



DEPARTMENT OF ACADEMIC UPGRADING

COURSE OUTLINE – FALL 2021

MA0131 (E2) - Mathematics Grade 12 Calculus Equivalent 5 (0-0-7.5) HS 112.5 hours for 15 Weeks

Grande Prairie Regional College respectfully acknowledges that we are located on Treaty 8 territory, the traditional homeland and gathering place for many diverse Indigenous peoples. We are honoured to be on the ancestral lands of the Cree, Dene/Beaver and Métis, whose histories, languages, and cultures continue to influence our vibrant community. We are grateful to have the opportunity to work, learn, and live on this land.

INSTRUCTOR: Reddy Ganta **PHONE:** (780) 539-2810 or 2850
OFFICE: A205 or B301 **E-MAIL:** Rganta@gprc.ab.ca
OFFICE HOURS: 4:30 pm to 6:00 pm on Wed & Thur.; or by appointment

CALENDAR DESCRIPTION:

This course includes limits of sequences, series, and functions, secants and tangents, derivatives from first principles, chain rule, product rule, quotient rule, implicit differentiation, curve sketching, maximum and minima applications, relates rates applications, anti-derivatives and area, limits, and derivatives of trigonometric functions.

PREREQUISITE(S)/COREQUISITE:

MA0120 or equivalent. Pre or Co-requisite: MA0130

REQUIRED TEXT/RESOURCE MATERIALS:

Text Book: Package of MA0131 modules;
Scientific calculator, graphing paper, geometry set

DELIVERY MODE:

- This course is delivered remotely. There is no face- to- face or onsite requirement. Students must have a computer with a webcam, Printer/Scanner, and reliable internet connection. Technological support is available through helpdesk@gprc.ab.ca.

- MA0131 is a modularized math course divided into 9 separate units called modules. The instructions for each topic are given in the modules, followed by several examples and exercises. Study the instructions and work through the examples before starting each exercise. The answers for each exercise are given at the end of each module. Check your work often to make sure you understand each topic. The key to success in working with modules is to ask questions whenever you have difficulty understanding instructions, the examples, or the exercises. **Do not hesitate to ask for help.**
- All tests and exams MUST be written at the scheduled times (page 5).
- One lowest test mark out of 5 test marks will be ignored.

COURSE OBJECTIVES:

The Course introduces students to:

- the review of graphing of functions by applying transformations to the graphs of a known function
- the review of factoring expressions with integral and rational exponents, rationalize expressions, and the four basic operations
- the limit of a functions using the graph of the function and using the limit theorems
- concept of a continuous and discontinuous function
- definition of a derivative to determine the derivative of $f(x) = x^n$ where n is a positive integer
- differentiation of a polynomial function and derivative to determine a rate
- chain rule in combination with a product and quotient rule to determine the derivative
- slope and equation of the tangent at a given point using the derivative of a function
- intervals where the derivative is greater than zero or less than zero
- use of the derivatives to determine maximum and minimum values for applications, and to solve rate of change applications
- anti-derivatives of polynomial, radical, and rational functions
- area between a curve and the x-axis over a given interval
- limit for a trigonometric function as the angle approaches a finite or infinite value
- derivative of the three primary and three reciprocal trigonometric functions
- derivative of more complicated trigonometric functions using the power, chain, product, and quotient rules

LEARNING OUTCOMES:

As a result of taking this course, students will gain the ability to:

- draw graphs of a functions by applying transformations to the graphs of known functions
- simplify rational expressions, using any of the four basic operations
- determine the limit of a functions for a given value using the graph of the function
- compute limits of functions, using definitions and limit theorems
- determine the slopes and equations of the tangent and the normal lines at a given point on a curve, using the definition of a derivative
- differentiate polynomial functions, using the derivative theorems for sum and difference
- determine the derivative of a combination function with the product and quotient using the chain rule
- differentiate a function using implicit differentiation
- sketch the graph of a function using first and second derivatives to find maxima, minima, and inflection point
- determine intervals where the derivative is greater than zero or less than zero in order to predict where the function is increasing or decreasing
- determine whether or not a critical point is a maximum or a minimum
- determine maximum or minimum values for application involving numbers, geometry, distance and time, economics, and science
- solve rate of change applications relating to science, area, volume, and related motion
- determine the area between a curve and the x-axis over a given interval
- determine velocity and displacement by finding the anti-derivatives of acceleration and velocity functions
- determine the limit for a trigonometric function as the angle approaches a finite or infinite value
- find the derivative of more complicated trigonometric functions using the power, chain, product and quotient rule

TRANSFERABILITY:

Please consult the Alberta Transfer Guide for more information. You may check to ensure the transferability of this course at the Alberta Transfer Guide main page

<http://www.transferralberta.ca>.

** 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

GRADING CRITERIA: Please note that most universities will not accept your course for transfer credit **IF** your grade is **less than C-**.

Alpha Grade	4-point Equivalent	Percentage Guidelines		Alpha Grade	4-point Equivalent	Percentage Guidelines
A+	4.0	90-100		C+	2.3	67-69
A	4.0	85-89		C	2.0	63-66
A-	3.7	80-84		C-	1.7	60-62
B+	3.3	77-79		D+	1.3	55-59
B	3.0	73-76		D	1.0	50-54
B-	2.7	70-72		F	0.0	00-49

EVALUATION CRITERIA:

Your course mark is determined by:

4 section tests	40 %
Midterm	20 %
Final Exam	40 %

All tests and exams **MUST** be written at the scheduled times. A missed test (exam) will result in a score of **ZERO** on that test (exam). The final exam is scheduled by the registrars' office during GPRC Exam weeks.

MA131 Test Schedule for Winter 2021

Topics / Tests / Exams

Test #	% Towards the final exam	Module's Title	Recommended Time & Test Date	Date written	Your mark
1	10%	Review & Limits	September 21 Tuesday		
2	10%	The Derivative & More Derivatives	October 7 Thursday		
	20%	MIDTERM - must be written on or before	October 11 Monday		
3	10%	Curve Sketching Applications: & Maximum/Minimum	November 2 Tuesday		
4	10%	Applications: Rate of Change & Anti-derivatives and Area	November 18 Thursday		
5	10%	Derivatives of Trigonometric Functions	December 2 Thursday		
Final Exam	40%		To be announced (Dec. 11 – 20)		

STUDENT RESPONSIBILITIES:

In addition to the *Student Rights and Responsibilities* as set out in the college website www.gprc.ab.ca/d/STUDENTRIGHTSRESPONSIBILITIES , the following guidelines will maintain an effective learning environment for everyone:

1. Regular attendance is expected of all students in all mathematics courses. Your success in math is directly linked to your attendance.
2. Students are expected to be punctual. Arrive on time for classes and remain for the duration of scheduled classes.
3. Refrain from disruptive talking or socializing during class time.

STATEMENT ON PLAGIARISM AND CHEATING:

Cheating and plagiarism will not be tolerated and there will be penalties. For a more precise definition of plagiarism and its consequences, refer to the Student Conduct section of the College Calendar at <http://www.gprc.ab.ca/programs/calendar/> or the College Policy on Student Misconduct: Plagiarism and Cheating at <https://www.gprc.ab.ca/about/administration/policies>

How to use a module:

1. Read and thoroughly understand the concepts and terminology of a section.
2. Understand and do each example very carefully using the terminology.
If difficulties arise, Do not hesitate to ask for help.
3. Match each question in an exercise with the corresponding examples before the exercise. *If difficulties arise, return in your module and rework the examples.*
4. Attempt the exercise questions and check the answers before moving on to the next section. ***If difficulties arise, Do not hesitate to ask for help.***