



School of Arts & Science
MATHEMATICS DEPARTMENT
MATH 113
Fundamentals of Math 2
Winter 2014 (Jan-Apr)

COURSE OUTLINE

The course description is online @ <http://camosun.ca/learn/calendar/current/web/math.html>

Ω Please note: the College electronically stores this outline for five (5) years only.
It is **strongly recommended** you keep a copy of this outline with your academic records.
You will need this outline for any future application/s for transfer credit/s to other colleges/universities.

1. Instructor Information

| | | | | |
|-----|---------------|---|--------------------|--------------|
| (a) | Instructor: | Jill Britton | | |
| (b) | Office Hours: | Daily 9:30-10:30, 11:30-12:30 | | |
| (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 | | |

2. Intended Learning Outcomes

At the end of the course students will be able to:

1. Convert between selected past and present numeration systems.
2. Analyze and validate different algorithms for addition, subtraction, multiplication and division.
3. Deduce and/or use formulas for terms and sums of terms of selected sequences (arithmetic, geometric, power).
4. Demonstrate competence in selected topics from number theory including prime numbers, GCD and LCM, modular (clock) arithmetic, the binary sequence, Pascal's triangle, and Venn diagrams.
5. Apply classic tests for divisibility.
6. Decode messages encrypted by substitution and modular (clock) arithmetic.
7. Execute classic probability experiments (capture-recapture, randomized responses, Plinko, the Monty Hall problem).
8. Apply triangle congruence, triangle similarity, and Euclidean constructions to geometric problems.
9. Identify classic proofs of the Pythagorean Theorem and apply the theorem to Pythagorean triples.
10. Derive and use measurement formulas for classic 2-D and 3-D figures.
11. Identify the use of perspective in classic artworks.
12. Apply the postulates of spherical geometry.
13. Identify the kinds of symmetry in polygons and selected graphics.
14. Create tessellating artwork with modified polygons using manual techniques and by accessing TesselMania! or Tessellation Exploration software.
15. Construct regular and semi-regular polyhedra by joining faces, using strut construction, by assembling paper nets, and by using paper folding (modular origami).
16. Build a tetrahedron kite, an icosahedron globe or geodesic, and polyhedra bubbles.
17. Identify topological properties of shapes, networks, mazes, and maps.
18. Assemble and use flexagons and kaleidocycles.

3. Required Materials

Two manuals will be distributed, the first to assist in the meeting of learning outcomes 1 to 12 and the second in the meeting of learning outcomes 13 to 18. Additional material for outcomes 13 to 16 can be found in the instructor's published books and in the coordinated web pages of links [Symmetry and Tessellations](#) and [Polyhedra Pastimes](#). Additional material for learning outcomes 17 and 18 can be found in the web page [Rubber Geometry](#). Students must purchase a mandatory materials card (\$55) in the bookstore to cover the cost of the manuals, handouts and consumables (hand in to your instructor by Friday January 17th). Several assignments require access to a Windows computer. Although software that can be installed on your home computer will be made available, each student must have a Camosun account to access the computers in the General Purpose Labs.

4. Course Content

This course has been designed to enrich the mathematical background of students intending to pursue a degree in Elementary Education. The content is NOT directly related to the standard elementary mathematics curriculum. The time analysis that follows is based on 50 minute classes. A detailed schedule will be found in <http://britton.disted.camosun.bc.ca/math113/schedule.pdf>. Attendance in classes in *red italic text* ("REC MATH") is mandatory. A binder of corresponding written assignments will be collected on the last day of classes. One mark will be deducted from the total grade on these assignments for each absence from the mandatory classes. [3-D assignments will be evaluated during the final examination.] The content of all other classes is subject to in-class testing, ALL material will be included in a cumulative 3-hour exam during the final exam period.

| | |
|---|-------------------|
| Mathematics: A Universal Language | 1 class |
| Numeration Systems Past and Present | 3 classes |
| Algorithms for Whole Number Operations | 2 classes |
| Sequences | 5 classes |
| Primes / Prime Factorization / Divisibility | 2 classes |
| Designs from Mathematical Patterns | 2 classes |
| Cryptography | 2 classes |
| <i>Symmetry & Polygons</i> | <i>3 classes</i> |
| <i>Tessellations & Escher Art</i> | <i>6 classes</i> |
| Introducing Geometry | 2 classes |
| Basic Geometric Constructions | 2 classes |
| Geometric Designs | 2 classes |
| Triangle Congruence | 2 classes |
| Area of Plane Figures | 2 classes |
| The Theorem of Pythagoras | 2 classes |
| Similarity | 2 classes |
| Surface Area, Volume / Spherical Geometry | 3 classes |
| Probability Experiments | 2 classes |
| <i>Polyhedra</i> | <i>10 classes</i> |
| <i>Recreational Topology</i> | <i>6 classes</i> |
| Tests, miscellaneous | 3 classes |
| Holidays, spare | 6 classes |

Attendance is compulsory in classes in red italic text.

5. Basis of Student Assessment (Weighting)

Evaluation will be based on

- (1) Assignments (15%)
- (2) Class Tests (20%)
- (3) Portfolio (30%)
- (4) Math Trail (5%)
- (5) Final Examination (30%)

Students will be awarded an A+ or A in the course if and only if they would be awarded at least the same letter grade for their term mark (assignments, class tests, math trail), for the final exam, AND for the portfolio ... indicating a consistent performance. Students who do not meet this minimum requirement will be awarded a letter grade that is one category lower (that is, A+ → A and A → A-).

A minimum of 50% on the final exam is necessary for grades of C or higher.

Students will not be awarded a passing grade until they have submitted a satisfactory portfolio.

6. Grading System

(No changes are to be made to this section unless the Approved Course Description has been forwarded through the Education Council of Camosun College 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 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 | <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, 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 3 rd course attempt or at the point of course completion.) |
| 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. |

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 the College web site in the Policy Section.