

**University of North Texas at Dallas**  
**Fall 2011**  
**SYLLABUS**

<b>MATH 4060 (Foundations of Geometry) (3Hrs)</b>	
<b>Department of</b>	Mathematics and Information Sciences
<b>Division of</b>	Liberal Arts and Life Sciences
<b>Instructor Name:</b>	Dr. Ali Shaqlaih
<b>Office Location:</b>	DAL2- 227
<b>Office Phone:</b>	972-338-1569
<b>Email Address:</b>	ali.shaqlaih@unt.edu
<b>Office Hours:</b>	M:2:00-5:00pm; T: 1:00-2:00pm W: 1:00-5:00 pm, Lab; M: 1:00-2:00
<b>Classroom Location:</b>	DAL2-242
<b>Class Meeting Times:</b>	T, R: 11:30 am-12:50 pm
<b>Course Catalog Description:</b>	Geometry is the first branch of Mathematics that humans managed to systematize and place on a rigorous footing. It is the foundation for our mathematical interpretation of the world. In this course, We will study a systematic development of geometry from an axiomatic point of view. We will be exploring the fundamentals of geometry, beginning with axioms and proceeding from there. We will also be looking at the logical structure of theorems and proofs. We will study the fundamentals of Euclidean Geometry, non- Euclidean Geometry and other topics as time permits. □
<b>Prerequisites:</b>	Math 3000 and prior or current enrollment in Math 3510. In addition, you should be proficient at writing basic proofs, a skill that you will enhance throughout this course.
<b>Required Text:</b>	<ul style="list-style-type: none"> <li>• Euclidean Geometry, A guided Inquiry Approach, by David M. Clark.</li> <li>• Gerard A. Venema (2005), <i>Foundations of Geometry</i>, first edition, second printing, Prentice Hall. ISBN: 0-13-143700-3.</li> <li>• Class notes and all the handouts distributed by the instructor in this class are as important as the textbook.</li> </ul>
<b>Recommended Text and References:</b>	<ul style="list-style-type: none"> <li>• Marvin Jay Greenberg (2008), <i>Euclidean and Non-Euclidean Geometries: Development and History</i>. Publisher: W. H. Freeman and Company, 4th edition. ISBN: 0716799480.</li> <li>• David C. Kay: Addison Wesley Longman (2001), <i>College Geometry: A Discovery Approach</i>. ISBN: 0-321-04624-2</li> </ul>
<b>Access to Learning Resources:</b>	UNT Dallas Library: phone: (972) 780-3625; web: <a href="http://www.unt.edu/unt-dallas/library.htm">http://www.unt.edu/unt-dallas/library.htm</a> UNT Dallas Bookstore: phone: (972) 780-3652; e-mail: <a href="mailto:1012mgr@fheg.follett.com">1012mgr@fheg.follett.com</a>

## Course Goals

### The goal of this course is to:

- Understand axiomatic systems.
- Strengthen ability to construct sound mathematical arguments.
- Learn about important issues in the history of geometry.
- Improve geometric intuition.
- Improve oral and written communication skills in Mathematics.
- Improve problem solving skills.
- Help the student develop the skills of logical reasoning and careful presentation of proof.

## Learning Objectives/Outcomes:

### Course Objectives:

At the end of this course, the student will be able to:

- Describe the difference between Euclid's approach and Hilbert's approach.
  - Describe some models of non-Euclidean geometries.
  - Write rigid mathematical proofs.
  - Explain important concepts in geometry.
  - Teach effectively the high school geometry.
- **Program Learning Outcomes:**  
In this course, the student will be able to:
- Formulate conjectures by considering examples that move from the specific to general
  - Use a variety of techniques-such as mathematical induction, proof by contradiction, or direct application to axioms, and previously proven theorems- to prove propositions.

## Course Outline

Priority will be given to understanding the material in depth rather than covering more topics. This schedule is subject to change by the instructor. Any changes to this schedule will be announced in class. We will try to cover as much as we can from the following topics as time permits.

TOPICS	TIMELINE
Euclid's Elements, Axiomatic Systems	Week of Aug.29
Theorems, Proofs, and Logic,	Week of Sep.5
The Axioms of Plane Geometry	Weeks of Sep. 12, 19, 26
Euclidean Geometry	Weeks of Oct.3, 10, 17, 24, 31
Circles	Week of Nov.1, 8
Transformations	Week of Nov. 15, 22
Geometry of Space	Weeks of Nov. 29
Hyperbolic Geometry	Week of Dec 6

### Course Evaluation

This course will utilize the following instruments to determine student grades and proficiency of the learning outcomes for the course.

