



**School of Arts & Science
MATHEMATICS DEPARTMENT**

**MATH 105-01/02
Algebra and Pre-Calculus
2008W**

COURSE OUTLINE

The Approved Course Description is available on the web @ _____

Ω Please note: this outline will be electronically stored for five (5) years only.
It is strongly recommended students keep this outline for your records.

1. Instructor Information

(a)	Instructor:	Peggy Tilley		
(b)	Office Hours:	Mon – Fri 10:00 – 10:45 or 2:00 – 2:30		
(c)	Location:	Ewing 244		
(d)	Phone:	370 - 3502	Alternative Phone:	
(e)	Email:	tilley@camosun.bc.ca		
(f)	Website:	http://peggytilley.googlepages.com		

2. Intended Learning Outcomes

(No changes are to be made to this section, unless the Approved Course Description has been forwarded through EDCO for approval.)

Upon completion of this course the student will be able to:

1. Evaluate functions, find the domain of functions, compose and decompose functions and find inverse functions.
2. Graph polynomial and rational functions using symmetry, intercepts, long run behaviour, asymptotes and a table of signs.
3. Prove the Remainder and Factor Theorems and use the theorems to factor polynomials and find their real and complex zeros.
4. Graph exponential and logarithmic functions and their transformations.
5. Prove the properties of logarithms and use these properties to simplify expressions, and solve equations and applied problems.
6. Graph the six trigonometric functions and their transformations and the three basic inverse trigonometric functions.
7. Use the unit circle definitions to derive the Pythagorean identities, the sum and difference formulas, and the double angle and half angle formulas. Use these identities to simplify expressions, solve equations and verify other identities.
8. Use trigonometric functions to model real-life problems involving cyclical patterns.
9. Evaluate limits, find derivatives using the definition, find equations of tangent lines and solve optimization problems using polynomial calculus.
10. Read and write mathematics at a level sufficient for entry into first year calculus.

3. Required Materials

(a)	Texts	Math 105 & 107 Exercise Sets
(b)	Other	Sharp EL 531 calculator (the current model is designated W but older models of the 531 are also permitted)

4. Course Content and Schedule

(Can include: class hours, lab hours, out of class requirements and/or dates for quizzes, exams, lectures, labs, seminars, practicums, etc.)

- Course Content:** MATH 105 is an algebra and precalculus course. Topics include algebra, functions, polynomial functions, rational functions, exponential and logarithmic functions, trigonometric functions and their inverses, trigonometric identities and equations, and a brief introduction to both conics and calculus.
- References:** We have several Precalculus textbooks in the math room and in the library. As well, there are videos and DVD's in the Lansdowne Library Viewing Room that are available on 3 day loan.
- Class times:** Section 1: Mon – Fri 8:30 – 9:50 in Y219
Section 2: Mon – Fr 12:30 – 1:50 in Y219
Feel free to mix and match (except on test days)
- Math Room:** Ewing 224 and Ewing 342
These are drop-in centres where you can work on your math homework and get free help from the math tutor or fellow students.
- Prerequisite:** The minimum recommended prerequisite is a **recent C+** in either Math 11 or MATH 073. If you have not completed Math 11 within the past 2 years or Math 12 within the last 3 years, then you probably want to take either the combination 072/073 or perhaps just 073 (all tuition free courses) this term. Math 105 is expensive – we want to ensure that it is the best choice for you this term. Please come and see myself or the chair of the math department as soon as possible for advice. It's really discouraging to be in the wrong course; even if you do a huge amount of work, you may not finish with a solid math background. And, then the pain will continue in your next math course.
- Math 105 or 107 ??** Math 107 is a lighter version of Math 105. If you need a UT Math 12 equivalent course for a BA degree or are heading for applied calculus for biology, business or social sciences, then you may wish to take Math 107 instead. Please come and see me or the chair of the mathematics department and we can talk about your particular situation. If you will be taking Math 100 (calculus for students in math, computer science, physics, chemistry, geology, etc) or one of the engineering technologies, then you should be in 105 rather than 107.
- Out-of-class Workload:** about 2 hours/day (not 10 hours on Sunday!)
This is an intensive 6-credit course. If you fall behind, it will be difficult to catch up.
- Tips for Success:**
1. Attend every class and get the most out of class time. Don't be afraid to ask and answer questions. Don't worry about answering a question wrong. I like wrong answers – it gives me a chance to correct misconceptions. I often give you a bit of time to start or finish a question before I write up the solution on the board. Please use that time to work on the problem or to get help from, or give help to, the person beside you. Please turn off and put away your cell phone.

