

# Syllabus

## Schedule of Topics

The following table lists the topics in each week together with references to the relevant sections in the course notes.

Time	Topics	Sections
Week 1	Power functions, polynomials	1.1 - 1.4
Week 2	Rational functions, limits at infinity, rates of change (average and instantaneous), continuity.	1.4 - 2.5
Week 3	Derivatives: geometric and computational interpretation; computing approximations; sketching; rules of differentiation	3.1 - 4.1
Week 4	More derivatives rules; antiderivatives of power functions; linear approximation	4.1 - 5.5
Week 5	Newton's method; function sketching	6.1 - 6.3
Week 6	Optimization	7.1 - 7.4
Week 7	Least squares; chain rule	8.1 - 8.4 & supplement
Week 8	Related rates; implicit differentiation; exponential functions	9.1 - 10.2
Week 9	Inverse functions; logarithms; introduction to differential equations	10.3 - 11.3,
Week 10	Linear differential equations; Newton's Law of Cooling; Euler's Method	11.4 - 12.3
Week 11	Slope fields; state-space diagrams; disease dynamics;	13.1 - 13.3
Week 12	Trigonometric functions; periodic functions	14.1 - 14.3
Week 13	Derivatives of trigonometric functions, inverse trig functions	15.1 - 15.3

## Learning Outcomes

Students should understand concepts such as rate of change, and be able to apply them in a wide variety of situations. Students should be able to perform multi-step computations accurately.

Students should be able to use their understanding of a concept to solve an unfamiliar problem.

Students should be able to implement basic functions in a computer spreadsheet, and understand

how the computer's calculations relate to the course concepts. Students should be able to clearly and accurately communicate technical information.

## Learning Activities

### Lectures

Classes consist of a mixture of asynchronous online material (mostly pre-recorded instructional videos and screen-casts) and synchronous discussions with your instructor during the allocated class time. The type of content of synchronous components can vary in form from traditional lecturing on a particular topic to worksheet and problem solving sessions or office hour opportunities to ask questions.

### Assignments

The material covered in lectures is complemented by weekly assignments to test and deepen your understanding of the concepts of calculus. Assignments are administered electronically through WebWork.

## Assessment of Learning

All assessment of learning is administered electronically through WebWork. This means students will use the same platform for completing homework assignments and for writing quizzes, midterms and the final exam. Therefore it is important to get to know the powerful computational capabilities of WebWork.

All tests are open book but no other assistance is allowed (neither online nor in person). For more information on academic integrity and academic misconduct, visit [UBC's academic calendar](http://www.calendar.ubc.ca/vancouver/index.cfm?tree=3,54,0,0) (<http://www.calendar.ubc.ca/vancouver/index.cfm?tree=3,54,0,0>).

### Quizzes 10%

Weekly quizzes cover a selection of problems from the assignment of the previous week. No quizzes in the first week and in weeks with midterms. Quizzes are specially designed WebWork assignments that are timed and require a password to start.

### Midterms 60% (3 x 20%)

Midterms cumulatively cover the material of the course. There will be three midterms spread out over the duration of the course. Midterms are longer than quizzes with questions based on the course material covered up to the previous week. Questions are variants of topics covered in the course notes, the videos and the assignments.

### Final exam 30%

The final exam cumulatively covers all material of the course. The final exam is a bit longer than the midterms mainly to reduce the time pressure. Questions are again variants of topics covered in the course notes, the videos and the assignments.

## Learning Resources

### Course notes

This course closely follows the course notes and any supplements posted on Canvas.

### Piazza

Piazza is a space for you to interact with your fellow students. Instructors may sometimes contribute to the discussion, but this is not the main purpose of the message board. Asking good questions is worth half the answer and providing good answers demonstrates mastery of the topic.

### Math Learning Centre (MLC)

An online version of the MLC is available for students to get virtual in-person help with course content and assignments.

## Course Policies

You are encouraged to work in groups on homework assignments, while recognizing that independent effort is also crucial to learning. However, any misrepresentation of another persons work as your own is considered to be academic dishonesty, see [UBC's academic calendar](http://www.calendar.ubc.ca/vancouver/index.cfm?tree=3,54,111,959) (<http://www.calendar.ubc.ca/vancouver/index.cfm?tree=3,54,111,959>). Academic misconduct results in a zero grade for Math 102 and will be reported to the undergraduate chair.

## University Policies

UBC provides resources to support student learning and to maintain healthy lifestyles but recognizes that sometimes crises arise and so there are additional resources available including those for survivors of sexual violence. UBC values respect for the person and ideas of all members of the academic community. Harassment and discrimination are not tolerated nor is suppression of academic freedom. UBC provides appropriate accommodation for students with disabilities and for religious observances. UBC values academic honesty and students are expected to acknowledge the ideas generated by others and to uphold the highest academic standards in all of their actions. Details of the policies and how to access support are available on the [UBC Senate website](https://senate.ubc.ca/policies-resources-support-student-success) (<https://senate.ubc.ca/policies-resources-support-student-success>)

