COQUITLAM COLLEGE
Established 1982

COURSE OUTLINE

Last Revised: September 2020

COURSE INFORMATION

Course Title: Calculus I   **Course Number:** MATH 101   **Credits:** 3

Total Weeks: 14 (Fall, Spring)   **Total Hours:** 39   **Course Level:**   ☒ First Year   ☐ Second Year
12 (Summer)   ☐ 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): PREC 12 (minimum grade of B) or MATH 100 or MATH 120

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

Precluded Courses: N/A

COURSE DESCRIPTION

This is a first course in calculus intended primarily for science, mathematics, or computer science majors. Topics include functions and graphs, conic sections, limits and continuity, derivatives, techniques and applications of differentiation, trigonometric functions, logarithms and exponentials, extrema, the mean value theorem, and polar coordinates.

LEARNING OUTCOMES

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

- Compute the limit of a function at a real number
- Determine whether the function is continuous at a real number
- Find the derivative of a function as a limit
- Find an equation of a tangent line to a function at a given number
- Compute derivatives of functions using differentiation formulae
- Apply differentiation to solve optimization and related rate problems
- Use implicit differentiation
- Graph functions using methods of calculus

INSTRUCTION AND GRADING

Instructional (Contact) Hours:

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

COURSE OUTLINE

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: % *Specify:*

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. Four ways to represent functions Mathematical models. New functions from old functions. Exponential functions. Inverse functions and logarithms.	1.1 – 1.6
Week 2	The tangent and velocity problems. The limit of a function. Calculating limits using limit laws. Continuity.	2.1 – 2.6
Week 3	Limits at infinity, horizontal asymptotes. Tangents, velocities, and other rates of change.	2.7 – 2.9
Week 4	Derivatives. The derivative as a function. Derivatives of polynomial and exponential functions. The product and the quotient rules.	3.1 – 3.4
Week 5	Derivatives of trigonometric functions. Chain rule. Implicit differentiation. Derivatives of logarithmic function.	3.5 – 3.6
Week 6	Rates of change in the natural and social sciences. Exponential growth and decay. Related rates.	3.7 – 3.9
Week 7	Linear approximation and differentials. Hyperbolic functions. Maximum and minimum values. **MIDTERM EXAM**	3.10 – 4.1
Week 8	The mean value theorem. The first and the second derivative tests for extrema. Concavity.	4.2 – 4.3
Week 9	Indeterminate forms and L'Hospital's rule. Summary of curve sketching.	4.4 – 4.5

Week 10	Optimization problems. Newton's method.	4.7 – 4.9
Week 11	Antiderivatives.	4.10
Week 12	Curves defined by parametric equations. Calculus with parametric curves.	10.1 – 10.2
Week 13	Polar coordinates and polar curves.	10.3
Week 14	**FINAL EXAM**	

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