Checking and sending messages during class is not a smart (or polite) use of class time. Copying notes for a class that you missed rather than working hard on the new material is also not the best (or polite) use of class time.

2. Do your homework every day. Math is not a spectator sport; understanding what we do in class is only the first step. Work through lots of exercises and really think about the ideas; don't just try to get your homework over with! On your timetable, schedule time each day for your math homework; it is really important to establish a routine. You can't put this course on the back burner and hope to cram it in at the end – there is way too much material.
3. Work with a classmate, a study buddy, some of the time. It's fun and you will see whether you really understand something when you try to explain it to someone else.
4. Please ask for help before you fall behind or become frustrated. If you can't get the correct answer, bring me your work so that I can see what you are thinking. I like to spend time explaining what is going wrong as well as nudging you towards a correct answer. Don't save up your questions until you have a long list; I find I can be more effective working with you on just one or two ideas at a time. Be a frequent user of the math help lab and my office hours.
5. Keep working, stay positive and do the best you can given all the other demands in your life.

5. Basis of Student Assessment (Weighting)

(Should be linked directly to learning outcomes.)

Tests: There are 3 in class tests, 4 take-homes and 1 trigonometry proof test. All tests are based on the homework in the Math 105 & 107 Exercise Sets. The test dates are shown on the course calendar attached to this outline.

Late Assignments/
Missed Tests:

Late assignments are not accepted and there are no rewrites for missed tests. If you miss a test or assignment for medical or other urgent reasons, please email me as soon as possible and bring in documentation when you return to class. Your temporary term mark will be the average of the tests/assignments that you do write. You will keep that term grade provided that you do well on the missed material on the final exam. However, if you are weak on that material on the final, I will calculate a mark for the missing work based on how you do on that material on the final exam. So, study the missed material well for the final exam!

Grade Calculation:	4 Take-homes & Trig Proof Test	12%
	3 Tests	38%
	Final Exam	50%

- (1) If you don't do so well on one test or assignment, don't worry that you have ruined your grade. If you do well on that material on the final and you are sitting on the boundary between two grades, then I will nudge you up to the next letter grade.
- (2) Occasionally it turns out that it would be to your benefit to have the final count 100%. This is possible with the condition that you need to be in the top half of a grade range (see below) to be awarded that grade. For example, if you want the final to count 100%, then you need to score at least 62.0% on the final for a C, 67.0% for a C+, ..., 87.0% for an A and 95.0% for an A+. Without this condition, I would need

to make the final exam harder than I want to (and harder than most of you would want me to).

Exit Grade You Need: If you are heading for Math 100 (calculus for students in mathematics, computing science, physics, chemistry, geology, etc), then you need a B in Math 105. For most other math courses and programs, a grade of C in Math 105 is sufficient. Note that many of our college programs and courses require C+ in Math 12 or C in Math 105 or 107 or 115.

6. Grading System

(*No changes are to be made to this section, unless the Approved Course Description has been forwarded through EDCO for approval.*)

Standard Grading System (GPA)

Percentage	Grade	Description	Grade Point Equivalency
90-100	A+		9
85-89	A		8
80-84	A-		7
77-79	B+		6
73-76	B		5
70-72	B-		4
65-69	C+		3
60-64	C		2
50-59	D	Minimum level of achievement for which credit is granted; a course with a "D" grade cannot be used as a prerequisite.	1
0-49	F	Minimum level has not been achieved.	0

Temporary Grades

Temporary grades are assigned for specific circumstances and will convert to a final grade according to the grading scheme being used in the course. See Grading Policy at camosun.ca or information on conversion to final grades, and for additional information on student record and transcript notations.

Temporary Grade	Description
I	<i>Incomplete:</i> A temporary grade assigned when the requirements of a course have not yet been completed due to hardship or extenuating circumstances, such as illness or death in the family.
IP	<i>In progress:</i> A temporary grade assigned for courses that are designed to have an anticipated enrollment that extends beyond one term. No more than two IP grades will be assigned for the same course.
CW	<i>Compulsory Withdrawal:</i> A temporary grade assigned by a Dean when an instructor, after documenting the prescriptive strategies applied and consulting with peers, deems that a student is unsafe to self or others and must be removed from the lab, practicum, worksite, or field placement.

