



**DEPARTMENT OF SCIENCE**  
**COURSE OUTLINE – FALL 2019**  
**MA 1130 C2 D2**  
**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: |    | 1:00-2:20 | W F | J228 |
| Seminar: | C3 | 2:30-4:20 | M   | J202 |
|          | D3 | 2:30-4:20 | W   | J203 |

**PREREQUISITE:** Mathematics 30-1 or equivalent

**REQUIRED TEXT/RESOURCE MATERIALS:**

Online textbook

**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:**

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

### **STUDENT RESPONSIBILITIES:**

Refer to the College Policy on Student Rights and Responsibilities at [www.gprc.ab.ca/d/STUDENTRIGHTSRESPONSIBILITIES](http://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](http://www.gprc.ab.ca/d/STUDENTMISCONDUCT)

\*\*Note: all Academic and Administrative policies are available at [www.gprc.ab.ca/about/administration/policies/](http://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](http://www.transferralberta.ca)