Fayetteville State University
College of Arts and Sciences
Department of Mathematics & Computer Science
MATH 262-01 Modern Geometry
Fall 2009

I. Locator Information:

Instructor: Dr. Dong Wang
Course # and Name: MATH 262-01 Modern Geometry Office Location: SBE 335B
Semester Credit Hours: 3
Day and Time Class Meets: MWF 2:00—2:50pm Office Phone: 910-672-1136
Where Class Meets: 105 SBE
Total Contact Hours for Class: 45
Email address: dwang@uncfsu.edu
Office Hours: MWF 10:00--11:00am, 12:30--1:30pm. 3:00--4:00pm or by appointment
Final Exam: To Be Determined

FSU Policy on Electronic Mail: Fayetteville State University provides to each student, free of charge, an electronic mail account that is easily accessible via the Internet. The university has established email as the primary mode of communicating with enrolled students about impending deadlines, upcoming events, and other information important to student progression at the university. Students are responsible for reading their email on a regular basis to remain aware of important information disseminated by the university. The university maintains open-use computer laboratories throughout the campus that can be used to access electronic mail.

Students making inquiries via email to FSU faculty and staff about academic records, grades, bills, financial aid, and other matters of a confidential nature are required to use their FSU email account.

Rules and regulations governing the use of FSU email may be found at:
http://www.uncfsu.edu/PDFs/EmailPolicyFinal.pdf

II. Course Description:

MATH262 includes studies of incidence geometry in planes and space, distance and congruence, separation in planes and space, angular measure, congruence between triangles, similarities between triangles and parallel postulates.
Prerequisites: Math 123 and Math 124, or Math 131

III. Disabled Student Services:

In accordance with Section 504 of the 1973 Rehabilitation Act and the Americans with Disabilities Act (ACA) of 1990, if you have a disability or think you have a disability to please contact the Center for Personal Development in the Spaulding Building, Room 155 (1st Floor); 910-672-1203.

IV. Textbook:

Alexander, Dan & Koeberlein, Geralyn, Elementary Geometry for College Students, 4ed, Houghton Mifflin Publishers Company, 2007.

V. Students Learning Outcomes:

Upon completion of this course, students should be able to

- Demonstrate the ability to use concepts of points, lines and planes in one, two and three dimensions.
- Demonstrate the ability to use the properties of angles, lines, planes, polygons, polyhedron, quadrilaterals, triangles and circles to solve problems and write valid proofs using a variety of reasoning strategies.

- Demonstrate a fluent understanding of the relationship between incidence relations, formulas and dimension count.

VI. COURSE COMPETENCIES:

DPI

1.0 Ability to recognize and solve problems.

1.1 Use mathematics and technological tools to solve "real world" problems that arise in social sciences, biological sciences, physical sciences, and other mathematical sciences.

2.1 Understand the concepts of variable, expression, equation, inequality, and the properties of integers, rational numbers, and real numbers.

a. Represent situations and number patterns with tables, graphs, verbal rules, and equations; explore connections between these representations
b. Analyze tables and graphs to identify properties and relationships.
c. Solve linear and non-linear equations and inequalities and systems using concrete, formal and informal methods.
d. Have knowledge of diverse examples of functions arising from a variety of problem situations and investigate the properties of these functions through appropriate technologies, including graphing utilities and graphing calculators.
e. Know the conic sections including their geometric properties and their relationship to the general second-degree equation in two variables.

4.9 Understand the concepts of polynomial and rational expressions, roots, and apply algebraic algorithms.

a. Demonstrate a thorough knowledge of the properties of polynomial with rational or real coefficients including the relationships between roots and factors, the roles of complex roots, and tests for rational roots.
b. Apply the Fundamental Theorem of Algebra.

11.1 Develop and analyze algorithms for computational efficiency.

11.2 Develop skills in using interactive and recursive techniques in solving problems.

11.5 Use computers and graphing calculators to explore mathematical concepts.

NCATE

10. MATHEMATICS PREPARATION

a. Programs prepare prospective teachers who--

i. Use a problem-solving approach to investigate and understand mathematical content.

ii. Formulate and solve problems from both mathematical and everyday situations.

b. Programs prepare prospective teachers who can communicate mathematical ideas.

i. In writing, using everyday mathematical language, including symbols.

ii. Orally, using both everyday and mathematical language.

c. Programs prepare prospective teachers who can make and evaluate mathematical conjectures and arguments and validate their own mathematical thinking.

d. Programs prepare prospective teachers who—

i. Show an understanding of the interrelationships within mathematics.

ii. Connect mathematics to other disciplines and real-world situations.
e. Programs prepare prospective teachers who—
i. Understand and apply concepts of number, number theory and number systems.
ii. Understand and apply numerical, computational and estimation techniques and extend them to algebraic expressions.
f. Programs prepare prospective teachers who—
i. Use calculators in computational and problem-solving situations.
ii. Use computer software to explore and solve mathematical problems.