Temporary grades are assigned for specific circumstances and will convert to a final grade according to the grading scheme being used in the course. See Grading Policy E-1.5 at camosun.ca for information on conversion to final grades, and for additional information on student record and transcript notations.

7. Recommended Materials or Services to Assist Students to Succeed Throughout the Course

LEARNING SUPPORT AND SERVICES FOR STUDENTS

There are a variety of services available for students to assist them throughout their learning. This information is available in the College calendar, at Student Services or the College web site at camosun.ca.

STUDENT CONDUCT POLICY

There is a Student Conduct Policy **which includes plagiarism**. It is the student's responsibility to become familiar with the content of this policy. The policy is available in each School Administration Office, at Student Services and on the College web site in the Policy Section.

ADDITIONAL COMMENTS AS APPROPRIATE OR AS REQUIRED

The numbers in the calendar refer to sections in the *Math 105 Problem Set Booklets* available at the bookstore. Some sections take a bit more than a day and some sections a bit less but this schedule is a good approximation.

Math 105 Tentative Calendar – Winter 2008

The numbers in the table refer to sections in the Math 105&107 Exercise Sets. Some sections take a bit more than a day and some sections a bit less but this schedule is a good approximation.

Takehomes are due UNDER my office door (E244) by 3 pm on the date shown.

Wk		Monday	Tuesday	Wednesday	Thursday	Friday
1	Jan.	7 1.1	8 1.2	9 1.3	10 1.4	11 1.5
2		14 1.6	15 1.7	16 1.8	17 1.9	18 2.1
3		21 2.2 Takehome 1	22 2.3	23 2.4	24 2.5	25 2.6
4		28 2.7	29 2.8	30 2.9	31 2.10	1 3.1
5	Feb.	4 3.2 Takehome 2	5 3.3	6 3.4	7 3.5	8 3.6
6		11 3.7	12 3.8	13 4.1	14 <i>Reading Break</i>	15 Reading Break
7		18 4.2	19 Test 1	20 4.2/4.3	21 4.3	22 4.4
8		25 4.5	26 5.1	27 5.2	28 5.3 Takehome 3	29 5.4
9	Mar.	3 5.5	4 5.6	5 5.7	6 5.8	7 5.9
10		10 6.1 Withdrawal Date	11 Test 2	12 6.1/6.2	13 6.2/6.3	14 6.3/6.4
11		17 6.4/6.5	18 6.6	19 6.7	20 6.8	21 Holiday
12		24 Holiday	25 6.9	26 7.1	27 7.2	28 Test 3
13	Apr.	31 7.3	1 7.4	2 7.5/7.6	3 7.6/7.9	4 7.7/7.8
14	.	7 7.8	8 7.9	9	10 Trig Proof Quiz	11 Takehome 4 (for 105)
15		Mon 14 – Sat 19 Final exams are timetabled by registration; the exam schedule is posted on Camlink at the end of February. Please don't book travel plans until April 23 .				
16		Mon 21 – Tues 22 Final exams continue				

MATH 105 Homework Winter 2008

Help is available in the math help labs (E224 or E342) and from me (E244) and your classmates. A good strategy is to go to a math room after class and to work on your homework there.

Usually the best approach is to do the current day's homework first – reinforce it while it is still fresh. Then, if you have time, go back and catch up on any outstanding homework.

