GPRC

DEPARTMENT OF ACADEMIC UPGRADING

COURSE OUTLINE – WINTER 2011
MA0130 – 5(6-0-0) HS 90 HOURS

INSTRUCTOR:	Joelle Reynolds	**PHONE:**	780-539-2204
OFFICE:	C305	**EMAIL:**	jreynolds@gprc.ab.ca
OFFICE HOURS:	MTRF 11:00 – 12:00 pm, or by appointment		

PREREQUISITE(S)/COREQUISITE:
MA0120 or equivalent, or equivalent math placement test score.

REQUIRED TEXT/RESOURCE MATERIALS:
- Student Notes and Problems – Math 30 (Pure) Workbook (Rao) Castle Rock Research Corp.
- Student Notes and Problems – Math 30 (Pure) Solution Manual (Rao) Castle Rock Research Corp.
- *Non-graphing* scientific calculator (Texas Instruments TI-30XIIS preferred, but not essential)
- Graph paper (a blue post-it note graph pad is ideal, sold in the GPRC Bookstore)
- Binder, loose leaf and dividers to organize handouts and notes provided

CALENDAR DESCRIPTION:
MA 0130 – Mathematics Grade 12 Equivalent (Pure)
This course explores transformations, exponents and logarithms, sequences, series, trigonometry (including the unit circle, graphs, identities and equations), quadratic relations, conics, permutations and combinations, probability and statistics.

CREDIT/CONTACT HOURS:
5 (6-0-0)   90 contact hours

DELIVERY MODE:
Students are guided through the workbook, additional notes and examples are provided as necessary. First, background concepts and rules are reviewed; then investigative work is done leading to new concepts, laws and formulas. Several related problems are assigned daily to reinforce new ideas and skills.

COURSE OUTCOMES:

Students will develop problem solving skills and gain an appreciation of the mathematics of modern society. This course prepares students for university transfer mathematics courses.

TRANSFERABILITY:

This course is listed in the Alberta Transfer Guide. It is accepted at colleges and universities in Alberta as equivalent to Math 30 Pure.
** Grades 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:

Unit Assignments: 9 assignments

     (Assignments 2, 4 and 6 are worth 2% each. All others are worth 3% each)   24%

Exams: 3 Section Exams at 12% each   36%

Final Exam: Cumulative   40%

GRANDE PRAIRIE REGIONAL COLLEGE			
GRADING CONVERSION CHART			
Alpha Grade	**4-point Equivalent**	**Percentage Guidelines**	**Designation**
A^+	4.0	90 – 100	**EXCELLENT**
A	4.0	85 – 89	
A^-	3.7	80 – 84	**FIRST CLASS STANDING**
B^+	3.3	77 – 79	
B	3.0	73 – 76	**GOOD**
B^-	2.7	70 – 72	
C^+	2.3	67 – 69	**SATISFACTORY**
C	2.0	63 – 66	
C^-	1.7	60 – 62	
D^+	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)**

COURSE SCHEDULE/TENTATIVE TIMELINE:
UNIT DESCRIPTIONS with Corresponding Textbook Lessons and Projected Timelines

Unit 1   Transformations   (Workbook Lessons 1-5)   **5 days**

- Review
- Graph polynomial, linear, quadratic, rational, absolute value, radical and cubic functions.
- Understand function notation and write an inverse function.
- Given the graph of any function, be able to plot the graph of a related function using translations (horizontal and vertical), stretches (about the x or y-axis), and reflections (in x-axis, in y-axis, in line $y=x$).
- Identify transformation(s) from an equation.
- Write an equation to reflect a given translation, reflection, or stretch.
- Identify and perform combinations of transformations on functions.

Complete an assignment at the end of this unit worth 3% of the final grade.

Unit 2   Exponents and Logarithms   (Workbook Lessons 1-8, 10-13)   **10 days**

- Use the laws of exponents and laws of logarithms to simplify expressions.
- Define logarithmic relationships and be able to interconvert exponential and logarithmic relations.
- Evaluate logarithms to find exact values.
- Evaluate common and natural logarithms using a calculator.
- Plot graphs of exponential & logarithmic functions.
- Identify transformations of exponential & logarithmic functions.
- Solve exponential & logarithmic equations.

Complete an assignment in the middle of this unit worth 3% of the final grade.