**Exams** – Written in-class closed-book tests to measure knowledge of presented course material.

**Homework** – Written assignments designed to supplement and reinforce course material.

**Participation** – Attendance and class participation to ensure effective and cooperative learning to and measure ability to present course material.

**Portfolio**- out of class work designed to supplement and reinforce course material.

**Quizzes** – Weekly quizzes to help student keep fresh with the material.

### Grading Matrix:

Instrument	Value	Total
Quizzes	7 quizzes at 20 points each	140
Hour Exams	2 exams at 100 points each	200
Portfolio	Many assignments	260
Attendance & Participation	participation and presentations	150
Final Exam	A comprehensive exam	250
Total:		1000

### Grade Determination:

The following standard grading scale will be used to determine your final letter grade:

**A = 90% or better, B = 80 – 89 %, C = 70 – 79 %, D = 60 – 69 %, F = less than 60%**

### Technology Use Policy:

We will be using the geometries sketchpad to explore advanced Euclidian geometry. I will try to make this software available in the math help lab so students can use it. In the class we will talk a little about the software and its use as time permits. It is important for the students to master the use of this program to be able to visualize some geometric concepts.

### Portfolio Policy:

This is working outside of class work; you will carefully write a final version of the proof of each of the theorems or problems and compile these in a single loose leaf notebook which you will periodically turn in for me to review. You should keep your portfolio up to date. I will ask for the portfolio to be submitted on regular basis (no previous notice will be given). Use of complete, correct English logical sentences is essential. Geometry provides an ideal context to develop this skill since it is always necessary to say exactly what you mean and to mean what you say. You will be able to make revisions to your portfolio as necessary, but in the end they must all be correct. Homework will be into two parts, one that is for practice that student doesn't need to turn in and another part that is to be solved and put in the portfolio. All homework should be written in appropriate way and all work must be shown in details. Homework is essential for your full understanding of the course material. The assigned homework problems are the minimum number of problems required to attain some level of mastery of the material and you should work more problems to achieve full mastery of the material. You should do all homework problems but only selected problems will be graded. Please be as neat as possible on the homework and try to keep the problems in order with space between them. Math gets harder the more unorganized you work! Late homework will **NOT** be accepted. Portfolio will be collected without prior notice to be graded so you need to be ready and up to date.

**Quizzes policy:**

There will be eleven quizzes throughout the course. At the end of the semester, each student's best 7 quizzes will be added to get a 105 possible-point total (will be counted as total of 100). The quizzes will be given in the first 15 minutes of the class. There will be no make-ups for missed quizzes for any reason. The material that will be covered in the quizzes will be announced a head of time.

**Exams Policy:**

Exams should be taken as scheduled in the class time. All exams are closed book exams. No makeup examinations will be allowed except for documented emergencies (See Student Handbook). The material that will be covered in the exams will be announced in class and the final exam will be comprehensive.

**Make-up exam policy:**

All requests for make-up exams **MUST** be submitted to the instructor in writing, with the supported documents. It is imperative that you contact your instructor as soon as possible (do **NOT** wait until you return to class!) and include a way that you can be reached.

**Presentation policy:**

You will be asked to take turns presenting and explaining your proofs at the board in front of the class. You should try to present as many times as you can and to present the material as clear as you can.

**Attendance and Participation Policy:**

The University attendance policy is in effect for this course. Class attendance and participation is expected because the class is designed as a shared learning experience and because essential information not in the textbook will be discussed in class. The dynamic and intensive nature of this course makes it impossible for students to make-up or to receive credit for missed classes. Attendance and participation in all class meetings is essential to the integration of course material and your ability to demonstrate proficiency. Coming to class late or leaving it early is considered an absence. Students are responsible to notify the instructor if they are missing class and for what reason. Students are also responsible to make up any work covered in class. It is recommended that each student coordinate with a student colleague to obtain a copy of the class notes, if they are absent. Learning is both more effective and more satisfying when you can be an active participant in the process. In this course students will spend a substantial part of the class time presenting their own work in class. You should plan to come to all classes prepared to do this.

