation, write an equation of the inverse relation
- n) given a graph of a relation or function, sketch a graph of its inverse
- o) use the horizontal line test to determine if a function is one-to-one and therefore has an inverse that is a function
- p) find a formula for the inverse of a function
- q) find $f^{-1}(f(x))$ and $f(f^{-1}(x))$ for any number x in the domains of the functions when the inverse of a function is also a function

3. Polynomial and Rational Functions

- a) graph quadratic functions and analyze graphs of quadratic functions identifying the vertex, line of symmetry, maximum/minimum values, and intercepts
- b) solve applied problems involving maximum and minimum function values
- c) determine the behaviour of the graphs of polynomial functions of higher degree using the leading coefficient test
- d) determine whether a function has a real zero between two real numbers
- e) recognize characteristics of the graphs of polynomial functions including real zeros, y-intercept, relative maxima and minima, domain and range
- f) divide polynomials using long division
- g) use synthetic division to divide a polynomial by $x - r$
- h) use the remainder and factor theorems to find function values and factors of a polynomial
- i) list the possible rational zeros for a polynomial function with integer coefficients
- j) factor polynomial functions and find the zeros
- k) find a polynomial with specified zeros
- l) solve polynomial and rational inequalities

On successful completion of this course, students will meet the learning outcomes found in the ABE Articulation Handbook at [bctransferguide.ca](https://www.bctransferguide.ca), 2019-20 Archive.

REQUIRED TEXTS, RESOURCES, AND TECHNOLOGY

Texts/Resources:

- Stewart, James et al. *Precalculus: Mathematics for Calculus, 5th Edition*. Cengage Learning, 2007.
- A TI graphing calculator

The Capilano Bookstore has instructions on how to purchase this book online or in-person <https://www.capilanou.ca/student-life/campuscommunity/bookstore/>

Recommended Technology for Remote Learning

To participate in this course, you will need to have access to a device (laptop, tablet or computer)

and WiFi.

- **Zoom** is used online coaching times with your instructor, you will need speakers and a microphone. The earphones from your mobile device may be an option. Use of video is optional. Download and tutorial information for Zoom
- You can access the **eLearn** web site using your favourite browser. There is also a mobile app available for eLearn.
- The **Capilano University Security Safe App** may also be useful to you if you are attending campus: download the [CapU Mobile Safety App](#)

COURSE CONTENT

Unit 1	Chapter 1	Fundamentals
Unit 2	Chapter 2	Functions
Unit 3	Chapter 3	Polynomial And Rational Functions

EVALUATION PROFILE

Unit Tests (3 x 20%).....	60%
Final Test	35%
Quizzes	<u>5%</u>
TOTAL	100%

GRADING PROFILE

A+ = 90-100	B+ = 77-79	C+ = 67-69	D = 50-59
A = 85-89	B = 73-76	C = 63-66	F = 0-49
A - = 80-84	B - = 70-72	C - = 60-62	NC*

** Students may be assigned "NC" (No Credit) following their first attempt of a self-paced course if they require more time to finish the course.*

Incomplete Grades

Grades of Incomplete "I" will not be assigned in this course.

Late Assignments

Not applicable.

Missed Exams/Quizzes/Labs

Make-up exams, quizzes and/or tests are given at the discretion of the instructor. They are generally given only in medical emergencies or severe personal crises. Some missed labs or other activities may not be able to be accommodated. Accommodations can be made to honour community needs and traditional practices.

Attendance

Regular attendance is crucial for student success and course completion. In an online environment, students should expect to log in 3-4 times per week and to spend 6-8 hours per week on course readings, assignments, quizzes, practice tests, and tests. Online coaching hours are hosted on Zoom, see the course eLearn page for link, days and times.

Participation

Where participation forms a part of the evaluation profile, the grade for the participation component of the course is based on participation in the classroom and/or eLearn course forums. The mark is based on both the frequency and the quality of the student's comments, questions, and observations, with the emphasis on quality. The quality is determined by, among other things, the relevance, insight, and clarity of remarks.

English Usage

Students are expected to proofread all written work for any grammatical, spelling and stylistic errors. Marks will be deducted for incorrect grammar and spelling in written assignments.

Electronic Devices

Students may use electronic devices during class for course related purposes only.

Online Communication, Behaviour And Expectations

Online Communication

Please be sure to check your official Capilano University email regularly as all official communication will be sent via this email address only.

Online Behaviour

- Adhere to the same standards of behaviour online that you follow in real life
- Keeping an open-mind and be willing to listen to the ideas of others
- Respect other people's time and bandwidth
- Respect other people's privacy (recording or screen shots without permission are not appropriate)

Online Expectations

What you can expect from your instructor:

- Respond to messages/emails within 24 hours, Monday through Friday
- To be available during student coaching hours to support your learning
- To be responsive to your feedback about the course

What your instructor can expect from you:

- Interact respectfully with peers and faculty
- Regularly log into and complete course material
- To ask questions and seek help when appropriate

UNIVERSITY OPERATIONAL DETAILS

Tools for Success

Many services are available to support student success for Capilano University students. A central navigation point for all services can be found at: <https://www.capilanou.ca/student-life/>

Capilano University Security: download the **CapU Mobile Safety App**

Policy Statement (S2009-06)

Capilano University has policies on Academic Appeals (including appeal of final grade), Student Conduct, Academic Integrity, Academic Probation and other educational issues. These and other policies are available on the University website.

