

MATH 119 – Geometry for Architects

Course Description from Bulletin: Basic analytic geometry in two and three dimensions; trigonometry. Equations of lines, circles, and conic sections; resolution of triangles; polar coordinates. Equations of planes, lines, and quadratic surfaces. Applications. (3-0-3) (C).

Enrollment: This course does not count for graduation in any engineering, mathematics, natural science or computer science degree program.

Textbook(s): Calter & Calter, *Technical Mathematics with Calculus*, 5th ed., Wiley & Sons, 2007.
Abbott, E.A., *Flatland*, Dover (in some sections)

Prerequisites: None

Objectives:

1. Students will learn to find equations of straight lines under various conditions and formats and will gain a thorough understanding of slope.
2. Student will learn basic geometric concepts of vectors and be proficient in vector arithmetic including cross-products.
3. Students will learn to solve right triangles with basic trigonometry and be familiar with the trigonometric functions.
4. Students will learn Cartesian coordinates in 3-dimensional space and find equations of lines and planes. They will see how this can be extended to higher dimensions.
5. Students will learn the equations and basic geometric properties of conic sections.

Lecture schedule: 3 50-minute (or 2 75-minute) lectures per week.

Course Outline:

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| 1. Basic Euclidean Geometry | Chapter 5 |
| 2. Cartesian coordinates, distance formula, functions, graphs | Chapter 4 |
| 3. Trigonometric functions, solving right triangles | Chapter 6 |
| 4. Vectors | Chapter 6 |
| 5. Equations of straight lines | Chapter 20.1 |
| 6. Radian measure and arc length | Chapter 13 |
| 7. Trigonometric, parametric, and polar graphs | Chapter 14 |
| 8. Higher dimensions, equations of lines and graphs | |
| 9. Conic sections | Chapter 20 |
| 10. Miscellaneous or optional topic | |

Assessment:	Homework	5-10%
	Projects	10-15%
	Quizzes/Tests	50-60%
	Final Exam	20-30%

Syllabus prepared by: Art Lubin and David Maslanka

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