

Marshall University Syllabus

Course Title/Number	Projective Geometry, MTH 449/549
Semester/Year	Spring 2014
Days/Time	MW 5:00-6:15
Location	SH 516
Instructor	Dr. J. Silver
Office	SH 713
Phone	304-696-3044
E-Mail	silver@marshall.edu
Office Hours	10:00-10:50 M-F
University Policies	<p>By enrolling in this course, you agree to the University Policies listed below. Please read the full text of each policy by going to www.marshall.edu/academic-affairs and clicking on "Marshall University Policies." Or, you can access the policies directly by going to http://www.marshall.edu/academic-affairs/?page_id=802</p> <p>Academic Dishonesty/ Excused Absence Policy for Undergraduates/ Computing Services Acceptable Use/ Inclement Weather/ Dead Week/ Students with Disabilities/ Academic Forgiveness/ Academic Probation and Suspension/ Academic Rights and Responsibilities of Students/ Affirmative Action/ Sexual Harassment</p>

Course Description: From Catalog

<i>Projective Geometry</i> . 3 hrs. Projective geometry using both synthetic and algebraic methods. (PR: MTH 300)

Course Student Learning Outcomes	How students will practice each outcome in this course	How student achievement of each outcome will be assessed in this course
1. Students will understand the fundamental objects of geometry.	Classroom lectures and examples, student board work, discussion, group work, homework, constructions and exploration using geometry software, posted lecture notes	Daily homework, three exams
2. Students will undertake a reasoned study of the major topics in projective geometry.	Classroom lectures and examples, student board work, discussion, group work, homework, constructions and exploration using geometry software, posted lecture notes	Daily homework, three exams
3. Students will appreciate the artistic qualities of space.	Classroom lectures and application examples, student board work, discussion, group work, homework, posted lecture notes	Daily homework, three exams

4. Students will become acquainted with geometry software	Classroom lectures and examples, student presentations, homework, constructions and exploration using geometry software	Daily homework
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Required Texts, Additional Reading, and Other Materials

<ol style="list-style-type: none"> 1. Edwards, Lawrence. <i>Projective Geometry</i>. Floris Books. 2003. ISBN 0-86315-393-3 2. Frantz, Marc; Futamura, Fumiko; Crannell, Annalisa. <i>Projective Geometry Worksheets</i>. 2013. 3. Futamura, Fumiko. <i>Projective Geometry</i>. http://sugeometryf12.pbworks.com/

Course Requirements / Due Dates

<ol style="list-style-type: none"> 1. Exams are on February 12, April 2, and May 5. 2. The last day to drop the course is Friday, March 28.

Grading Policy

<p>Grades will be figured on a percentage basis. There will be three exams. The homework average will be counted as equivalent to a fourth exam.</p> <p>90 - 100% = A, 80 - 89% = B, 70 - 79% = C, 60 - 69% = D, 0 - 59% = F</p>
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Attendance Policy

<p>Attendance will taken by daily homework. Borderline grades will be determined by class attendance. If you are unable to take an exam due to unavoidable circumstances (e.g. illness, death in the family, accidents), you must contact me prior to the exam time and furnish written verification of the excuse in order to take a make-up test.</p>

Tentative Course Schedule

Date	Text Coverage	Topic
January 13	Chapter 1	Introduction and <i>After Math</i>
January 15	Chapter 1	<i>Image of a Line</i>
January 20	None	Martin Luther King Day
January 22	Chapter 1	Definitions and Dimensions
January 27	Chapter 1	Perspective Drawing
January 29	Chapter 2	Duality and Polarity
February 3	Chapter 2	Curves in Space
February 5	Chapter 2	Tangency

February 10	Chapter 2	Order and Class
February 12	Chapters 1 & 2	Exam 1
February 17	Chapter 3	Collineation
February 19	Chapter 3	Desargues Theorem
February 24	Chapter 3	Two-dimensional Transformations
February 26	Chapter 3	Elations
March 3	Chapter 4	The Cross Ratio
March 5	Chapter 4	The Four-Point
March 10	Chapter 4	Projective Correspondence
March 12	Chapter 4	Harmonic Ratios and Music
March 17-21	None	Spring Break
March 24	Chapter 4	Circular Products
March 26	Chapter 4	Casey Angles
March 31	Chapter 4	The Absolute Line
April 2	Chapters 3 & 4	Exam 2
April 7	Chapter 5	Correspondences
April 9	Chapter 5	The Fundamental Theorem
April 14	Chapter 6	The Conic
April 16	Chapter 6	Cross Ratios on a Conic
April 21	Chapter 6	Theorems of Pascal and Brianchon
April 23	Chapter 6	The Eight Point Conic
April 28	Chapter 6	The Steiner Circle
April 30	Chapter 6	Conics on a Sphere
Monday, May 5	Chapters 7 - 8	Exam 3

Partial Bibliography:

Bennett, Dan. (2002). *Exploring Geometry with The Geometer's Sketchpad*. Emeryville, CA: Key Curriculum Press.

- Burger, E. B. (2005). *The Heart of Mathematics, 2nd Ed.*. Emeryville, CA: Key Curriculum Press.
- Coxeter, H.S.M. (2003). *Projective Geometry*. NY: Springer-Verlag.
- Edwards, Lawrence. (2003). *Projective Geometry*. Great Britain: Floris Books.
- Faulkner, T. Ewan. (2006). *Projective Geometry*. Mineola, NY: Dover Books.
- Frantz, Marc, and Annalisa Crannell. (2011) *Viewpoints: Mathematical Perspective and Fractal Geometry in Art*. Princeton University Press.
- Meserve, Bruce E., and Izzo, Joseph A. (1969) *Fundamentals of Geometry*. Indianapolis, IN: Addison-Wesley.
- Peil, Timothy. (2007) *Survey of Geometry*. Available:
<http://www.mnstate.edu/peil/geometry/index.htm>
- Posamentier, Alfred S. (1999). *Advanced Euclidean Geometry*. Emeryville, CA: Key Curriculum Press.
- Reynolds, B. E., and Fenton, W. E. (2006). *College Geometry Using The Geometer's Sketchpad*. Emeryville, CA: Key Curriculum Press.
- Sanders, Cathi. (1994) *Perspective Drawing with The Geometer's Sketchpad*. Emeryville, CA: Key Curriculum Press.