Morehead State University
Professional Education Unit
College of Science and Technology
Department of Mathematics, Computer Science, and Physics

MATH 371—College Geometry II (face to face)
Spring 2010 MWF 9:10

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Office Hours: 8:00-9:00 M-F
or by appointment

Catalog Course Description: MATH 371. College Geometry II. **(3-0-3); II.** *Prerequisite: MATH 370.* Geometric transformations, non-Euclidean geometry, projective geometry, geometric topology, geometry of inversion.

Text: Modern Geometries (5th edition) by James R. Smart (**ISBN:** 9780534351885)

Required Field Experience: Not Applicable.

"Community Engagement: A Light to and From the Mountains"
The Professional Education Unit in the Department of Mathematics and Computer Science at Morehead State University delivers rigorous, high quality programs and courses that prepare professionals informed by NCTM and MAA standards- preparing professionals to improve the schools, quality of life, and the communities in which they live and serve. This statement is not only the strategic mission for the department, but it also incorporates the conceptual framework that guides its activities.

Conceptual Framework Outcomes (CFO)
The Unit and the faculty within individual programs assess the degree to which its graduates:

1) Master the content knowledge, professional and the twenty – first century skills need to make an optimal contribution to "whole" student learning in education settings.

2) Are competent in the collection and use of data to inform decision – making and to demonstrate accountability for student learning.

3) Demonstrate professional dispositions

4) Are culturally competent and understand the regions from which they have come utilizing knowledge and experiences to effectively "bridge the gaps" (economic, achievement, and geographic) ensuring optimal learning for all students.

5) Engage in authentic field experiences in collaboration with committed school – based partners and are empowered to improve the quality of education throughout this region and beyond.

Student Learning Outcomes (SLO)
College Geometry II is intended for students pursuing a degree in secondary education in the field of mathematics but is also appropriate for any student interested in mathematics. Students completing the course should have an appreciation for the power of geometry in solving real world problems through the use of inversion. The study of projective geometry should show how geometry and linear algebra are related and how projective geometry is used in computer applications. The study of hyperbolic geometry should make students aware of a valid alternative to Euclidean geometry and that they may not be living in a Euclidean space. Demonstrations will be given using Wingeom software (a package that can be downloaded free of charge) to solve problems related to the topics and students will be given explorations to do using the same software. The software package NonEuclid may also be demonstrated to illustrate an alternative to Wingeom for nonEuclidean geometry.

Candidates will:
1. Build new mathematical knowledge through problem solving.
2. Select and use various types of reasoning and methods of proof.
3. Communicate mathematical thinking coherently and clearly to peers, professors, and others in both written and spoken form.
4. Understand how mathematical ideas interconnect and build on one another to produce a coherent whole.
5. Use of multiple representations to model and interpret physical, social, and mathematical phenomena.
6. Demonstrate skills, explain concepts, and justify generalizations in the content area of Geometry.
7. Use Wingeom software to solve geometry problems.

Grading: Three hour exams, homework, and participation will account for your grade in this course. Each exam will consist of a variety of questions involving the topics discussed in class. The last exam will be administered during the final exam period designated by the university. Homework, quizzes, and participation will account for 25% of your grade. Exams will be weighted equally and account for the remaining 75% of your grade. Homework will be due at the beginning of class and will not be accepted late. If you must miss class, it is your responsibility to make arrangements to have assignments turned in on time.

Grades will be assigned using the following scale:

91%-100%	A
80%-90.99%	B
68%-79.99%	C

55%-67.99% D

Program: MATH 371 College Geometry					
Aligned with Assessment (point values)	**Kentucky Teacher Standards (KYS)**	**Kentucky Education Kentucky Core Academic Standards (KCAS)**	**Education Professional Standards Board (EPSB)**	**National Council of Teachers of Mathematics (NCTM)**	**NCATE**
Exam I (25% of grade) CFO: 1 SLO: 1,2,3,4,5,6,7	1	Geometry	N/A	1,2,3,4,5,9,11	1
Exam II (25% of grade) CFO: 1 SLO: 1,2,3,4,5,6,7	1	Geometry	N/A	1,2,3,4,5,9,11	1
Exam III (25% of grade) CFO: 1 SLO:1,2,3,4,5,6,7	1	Geometry	N/A	1,2,3,4,5,9,11	1
Quizzes, Project, and Homework CFO: 1 SLO:1,2,3,4,5,6,7	1	Geometry	Closing the achievement gap	1,2,3,4,5,6,9,11	1