Pg	Section	Homework – no calculator for units 1 & 2
P1:A1	1.1 Real Numbers	2d, 3d, 4c, 5d, 6c, 7d, 8d, 9, 10, 11, 12, 13, 14, (15c,d,e), 16a, 17
P4:A4	1.2 Integer Exponents	1f, (2c,d), 4, (5a,b,d,f), 7
P6:A6	1.3 Rational Exponents & Radicals I	1d, 2b, (3e,f,g), (4d,e,f), 7, (8c,d,e,f), 9, 11, 12, 13
P8:A9	1.4 Radicals II	(1d,e,f), (2d,e), 3c, 5, 6, (8c,d,e), (9d,e), 10, 11, 12, 13, 14, (15b,e), 16, (19c,e,f)
P13:A13	1.5 Polynomials	1, 2, (5e,f), 6, (7a,e,g), 9, 10, 11, 12
P15:A15	1.6 Factoring I	1, (2b,d,e,f), (3d,e,f), 4, (5b,c,d), 6c, (7b,d), (8b,d), (9c,d), (10c,d,e), (11c,d,e,f,g,h), (12b,d,e), 13, 14
P18:A18	1.7 Factoring II	1, (2b,c,d), 3c, 4, (5c,d), (6a,b), 7, 8, 9a, 10, (11b,d), (12a,b)
P21:A21	1.8 Rational Expressions	1d, (2d,e,f), 3, (6c,d), 7d, (8a,b,c), 9, 10c, (11c,d,e), (12b,c), 13, 14
P25:A24	1.9 Complex Fractions	2d, (3b,c,e), (4a,c,h), 5d,(6b,c), (7c,d), (8a,b,d,e)
P1:A1	2.1 Linear Equations & Inequalities	1, 3, (6b,c), 7, 8, 9, 11, 12, (13a,d), (14a,b)
P4:A5	2.2 Quadratic Equations	1, 2, 3, 4, 5, 6c, (7c,d), 8 in class, (9b,c), 10, 11, 12, 13, 14, 15
P7:A9	2.3 Equations Involving Rational Expressions	1b, (2e,f), 3, 4, 5, (6c,d,e), 7 in class, 8b, 9, (10b,c,d,e,i), 11
P10:A13	2.4 More Equations	(1a,c,e,g), 2, 3, 4, (5b,c), 6, (7a,b), (8a,b), (9a,b,c,d), (10a,b,c)
P12:A16	2.5 Polynomial & Rational Inequalities	(1a,b,c), 2, (3c,d), 4, (5a,b,c,d)
P14:A20	2.6 Distance, Midpoint & Slope	(1b,c), 2, 4, 5b, 7, 8, 9, 10a, 11, 12, 13, 14, 15, 16
P16:A23	2.7 Linear Equations in Two Variables	1, 2, (3a,c), 4a, 5, (6c,e), (7b,c,e), (8b, c), 9, 10, 11 in class
P19:A26	2.8 Circles	1d, 2, 3, (4a,b,c), (5a,b), 6, (7a,c), 8

Pg	Section	Homework – no calculator for units 1 & 2
P21:A28	2.9 Ellipses & Hyperbolas	1 in class, 2, 3, (4a,c,d), (5a,b,c), 6, 7 (calculator)
P23:A32	2.10 Systems of Equations in Two Variables	1b, 2b, (3a,c), (4a,b,c), 5, 6,7
P1:A1	3.1 What is a Function?	1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 14, 15, 16 in class, 17, 18, 19
P5:A4	3.2 Piecewise Defined Functions; Constructing Functions	1a, 2b, 3, 4, 5, 6, 7(In part a, the final answer is correct but the work is wrong), 8 in class, 9, (10a,b,c), 11, 12, 14
P8:A8	3.3 Function Notation & Difference Quotients	(1a,c,h,i,l), 2, 3, 4, 5, 6, 7, 8
P10:A11	3.4 A Library of Functions	1, 2, 3 & 4 in class, 5, 6, 7, (8a,c,d), 9, 10a, 11, 12, 13
P14:A14	3.5 Domains, X-intercepts & Symmetry	2, 3, 4, 5, 7, 8, 9, 10, 11, 12, 13
P17:A18	3.6 Translating & Reflecting	1, 2, (3c, e), 4, 5, 6, 7, 8, 9, 10, 11a, 12
P22:A22	3.7 Stretching/Shrinking	1 in class, 2, (3d,e,f), 4, 5c, 6, 7, 8b, 9, 10, 11, 12
P28:A27	3.8 Combinations of Functions	1, 2, 3a, 4, 5, 7c, 8, 9, 10, 11a, 12, 13
P1:A1	4.1 Limits	1, 2, 3, 4, 5, (6d,e), 7, (8a,b,c)
P4:A4	4.2 The Derivative	(1b,c,d), 2, 3, 4, 5, 6, 7, 8
P6:A8	4.3 Graphing Polynomial Functions	2 in class, 3, (5a,b,c,d), 6, 7
P9:A13	4.4 Asymptotes, Holes & Intercepts	1, 2, 3, 4, 5, 6, 8, 9, 10
P11:A16	4.5 Graphing Rational Functions	1, (2c,d,e,f), 3, 4, 5
P1:A1	5.1 Inverse Functions	1, 2, 3, 4, 6a, 7b, 8, 10, 11, 12, 13, 14, 16
P6:A6	5.2 Graphing Exponential Functions	1, 2, (3c,d,e), 4, 5, 6, 7 – 9 in class
P9:A9	5.3 Working with Exponential Functions	1, 2, 3, 4b, 5, 6, 7 in class, 8
P11:A12	5.4 An Introduction to Logarithms	1, 2, 3, 4, 5, (6c,d), 7, (8a,d), 9, 10, 11, 12, 13
P14:A15	5.5 Logarithmic Functions	1, 2, 3, 4a, 5, 6, (7c,d), 8, 9, 10, 11, 12, 13, 14, 15, (16a,b,c,d)
P18:A20	5.6 Properties of Logarithms	1, 2, 3, 4, 5, 6, 7, 8, 9, 10 & 11 in class, 12, 13, 14, 15, 16, (17a,b),19, 21

