Spring 2020

EME 302 Technology in Mathematics Education

Instructor: Dr. Elçin Emre-Akdoğan	**Place:** A 211/ Online (Zoom)
Office Hours: by appointment	**Textbook:** Lecture Notes
Office: GB24	**Program:** The Geometers Sketchpad (GSP), GeoGebra, Cabri3D
Email: elcin.akdogan@tedu.edu.tr	**Time:** Monday 13:00-15:00 Friday 15:00-17:00

Course Description:
Benefits and limitations of using educational technologies in mathematics. Using interfaces of the software (GSP, GeoGebra, Cabri 3D) of technological tools and resources. Integration of the new and developing educational technology such as web-based software, dynamic software, graphical tools (CBR), simulations, and calculators. Design, and critique technology- enhanced mathematical activities.

Course objectives:
This course aimed to have a deep understanding about the best practices for use of educational technology in the classroom and prepare prospective teachers who use a variety of resource materials such as software, print materials, technology, and activity files to enhance the learning of mathematics. In addition to these, the main issues related to the use of appropriate technology to support the learning of mathematics and the role of online platforms and social media in teaching.

Learning Outcomes:

- Have an understanding about the issues regarding the integration of technology in mathematics learning and teaching.
- Have knowledge of current research related to the use of technology for instruction in the mathematics classrooms.
- Have a deep understanding of the characteristics of good lessons and strategies when using technology
- Use resources and materials available to assist in designing, delivering, and assessing technology-enhanced instruction in the elementary mathematics curriculum.
- Have a competence with at least one mathematics-specific technology that is in use in mathematics classrooms.
- Gain a point of view on the issues of classroom management in technology enhanced lessons
- Have a grasp of issues related to assessment when technology is an integral part of instruction.

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 in-class activities, take-home homework and project. The ungraded activities will be used to monitor your progress. A variety of these ungraded assessment techniques may be employed, including activities to be completed during class, direct questioning of students, answering students questions in class, and discussions during office hours.

In-class activities: Please send email to elcin.akdogan@tedu.edu.tr, your document's title should be NAME_SURNAME_In-ClassActivities-X(X:number)

Take-Home Homework: Project: You need to upload two files to moodle;

1. Prepare your first document that include your Take-home homework's information:
   Name-Surname:
   Title of the Project:
   Mathematical concept:
   Grade Level:
   Learning outcome:
   Group work/ Individual work: Indicate if the activity will be conducted by group work or individual work.
   Class activity: Indicate the classroom activities that students need to implement while conducting the GSP activity.
   (Word file)
2. Second document should be your activity that you prepared in GSP (GSP file)

Both of your document's title should be NAME_SURNAME_Takehomehomework

Project: You need to upload two files to moodle;

1. Prepare your first document that include your project's information:
   Name-Surname:
   Title of the Project:
   Mathematical concept:
   Grade Level:
   Learning outcome:
   Group work/ Individual work: Indicate if the activity will be conducted by group work or individual work.
   Class activity: Indicate the classroom activities that students need to implement while conducting the GeoGebra activity.
   (Word file)
2. Second document should be your activity that you prepared in GeoGebra (GeoGebra file)

Both of your document's title should be NAME_SURNAME_Project

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:

50%	In-Class Activities	Details will be given during class
20%	Take-Home Homework	Details will be given during class
30%	Project	Details will be given during class

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**
Week 1 Session 1 (14/02/2020)	Technology in Mathematics Education	Introduction
Week 2 Session 1 (17/02/2020)	The Geometers Sketchpad (GSP)	Introducing interfaces and tools of GSP
Week 2 Session 2 (21/02/2020)	The Geometers Sketchpad (GSP)	Introducing interfaces and tools of GSP
Week 3 Session 1 (24/02/2020)	The Geometers Sketchpad (GSP)	In-Class Activities-1 (GSP-Rhombus)
Week 3 Session 2 (28/02/2020)	The Geometers Sketchpad (GSP)	In-Class Activities-2 (GSP-Daisy Design)
Week 4 Session 1 (02/03/2020)	The Geometers Sketchpad (GSP)	In-Class Activities-3 (GSP-Parallel Lines) In-Class Activities-4 (GSP-Drawing a Box)
Week 4 Session 2 (06/03/2020)	The Geometers Sketchpad (GSP)	In-Class Activities-5 (GSP-String Art) In-Class Activities-6 (GSP-Altitudes in a Triangle)
Week 5 Session 1 (09/03/2020)	The Geometers Sketchpad (GSP)	In-Class Activities-7 (GSP-Medians in a Triangle) In-Class Activities-8 (GSP-Perpendicular Bisector)

