



DEPARTMENT OF SCIENCE
COURSE OUTLINE – WINTER 2016
MA 1130 C3
ELEMENTARY CALCULUS I- 3 (3-2-0)
75 Hours over 15 Weeks

INSTRUCTOR: Thomas Kaip **PHONE:** (780) 539-2963

OFFICE: J218 **EMAIL:** tkaip@gprc.ab.ca

OFFICE
HOURS: TBA

DELIVERY MODE(S):

| | | | | |
|----------|----|-----------|-----|------|
| Lecture: | C3 | 1:00-2:20 | W F | J227 |
| Seminar: | C3 | 2:30-4:20 | R | J202 |

PREREQUISITE: Mathematics 30-1 or equivalent

REQUIRED TEXT/RESOURCE MATERIALS:

Stewart: Single Variable Calculus, 7E, Brooks/Cole 2012.

CALENDAR DESCRIPTION:

The course will include a review of analytic geometry; functions, limits, continuity; differentiation of elementary functions; applications to maxima, minima and rates; introduction to integration; Fundamental Theorem; numerical integration; and areas and other applications of the definite integral to areas.

COURSE OBJECTIVES:

This course is an introduction to calculus as a basic mathematical tool in solving optimization, rate of change and area problems. The objective of the course is to provide a basic knowledge of calculus and its applications.

LEARNING OUTCOMES:

At the end of this course, students should be able to:

- State the definition of a function and describe the various ways a function can be represented;
- Identify and sketch standard algebraic, exponential, logarithmic, trigonometric and piecewise defined functions;
- Find the domain and range of a function;
- Apply transformations of functions (shift, stretch and reflect) and combine functions by the standard arithmetic operations;
- Compose functions;
- Calculate limits of functions using the limit laws;
- Identify points or intervals where a function is continuous/discontinuous;
- Calculate derivatives of functions using the limit definition and the differentiation rules;
- Estimate the value of a function at a point using the tangent line (linear) approximation or differentials;
- Calculate derivatives implicitly and solve related rates problems;
- Sketch the graph of a function and indicate the extreme values, points of inflection, vertical, horizontal and oblique asymptotes, and intervals of concavity;
- Apply calculus to solve optimization problems;
- Calculate definite integrals using Riemann sums and the Fundamental Theorem of Calculus;
- Calculate definite and indefinite integrals
- Use the definite integral to find the area between curves.

COURSE SCHEDULE/TENTATIVE TIMELINE:

| Topics | Text Section | Timeline |
|---------------------------------|------------------|-----------|
| Precalculus Review | | 1.5 weeks |
| Functions, Limits & Continuity | 1.1-1.6; 1.8 | 2.5 weeks |
| Differentiation | 2.1-2.9; 6.2-6.4 | 3 weeks |
| Applications of Differentiation | 3.1-3.5; 3.7 | 3 weeks |
| Integration | 3.9; 4.1-4.5 | 3 weeks |
| Areas Between Curves | 5.1 | 1 week |
| Review | | 1 week |

EVALUATIONS:

Quizzes: 20%

Midterm: 30%

Final Exam: 50% (Cumulative and scheduled during exam period, TBA)

Note: There will be no make-up quizzes or exams. If a quiz/test is missed for a valid reason and proper documentation is provided, then the weight of the quiz/test will be transferred to another component. Late assignments will not be accepted.

GRADING CRITERIA:

| GRANDE PRAIRIE REGIONAL COLLEGE | | | |
|--|---------------------------|------------------------------|--|
| GRADING CONVERSION CHART | | | |
| Alpha Grade | 4-point Equivalent | Percentage Guidelines | Designation |
| A⁺ | 4.0 | 95 – 100 | EXCELLENT |
| A | 4.0 | 90 – 94 | |
| A⁻ | 3.7 | 85 – 89 | FIRST CLASS STANDING |
| B⁺ | 3.3 | 80 – 84 | |
| B | 3.0 | 75 – 79 | GOOD |
| B⁻ | 2.7 | 70 – 74 | |
| C⁺ | 2.3 | 66 – 69 | SATISFACTORY |
| C | 2.0 | 62 – 65 | |
| C⁻ | 1.7 | 58 – 61 | |
| D⁺ | 1.3 | 55 – 57 | MINIMAL PASS |
| D | 1.0 | 50 – 54 | |
| F | 0.0 | 0 – 49 | FAIL |
| WF | 0.0 | 0 | FAIL, withdrawal after the deadline |

STUDENT RESPONSIBILITIES:

Refer to the College Policy on Student Rights and Responsibilities at www.gprc.ab.ca/d/STUDENTRIGHTSRESPONSIBILITIES

STATEMENT ON PLAGIARISM AND CHEATING:

Refer to the College Student Misconduct: Academic and Non-Academic Policy at www.gprc.ab.ca/d/STUDENTMISCONDUCT

**Note: all Academic and Administrative policies are available at www.gprc.ab.ca/about/administration/policies/

TRANSFERABILITY:

University of Alberta *, University of Calgary *, University of Lethbridge *, Athabasca University *
Augustana Faculty, University of Alberta *, Concordia University College, Canadian University
College, Grant MacEwan University, King's University College.
Other (transfers in combination with other courses or to other institutions) (From the GPRC catalog)

* An asterisk (*) beside any transfer institution indicates important transfer information. Consult the Alberta Transfer Guide.

Note: Grade of D or D+ may not be acceptable for transfer to other post-secondary institutions. Students are cautioned that it is their responsibility to contact the receiving institutions to ensure transferability

Please refer to the Alberta Transfer guide for current transfer agreements:

www.transferralberta.ca