Pg	Section	Homework – no calculator for units 1 & 2
P23:A26	5.7 Exponential Equations & Compound Interest	1, 2, 3, 4, 5b, 6, (7b,c), 8, 9b, 10a, (11a,b,c,d,e), 13
P26:A30	5.8 Exponential Growth & Decay	3, 4 in class, 5, 6, 7, 8, 9, 10, 11
P28:A32	5.9 Logarithmic Equations & Applications	1, 2, 3, 4, 5, 7, 8, 9
P1:A1	6.1 Radian Measure	1, 2, 3, 4, 5b, 6, (7c should be 1° & 7d should be π°), 8b, (9b answer is 8.73 cm), (10a,b), 11
P4:A3	6.2 The Sine & Cosine Functions	1, 2, 3, 4 in class, 5, 6, 7, 8, 9, 10, 11, 13, 14
P8:A6	6.3 Pythagorean Identities	1, 2, 3, 4, 5, 6, 7, 8, 10
P11:A11	6.4 Transformations of Sine & Cosine	1, 2, 3, 4, 5, (6a,b,c,d), 7, 8
P13:A14	6.5 Modelling with Sine & Cosine	1, 2, 3, 4, 5, 6
P15:A16	6.6 Other Trig Graphs	1–4 in class, 5, 6, 7, 8, 9
P18:A20	6.7 Right Triangle Trigonometry	1, 2c, 4, 5, 6, 7, 8, 9, 10, 12, 13 in class, 14, 15, 16
P22:A23	6.8 Trig Functions of Any Angle	1, 2b, 3, 4, 5, 6, 7, 8, 9, 10, 12, 13a, 14, 15, 16
P26:A25	6.9 Trigonometric Equations	1, 2, 3, 4, 5, 6, 8, 9
P1:A1	7.1 Verifying Identities	1, 2, 3, 5, 6, 7, 8, 9, 12, 13
P5:A9	7.2 Sum & Difference Identities	1, (2a,b,c), 3, (4b,4c,4d), 5, 6, (7a,c), 8**
P7:A11	7.3 The Derivatives of Sine & Cosine	1 & 2a & 3 in class; 2b (takehome), 4
P8:A13	7.4 Double Angle Identities	1, 2, 3, 4, 5, 6, 7, 8, 9, 10, (11a,c,e,g,h)
P11:A19	7.5 Power Reducing Formulas	1, 2, 3, 4 The answers should be numbered 1 – 4 instead of 14 – 17.
P12:A20	7.6 Half Angle Identities	1, 2, (3a,c,d), 4, 5a, 6a, 7
P14:A22	7.7 Graphing Inverse Trig Functions	1 in class, 2, 3, 4, 5 & 6 in class, 7, 8, 9, 10, 14
P19:A27	7.8 Compositions with Inverse Trig Functions	1 & 2 & 3 warm-up as needed, (4f,g,h,i,j), (5c,d,e), (6a,b,c,d), (7a,b,c,d), (8a,b,c), (9a,b,c), (10e,f,g,h), 11, 12, 13
P24:A33	7.9 More Trig Equations	1, 2, 3, 4, (5a,b,c,d,e)