



Philadelphia University
Faculty of Science
Department of Basic Sciences and Mathematics
First (fall) Semester 2009/2010

<u>Course Syllabus</u>			
Course Title	Modern Euclidean Geometry	Course Code	250261
Course Level	"2"	Course Prerequisite	250251 "Set Theory"
Lecture Time	Mon. and Wed. 09:45–11:15	Credit Hours	"3"

<u>Academic Staff Specific</u>				
Name	Dr. Mahmoud Kishta	Office Hours	Monday Wednesday	11:15 – 12:45
Rank	Full Professor			
Location	Faculty of Scientific Research			
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Course Description:

This course deals with the following main topics: Axioms of Euclidean geometries, isomorphisms and models, Finite geometry, Neutral geometry, equivalence of the parallel postulate, hyperbolic geometry. Projective geometry.

Course Objectives:

In this module students will learn the rigorous modern approach to Euclidean geometry. Additionally they will also be introduced to some non-Euclidean geometries and the motivations behind their discoveries.

Course Components (Text Book):

Title	:	Euclidean and Non-Euclidean Geometries: Development and History.
Author	:	Marvin J. Greenberg.
Publisher	:	W. H. Freeman.
Edition	:	4 th Edition.
Year	:	2007
ISBN	:	0716799480



Teaching Methods:

1. To learn it is imperative for the student to take an active interest in their own education. To learn mathematics the student must read, think, and write in an analytical manner and this takes practice. Such practice is by working exercises. When troubles arise, and they will, the student must ask questions. Questions may be posed to the instructor or to other students in a variety of ways; online office hours, or in class.
2. Homework will be assigned each week; not to be collected or graded by the instructor. In addition, at the end of a chapter, challenge problems will be assigned for "work-hard" students. Further more, mathematical projects on real-life problems will be assigned to the students through out the semester.

Learning Outcomes:

1. Have a complete sense of what modern geometry is about.
2. Be able to read and construct mathematical proofs in the right logical sequence.
3. Calculate the gradient and its derivative.

4. Comprehend different models of non-Euclidean geometries and a bit of their historical developments.

Assessment Instruments

<u>Allocation of Marks</u>				
<u>Assessment Instruments</u>	<u>Mark</u>	<u>Expected Appointment</u>		
		<u>Date</u>	<u>Day</u>	<u>Time</u>
First Examination	20	23.11.09	Monday	09:45
Second Examination	20	30.12.09	Wednesday	09:45
Homeworks and Projects	10	T.B.A		
Final Examination	50	24.01.10 – 02.02.10		
Total	100			

Course Academic Calendar

<u>Week</u>	<u>Basic and Support Material to be Covered</u>
(1)	Survey of the origins of geometry, Euclid's postulates, the parallel postulate and discussion of its attempted proofs.
(2)	Revision of the methods of mathematical proofs.
(3)	The Incidence Axioms and propositions.
(4)	Models and Isomorphisms of models.
(5)	The Betweenness Axioms and propositions.
(6) <i>First Exam</i>	The Betweenness Axioms and propositions (continue).
(7)	The Congruence Axioms and propositions.
(8)	The Congruence Axioms and propositions (continue).
(9)	The Continuity Axioms and the Parallelism Axiom.
(10)	Theorems in Neutral Geometry.
(11) <i>Second Exam</i>	Theorems in Neutral Geometry (continue).
(12)	Equivalence of the Euclid's Parallel Postulate.
(13)	Hyperbolic Geometry axioms and theorems.
(14)	Consistency of the 2 geometries, Discussions on elliptic geometry and other geometries.
(15)	Project: Drawing in Hyperbolic Geometry using "Non-Euclid" software
(16)	<i>Final Exam.</i>

Expected Workload:

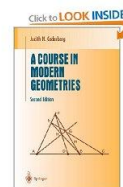
On average students need to spend, at least, 9 hours of study and preparation per week for this course.

Attendance Policy:

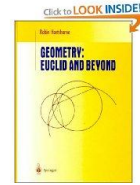
Absence from lectures shall not exceed 15%. Students who exceed the 15% limit without a medical or emergency excuse acceptable to and approved by the Dean of the relevant college/faculty shall not be allowed to take the final examination and shall receive a mark of zero for the course. If the excuse is approved by the Dean, the student shall be considered to have withdrawn from the course.

Module Reference(s):

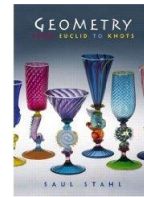
Title : A Course in Modern Geometries.
 Author : Judith N. Cederberg.
 Publisher : Springer.
 Edition : 2nd Edition.
 Year : 2001
 ISBN : 0387989722



Title : **Geometry: Euclid and Beyond.**
Author : **Robin Hartshorne.**
Publisher : **Springer.**
Edition : **1st Edition.**
Year : **2005**
ISBN : **0387986502**



Title : **Geometry: From Euclid to Knots.**
Author : **Saul Stahl.**
Publisher : **Prentice Hall.**
Edition : **1st Edition.**
Year : **2002**
ISBN : **0130329274**



Website:

- Department of Basic Sciences: <http://www.philadelphia.edu.jo/math/>.
- Hyperbolic Geometry freeware: <http://cs.unm.edu/~joel/NonEuclid/>.