DEPARTMENT OF ACADEMIC UPGRADING

COURSE OUTLINE – FALL 2014
MA0130 – 5(6-0-0) HS 90 HOURS

INSTRUCTOR:	Joelle Reynolds	**PHONE:**	780-539-2204
OFFICE:	C305	**EMAIL:**	jreynolds@gprc.ab.ca
	By appointment in office or via computer		
OFFICE HOURS:	W/F 1 – 2 pm or T/R 10 – 11 am		

PREREQUISITE(S)/COREQUISITE:

MA0120 or MA0132 or equivalent, or equivalent math placement test score, or 60% or better in Math 20-1 or Math 30-2 or equivalent within the previous two years

REQUIRED TEXT/RESOURCE MATERIALS:

- Pre-Calculus 12 – My Worktext (Czukar) Pearson Canada Inc.
- Pre-Calculus 12 – MathXL (single student access) Pearson Canada Inc.
- *Non-graphing* scientific calculator
- Graph paper (a blue post-it note graph pad is ideal, sold in the GPRC Bookstore)

CALENDAR DESCRIPTION:

MA 0130 – Mathematics Grade 12 Equivalent (Pre-Calculus 30-1)

This course explores polynomial, radical, rational, exponential and logarithmic functions, transformation and combinations of functions, trigonometry (including the unit circle, graphs, identities and equations), and permutations and combinations.

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.

OBJECTIVES:

Unit 1   Polynomial Functions

- Divide polynomials with long division and synthetic division.
- Write division statements for polynomials.
- Factor polynomials.
- Use the Remainder Theorems to determine the remainder when a polynomial is divided by a binomial.
- Use the Factor Theorem to find factors.
- Sketch the graph of polynomial functions using the zeros of a function to plot x-intercepts, the constant term as the y – intercept and the leading coefficient as the end behaviour for a graph.
- Write polynomial functions to model situations.

Unit 2   Radical and Rational Functions

- Sketch the graph of a radical function where the radicand is a linear function.
- Sketch the graph of a radical function where the radicand is a quadratic function.
- Compare the domain and range of a radical function to the domain and range of the radicand function.
- Sketch the graph of a rational function.
- Determine whether a rational function will have a vertical asymptote or a hole for a non-permissible value.
- Determine whether a rational function will have horizontal or oblique asymptotes.

Unit 3   Transformations

- Given the graph of any function, be able to sketch the graph of a related function using translations (horizontal and vertical), stretches (about the *x* or *y*-axis), and reflections (in *x*-axis or the *y*-axis*).
- Given $y = f(x)$ and $y = af(b(x-h))+k$ be able to sketch the graph of a related function using translations (horizontal and vertical), stretches (about the *x* or *y*-axis), and reflections (in *x*-axis or the *y*-axis*).
- Write an equation to reflect a given translation, reflection, or stretch.
- Identify combinations of transformations to graph or write an equation.
- Graph and find equations for inverse relations.

Unit 4 Combining Functions

- Combine functions graphically to sketch graphs of functions that are the sum, difference, product or quotient to two functions.
- Combine functions algebraically to write equations of functions that are the sum, difference product or quotient to other functions.
- Determine the domain and range for combined functions.
- Determine the value of a composition of functions at a point.
- Determine the equation of a composition function.
- Sketch the graph of a composition function.
- Identify restrictions for composition functions.

Unit 5 Exponents and Logarithms

- Plot graphs of exponential & logarithmic functions and describe their characteristics.
- Apply transformations to the equations and graphs of exponential & logarithmic functions.
- Evaluate logarithms to find exact values.
- Use the laws of exponents and laws of logarithms to simplify expressions.
- Define logarithmic relationships and be able to interconvert exponential and logarithmic relations.
- Solve exponential & logarithmic equations.
- Evaluate common and natural logarithms using a calculator.
- Solve problems by modelling situations with exponential and logarithmic equations.

Units 6 and 7 Trigonometry

- 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.
- Solve first and second degree trigonometric equations giving specific and general solutionsl.
- 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.
- 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.

- Apply the fundamental counting principle to determine the number of different ways to perform multi-step operations.
- Use factorial notation to determine permuations 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.
- 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.

