

Mathematical Experience II: Shape and Space

Education 212

Section: D100

Term: 2014 Spring

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Office hours: Will be posted

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Friday 2:30-5:20 pm SWH 10051

First day of class: January 10th

Last day of class: April 4th

Discussion Topics: This course explores a variety of mathematical topics in order to increase the mathematical literacy of Liberal Arts students in general, and to increase their capabilities for quantitative reasoning and deductive argumentation in particular. Our focus is on the issues of aesthetics and utility of mathematical experience, emphasizing the human experience in learning and doing mathematics. Though the course content comes from mathematics, the approach is a pedagogical one, which draws on the knowledge and practices from education rather than applying the lecture/tutorial format most commonly seen in undergraduate mathematics courses. Students will engage in problem solving, investigate conjectures, and develop connections among mathematical topics.

The mathematical content chosen for these courses is flexible and in other settings may be considered as "enrichment". However, in-depth exploration of these topics provides an engaging opportunity to revisit and strengthen more basic concepts that lie at the heart of geometry. Topics include:

The Golden Ratio

o Pythagorean Theorem

Platonic Solids and Euler's Formula

Möbius Band and the Klein Bottle

Fractals

Art gallery problem

Taxicab geometry

Symmetry and patterns

Transformations and Tiling

Note 1: You need to be open and adaptable to learning a new software since some of the course content

will be delivered and assessed through the dynamic geometry software called: Geometers Sketchpad

(GSP). As with any software, there will be a learning curve. You will be assigned to watch tutorial videos

every week that walk you through the basic steps. You will receive some help during the class time and

office hours, but as is the nature of learning any software, practice and self-learning is involved. Please

email me if you would like to get a head start with GSP.

Note 2: EDUC 212 is one of Quantitative and Breadth Science Courses for Arts Students. Students taking

this course for Q-credit need to achieve a minimum of C-

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Note 3: There will be no class on the following date:
Friday February 14th: Reading Break (Feb 10- Feb 15th)

Grading: Course requirements:

- Active participation
- Weekly homework
- Midterm exam
- Class quizzes
- Collaborative project
- Final exam

Required Texts: Burger, E. B., & Starbird, M. (2009). The Heart of Mathematics 4th Edition. Wiley

Required Software:

You will need access to GSP software for many of the assigned problems and part of the group project.

Since the computer lab in education building (open to students taking Education courses) is equipped with

GSP, you dont need to get hold of a GSP license for your personal computer. However if for any reason

(including not being on campus frequently) you would like to work on assignments and tasks at home,

you will need to purchase a license (as of now a one-year student license costs around 20 dollars).

Instructions will be provided on first class meeting.

Readings:

Along with sections from the textbook, supplementary material including papers and tutorial videos will

be assigned as readings of the week on a regular basis.

Recommended Texts:

Materials/Supplies:

Prerequisite/Corequisite: Students who have credit for MATH 151, MATH 154, MATH 157 need special permission to participate in EDUC 211 and EDUC 212. QUANTITATIVE/BREADTH-SCIENCE.

Notes: Students in all Faculty

of Education courses are encouraged to review policies pertaining to academic

integrity available on the Undergraduate Programs website:

http://www.educ.sfu.ca/ugradprogs/student_resources/index.html

This outline is derived from a course outline repository database that was maintained by SFU Student Services and the University's IT Services Department. The database was retired in 2014 and the data migrated to SFU Archives in 2015.