Department of
Mathematics and Statistics

http://artsandscience.usask.ca/math

Course Outline

Course Details

Course Name:	Precalculus Mathematics
Course Number:	MATH 102.3(01), MATH 102.3(05)
Course Code (CRN):	89145 (section 1) and 88882 (section 5)
Year & Term:	2014-2015 Regular Session, Term 1
Required Text:	Precalculus: A Concise Course, 3rd Ed., by Ron Larson. Publisher: Brooks/Cole
Course Website:	Blackboard – https://bblearn.usask.ca/ (also accessible via PAWS: Academics Tab > My Courses > Course Tools)
Restrictions:	This course may not be taken for credit concurrently with or after any other 100-level MATH course. Students are allowed to have credit for only one of MATH 102 and 104; students who take MATH 102 and then take MATH 104 will lose credit for MATH 102. This course may be used as an alternative prerequisite for MATH 110, 121, 123, or 125 (clears deficiencies in high school 30-level mathematics courses). MATH 102 may not be included in the courses comprising a major or honours in either mathematics or statistics. In Arts & Science programs, this course may be used only in the Electives Requirement.
Prerequisites:	High school Math A30 and Math B30; or Apprenticeship and Workplace Mathematics 30; or Foundations of Mathematics 30; or Pre-Calculus 30.

Instructor Details

Instructor 1 (Section 1)

Name:	Dr. Pawel Gladki
Email:	pag998@mail.usask.ca
Office Hours:	Monday, 2:30-3:30 pm in 215 McLean Hall

Instructor 2 (Section 5)

Name:	Dr. Charlotte Gils
Email:	charlotte.gils@usask.ca
Office Hours:	Monday, 2:30-3:30 pm in 209 McLean Hall

Schedule

Lectures:	**Day**	**Time**	**Location**
Section 1	Mon, Wed, Fri	1:30 – 2:20 pm	THORV 271
Section 5	Mon, Wed, Fri	1:30 – 2:20 pm	ENG 1B71

Course Description:

This course discusses mathematical ideas essential for the study of calculus. Topics include: the fundamentals of algebra; functions, their properties and graphs; polynomial and rational functions; exponential and logarithmic functions; trigonometric and inverse trigonometric functions; trigonometric properties.

Content Overview:

1. Fundamentals of Algebra – Appendix A: posted on PAWS (“Course Materials”)
2. Functions and Graphs - Chapter 1.
3. Polynomial and Rational Functions - Chapter 2.
4. Exponential and Logarithmic Functions - Chapter 3.

5. Trigonometric Functions - Chapter 4.
6. Trigonometric Identities and Properties - Chapter 5.

Evaluation:

Methods of evaluation and weight in final grade	Take-home assignments	20.00%
	Midterm Exam 1	15.00%
	Midterm Exam 2	15.00%
	Final Exam	50.00%
	Total	**100%**

Assignments:

Eleven take-home assignments will be posted before class each Wednesday, starting Sept. 10, and ending Nov. 26, 2014 (with the exception Nov 12).

Each assignment is **due in class on the following Wednesday**. **Late submissions will not be accepted.**

The best ten assignments will count towards the grade.

If you fail to submit at least ten take-home assignments in time through no fault of your own (for medical or other valid reasons), you must provide the instructor with verifiable documentation for your absence. Upon approval, the weight of the missed assignment will be added to the weight of your final examination.

Midterm Tests:

Two midterm tests will be held during lecture time on the following dates.

1. **Wednesday, October 8, 2014**
2. **Wednesday, November 19, 2014**

Final Examination:

Date and time to be announced.

Examination Policies:

1. **The midterm tests and the final examination are all closed-book.**

2. **Books, notes, and formula sheets of any kind are prohibited during the midterm tests and the final examination. No formula sheets will be provided.**

3. **Calculators and electronic devices of any kind are prohibited in the midterm tests and the final examination.**

4. If you miss a midterm test through no fault of your own (for medical or other valid reasons), you must provide the instructor with verifiable documentation for your absence. Upon approval, the weight of the missed midterm test will be added to the weight of your final examination.

5. If you are absent from the final examination through no fault of your own (for medical other valid reasons) you may apply to the College of Arts and Science Undergraduate Student Office. The application must be made within three days of the missed examination along with supporting documentary evidence.

6. Further policies see below.

Academic Misconduct and Appeal Procedures

This course will conform to the rules and guidelines for both academic misconduct and appeal procedures; see http://www.arts.usask.ca/students/academics/appeals-integrity.php and http://www.usask.ca/university_secretary/honesty/policies_and_procedures.php for description.

Students with Disabilities:

If you require academic accommodations to lessen the impact of your disability, please register with the Disability Services for Students (DSS). See http://students.usask.ca/current/disability/ for additional details.

Homework Exercises:

In order to do well in this course, you are strongly advised to solve the homework exercises listed below (in addition to the marked take-home assignments). The exercises are not to be submitted. For exercises in Appendix A, the solutions are posted on PAWS in folder "Course Materials", for chapters 1-5, the solutions can be found at the end of the textbook. Worked out solutions are available at www.calcchat.com/book/Precalculus:-A-Concise-Course-Course-3e/.