Week 5 Session 2 (13/03/2020)	The Geometers Sketchpad (GSP)	In-Class Activities-9 (GSP- Angle Bisectors) In-Class Activities-10 (GSP-Reflection)
Week 6 Session 1 (16/03/2020)	COVID-19 BREAK!	
Week 6 Session 2 (20/03/2020)	COVID-19 BREAK!	
Week 7 Session 1 (23/03/2020)	The Geometers Sketchpad (GSP)	In-Class Activities-11 (GSP-Triangle Congruence) In-Class Activities-12 (GSP-The 30°-60° Right Triangle)
Week 7 Session 2 (27/03/2020)	The Geometers Sketchpad (GSP)	In-Class Activities-13 (GSP- Arcs and Angles) In-Class Activities-14 (GSP-Burning Tent)
Week 8 Session 1 (30/03/2020)	GeoGebra	Introducing interfaces and tools of GeoGebra
Week 8 Session 2 (03/04/2020)	GeoGebra	Introducing interfaces and tools of GeoGebra
Week 9 Session 1 (06/04/2020)	GeoGebra	In-Class Activities-1 (GeoGebra-Parallelogram) In-Class Activities-2 (GeoGebra-constructing isosceles triangles) In-Class Activities-3 (GeoGebra-constructing medians) In-Class Activities-4 (GeoGebra-constructing perpendicular bisectors)
Week 9 Session 2 (10/04/2020)	GeoGebra	In-Class Activities-5 (GeoGebra-Slope) In-Class Activities-6 (GeoGebra-Circle) **TAKE-HOME HOMEWORK(GSP)! (Due date: 10/05/2020)**
Week 10 Session 1 (13/04/2020)	GeoGebra	In-Class Activities-7 (GeoGebra-Triangle Inequalities) In-Class Activities-8 (GeoGebra-Midpoints) In-Class Activities-9 (GeoGebra-Enlargement) In-Class Activities-10 (GeoGebra-Circle)
Week 10 Session2 (17/04/2020)	GeoGebra	In-Class Activities-11 (GeoGebra-Random line) In-Class Activities-12 (GeoGebra-SystemofEquation) In-Class Activities-13 (GeoGebra-SlopeofPyramid)
Week 11 Session 1 (20/04/2020)	GeoGebra	In-Class Activities-14 (GeoGebra-IntegerAddtion)
Week 11 Session 2 (24/04/2020)	BREAK!	
Week 12 Session 1 (27/04/2020)	GeoGebra	In-Class Activities-13 (GeoGebra) **PROJECT (GeoGebra) (Due Date: 29/05/2020)**
Week 12 Session 2 (01/05/2020)	HOLIDAY!	
Week 13 Session 1 (04/05/2020)	GeoGebra	In-Class Activities-15 (GeoGebra-Spreadsheetview) In-Class Activities-16 (GeoGebra-Evaluationofexamscores) In-Class Activities-17(GeoGebra-Evaluationofexamscoresextended) In-Class Activities-18 (GeoGebra-Mode,Mean,Median)
Week 13 Session 2 (08/05/2020)	GeoGebra	In-Class Activities-19 (GeoGebra)

Week 14 Session 1 (11/05/2020)	GeoGebra	In-Class Activities-20 (GeoGebra)
Week 14 Session 2 (15/05/2020)	Cabri 3D	Introducing interfaces and tools of Cabri3D
Week 15 Session 1 (18/05/2020)	Cabri 3D	In-Class Activities-1 (Cabri 3D)
Week 15 Session 2 (22/05/2020)	Cabri 3D	In-Class Activities-2 (Cabri 3D)