# GPRC

**DEPARTMENT OF ACADEMIC UPGRADING**
**COURSE OUTLINE   Fall 2017**

**MA0132 (A2/VC) - Mathematics Grade 12 Equivalent (Principles 30-2) 5 (6-0-0) HS**
**6 hours/ week  for 15 weeks (90 hours)**

| | | | |
|---|---|---|---|
| **INSTRUCTOR:** | Sheryl Heikel | **PHONE:** | Office:  780–539–2059 |
| **OFFICE:** | C417 | **E-MAIL:** | sheikel@gprc.ab.ca |

**OFFICE HOURS:**   Tuesday /Thursday 10:00 – 11:00am (Location to be determined)
Or by appointment

**CALENDAR DESCRIPTION**:

**MA0132 - Mathematics Grade 12 Equivalent (Principles 30-2) 5 (6-0-0) HS**
This course explores set theory, counting methods, probability, rational expressions and equations, and functions (polynomial, exponential, logarithmic and sinusoidal).

**PREREQUISITE(S)/COREQUISITE:**

MA0122 or MA0120 or equivalent, or equivalent math placement test score, or Math 20-1 or 60% or better in Math 20-2 or equivalent within the previous two years.

**REQUIRED TEXT/RESOURCE MATERIALS:**

iWrite Math Foundations of Mathematics Book 12  (Absolute Value Publications)
NON-GRAPHING scientific calculator,
     If you are purchasing a TI-**30X** IIS is recommended,
graph paper

**DELIVERY MODE(S):**
Classroom instruction. Use of Moodle is required. This course is also available by video conference at other GPRC sites.

**COURSE OBJECTIVES:**
As stated by Alberta Education, https://education.alberta.ca/teachers/program/math/educator/progstudy/
          upon successful completion of this course the student will be able to:


Develop logical reasoning.
1. Analyze puzzles and games that involve numerical and logical reasoning, using
   problem-solving strategies.
2. Solve problems that involve the application of set theory.

Develop critical thinking skills related to uncertainty.   Probability
1. Interpret and assess the validity of odds and probability statements.
2. Solve problems that involve the probability of mutually exclusive and non–mutually exclusive
   events.
3. Solve problems that involve the probability of two events.
4. Solve problems that involve the fundamental counting principle.
5. Solve problems that involve permutations.
6. Solve problems that involve combinations.

Develop algebraic and graphical reasoning through the study of relations.
1. Determine equivalent forms of rational expressions (limited to numerators and
   denominators that are monomials and binomials).
2. Perform operations on rational expressions (limited to numerators and denominators
   that are monomials and binomials).
3. Solve problems that involve rational equations (limited to numerators and denominators
   that are monomials and binomials).
4. Demonstrate an understanding of logarithms and the laws of logarithms.
5. Solve problems that involve exponential equations.
6. Represent data, using exponential and logarithmic functions, to solve problems.
7. Represent data, using polynomial functions (of degree ≤ 3), to solve problems.
8. Represent data, using sinusoidal functions, to solve problems.


**LEARNING OUTCOMES:**
After completing MA0132, students will be able to:


**Section 1**     **Logical Reasoning and Set Theory**  (text pages 1– 62)
- Use set notation and Venn diagrams.
- Determine the number of elements in a set.
- Determine the relationships between sets.
- Represent the intersection and union of two sets.
- Apply set theory to solve problems.
- Analyze puzzles and games

**Permutations and Cominations**  (text pages 63 – 122)
- Apply the fundamental counting principle to determine the number of different ways to
  perform multi-step operations.
- Use factorial notation to determine permutations and combinations, or to solve for $n$ or $r$.
- Determine the number of permutations of $n$ different objects when all, or part, are used at a time.
- Determine the number of permutations of $n$ objects when some of them are identical.
- Define combinations of $n$ objects.
- Determine the number of different combinations when $r$ objects are selected from $n$
  different objects.
- Apply the principle of combinations to different situations, and solve related problems.

## Section 2
**Probability**  (text pages 123 – 190, 571 – 578)
- Distinguish between experimental and theoretical probability.
- Interpret odds and relate them to probability.
- Solve probability questions that involve permutations and combinations.
- Solve problems that involve mutually exclusive and non-mutually exclusive events.
- Solve problems that involve dependent and independent events.
- Analyze puzzles and games

**Rational Expressions and Equations** (text pages 417 – 498)
- Determine equivalent rational expressions.
- Determine non-permissible values.
- Perform operations with rational expressions: add, subtract, multiply and divide .
- Simplify rational expressions that require factoring of binomials.
- Solve rational equations.