Academic Integrity (S2017-05)

Any instance of academic dishonesty or breach of the standards of academic integrity is serious and students will be held accountable for their actions, whether acting alone or in a group. See policy and procedures S2017-05 Academic Integrity for more information:

<https://www.capilanou.ca/media/capilanouca/about-capu/connect-with-capu/governance/policies-amp-procedures/senate-policies-amp-procedures/Academic-> <https://www.capilanou.ca/about-capu/governance/policies/>

Violations of academic integrity, including dishonesty in assignments, examinations, or other academic performances, are prohibited and will be handled in accordance with the Student Academic Integrity Procedures.

Academic dishonesty is any act that breaches one or more of the principles of academic integrity. Acts of academic dishonesty may include but are not limited to the following types:

Cheating: Using or providing unauthorized aids, assistance or materials while preparing or completing assessments, or when completing practical work (in clinical, practicum, or lab settings), including but not limited to the following:

- Copying or attempting to copy the work of another during an assessment;
- Communicating work to another student during an examination;
- Using unauthorized aids, notes, or electronic devices or means during an examination;
- Unauthorized possession of an assessment or answer key; and/or,
- Submitting of a substantially similar assessment by two or more students, except in the case where such submission is specifically authorized by the instructor.

Fraud: Creation or use of falsified documents.

Misuse or misrepresentation of sources: Presenting source material in such a way as to distort its original purpose or implication(s); misattributing words, ideas, etc. to someone other than the original source; misrepresenting or manipulating research findings or data; and/or suppressing aspects of findings or data in order to present conclusions in a light other than the research, taken as a whole, would support.

Plagiarism: Presenting or submitting, as one's own work, the research, words, ideas, artistic imagery, arguments, calculations, illustrations, or diagrams of another person or persons without explicit or accurate citation or credit.

Self-Plagiarism: Submitting one's own work for credit in more than one course without the permission of the instructors, or re-submitting work, in whole or in part, for which credit has already been granted without permission of the instructors.

Prohibited Conduct: The following are examples of other conduct specifically prohibited:

- Taking unauthorized possession of the work of another student (for example, intercepting and removing such work from a photocopier or printer, or collecting the graded work of another student from a stack of papers);
- Falsifying one's own and/or other students' attendance in a course;
- Impersonating or allowing the impersonation of an individual;
- Modifying a graded assessment then submitting it for re-grading; or,
- Assisting or attempting to assist another person to commit any breach of academic integrity.

Sexual Violence and Misconduct

All Members of the University Community have the right to work, teach and study in an environment that is free from all forms of sexual violence and misconduct. Policy B401 defines sexual assault as follows:

Sexual assault is any form of sexual contact that occurs without ongoing and freely given consent, including the threat of sexual contact without consent. Sexual assault can be committed by a stranger, someone known to the survivor or an intimate partner.

Safety and security at the University are a priority and any form of sexual violence and misconduct will not be tolerated or condoned. The University expects all Students and Members of the University Community to abide by all laws and University policies, including B.401 Sexual Violence and Misconduct Policy and B.401.1 Sexual Violence and Misconduct Procedure (found on Policy page <https://www.capilanou.ca/about-capu/governance/policies/>)

Emergencies: Students are expected to familiarise themselves with the emergency policies where appropriate and the emergency procedures posted on the wall of the classroom.

DEPARTMENT/COURSE OPERATIONAL DETAILS

Progress

There is an expectation that students finish the course level for which they registered during the semester; however, students may re-register in a course a second time if they need additional time to complete the course material. If students require more than 2 semesters to complete a course, further registration requires instructor permission, which will only be granted if students have made acceptable progress in the previous semester.

Class Recordings

This course or portions of this class may be recorded by the instructor for educational purposes. These recordings will be shared only with students enrolled in the course. This is intended to supplement the course experiences.

Privacy

Capilano University is committed to preserving your right to privacy. We ensure that the confidentiality of your information is maintained and the collection, use and disclosure of your

information is in compliance with the Freedom of Information and Protection of Privacy Act (FIPPA). The personal information collected by online tools licensed by the University for delivering courses are not distributed to any private organizations or used for commercial marketing.

Inclusivity

In this course you will be treated with respect. I welcome individuals of all ages, backgrounds, beliefs, ethnicities, genders, gender identities, gender expressions, national origins, religious affiliations, sexual orientations, ability – and other visible and nonvisible differences. All members of this course are expected to contribute to a respectful, welcoming and inclusive environment for learning.

Student Support Resources

Learn more about the many services, resources and personal supports you can access on-campus (and virtually) at Capilano University. Whether you're searching for academic advising, on-campus housing, accessibility services for academic accommodations and disability funding, career counselling or options for new and Indigenous students, you'll find it at:
<https://www.capilanou.ca/student-life/>

Student Digital Ambassadors

The Student Digital Ambassadors provide peer-to-peer support for students navigating the online environment and the educational technology tools such as eLearn and Zoom used at CapU. Ambassadors are available online. For more information visit <https://sda.capilanou.ca>