DEPARTMENT OF ACADEMIC UPGRADING

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

INSTRUCTOR:	Lindsay Urness	**PHONE:**	780-539-2223
OFFICE:	C416	**EMAIL:**	lurness@gprc.ab.ca
OFFICE HOURS:			

Monday 1:30pm-3:00pm,
Tuesday 8:00am-9:30am,
Thursday 1:00 pm-2:00pm,

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.
- *Non-graphing* scientific calculator (Texas Instruments TI-30XIIS preferred, but not essential)
- Graph paper

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   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.

Unit 5   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 6   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.

- 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:

8 Assignments (3% each)	24%
4 Unit Exams (10% each)	40%
Final Exam	36%

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
Assignments are due **at the beginning of class** on the specified dates. Late assignments will not be marked unless given a justifiable excuse

Exams 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.

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.

Please stow your phones
Cell phone use is a distraction to you, your classmates, and the instructor. Cellphone calculators will not be permitted during exams.

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.

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.

https://www.gprc.ab.ca/files/forms_documents/Student_Misconduct.pdf

MA0130 TIMELINE

Unit	TOPIC/DESCRIPTION	Approximate Timeline	Your Mark
1	Polynomial Functions	5 days	
2	Radical and Rational Functions	4 day	
	Review, Test #1	2 days	
3	Transformations	5 days	
4	Combinations of Functions	4 days	
	Review, Test #2	2 days	
6	Trigonometry	7 days	
7	Trigonometric Equations and Identities	6 days	
	Review, Test #3	2 days	
5	Exponents and Logs	8 days	
8	Permutations and Combinations	5 days	
	Review, Test #4	2 days	
	Review for Final Exam	2 days	
	Final Exam	TBA	

Calendar Tentative to Changes

January 2014

	Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
Dec 29 - Jan 4	Dec 29	30	31	Jan 1, 14	2	3	4
Jan 5 - 11	5	6 — Orientation	7 — First Day of Classes for	8 — 1.1	9 — 1.2	10 — 1.3	11
Jan 12 - 18	12	13	14 — 1.4	15 — 1.5	16 — 2.1	17 — 2.2	18
Jan 19 - 25	19	20	21 — 2.3	22 — 2.4	23 — Review	24 — Test #1	25
Jan 26 - Feb 1	26	27	28 — 3.1	29 — 3.2	30 — 3.3	31 — 3.4	Feb 1

February 2014

	Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
Jan 26 - Feb 1	Jan 26	27	28	29	30	31	Feb 1
Feb 2 - 8	2	3	4 — 3.5	5 — 4.1	6 — 4.2	7 — 4.3	8
Feb 9 - 15	9	10	11 — 4.4	12 — Review	13 — Test#2	14 — 6.1	15
Feb 16 - 22	16	17 — Family Day	18 — Winter Break	19	20	21	22
Feb 23 - Mar 1	23	24	25 — 6.2	26 — 6.3	27 — 6.4	28 — 6.5	Mar 1

Calendar Tentative to Changes

March 2014

March 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					

April 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
2/23 - 28	Feb 23	24	25	26	27	28	Mar 1
3/2 - 7	2	3	4 6.6	5 6.7	6 7.1 7.2	7 7.2	8 Convocation
3/9 - 14	9	10	11 7.3	12 7.4	13 7.5 7.6	14 Review	15
3/16 - 21	16	17	18 Test #3	19 5.1	20 5.2	21 5.3	22
3/23 - 28	23	24	25 5.4	26 5.5	27 5.6	28 5.7	29
3/30 - 4/4	30	31	Apr 1	2	3	4	5

April 2014

April 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			

May 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
Mar 30 - Apr 5	Mar 30	31	Apr 1 5.8	2 8.1 8.2	3 8.3	4 8.4 8.5	5
Apr 6 - 12	6	7	8 8.6	9 Rerview	10 Test #4	11 Review For Final	12
Apr 13 - 19	13	14 Last Day of Classes Review For Final	15 Exam Week	16	17	18 Good Friday	19
Apr 20 - 26	20	21	22 Exam Week	23	24	25	26
Apr 27 - May 3	27	28 Last days of Exams	29	30	May 1	2	3

Calendar Tentative to Changes