11. TEACHER PREPARATION
2.1 Programs prepare prospective teachers who can identify and model Strategies used for problem-solving in grades 7-12.
a. Programs prepare prospective teachers who use graphing calculators, computers and other technologies as tools for teaching mathematics.

VII. EVALUATION CRITERIA/GRADING SCALE:

Tests **35%**
Homework **20%**
Research Project **15%**
Final **30%**

There will be a test at the end of each chapter. The lowest test score will be dropped and **NO MAKE UP TESTS WILL BE GIVEN.**

Final grades will be assigned on the basis of academic performance in the following manner:

Grading Scale

A = 90-100%, B = 80-89%, C = 70-79%, D = 60-69%, F= below 60%

VIII. COURSE REQUIREMENTS:

Conduct of Course/Classroom Decorum:

1. Students are responsible for availing themselves for **all** class meetings, tutorial sessions, computer lab sessions, and individual help from the instructor.
2. Students are responsible for maintaining a notebook of problems selected by the instructor. Students are encouraged to include as many additional problems as possible.
3. There will be a test on each chapter, and there will be a *comprehensive* final examination. All tests will be announced prior to their administration. Since the lowest chapter test will be dropped, **no make-up tests** will be given.
4. Students are expected to enter the classroom on time and remain until the class ends. Late arrivals and/or early departures will be noted in the record book. ***The class attendance policy given in the 2000-2002 FSU Catalogue will be strictly adhered to.***
5. Students must refrain from smoking, eating and drinking in the classroom. The rights of others must be respected at all times.
6. Students are encouraged to ask questions of the instructor in class and to respond to those posed by the instructor. They should not discourage others from asking or answering questions. Other students often have the same questions on their minds, but are hesitant to ask.
7. Students are expected to complete all class assignments, to spend adequate time on their class work, *and to read each topic prior to class discussion* to ensure that the course outcomes are met.

8. Talking in class between students is strictly unacceptable. Discussions should be directed to the instructor.
9. Extra recitation periods and/or computer lab attendance are mandatory for students whose grades fall below **"C"**. They must meet with the instructor to arrange for extra activities.
10. **Dishonesty on graded assignments will not be tolerated**. Students must neither give nor receive help on any work to be graded. The University policy on cheating will be applied to any violations. The **minimum** penalty will be a grade of **zero** on the assignment.
11. ***Please do not bring your children to class.***

IX. RESEARCH PROJECT

Each student will be required to finish one of the following projects

1. Writing a 4 to 5 page paper illustrating how he /she used or plans to use the knowledge from geometry in his/her field of study or work.
2. Writing a 4 to 5 page paper illustrating the development of geometry: From Euclidean Geometry to Non-Euclidean Geometry.

X. COURSE OUTLINE

LECTURE	SECTIONS
1	1.1 Sets, Statements, and Reasoning 1.2 Informal Geometry and Measurement
2	1.3 Early Definitions and Postulates 1.4 Angles and Their Relationships
3	1.5 Introduction to Geometric Proof 1.6 Relationships: Perpendicular Lines
4	1.7 The Formal Proof of a Theorem
5	2.1 The Parallel Postulate and Special Angles 2.2 Indirect Proof
6	2.3 Proving Lines Parallel 2.4 The Angles of a Triangle
7	2.5 Convex Polygons
Test #1	
8	3.1 Congruent Triangles 3.2 Corresponding Parts of Congruent Triangles
9	3.3 Isosceles Triangles 3.5 Inequalities in a Triangle
10	4.1 Properties of a Parallelogram 4.2 The Parallelogram and Kite
11	4.3 The Rectangle, Square, and Rhombus 4.4 The Trapezoid
Test #2	
12	5.1 Ratios, Rates, and Proportions 5.2 Similar Polygons
13	5.3 Proving Triangles Similar 5.4 The Pythagorean Theorem
14	5.5 Special Right Triangles 5.6 Segments Divided Proportionally

15	6.1 Circles and Related Segments and Angles
16	6.2 More Angle Measures in the Circle
17	6.3 Line and Segment Relationships in the Circle
18	6.4 Some Constructions and Inequalities for the Circle 6.5 Locus of Points
19	6.6 Concurrence of Lines
Test #3	
20	7.1 Area and Initial Postulates 7.2 Perimeter and Area of Polygons
21	7.3 Regular Polygons and Area 7.4 Circumference and Area of a Circle
22	7.5 More Area Relationships in the Circle
23	8.1 Prisms, Area, and Volume 8.2 Pyramids, Area, and Volume
24	8.3 Cylinders and Cones 8.4 Polyhedrons and Spheres
25	9.1 Hyperbolic and Other Non-Euclidean Geometries
26	9.2 Spherical Geometry: A Three-Dimensional View
Test #4	
Final Exam	