TRANSFERABILITY:

This course is listed in the Alberta Transfer Guide. It is accepted at colleges and universities in Alberta as equivalent to Math 30-1

** 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:

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)**

EVALUATION:

Assignments and Tests	20%
Exams	20%
Midterm Exam	20%
Final Exam: Cumulative	40%

STUDENT RESPONSIBILITIES:

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. Please read and ensure you understand the following expectations before we begin:

Assignments must be submitted on time

Late submissions are not acceptable for labs, in-class assignments or chapter tests. If an extenuating circumstance prevents you from completing your work on time, please contact me to discuss a solution as soon as possible.

Exams, Midterms and Finals must be written on the days announced in class

If an emergency prevents attendance on an exam day, students must contact me **immediately** via phone or email and may be asked to provide documentation to justify their absence. Students will then be scheduled to write *an alternate version* of the exam at the first available opportunity. Please do not book holidays during exam weeks in December or April.

Classes will start on time

Students are asked to remain in class for the duration of the class. Late students may be required to wait to enter to avoid disturbing the class in progress.

Complete Daily Homework

Students should expect to complete **at least 1 hour of study per day** outside of class time.

Take responsibility for your learning

The instructor will monitor and periodically update students with their progress, but it is ultimately the students' responsibility to direct and manage their own learning.

Participation

Students will be asked for feedback, to answer and to ask questions in class.

Communicate with your instructors.

If there are major influences that may interfere with your learning, inform your instructor well in advance, so that arrangements can be made to work around them if possible. If you are concerned with your progress in the course, please make an appointment with your instructor to discuss strategies for success.

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.

This schedule is tentative, and may change at any point in the course at the discretion of the instructor.

September 2014

September 2014
Su Mo Tu We Th Fr Sa
1 2 3 4 5 6
7 8 9 10 11 12 13
14 15 16 17 18 19 20
21 22 23 24 25 26 27
28 29 30

October 2014
Su Mo Tu We Th Fr Sa
1 2 3 4
5 6 7 8 9 10 11
12 13 14 15 16 17 18
19 20 21 22 23 24 25
26 27 28 29 30 31

SUNDAY	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY
Aug 31	Sep 1	2	3	4 Course Intro	5 1.1	6
7	8	9 1.2	10 1.3	11 1.4	12 1.5	13
14	15	16 2.1	17 2.2	18 2.3	19 2.4	20
21	22	23 Review	24 Test 1	25 3.1	26 3.2	27
28	29	30 3.3	Oct 1	2	3	4

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October 2014

October 2014
Su Mo Tu We Th Fr Sa
1 2 3 4
5 6 7 8 9 10 11
12 13 14 15 16 17 18
19 20 21 22 23 24 25
26 27 28 29 30 31

November 2014
Su Mo Tu We Th Fr Sa
1
2 3 4 5 6 7 8
9 10 11 12 13 14 15
16 17 18 19 20 21 22
23 24 25 26 27 28 29
30

SUNDAY	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY
Sep 28	29	30	Oct 1 3.4	2 4.1	3 4.2	4
5	6	7 4.3	8 4.4	9 Review	10 Test 2	11
12	13	14 Review	15 Midterm	16 5.1	17 5.2	18
19	20	21 5.3	22 5.4	23 5.5	24 5.6	25
26	27	28 5.7	29 5.8	30 6.1	31 6.2	Nov 1

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Timelines are tentative and may change at the instructor's discretion

November 2014

SUNDAY	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY
Oct 26	27	28	29	30	31	Nov 1
2	3	4 6.3	5 6.4	6 6.5	7 6.6	8
9	10	11	12 6.7	13 Review	14 Test 3	15
16	17	18 7.1	19 7.2	20 7.3	21 7.4	22
23	24	25 7.5	26 8.1	27 8.2 8.3	28 8.4	29
30	Dec 1	2	3	4	5	6

December 2014

SUNDAY	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY
Nov 30	Dec 1	2 8.5	3 8.6	4 Review	5 Test 4	6
7	8	9	10	11	12	13
14	15	16	17	18	19	20
21	22	23	24	25	26	27
28	29	30	31	Jan 1, 15	2	3

Timelines are tentative and may change at the instructor's discretion