- Define **geometric sequence**, common ratio, and general term. Also, be able to identify a geometric sequence.
- Determine the general term as well as specific terms of a geometric sequence.
- Determine the sum of a given geometric sequence to a desired number of terms.
- Expand and evaluate expressions written in Sigma notation.
- Solve related problems
- Develop a model for exponential growth or decay and solve related problems.
- Determine the doubling period, half-life or any other time period for exponential growth or decay, and solve related problems.
- Solve problems based on logarithmic formulas, including Richter, decibel, and pH scales.

Complete an assignment at the end of this unit worth 2% of the total grade.

Complete an exam worth 12% of the final grade

<u>**Unit 3   Trigonometry**</u>   (Workbook Lessons 1-10,12-20,22)   **13 days**

- Define the primary and reciprocal trigonometric ratios of an angle.
- Define principal and coterminal angles, and state relationship between them.
- Define radian measure of an angle; be able to convert radians to degrees and vice-versa.
- Given one trigonometric ratio of an angle, determine the other 5 ratios.
- Determine reference angle and apply the CAST rule.
- Determine exact values of trigonometric ratios for special angles on the unit circle.

Complete an assignment in the middle of this unit worth 2% of the total grade.

- Solve first and second degree trigonometric equations giving specific and general solutions.
- Verify an identity is true for a specific value of the variable.
- Prove trigonometric identities for all defined values of the variable.
- Apply sum and differences identities as well as double angle identities.

Complete an assignment in the middle of this unit worth 3% of the total grade.

- Define period and amplitude of a periodic function.
- Plot graphs of the basic sine, cosine and tangent functions.
- Determine the period and the amplitude of a periodic function from a given graph, and be able to write the equation of a sinusoidal function given its graph.
- Use transformations to plot the graphs of more complex sine and cosine functions.
- Solve application questions involving sinusoidal functions

Complete an assignment at the end of this unit worth 2% of the total grade.

Complete an exam worth 12% of the total grade.

Unit 4   Permutations and Combinations   (Workbook Lessons 1-8,10-13)   **6 days**

- Apply the fundamental counting principle to determine the number of different ways to perform multi-step operations.
- Define permutations of *n* objects and factorials.
- 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.
- Explain Pascal's triangle and how it is related to combinations and the Binomial Theorem.
- Use the Binomial Theorem to expand a binomial or to find a specific term in the expansion of a binomial where the exponent *n* is a natural number.
- Use permutations, combinations, or the fundamental counting principle to solve probability problems.

    Complete an assignment at the end of this unit worth 3% of the final grade.

Unit 5   Statistics and Probability Distribution   (Workbook Lessons 1-5)   **5 days**

- Define the measures of central tendency (mean, mode, median) and determine the value for each of them for a set of data.
- Define the measures of dispersion (range, standard deviation).
- Calculate standard deviation for a population and apply to analyse given data.
- Define and display a probability distribution.
- Determine the probability for a binomial experiment.
- Define *z*-score, and calculate *z*-score for a given set of data, and apply to solve related problems.
- Explain normal distribution and standard normal curve.
- Use area under the standard normal curve and *z*-scores to solve related problems.

    Complete an assignment at the end of this unit worth 3% of the final grade.

- Identify the parts of a double-napped cone.
- Given information on how a plane intersects a cone, determine whether the conic formed is a circle, ellipse, parabola, hyperbola, or a degenerate of one of these.
- Explain how the values for A and C in the general form of the equation of a conic section determine the shape of the conic.
- Identify the appropriate conic section from an equation given in general form.
- Given an equation in standard form, identify the conic.
- Determine the series of transformations necessary to transform the graph of one conic to the graph of another or the equation of one conic to the equation of another.
- Determine the equation of a conic given an original equation and a series of transformations.
- Write an equation of a conic given specific characteristics.
- Given the equation of a parabola in standard form, determine the direction, vertex, domain and range, intercepts and sketch the graph.
- Given the equation of a circle, determine the centre, radius, domain and range and sketch the graph.
- Given the equation of an ellipse, determine the direction, centre, vertices, domain and range, lengths of major and minor axes, intercepts and sketch the graph.
- Given the equation of a hyperbola, determine the direction, centre, vertices, lengths of transverse and conjugate axes, domain and range, intercepts, slopes of asymptotes and sketch the graph.
- Convert a given equation of a conic section from general to standard form and vice-versa.
- Graph conic sections from equations in standard form, and state the domain, range and defining characteristics of the graph
- Solve application problems that model conic sections

Complete an assignment at the end of this unit worth 3% of the final grade.
Complete an exam worth 12% of the total grade.