## Section 3
**Exponential and Logarithmic Functions**
**Applications**          (text pages 199 – 330)
- Use the equation of an exponential function to predict the characteristics of its graph and
- identify the graph.
- Solve exponential equations by using common bases and graphically.
- Solve problems modelled with exponential functions.
- Represent data using an exponential function and interpret the graph to solve problems.
- Solve loan, mortgage and depreciation problems using exponential functions.
- Determine the characteristics of logarithmic functions from an equation.
- Estimate and determine the values of logarithmic expressions.
- Understand and apply the laws of logarithms.
- Use logarithms to solve exponential equations.
- Model situations using logarithmic functions and interpret the models.

## Section 4
**Polynomial and Sinusoidal Functions**  (text pages 331 - 410)
- Identify characteristics of graphs of polynomial functions.
- Determine characteristics of graphs from the leading coefficient and constant term.
- Determine the best fit line for a set of data, and use the function to solve a problem.
- Determine the curve of best fit for a set of data and use the function to solve problems.
- Sketch angles in degree and radian measure.
- Estimate the radian measure of an angle given the degree measure.
- Describe the characteristics of sinusoidal functions using their graphs and equations.
- Graph data for and model a situation using a sinusoidal function.
- Solve problems using sinusoidal function models.

**TRANSFERABILITY:**
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. This course is listed in the Alberta Transfer Guide as equivalent to Math 30-2. ** Although 50% (D) is considered a pass for this course, it is strongly recommend that you achieve a mark of 65% (C) to be successful at the next level.

**EVALUATIONS:**   Course final grade will be based on the following components.

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| 4 Section Tests | 40% |
| Seminar Assignments | 5% |
| Midterm Exam | 20% |
| Final Exam (Cumulative) | 35% |

All tests and exams MUST be written at the scheduled times unless **PRIOR** arrangements have been made with the instructor. A missed test (exam) will result in a score of ZERO on that test (exam). Only in very specific cases may student be given an opportunity to make up a missed exam (student will be presented with a different version of the exam).  Doctor, lawyer or police documentation may be required.  The final exam is 3 hours long and is scheduled by the registrars' office during GPRC Exam weeks. Do not book vacation in this time period.

**GRADING CRITERIA:** Final Grades will be assigned on the Letter Grading System.

| 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 |

**COURSE SCHEDULE / TENTATIVE TIMELINE:**

**Math 0132**  divides into 4 Sections or Units                    **Tentative** Exam dates

| | | |
|---|---|---|
| A. | Logical Reasoning and Set Theory Permutations and Combinations | September 20 |
| B. | Probability Rational Expressions and Equations | October 19 |
| | Midterm Exam  (20%) | October 25 |
| C | Exponential and Logarithmic Functions Applications | November 17 |
| D. | Polynomial and Sinusoidal Functions | December 6 |

**STUDENT RESPONSIBILITIES:**

> Refer to the College Policy on Student Rights and Responsibilities at
> https://www.gprc.ab.ca/files/forms_documents/StudentRightsandResponsibilities.pdf

MA0130 is required for many post-secondary programs.  In taking this course, the primary goal is that students will develop their appreciation, understanding of and ability to use mathematics. Students in this course are also learning how to prepare for the demands and expectations of post-secondary education.

The Academic Upgrading Department is an adult education environment. Students are expected to show respect for each other as well as faculty and staff. Students are expected to participate fully in achieving their educational goals.

Certain activities are disruptive and not conducive to an atmosphere of learning. In addition to the *Student Rights and Responsibilities* as set out in the College calendar, the following guidelines will maintain an effective learning environment for everyone. We ask the cooperation of all students in the following areas of classroom deportment.

1. **Attendance**:  Regular attendance and class participation is expected of all students and is crucial to good performance in the course. Class interruption due to habitual late arrival or leaving early will not be permitted. You may be debarred from the final exam if your absences exceed 15% of class days (10 lecture classes).
2. **Once in class** – remain in class. Leaving to get a coffee is disruptive for others.
3. Check **Moodle** as well as **GPRC email** on a regular basis.
4. Exams must be written on the days announced in class.
5. If an emergency prevents attendance on an exam day, students must contact me as soon as possible via phone or email, and may be asked to provide documentation to justify their absence.
6. No unspecified electronic devices will be permitted during exams.
7. Complete daily homework.  **At least** 1 hour of study per day outside of class time is required.
8. Behaviors that interfere with learning are not acceptable.
9. Take responsibility for your learning.
10. **Communicate all requests regarding appointments, etc via email**.

**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

**Note: all Academic and Administrative policies are available on the same page.