0%-54.99% E

NO CURVE WILL BE USED

NCATE/EPSB Accreditation Alignment of CFOs and SLOs

Program: College Geometry II—Math 371	
Assessment (point value)	**Description**
Exam I, 25% of grade	Chapters 6
Exam II, 25% of grade.	Chapter 7
Final Exam, 25 % of grade	Chapter 9
Homework, 15% of grade	Various homework problems given during the course of the semester..
Class participation, 10% of grade	Students will present solutions to homework in class

Assignment Descriptions

Week	Topic
1	Basic concepts of inversion, Constructions, proofs
2	Additional properties, analytic geometry of inversion
3	Images of lines and circles under inversion
4	Applications of inversion, orthogonal circles, poles and polars
5	Internal and External division of segments, **Exam I**
6	Introduction to projective geometry, duality, postulates
7	Complete quadrangle, diagonal points, Desargues theorem, complete quadrilateral, diagonal lines
8	Harmonic sets and related theorems, perspectivities and projectivities, fundamental theorem
9	Pappus' theorem, cross joins, invariance of cross ratio
10	Analytic projective geometry, relationship to linear algebra, harmonic sets, cross ratios
11	Projective coordinate system, **Exam II**
12	Characteristic postulate of hyperbolic geometry, angle of parallelism, ideal points
13	Omega triangles and related theorems
14	Saccheri and Lambert quadrilaterals
15	Lambert Quadrilaterals, defect of a triangle
16	**Final exam**

Tentative Schedule

You will need a (good) compass and straightedge. Colored pencils might be useful

Success in this course will require the following activities

1. Read the book
2. Ask questions in class
3. Use my office hours.
4. Complete all assignments
5. Discuss topics with classmates

Last Day to Drop a Course with a grade of W: March 31, 2011

Attendance Policy: You are expected to attend class daily and be prepared for daily discussions. For each unexcused absence in excess of 3, your grade will be dropped by one letter. If you must miss class, **you** are still responsible for all material covered during your absence and to provide written documentation of why your absence should be. Any graded activities, except for exams, completed during your absence can not be made up for any reason. Also, late work will not be accepted. Makeup exams will only be given if a legitimate excuse is provided for the absence. The instructor is the sole judge of whether an excuse is valid. If possible, the instructor should be notified before a student misses an exam.

Academic Honesty
Cheating, fabrication, plagiarism or helping others to commit these acts will not be tolerated. Academic dishonesty will result in severe disciplinary action including, but not limited to, failure of the student assessment item or course, and/ or dismissal from MSU. If you are not sure what constitutes academic dishonesty, read the Eagle: Student Handbook or ask your instructor. An example of plagiarism is copying information from the internet when appropriate credit is not given. The policy is located at
http://morehead-st.edu/units/studentlife/handbook/academicdishonesty.html

Americans with Disabilities Act (ADA)
In compliance with the ADA, all students with a documented disability are entitled to reasonable accommodations and services to support their academic success and safety. Though a request for services may be made at any time, services are best applied when they are requested at or before the start of the semester. To receive accommodations and services the student should immediately contact the Disability Services Coordinator in the Office of Academic and Career Services, 223 Allie Young Hall, 606-783-5188, www.moreheadstate.edu/acs/

Campus Safety Statement
Emergency response information will be discussed in class. Students should familiarize themselves with the nearest exit routes in the event evacuation becomes necessary. You should notify your instructor at the beginning of the semester if you have special needs or will require assistance during an emergency evacuation. Students should familiarize themselves with emergency response protocols at http://www.moreheadstate.edu/emergency

The instructor reserves the right to alter this syllabus at anytime during the course of the semester, with due notice being given to the class.