

Mathematics 267

University Calculus II

(see Course Descriptions for the applicable academic year: <http://www.ucalgary.ca/pubs/calendar/>)

*Syllabus*

Topic	Number of Instructional Hours
<b>Techniques of integration:</b> integration by substitution, inverse trigonometric substitution; integration by parts; partial fraction decomposition	6
<b>Sequences and series:</b> monotone convergence; geometric series; absolute and conditional convergence; Harmonic p-series; comparison and limit comparison test, integral test, ratio and root test, alternating series test	6
<b>Series of functions:</b> power series; radius and interval of convergence; differentiation and integration of power series; Taylor series; computation of Taylor series for basic functions	6
<b>Differential calculus in several variables:</b> domains and level curves; partial differentiation; the chain rule; differentiable curves, parametrization and arc-length	6
<b>Integral calculus in several variables:</b> double and triples integrals; iterated integrals and Fubini's theorem; polar coordinates; cylindrical and spherical coordinates; general change of variables (time-permitting)	12
<b>Total Hours: 36</b>	

## *Course Outcomes*

**Overview.** This course is a continuation of Math 265 (University Calculus I). We shall build upon the knowledge and skills acquired in Math 265 to learn about further topics in Calculus. Specifically, by the end of this course students should be able to

1. use the language and notion of integral calculus, and apply the key concepts to compute integrals of functions of several real variables.
2. explore the relationship between key calculus concepts and their geometric representation, and seek to apply calculus techniques to a wide variety of practical problems.
3. recognize that not only the technology can be used to achieve some desired results; but also it has limitations.

### **Subject specific knowledge.**

4. **Techniques of Integration.** Students will be able to calculate indefinite integrals using techniques covered in the course.
5. **Applications of Integration.** Students will be able to set up and calculate an appropriate definite integral in order to evaluate the volume of a solid, the length of a curve, and the area of a surface of revolution.
6. **Partial Differentiation and Double Integration.** Students will be able to explain the notion of a function of several variables, its graph, cross-sections, and level curves/surfaces. Students will be able to evaluate partial derivatives and double integrals, and will be able to demonstrate the geometric significance of these concepts.
7. **Sequences and Series.** Students will be able to identify sequences and series, determine convergence by applying a suitable test or theorem covered in the course and contrast between absolute and conditional convergence. Students will be able to determine a Taylor series, analyze the error of Taylor polynomial approximations and compute the radius and interval of convergence of a power series.