COQUITLAM COLLEGE
Established 1982

COURSE OUTLINE

Last Revised: March 2017

COURSE INFORMATION

Course Title: Integral Calculus w/Application to Commerce & Social Sciences   **Course Number:** MATH 105   **Credits:** 3

Total Weeks: 14 (Fall, Spring)   **Total Hours:** 39   **Course Level:**   ☒ First Year   ☐ Second Year
12 (Summer)   ☐ New   ☐ Revised Course
                                                                                           ☐ Replacement Course

Department: Mathematics   **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

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

Precluded Courses: N/A

COURSE DESCRIPTION

Anti-derivatives, the definite integral, techniques and applications of integration, multi-variable calculus, introduction to differential equations, probability, discrete and continuous random variables, sequence and series, Taylor polynomials/series. applications in economics, commerce, and business administration.

LEARNING OUTCOMES

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

- Upon successful completion of this course, students will have a good command of the concepts of Multivariable Calculus, Integration, Differential Equations, Probability, Sequences, Series, and be able to apply this knowledge to problems in economics, commerce and business administration.

INSTRUCTION AND GRADING

Instructional (Contact) Hours:

Type	Duration
Lecture	39
Seminars/Tutorials	
Laboratory	
Field Experience	
Other (s*pecify):*	
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: 10%	Lab Work: %	Participation: %	Project: %
Specify number of, variety, and nature of assignments:		*Specify nature of participation:*	*Specify nature of project:*
Quizzes/Test: %	3 Midterm Exam: 20% each	Final Exam: 30%	Other: %

TEXT(S) AND RESOURCE MATERIALS

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

Calculus with Applications by Lial, Greenwell and Ritchey, Latest edition, Pearson, required
Calculus: Early Transcendentals by Briggs and Cochran, Latest edition, Pearson, not required

COURSE TOPICS

List topics and sequence covered.

Week	Topic
Week	**Topic**
Week 1	Review of Derivatives. Anti-derivatives, Indefinite Integrals, Integration by Substitution.
Week 2	Stigma Notation, Approximating the Area under a Curve, The Definite Integral. The Fundamental Theorem of Calculus. Area between Curves.
Week 3	The Consumers' and Producers' Surplus; Continuous Money Flow. Approximate Integration (Midpoint Rule, Trapezoid Rule and Simpson's Rule).
Week 4	**Midterm 1** Integration Methods: Partial Fractions, Integration by Parts. Average of Functions, Volumes of Solids of Revolution.
Week 5	Improper Integrals. Calculus and Probability: Discrete and Continuous Random Variables, Density Functions, Expected value, Variance, and Standard Derivation.
Week 6	Sequences and Infinite Series: Convergence & Divergence (Telescoping Series, Geometric Series), Divergence Test, Integral Test (p-series). Estimate of Sums, Arithmetic with Series.
Week 7	**Midterm 2** Series continued: Direct Comparison Test, Limit Comparison Test, Ratio Test. Alternating Series, Absolute and Conditional Convergence.
Week 8	Functions of 2 Variables: Graphs, Level Curves, Partial Derivatives. Relative and Absolute Extrema.
Week 9	Lagrange Multipliers, Double Integrals. .

Week 10	**Midterm 3** Introduction to Differential Equations: Elementary, Separable and First Order Linear Differential Equations; Applications.
Week 11	Power Series: Interval of Convergence, Taylor Series and Taylor Polynomials. Error in the Taylor Polynomial Approximation.
Week 12	Techniques for Finding Taylor Series and Taylor Polynomials. Applications
Week 13	Review
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