Tentative Schedule:

Week	Dates	Topic/Section	Homework exercises
1	Sept. 3,5	A.1 Real numbers and their properties A.2 Exponents and Radicals	A.1: 7-79 odd

			A.2: 9-77 odd, 81,83
2	Sept. 8,10,12	A.2 Exponents and Radicals A.3 Polynomials and Factoring (not: page A31, in addition: factoring using quadratic formula)	A.3: 9-95 odd
3	Sept. 15,17,19	A.4 Rational Expressions A.5 Solving Equations	A.4: 5-75 odd, 79,81 A.5: 5-99 odd
4	Sept. 22,24,26	A.6 Linear Inequalities in One Variable 1.1 Rectangular coordinates 1.2 Graphs of Equations	A.6: 1-57 odd, 75-101 odd, 109, 111 1.1: 5-13 odd, 17-43 odd 1.2: 7-55 odd, 69-81 odd
5	Sept. 29, Oct. 1,3	1.3 Linear Equations in Two Variables 1.4 Functions	1.3: 9-107 odd 1.4: 11-59 odd, 63,65, 75, 85-93
6	Oct. 6, 10 **Midterm 1 on Oct. 8**	1.5 Analyzing Graphs of Functions 1.6 A Library of Parent Functions	1.5: 7-23 odd, 31-37 odd, 55,57,71-81 odd 1.6: 11,13, 35-39 odd
7	Oct. 13,15,17	2.1 Quadratic Functions and Models 2.2 Polynomials of Higher Degree	2.1: 7-33 odd, 43-57 odd, 65-69 odd, 75-79 odd, 83 2.2: 9-13 odd, 19-29 odd
8	Oct. 20,22,24	2.3 Polynomial and Synthetic Division (only polynomial division) 3.1 Exponential Functions and Their Graphs	2.3: 11-25 odd, 27-45 odd (use polynomial div.), 47-53 odd, 59-65 odd, 67-73 odd (not part (e)), 81, 83 3.1: 7-15 odd, 23,25, 35,37, 51-65 odd, 71,75,77,85
9	Oct. 27,29,31	3.2 Logarithmic Function and Their Graphs 3.3 Properties of Logarithms 4.1 Radian and Degree Measure	3.2: 7-19 odd,25-31 odd, 73,75 3.3: 7-81 odd 4.1: 11,13, 25, 27, 35-45 odd, 51-61 odd
10	Nov. 3,5,7	4.2 Trigonometric Functions: The Unit Circle 4.3 Right Triangle Trigonometry 4.4 Trigonometric Functions of Any Angle	4.2: 5-41 odd 4.3: 5-29 odd, 41-83 odd 4.4: 9-31 odd, 53-73 odd, 91-95 odd
11	Reading week		
12	Nov. 17, 21. **Midterm 2 on Nov. 19**	4.5 Graphs of Sine and Cosine Functions 4.6 Graphs of Other Trigonometric Functions	4.5: 5-37 odd, 93 (not part (c)) 4.6: 9-13 odd
13	Nov. 24,26,28	5.1 Using Fundamental Identities 5.2 Verifying Trigonometric Identities	5.1: 7-19 odd, 53-57 odd 5.2: 9-51 odd

		5.4 Sum and Difference Formulas 5.5 Multiple-Angle and Product-to-Sum Formulas	5.4: 7-51 odd, 79 5.5: 7-13 odd, 27-43 odd, 49-59 odd, 65-71 odd, 73
14	Dec. 1,3,5	5.6 Law of Sines 5.7 Law of Cosines Review	5.6: 5-9 odd, 25-41 odd, 47,49,53 5.7: 5-17 odd, 25-29 odd, 37-43 odd, 47,57,63

Learning Objectives:

In this course, students will learn to

- apply the basic rules of algebra and use the properties of exponents and radicals
- factor polynomials and simplify rational expressions
- solve equations and inequalities in one variable
- compute distances and midpoints of points in the cartesian plane
- sketch graphs of equations and functions and determine intercepts of graphs and functions
- determine the slope of a line, write linear equations in two variables and identify parallel and perpendicular lines
- determine whether relations between two variables are functions and find the domains of functions
- analyze and sketch the graphs of functions and recognize the graphs of certain parent functions
- write quadratic functions in standard form
- apply long division of polynomials, and find zeros of polynomials
- analyze and sketch exponential and logarithmic functions, use the one-to-one property
- use the properties of logarithms to evaluate or rewrite logarithmic expressions
- use radian and degree measure to describe angles
- know the definitions of the trigonometric functions, evaluate trigonometric functions and determine reference angles
- know and use the fundamental trigonometric identities
- identify and sketch the graphs of trigonometric functions
- know and use sum and difference formulas, as well as multiple angle formulas and product-to-sum formulas

- know and use the Law of Sines and the Law of Cosines.

Moreover, students will be able to apply the above listed concepts to solve real-life problems.