Fall 2019   MATE 205 Analytic Geometry

Instructor: Dr. Elçin Emre-Akdoğan	**Place:** A116
Office Hours: By appointment	**Textbook:** Karakaş, H.İ. Analytic Geometry, METU Press, 1994. Lecture Notes
Office: G104	**Program:** Geogebra
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Course Description: This analytic geometry course covers the concepts of Cartesian coordinates, lines in the plane and space and vectors in plane and space. Topics include:

- Cartesian coordinates in plane and space
- Vectors in plane and space
- Lines in the plane
- Lines and planes in three- dimensional space
- Reflections by line and plane
- Relationships of point-line, line-plane, and planes with each other
- Translation in plane
- Rotation in plane

Course objectives:
The aim of this course is to provide understanding of fundamental concepts and procedures in analytic geometry. Students, by dealing with several transformations in plane and investigations based on relations of line, plane and space will have a good grasp of those concepts and procedures.

Learning Outcomes:
Upon successful completion of this course, the student should be able to:

- Interpret Cartesian coordinates in plane and space.
- Use vectors to solve problems.
- Define lines in the plane, lines and planes in three- dimensional space.
- Perform reflections by line and plane.
- Designate the relationships of point-line, line-plane, and planes with each other.
- Perform translation in plane.
- Perform rotation in plane.

Methods for Assessment of Learning Outcomes: The expected learning outcomes for the course will be assessed through graded activities and ungraded activities. The graded activities include exams, homework, and quiz. The ungraded activities will be used to monitor your progress. A variety of these ungraded assessment techniques may be employed, including problems to be completed during class, direct questioning of students, answering students questions in class, and discussions during office hours.

Attendance: This course requires strong involvement and attendance. You are responsible for all information given out during the courses. Exceeding 20% of attendance with unexcused absences will result a half letter grade reduction. You are expected to arrive on time for the lectures.

Communication: All announcements will be sent to your e-mail address through Moodle. Check your e-mails regularly in order to be informed.

Grades: Your final grade will be weighted as follows:

25%	Homework	Details will be given during the course
15%	Quiz	Details will be given during the course
25%	Midterm Exam	Date and Location To Be Announced
35%	Final Exam	Date and Location To Be Announced

Homework: As in all mathematics courses, working on problems is the key to success. It is also vital to work on problems on a regular basis. Each assignment will be due at the **beginning** of the following class.

Homework Exercises will be from the textbook. One exercise will be chosen at random from each assignment and graded on a scale of 0-10.

Solutions to homework exercises will be posted after the class during which they have been collected.

<u>Late Homework Policy:</u>

Homework is due at the **beginning** of class.
Examples:

- If you are not in class when homework is collected, your homework will be considered late.
  This includes lateness due to oversleeping, traffic, and parking availability.
- If you pass homework in at the end of class on the day it is due, it will be considered late.
- If you can not make it to class, **you are responsible** for turning in the assignment early or finding someone to drop it off in class for you.
- Only under severe circumstances will late homework be accepted for full credit, for example, involvement in a traffic accident, or illness requiring medical attention.

Late homework **will** be accepted at any time, subject to the following conditions:

- The word "LATE" must be written at the top of the assignment.
- Only half credit will be awarded, solely based on effort.

Academic Honesty: It hardly needs to be said that such things as plagiarism or stealing another student's work are unacceptable. However, in this class, it is entirely proper to work in teams to do discussion on the problems or the problem solving, as long as you yourself have mastery of those answers and are prepared on your own to present them in class. Plagiarism is a serious breach of academic trust. In academic work, our words and ideas are the value of our work, so turning in someone else's work as if it were your own is a form of theft. When you use someone else's words and ideas--whether it's the work of a famous writer or a fellow student--without crediting the source or authorship of those words and ideas, you are plagiarizing. So here's the bottom line: original work only, credit to ideas, writing, or words from someone other than you.

SCHEDULE

Date	Topic	Content	Next lesson
Week 1 **Session 1** **(25/09/2019)**	Chapter 2 Cartesian Coordinates	Introduction	No assignment
Week 2 **Session 1** **(02/10/2019)**	Chapter 2 Cartesian Coordinates	2.1. Cartesian Coordinates in Plane 2.2. Lines in Plane https://www.geogebra.org/m/yWrKbNxC https://www.geogebra.org/m/vUWvK7DB https://www.geogebra.org/m/e5dAM3TV	No assignment
Week 3 **Session 3** **(09/10/2019)**	Chapter 2 Cartesian Coordinates	2.7. Cartesian Coordinates in 3-sapce https://www.youtube.com/watch?v=VA5AmjhTA3A https://www.geogebra.org/m/rA4fWtKH	No assignment
Week 4 **Session 1** **(16/10/2019)**	Chapter 2 Cartesian Coordinates	3.1. Directed Segments and Vectors 3.2. Algebra of Vectors https://www.geogebra.org/m/sbT86GQW https://www.geogebra.org/m/kBqJpm7h https://www.geogebra.org/m/wDCSJEKy https://www.geogebra.org/m/tsBer5An https://www.geogebra.org/m/tfgc32au	*Homework assignment from textbook
Week 5 **Session 1** **(23/10/2019)**	Chapter 3 Vectors in the Plane	3.3. Scalar Product, Angle Between two Vectors https://www.geogebra.org/m/rSUZbBzY https://www.geogebra.org/m/ehE6JsHb	No assignment

Week 6 Session 1 (30/10/2019)	Chapter 3 Vectors in the Plane	3.5. More about Lines: Distance, Bisectors, Symmetry https://www.geogebra.org/m/rhPJcqgf	*Homework assignment from textbook
Week 7 Session 1 (06/11/2019)	Chapter 3 Vectors in the Plane	5.1. Directed Segments and Vectors 5.2.Algebra of Vectors in 3-space https://www.geogebra.org/m/sbT86GQW	No assignment
Week 8 Session 1 (13/11/2019)	Chapter 5 Vectors in Three Space	5.3. Scalar Product, Angle Between Two Vectors 5.4. Cross Product	*Homework assignment from textbook
Week 9 Session 1 (20/11/2019)	MIDTERM EXAM!		
Week 10 (28/11/2019)	13:00-15:00 Field Trip to Tales Museum!		
Week 10 Session 1 (27/11/2019)	Chapter 5 Vectors in Three Space	5.5. Lines in 3-space	No assignment
Week 11 Session 1 (04/12/2019)	Chapter 5 Vectors in Three Space	5.6. Planes	*Homework assignment from textbook
Week 12 Session 1 (11/12/2019)	Chapter 5 Vectors in Three Space	5.7. Distance from a point to a plane or to a Line	No assignment
Week 13 Session 1 (18/12/2019)	Chapter 5 Vectors in Three Space	Translation and Rotation	*Homework assignment from textbook
Week 14 Session 1 (25/12/2019)	Chapter 2, Chapter3, Chapter 5	Problem Solving	No assignment