CAMOSUN COLLEGE	***School of Arts & Science*** ***MATHEMATICS DEPARTMENT*** **MATH 213 – Section 1** **Math for Elementary Education** **2008F**

COURSE OUTLINE

Prerequisite: Math 112 and Math 113

Course Description: A survey of mathematical techniques and methods with a focus on analytical skills and problem solving. Topics include: Mathematical Ways of Thinking, Problem Solving Strategies, Numeration Systems Past and Present, Number Theory, Sequences, Euclidean and Non-Euclidean Geometry, Strategy and Games, Cryptography, Statistical Duplicity. (T)

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1. Instructor Information

(a)	Instructor:	Jill Britton		
(b)	Office Hours:	Daily 9:30-10:20; M and W 11:30-2:20		
(c)	Location:	E246		
(d)	Phone:	250-370-3471	Alternative Phone:	250-652-5316
(e)	Email:	jbritton@camosun.bc.ca		
(f)	Website:	http://britton.disted.camosun.bc.ca/index.html		

2. Intended Learning Outcomes

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

1. Differentiate between inductive and deductive approaches to problem solving.
2. Identify and use classic problem solving strategies, including those of George Polya.
3. Convert between selected past and present numeration systems.
4. Investigate and use models for manipulating whole numbers, integers, rational numbers (fractions), and real numbers (decimals).
5. Confirm mastery of selected topics in number theory from Math 112 including prime numbers, LCM and GCD, modular (clock) arithmetic, binary numbers, Pascal's triangle, and Venn diagrams.
6. Apply classic tests for divisibility.
7. Deduce and/or use formulas for terms of selected sequences and series.
8. Derive and/or use measurement formulas for classic 2-D and 3-D figures.
9. Derive and apply the Pythagorean Theorem (including Pythagorean triples).
10. Apply triangle congruence, triangle similarly, and Euclidean constructions to geometric problems.
11. Apply the postulates of selected non-Euclidean geometries (projective, spherical)
12. Use appropriate strategies with selected mathematical games.
13. Decode messages encrypted by substitution, modular (clock) arithmetic, and matrices.

3. Required Materials

There will be no prescribed text. The instructor's teaching notes and coordinated transparency masters are available on-line as Acrobat Reader files for student use (see direct links below). A coordinated student manual of notes, examples and exercises will be provided by the instructor. The manual is also available on-line. Please allow sufficient time to download (6.2 MB).

Students must purchase a materials card in the college bookstore to cover the cost of the student manual, printed assignments and handouts, and consumables. Students will also require a scientific calculator (CASIO fx-00MS, the prescribed calculator for both Math 112 and Math 113). Finally, students will require a set of chisel tip markers for coloring and a geometry set with a precision compass, ruler, protractor, and set square. Suitable items are available in the college bookstore.

4. Course Content and Schedule

Lecture 01:	Introduction: Mathematics, A Universal Language	
Lecture 02:	Inductive Reasoning	Assignment
Lecture 03:	Deductive Reasoning	Assignment
Lecture 04:	Strategies for Problem Solving	
Lecture 05:	More Strategies for Problem Solving	Assignment
Lecture 06:	Numeration Systems Past and Present	Assignment
Lecture 07:	Arithmetic Sequences	Assignment
Lecture 08:	Geometric Sequences	Assignment
Lecture 09:	Power Sequences	Assignment
Lecture 10:	Primes and Divisibility	Assignment
Lecture 11:	Prime Factorization	Assignment
Lecture 12:	Designs from Mathematical Patterns	Assignment
Lecture 13:	Cryptography	Assignment
Lecture 14:	Modern Cryptography	Assignment
Lecture 15:	Introducing Geometry	Assignment
Lecture 16:	Basic Geometric Constructions	Assignment
Lecture 17:	Geometric Designs	Assignment
Lecture 18:	Triangle Congruence	Assignment
Lecture 19:	Area of Plane Figures	Assignment
Lecture 20:	The Theorem of Pythagoras	Assignment
Lecture 21:	Similarity	Assignment
Lecture 22:	Surface Area and Volume	Assignment
Lecture 23:	Perspective Drawing	Assignment
Lecture 24:	Spherical Geometry	
Lecture 25:	Probability Experiments	

5. Basis of Student Assessment (Weighting)

Evaluation will be based on

(1) Assignments and Class Work (40%)
Assignments are generally due two classes following their issue. The assignment for lectures 04 and 05 is compulsory and will be awarded a maximum of 4 points. The best 18 of the remaining 20 assignments will be awarded a maximum of 2 points each. Assignments submitted one class day late will be reduced to half their value. No late assignments will be accepted thereafter. Attendance in class is compulsory and will be recorded. One point will be deducted for each "missed" class (allowing 2 "freebees" without penalty) up to a maximum of 10 points.

(2) Supplementary Investigations (10%)
Each student must submit a portfolio of projects based on selected class material by a specific date. Portfolios will be returned. Each student's submissions must be assembled in a standard 3-ring binder. Pages may be 3-hole punched or inserted in 3-hole plastic sleeves. Projects will be evaluated on their completeness, quality, accuracy, and originality. An extensive "math trail" (complete with appropriate photos and graphics) will be awarded up to 5 points.

(3) Final examination (50%)

6. Grading System

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 E-1.5 at **camosun.ca** for information on conversion to final grades, and for additional information on student record and transcript notations.

Temporary Grade	Description

I	*Incomplete*: 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	*In progress*: A temporary grade assigned for courses that, due to design may require a further enrollment in the same course. No more than two IP grades will be assigned for the same course. *(For these courses a final grade will be assigned to either the 3rd course attempt or at the point of course completion.)*
CW	*Compulsory Withdrawal:* 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.

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.