MATH 243 Winter 2008
Geometry II

Department of Mathematical and Statistical Sciences
University of Alberta

Geometry II: Transformation Geometry

Lecture Q1:   M W F 9:00 - 9:50 CAB 273

Instructor: Ed Leonard, 679 CAB
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web: http://www.math.ualberta.ca/~isaac
(class notes, handouts, solutions, etc. will be available here)

Text: *Transformation Geometry: An Introduction to Symmetry*
by George E. Martin.

References: *Modern Geometry* by Claire Adler.
Introduction to Geometry by H. S. M. Coxeter.
Geometry Revisited by H. S. M. Coxeter and S. L. Greitzer.
A Survey of Geometry by Howard Eves.
Modern Geometries by James R. Smart.
Geometric Transformations I and II by I. M. Yaglom.
Excursions in Geometry by C. Stanley Ogilvy.

Schedule:

Event	Date
First class	Monday, Jan 7
Quiz	Friday, Feb 15
Reading Week	Feb 18 – Feb 22 (no classes)
Midterm Exam	Friday, Mar 14
Last class	Friday, Apr 11
Final Exam	Monday, Apr 21, 2008; 9:00 am
Deferred Final Exam	Saturday, May 10, 2008; 09:00–11:00, CAB 273

Note: There are no deferred midterm examinations.
The deferred final exam is not an option, but is intended to accommodate those
who have a legitimate reason for missing the final exam, for example, due to illness.

Assignments: There will be five or six problem sets given during the term, and each problem set will consist of problems taken from the text. Problem sets will not be collected for marking, solutions to the problem sets will be posted on my webpage and the quiz problems and examination problems will be similar to problems from these problem sets.

Solutions to all problem sets will be posted on my web page (*not* WebCT), and you may need Adobe Reader to view and print them. If you have difficulty accessing the web pages, please let me know.

Note: A Geometry Set (ruler, compass, and protractor) is required for problem sets and examinations. No calculators are permitted on the examinations.

Course summary: The course covers the basic transformations in Plane Euclidean Geometry: reflections, rotations, translations, and homotheties, and combinations of these. The course will be problem based. The emphasis is on how the transformations can be used to solve geometric problems, and how the algebra associated with these transformations also contributes to the solutions. We will cover the following topics in the text.

Chapter 1: Introduction. Transformations and collineations.

Chapter 2: Properties of Transformations. Groups of transformations and involutions.

Chapter 3: Translations and Halfturns.

Chapter 4: Reflections. Equations for a reflection, properties of a reflection.

Chapter 5: Congruence. Isometries as products of reflections.

Chapter 6: Product of Two Reflections. Translations and rotations. Fixed points and involutions.

Chapter 7: Even Isometries . Parity, the dihedral groups.

Chapter 8: Classification of Plane Isometries. Glide reflections, Leonardo's theorem.

Chapter 9: Equations for Isometries.

Chapter 13: Similarities on the Plane. Classification of Similarities. Equations for similarities.

Chapter 16: Transformations on Three-space. Isometries on space, similarities on space.

Marking Breakdown:

Quiz:	20%
Midterm test:	30%
Final exam:	50%

Grading:

Grade	Percent	Grade	Percent
A+	95 – 100	C+	65 – 69
A	90 – 94	C	60 – 64
A−	85 – 89	C−	55 – 59
B+	80 – 84	D+	50 – 54
B	75 – 79	D	45 – 49
B−	70 – 74	F	0 – 44

Code of Student Behavior: The University of Alberta is committed to the highest standards of academic integrity and honesty. Students are expected to be familiar with these standards regarding academic honesty and to uphold the policies of the University in this respect. Students are particularly urged to familiarize themselves with the provisions of the Code of Student Behavior and avoid any behavior which could potentially result in suspicion of cheating, plagiarism, misrepresentation of facts and/or participation in an offence. Academic dishonesty is a serious offence and can result in suspension or expulsion from the University.

Policy about course outlines can be found in Section 23.4(2) of the University Calendar.
Students who require accommodations in this course due to a disability affecting mobility, vision, hearing, learning, or mental or physical health are advised to discuss their needs with Specialized Support and Disability Services, 2-800 Students' Union Building, 492-3381 (phone) or 492-7269 (TTY).