CHAPMAN UNIVERSITY
University Honors Program
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COURSE SYLLABUS

HON 208 **Spring 2009**
Universal Geometry

Catalog Description:
Prerequisite: Math 104, or equivalent; and acceptance to the University Honors Program, or consent of instructor. Students will learn elements of Euclidean and non-Euclidean geometries in the context of axiomatic systems. The main objective of this course is to help students develop quantitative and logical skills of mathematical reasoning. (Offered as needed.) 3 credits.

Restrictions:
Acceptance into the University Honors Program, or consent of instructor.

Essential Equipment and Facilities:
None

Course Goals, Objectives and Learning Outcomes:
The course is intended for all Honors students who are interested in both the elegance and the rigor of geometry and numbers. Upon completion of this course, both liberal arts or mathematics major students should:

1. Understand why we use proofs in mathematics and how to produce them;
2. How and why we can describe the spatial physical reality in the absence of real numbers;
3. How real numbers and their properties can be constructed and deduced in geometric terms;
4. How the notion of continuity can be regarded either as an abstract concept or as a scientific fact.
5. Appreciate the historical and cultural role that geometry has played in the development of mathematics.
6. Be able to write coherent and correct geometrical proofs.

Content:
Universal Geometry is designed to help students develop quantitative and logical skills of mathematical reasoning. Students will learn ideas of abstraction, aesthetics, the development of mathematical tools, the use of the language of mathematics. In conjunction with these topics, there is an emphasis on the geometry curriculum standards as directed by the National Council of Teachers of Mathematics.

Current Required Text:
Euclidean and Non-Euclidean Geometries by M.J. Greenberg, Third Edition, WH Freeman and Company, 1993.

Instructional Strategies:
The course is build around a series of lectures and group exercises. Each class session begins with a short lecture introducing a new concept, followed by a discussion with the students as they self-discover and construct examples and proofs of properties shared by the concept. The lectures will emphasize proofs as well as examples from higher mathematics, both pure and applied, to entice students to pursue related research subjects. Precise mathematical notation and critical thinking are stressed throughout the course.

Methods of Evaluation:
Written examinations and projects should be given periodically and at the end of the course a comprehensive final should be given.

Chapman University Academic Integrity Policy:
The course syllabus should include the following statement:
Chapman University is a community of scholars which emphasizes the mutual responsibility of all members to seek knowledge honestly and in good faith. Students are responsible for doing their own work, and academic dishonesty of any kind will not be tolerated anywhere in the university

Students with Disabilities Policy:
The course syllabus should include the following statement:
In compliance with ADA guidelines, students who have any condition, either permanent or temporary, that might affect their ability to perform in this class are encouraged to inform the instructor at the beginning of the term. The University, through the Center for Academic Success, will work with the appropriate faculty member who is asked to provide the accommodations for a student in determining what accommodations are suitable based on the documentation and the individual student needs. The granting of any accommodation will not be retroactive and cannot jeopardize the academic standards or integrity of the course.

Bibliography:

1. *Euclidean and Non-Euclidean Geometries* by M.J. Greenberg, Third Edition, WH Freeman and Company, 1993.
2. *Foundations of Geometry* by G. Venema, Prentice Hall, 2002.
3. *Euclidean and Non-Euclidean Geometries* by M. H. Noronha, Prentice Hall, latest edition
4. *Foundations of Geometry* by W. Boskoff and A. Vajiac, preprint.

Prepared by:
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Last revised by:
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