**General Policies & Procedures:**

- The first and most fundamental expectation I have for everyone in the class is to respect one another. Among other things, this means that only one person speaks at a time, no one uses cell phones (including texting); reading newspaper in class, no one works on anything not related to our class, and everyone will put forth an honest effort.
- It is the student's responsibility to stay abreast of all class announcements and changes made to this syllabus in class, whether present or not.
- Leaving and entering the class back multiple times is not allowed. You can leave the class if you are not returning or going to bathroom or for real emergency case. Leaving the class should be by the permission of the instructor.

- You are expected to review all graded quizzes and exam papers as soon as they are returned. All questions about the grading of quizzes, homework or exam papers must be reported within seven calendar days of the date on which the paper was returned.
- You are fully responsible for the material covered in class either from the text or not.
- Do the homework and extra problems steadily every day rather than once a week. Do not fall behind. To catch up, if class is missed, contact the instructor by e-mail.
- This class will be very active and I expect you to participate as much as possible. Mathematics is all about exploring ideas. Don't be afraid to make mistakes or ask questions, the more you get involved, the better you'll do!
- This course requires you to learn a fair amount of new mathematical vocabulary. Understanding the vocabulary is essential for you to read questions correctly and express your thoughts, ideas and answers using the proper terminology.
- To do well in this course attend class every meeting on time, be prepared to work for the full class time, be organized, bring all necessary materials to class and follow teacher directions.
- If you need help, please ask for it. My door will always be open and you should feel free to use email me if you have questions outside of school time.
- Don't stress out about math! You have the abilities to do very well as long as you work hard.

### **Students with Disabilities (ADA Compliance):**

The University of North Texas Dallas faculty is committed to complying with the Americans with Disabilities Act (ADA). Students' with documented disabilities are responsible for informing faculty of their needs for reasonable accommodations and providing written authorized documentation. For more information, you may visit the Office of Disability Accommodation/Student Development Office, Suite 115 or call Laura Smith at 972-780-3632.

### **Student Evaluation of Teaching Effectiveness Policy:**

The Student Evaluation of Teaching Effectiveness (SETE) is a requirement for all organized classes at UNT. This short survey will be made available to you at the end of the semester, providing you a chance to comment on how this class is taught. I am very interested in the feedback I get from students, as I work to continually improve my teaching. I consider the SETE to be an important part of your participation *in this class*.

### **Bad Weather Policy:**

On those days that present severe weather and driving conditions, a decision may be made to close the campus. In case of inclement weather, call UNT Dallas Campuses main voicemail number (972) 780-3600 or search postings on the campus website [www.unt.edu/dallas](http://www.unt.edu/dallas). Students are encouraged to update their Eagle Alert contact information, so they will receive this information automatically.

### **Academic Integrity:**

Academic integrity is a hallmark of higher education. You are expected to abide by the University's code of Academic Integrity policy. Any person suspected of academic dishonesty (i.e., cheating or plagiarism) will be handled in accordance with the University's policies and procedures. Refer to the Student Code of Academic Integrity at <http://www.unt.edu/unt-dallas/policies/Chapter%2007%20Student%20Affairs,%20Education,%20and%20Funding/7.002%20Code%20of%20Academic%20Integrity.pdf> for complete provisions of this code.

In addition, all academic work submitted for this class, including exams, papers, and written assignments should include the following statement:

**On my honor, I have not given, nor received, nor witnessed any unauthorized assistance that violates the UNTD Academic Integrity Policy.**

**Diversity/Tolerance Policy:**

Students are encouraged to contribute their perspectives and insights to class discussions. However, offensive & inappropriate language (swearing) and remarks offensive to others of particular nationalities, ethnic groups, sexual preferences, religious groups, genders, or other ascribed statuses will not be tolerated. Disruptions which violate the Code of Student Conduct will be referred to the Center for Student Rights and Responsibilities as the instructor deems appropriate.

**Important dates:**

Quiz 1	Sep.1
Quiz 2	Sep. 8
Quiz3	Sep.15
Quiz 4	Sep.22
<b>First hour exam</b>	<b>Sep.29</b>
<b>Last day to withdraw with an automatic W</b>	<b>Oct. 4</b>
Quiz 5	Oct.6
Quiz 6	Oct.13
Quiz 7	Oct.20
Quiz 8	Oct.27
<b>Last day to drop with W or WF</b>	<b>Oct. 28</b>
Quiz 9	Nov.3
Quiz 10	Nov.10
<b>Second hour exam</b>	<b>Nov. 17</b>
Quiz11	Dec. 1
<b>Final exam</b>	<b>Dec 13 at 11:00 am</b>