



**DEPARTMENT OF ACADEMIC UPGRADING**  
**COURSE OUTLINE – WINTER 2015(NIGHT CLASS)**  
**MATH 0120 Mathematics Grade 20-1 Equivalent**

**INSTRUCTOR:** Reddy Ganta                      **PHONE:** (780) 539-2810 or 2850

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**OFFICE HOURS:** 1:00-2:20 pm Tuesday and Thursday

**PREREQUISITE(S)/COREQUISITE:**

MA0110, Mathematics 10 – C, or equivalent math placement test score

**REQUIRED TEXT/RESOURCE MATERIALS:**

Pre-Calculus 11 Work Text, 2011 (Pearson), publisher Mike Czukar

Loose leaf paper or note book; a pencil, an eraser, a ruler; a scientific calculator, graph paper

**CALENDAR DESCRIPTION:**

This course explores sequences and series, radical expressions and equations, quadratic equations and functions, linear and quadratic inequalities, linear-quadratic and quadratic-quadratic systems of equation, rational expressions and equations, absolute value functions, reciprocal functions, and trigonometry including the sine and cosine laws.

**CREDIT/CONTACT HOURS:**

MA 0120 Mathematics Grade 20 -1 Equivalent 5 (5-0-0), Time: 75 Hours

## DELIVERY MODE:

- MA 0120 is a modularized math course divided into 8 separate topics. Each topic introduces new vocabulary of the topic. The topic is further divided into five or six sub-topics. Each sub-topic introduces one new objective to be accomplished, followed by new term written in **bold letters** with its explanation, up to a maximum of four to six new terms. Each new objective is demonstrated with four examples with clearly stated instructions, followed by exercise questions. Study the terms and their explanations and work through the examples before starting the exercise questions. The answers to all the exercise questions are listed under the title **Answers** before starting the next sub-topic. The mastery of every two sub-topics is further tested in an exercise called **Assess Your Understanding**. There is a lot of provision to review the material learnt in each topic. Do every single question to make sure you understand the newly introduced concepts. There will be four assignments, four tests, one midterm, and a final exam in this course
- You must submit an **assignment** for marks for certain topics.
- When doing your assignment or writing a test, be sure to show all of your work. Marks are given for the method as well as the final answer.
- A passing mark of 60% is required on the test before continuing on to the next section. If you are unable to attain this mark, you must review the material and rewrite the test. The first and second test marks will be averaged. Upon completion of the first four topics, a midterm test will be written on or before **Tuesday, March 3**. If you miss this date, you will receive a mark of 0% on your midterm. Upon completion of all eight sections, you will write a three hour final exam.
- The recommended test date or assignment date for topic(s) is on the course outline. Follow these dates as closely as you can. You are encouraged to write a test or assignment early if you are prepared. **All tests/assignments must be written by Tuesday, April 14.**

### Bonus

When you write your module tests on or before the given date, you will be awarded an additional 2% on your score for each test.

## LEARNING OUTCOMES

### Topic 1: Sequence and Series

- Relate linear functions and arithmetic sequences, then solve problems related to arithmetic sequences.
- Derive a rule to determine the sum of  $n$  terms of an arithmetic series, then solve related problems.
- Solve problems involving geometric sequences.
- Derive a rule to determine the sum of  $n$  terms of a geometric series, then solve related problems.
- Investigate the graphs of geometric sequences and geometric series.
- Determine the sum of infinite geometric series.

### Topic 2: Absolute Values and Radicals

- Develop the concept of absolute value of a real number and relate it to the square root.
- Simplify radical expressions with numerical or variable.
- Simplify sums and differences of radical expressions.
- Simplify products and quotients of radical expressions.
- Extend strategies for solving linear equations and simplifying radicals to solving equations involving radicals.

### Topic 3: Solving Quadratic Equations

- Factor polynomial expressions that contain functions.
- Apply factoring strategies to solve quadratic equations.
- Use the strategies of determining square roots and completing the square to solve quadratic equations.
- Use completing the squares to develop a formula to solve a quadratic equation.
- Determine the number of solutions of a quadratic equations without solving the equation.

#### **Topic 4: Analyzing Quadratic Functions**

- Determine the characteristics of a quadratic function and sketch its graph,
- Relate a quadratic equation to its corresponding quadratic function.
- Explore three transformations of the graph of a quadratic function.
- Determine the characteristics of the graph of a quadratic function from its quadratic equation in standard form and sketch the graph.
- Complete the square to write an equation in general form as an equation in standard form.
- Determine the characteristics of the graph of a quadratic function with its equation in general form.
- Write a quadratic function to model a problem, then solve that problem.

#### **Topic 5: Graphing Inequalities and Systems of Equations**

- Solving quadratic inequalities in one variable using different strategy.
- Graph linear inequalities in two variables and solve related problems.
- Graph the quadratic inequalities in two variables and solve related problems.
- Solve Systems of linear-quadratic equations and quadratic-quadratic equations by graphing.
- Use algebraic strategies to solve linear-quadratic systems and quadratic-quadratic systems.