Write a Cumulative Final Exam worth 40% of the final grade.

MA0130 is a prerequisite for many post-secondary programs. In taking this course, the primary goal is that students will develop their understanding of and ability to use mathematics. However, students in this course are also learning how to prepare for the demands and expectations of post secondary education. Expectations for student behavior at the post secondary level are different than those at the middle or high school levels. Please read and ensure you understand the following expectations before we begin:

ASSIGNMENTS AND EXAMINATIONS:

Assignments will be submitted on time
o Assignments are due **at the beginning of class** on the specified dates.
o Students who cannot submit on time due to unforeseen circumstances must contact the instructor **prior to the beginning of class** on the due date to make alternate arrangements.
o **Students will not be allowed to hand in more than one late assignment.**
o Late assignments will not be accepted after marked assignments have been returned to the class.

Exams will be written on the days announced in class
o There are three major exams in this course. Please treat these exams like midterms. The dates of these exams are not flexible and will not be changed because you have worked ahead or fallen behind the class. If you have a very good reason to miss one of these exams, please see me **prior to the exam** to arrange a time to write an alternate version of the exam.
o Students who do not make prior arrangements or have **documentation** supporting their unplanned absence from these exams will receive a grade of **ZERO** on the missed exam.

STUDENT RESPONSIBILITIES:

Classes will start on time. Students will remain in class for the duration of the class
o Arriving to class late/leaving early is a disservice to you and an unfair distraction to your classmates and instructor. Again, this causes students to miss important information, breaks concentration and interferes with your learning and my teaching.
o Chronically arriving to class late/leaving early nonverbally communicates that you do not mind interfering with the learning of others on a regular basis.
o If you happen to be late on an isolated occasion, please knock on the door. I will let you in at the first opportunity where the class will be least disturbed by your interruption.

Students will attempt to catch up on missed classes independently
- o Attending class is **EXTREMELY IMPORTANT** in this course.
- o Attendance is taken daily and may influence discretional decisions (rescheduling of exams, etc).
- o It is **your responsibility** to get any notes that you missed from a classmate and cover the material you missed from the workbook before seeing me for help.
- o Students with chronic absences will not be permitted to monopolize the instructor's time.

Complete Daily Homework
- o In order to succeed in this course, it is absolutely essential that students complete practice exercises assigned during the lesson. In order to succeed in this course, most students will need to commit to **at least 1 hour of study per day** outside of class time. Schedule this time into your daily routine.

Cell phones will be turned off
- o Cell phone use, even in silent modes and texting, is a distraction to you, your classmates, and the instructor. As with any other distraction, cell phone use causes students to miss important information, breaks concentration, interferes with the learning of new material, and causes me to be distracted by your lack of attention.
- o Using a cell phone in class nonverbally communicates that you feel that attending to your personal life is more important than interrupting our learning environment.
- o As an instructor, it is my job to eliminate distractions and protect the learning environment of our class. I will ask you to put away cell phones if I see them.

Students are expected to participate and be attentive
- o Whatever your prior experience in math has been, it is important that you approach this course with the desire to *understand* (not just finish!). You will apply your understanding to solve problems, so there will be many different types of questions based on any one concept.
- o You will be asked for feedback, to answer and to ask questions in class. Our classroom works best when there is continual interaction between students and instructor.
- o As much as possible, it is best that we address all of your questions **AS WE GO**, so don't hold back! Your questions, comments and discoveries will enhance the learning of those around you.
- o If you ever feel overwhelmed, please come see me right away. You may want to try MA0120 to build better skills before attempting MA0130, or there may be specific study strategies I can recommend.

STATEMENT ON PLAGIARISM AND CHEATING:
Please refer to pages 49-50 of the College calendar regarding plagiarism, cheating and the resultant penalties. These are serious issues and will be dealt with severely.

Please see me if you have any questions regarding these expectations. By signing below, you are declaring that you understand your rights and obligations as a member of the MA0130 class.

Name:_____   Date: _____

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