

Last Revised: September 2021

Last Reviewed: January 2022

### COURSE INFORMATION

**Course Title:** Calculus II

**Course Number:** MATH 102

**Credits:** 3

**Total Weeks:** 14 (Fall, Spring)  
12 (Summer)

**Total Hours:** 39

**Course Level:**  First Year  Second Year  
 New  Revised Course  
 Replacement Course

**Department:** Math / Statistics

**Department Head:** G. Belchev

**Former Course Code(s) and Number(s) (if applicable):** N/A

**Pre-requisites (If there are no prerequisites, type NONE):** MATH 101 or MATH 111 (minimum grade of C-)

**Co-requisite Statement (List if applicable or type NONE):** NONE

**Precluded Courses:** N/A

### COURSE DESCRIPTION

This course is the second half of first year calculus intended primarily for science, mathematics, or computer science students. Topics include integrals, techniques and applications of integrations, approximations, sequences and series, and area and arc length in polar coordinates.

### LEARNING OUTCOMES

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

- Evaluate a definite integral as a limit
- Evaluate a definite integral using integration formulas
- Find indefinite integrals
- Apply different integration methods
- Find areas and volumes by integration
- Solve simple separable differential equations
- Determine the limit of convergent sequences
- Determine the limit of convergent series
- Represent functions as power series
- Apply Maclaurin/Taylor polynomials to approximate functions

**INSTRUCTION AND GRADING**

Instructional (Contact) Hours:

Type	Duration
Lecture	39
Seminars/Tutorials	
Laboratory	
Field Experience	
Other ( <i>specify</i> ):	
Total	39

**Grading System:** Letter Grades  Percentage  Pass/Fail  Satisfactory/Unsatisfactory  Other 
**Specify passing grade:** 50%

**Evaluation Activities and Weighting** (total must equal 100%)

Assignments: 25%	Lab Work: %	Participation: %	Project: %
Quizzes/Test: %	Midterm Exams: % Midterm 1 25% Midterm 2 25%	Final Exam: 25%	Other: % <i>Specify:</i>

**TEXT(S) AND RESOURCE MATERIALS**

Provide a full reference for each text and/or resource material and include whether required/not required.

Calculus, Early Transcendentals (8th edition) by J. Stewart, ISBN: 9781285741550

**COURSE TOPICS**

List topics and sequence covered.

Week	Topic	Chapter
Week 1	Introduction Areas and distances, the definite integral, the fundamental Theorem of Calculus.	5.1 – 5.3
Week 2	Indefinite integrals and the Total Change Theorem, The substitution Rule. Areas between the curves. Volumes.	5.4 – 6.2
Week 3	Volumes by cylindrical shells. Work. Average value of a function. Integration by parts. Trigonometric integrals.	6.3 – 7.2
Week 4	Trigonometric substitution. Integration of rational functions by partial fractions. Strategy for integration.	7.3 – 7.5

Week 5	Approximate integration. Improper integrals.	
Week 6	Arc length. Area of surface of revolution. Applications in Physics, Engineering and Life Sciences.	8.1 – 8.3
Week 7	Modeling with Differential equations. Separable Differential Equations. <b>MIDTERM EXAM</b>	9.1 – 9.3
Week 8	Arc Length and Surface Area. Areas and Length in Polar Coordinates.	10.2 – 10.4
Week 9	Sequences. Series. The Integral Test and Estimates of Sums.	11.1 – 11.3
Week 10	The Comparison Test. Alternating Series.	11.4 – 11.5
Week 11	Absolute Convergence and the Ratio and Root Tests. Strategy for testing Series. Power Series.	11.6 – 11.8
Week 12	Representations of Functions as Power Series. Taylor and Maclaurin Series.	11.9 – 11.10
Week 13	Applications of Taylor Polynomials.	11.12
Week 14	<b>FINAL EXAM</b>	

### NOTES

1. Students are required to follow all College policies. Policies are available on the website at: [Coquitlam College Policies](#)
2. To find out how this course transfers, visit the BC Transfer Guide at: [bctransferguide.ca](http://bctransferguide.ca)