#### **Topic 6: Trigonometry**

- Relate the primary trigonometric ratios to angles in standard positions.
- Use the angles in standard position to determine the trigonometric ratios of angles from  $0^\circ$  to  $360^\circ$ .
- Explore the conditions for which given information is sufficient to construct a unique triangle.
- Apply the Sine Law to solve problems in triangles that are not right triangles.
- Apply the Cosine Law to solve problems in triangles that are not right triangles.

**Topic 7: Rational Expressions and Equations**

- Determine equivalent forms of rational expressions.
- Simplify products and quotients of rational expressions.
- Add and subtract rational expressions with monomials.
- Add and subtract rational expressions with binomials and trinomial denominators.
- Solve equations involving rational expressions.
- Solve problems by writing, then solving equations involving rational expressions.

**Topic 8: Absolute Value and Reciprocal Functions**

- Graph and identify the properties of absolute value functions.
- Use different strategies to solve absolute value equations.

## TRANSFERABILITY:

This course is listed in Alberta Transfer Guide. It is accepted at colleges and universities in Alberta as equivalent to Math 20 -1.

## OBJECTIVES:

Students will develop problem solving skills and gain awareness of mathematics in modern society.

## SUCCESS STANDARD:

Although 50% is considered a pass for this course, if you wish to be successful at the next level, we strongly recommend that you achieve a mark of 65% or better.

## GRADING CRITERIA:

Your final mark is determined by:

|                 |      |
|-----------------|------|
| 4 assignments   | 16%  |
| 4 section tests | 32 % |
| Midterm         | 17 % |
| Final Exam      | 35 % |

| GRANDE PRAIRIE REGIONAL COLLEGE |                    |                       |                                     |
|---------------------------------|--------------------|-----------------------|-------------------------------------|
| GRADING CONVERSION CHART        |                    |                       |                                     |
| Alpha Grade                     | 4-point Equivalent | Percentage Guidelines | Designation                         |
| A <sup>+</sup>                  | 4.0                | 90 – 100              | EXCELLENT                           |
| A                               | 4.0                | 85 – 89               |                                     |
| A <sup>-</sup>                  | 3.7                | 80 – 84               | FIRST CLASS STANDING                |
| B <sup>+</sup>                  | 3.3                | 77 – 79               |                                     |
| B                               | 3.0                | 73 – 76               | GOOD                                |
| B <sup>-</sup>                  | 2.7                | 70 – 72               |                                     |
| C <sup>+</sup>                  | 2.3                | 67 – 69               | SATISFACTORY                        |
| C                               | 2.0                | 63 – 66               |                                     |
| C <sup>-</sup>                  | 1.7                | 60 – 62               |                                     |
| D <sup>+</sup>                  | 1.3                | 55 – 59               | MINIMAL PASS                        |
| D                               | 1.0                | 50 – 54               |                                     |
| F                               | 0.0                | 0 – 49                | FAIL                                |
| WF                              | 0.0                | 0                     | FAIL, withdrawal after the deadline |

**Winter 2015**  
**MA0120 Topics/Tests or Assignment**

**1. Sequence and Series**

- **Assignment**
- **Recommended date and day for the assignment to be handed in for marks is Jan. 15.**

**2. Radical Expressions and Equations**

- **Test which would include topic 1 and 2.**
- **Recommended date and day for the test is Jan. 29.**

**3. Solving Quadratic Equations**

- **Assignment**
- **Recommended date and day for the assignment to be handed in for marks is February 10.**

**4. Analyzing Quadratic Functions**

- **Test which would include topic 3 and 4.**
- **Recommended date and day for the test is February 26.**

**Midterm must be written on March 3**

**5. Graphing Inequalities and System of Equations**

- **Assignment**
- **Recommended date and day for the assignment to be handed in for marks is March 17.**

**6. Trigonometry**

- **Test which would include topic 5 and 6.**
- **Recommended date and day for the test is March 26.**

**7. Rational Expressions and Equations**

- **Assignment**
- **Recommended date and day for the assignment to be handed in for marks is April 2.**

**8. Absolute Values**

- **Test which would include topic 7 and 8.**
- **Recommended date and day for the test is April 9.**

**Final Exam TBA (April 16 – 27)**



### **STUDENT RESPONSIBILITIES:**

In addition to the *Student Rights and Responsibilities* as set out in the college website, 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. Attendance will be taken daily.
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.
4. Be respectful of others regarding food or beverages in the classroom. Clean up your eating area and dispose of garbage.
5. Recycle paper, bottles, and cans in the appropriate containers.
6. Children are not permitted in the classrooms.
7. Students are expected to notify the instructor of any extenuating circumstances.

### **ELECTRONIC DEVICES:**

Students are expected to turn off cell phones during class time or in labs. No unspecified electronic devices will be allowed in exams.

### **STATEMENT OF PLAGIARISM:**

Please refer to the College Website for policies regarding plagiarism and cheating as well as the resultant penalties. These are serious issues and will be dealt with severely.

### **STUDENT PRINTING POLICY:**

Please refer to the College website (Home > Tuition and Fees) for the printing policy which limits the free use of paper; extra charges will be applied if the limit is exceeded.