

Math 302

Foundations of Geometry

Winter Semester 2006

Professor: Susan Barton
Office: GCB 160 D
Office Phone: 293-3811
Office Hours: M,W,F 2:10 a.m-3:00 p.m. *
 * Other times available by appointment

Text: *College Geometry: A Discovery Approach 2nd Edition*, by David C. Kay
 2001 Addison Wesley Longman, Inc.

Grading:	Homework, Quizzes & Computer Mini-Projects %	100 points
	3 Exams (100 points. each)	300 points
	Final Exam (comprehensive)	<u>200 points</u>
	TOTAL POSSIBLE	600 points

Grading Scale:	92.5 - 100 % = A	69.5 - 74.4 % = C
	89.5 - 92.4 % = A-	64.5 - 69.4 % = C-
	86.5 - 89.4 % = B+	59.5 - 64.4 % = D+
	82.5 - 86.4 % = B	54.5 - 59.4 % = D
	79.5 - 82.4 % = B-	49.5 - 54.4 % = D-
	74.5 - 79.4 % = C+	Below 49.5 % = F

Homework: Part of knowing mathematics well enough to teach it, is learning how to communicate mathematically in written form. So please write neatly and use complete sentences whenever possible on your homework, projects, and exams. An important part of successfully doing higher level mathematics is to work problems and construct proofs in an efficient manner. A challenging task for you, will be to learn to balance efficiency with well communicated thoughts.

Approximately 75% of your homework scores will come from quality (graded questions) and 25% will come from quantity (completeness). It is critical that you show your work (thought processes) in order to receive full credit. Remember, part of the homework assignment is to read the section to be discussed the next class period before coming to that class session. Short quizzes may be given during class and will be counted with the homework scores.

Class Participation In order to be successful in a vocation after graduating from college, it is vital that you be able to intelligently express your thoughts both through oral and written communication. Hence in this course you will be provided with opportunities to verbally express yourself in discussing mathematical ideas as well as in communicating your thoughts in written form. Many students who take Math 302 become teachers of geometry at the secondary level and thus need every opportunity to refine presentation skills and teaching of mathematical concepts.

Exams: There will be three Chapter Exams and a comprehensive Final Exam given as shown on the schedule. A missed exam will result in a score of "0" unless prior consent is given by the instructor for a make-up exam.

(A word to the wise: make- up exams are **rarely given.**) The exams will include problems requiring use of the computer software Geometer's Sketchpad.

Honor Code: In this course you will have an opportunity to expand upon your knowledge of mathematics. However, gaining knowledge must also go hand in hand with developing a strong code of ethics and integrity. Since one of the conditions of my employment and your attendance at BYU is that we all obey the Honor Code in all matters, we must take it very seriously. Remember who you are and what you represent; it will be your first line of defense. Also, as described in the Honor Code, any student who is dishonest in this course, regardless of role or level of participation, will be assigned a failing grade for the course and will be referred to the Standards Office for further action.

Policies: BYUH's policy against sexual harassment extends not only to employees of the university but to students as well. If you encounter sexual harassment or gender-based discrimination, please talk to your professor, contact the Counseling Office, or contact the Honor Code Office.

Brigham Young University-Hawai'i is committed to providing a working and learning atmosphere, which reasonably accommodates **qualified persons with disabilities**. If you have any disability that may impair your ability to complete this course successfully, please contact the students with Special Need Coordinator, Leilani A'una at 293-3518. Reasonable academic accommodations are reviewed for all students who have qualified documented disabilities. If you need assistance or if you feel you have been unlawfully discriminated against on the basis of disability, you may seek resolution through established grievance policy and procedures. You should contact the Human Resource Services at 780-8875.

Please show respect to the teacher and your fellow classmates by turning your cell phone off before class begins.

Description & Objectives: In this course we will cover material from Chapters 2 - 4 thoroughly and conceptual highlights of chapter 5, 6 and 1 from the textbook *College Geometry*. Additionally, the computer software Geometer's Sketchpad will be used throughout the course to facilitate exploration of geometrical ideas. There will be a few Sketchpad mini-projects assigned throughout the course. Major concepts in this course include foundations of geometry, Euclidean geometry, transformations in geometry, and non-Euclidean geometry. Two objectives in this course are to provide you with opportunities to problem solve and to gain experience in exploring, discovering and expressing geometry concepts in both written and verbal formats. Another important objective/goal is to have you understand axiomatic systems and models including basic axioms, major theorems, and definitions in order to write clear, efficient, compelling, and rigorous mathematical arguments in the context of geometry.

The intent of the course is to help prepare you for the time when you will face your own class in geometry. However the major aim of the course is "not to show you explicitly how to teach geometry, but rather to emphasize the concepts and inherent beauty of geometry so you will be inclined to teach geometry as an exciting subject yourself..." (Kay, p. xvii).

Now let's go have some fun with geometry!!

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Winter 2006 Proposed Schedule

Jan. 11 - Jan. 30	Chapter 2--Foundations of Geometry I (and parts of Chapter 1) Proof, Finite Geometry, Incidence Axioms, Postulates, and Definitions Basics of Geometer's Sketchpad Computer Software
January 31-February 1	EXAM I (Chapter 2 and Sketchpad) Take in Testing Center
Feb. 3 - Feb. 24	Chapter 3--Foundations of Geometry II Triangles, Quadrilaterals, Circles, Congruence Relations and Theorems, Riemannian Geometry (Elliptic Geometry) Tasks using Geometer's Sketchpad
February 27- 28	EXAM II (Chapter 3 and Sketchpad) Take in Testing Center
Mar. 1 - Mar. 22	Chapter 4--Euclidean Geometry Absolute Geometry, Euclidean Parallelism, Parallel Lines Theorems, Parallelograms Rectangles, Trapezoids, Transformations, Tiling, Tessellations, Euclidean Trigonometry, Geometer's Sketchpad Activities
March 23-24	EXAM III (Chapter 4 and Sketchpad) Take in Testing Center
Mar. 27 - Apr. 7	Chapter 5-- Transformations in Geometry Plane Transformations, Reflections, Translations, Rotations, Other Isometries, Linear Transformations, and Transformation Theory in "Proofs" assisted by Geometer's Sketchpad Software
Apr. 10 - Apr. 17	Chapter 6-- Non Euclidean Geometry (and some of Chapter 7) Historical background of Non-Euclidean Geometry, Hyperbolic (or Lobachevskian) Geometry using Geometer's Sketchpad, Highlights of Spherical Geometry
April 19	Comprehensive Take Home Final Exam with Sketchpad problems. Must be submitted no later than 5:00 p.m. April 25, 2005
April 24	Multiple Choice & True/False Exam on Euclidean and Non-Euclidean Geometries Monday, 11:00 a.m. - 2:00 p.m (Take in the Testing Center)