Spring 2024

EMT304 Technology in Mathematics Education

Instructor: Dr. Elçin Emre-Akdoğan	**Place:** G205, G113
Office Hours: by appointment	**Textbook:** Lecture Notes
Office: GB24	**Program:** The Geometers Sketchpad (GSP), GeoGebra, Cabri3D
Email: elcin.akdogan@tedu.edu.tr	**Time:** Monday 09:00-11:00, Thursday 09:00-11:00

Course Description:
The importance of technology in teaching mathematics. Benefits and limitations of using educational technologies in mathematics. Use interfaces of the software of technological tools and resources. Integration of the new and developing educational technology such as web-based software, dynamic software, graphical tools, simulations, calculators in mathematics education. Use software such as Computer Algebra Systems (CAS) and Dynamic Geometry Systems (DGS), producing and applying interactive activities through this software. Design, and critique technology-enhanced mathematical activities. Evaluation of students' products.

Course objectives:
This course aims to prepare students to have an in-depth understanding of best practices for the use of educational technology in the classroom and to use a variety of resource materials such as software, printed materials, and technology and activity files to improve mathematics learning. In addition, students will be informed about the main issues related to the use of appropriate technology to support mathematics learning, the role of online platforms and social media in teaching.

Learning Outcomes:

Upon successful completion of this course, students will be able to:

1. recognize the issues regarding the integration of technology in mathematics learning and teaching,
2. describe the characteristics of good lessons and strategies when using technology,
3. use resources and materials available to assist in designing, delivering, and assessing technology-enhanced instruction in the middle school mathematics curriculum,
4. practice mathematics-specific technology that is in use in mathematics classrooms,
5. recognize the issues of classroom management in technology enhanced lessons,
6. solve 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 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. Various 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 an effort to accommodate various learning styles, opportunities will be given to engaging in in-class activities. This will include lectures, discussions in small and large groups, and individual learning activities. Each student will learn using technology in mathematics education while working with peers as a team in small groups. Each small group will receive points for completing the assigned activities. To earn credit for the group activities, your presence and active participation are vital for each group working session.

In-class activities: You need to upload your project to LMS; your document's title should be NAME_SURNAME_In-Class Activities-X (X: number)

In-Class activities will be graded on a scale of 0-10.

Take-Home Homework: You need to complete the given take-home homework by using GeoGebra.
Both of your document's title should be NAME_SURNAME_Take-Home Homework

Project: You need to upload two files to LMS;

1. Prepare your first document that includes 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 or individual work.
   Class activity: Indicate the classroom activities students must implement while conducting the GeoGebra/GeoGebra AR activity.
   (Word file)
2. The second document should be the activity that you prepared in *GeoGebra/GeoGebra AR* (GeoGebra file)

Both of your document's title should be GROUPX_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 in 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 LMS. Check your e-mails regularly to be informed.

Grades: Your final grade will be weighted as follows:

40 points	In-Class Activities	Individual Work
30 points	Take-Home Homework	Individual Work
30 points	Project	Group Work

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.

STUDENT SERVICES INFO:

o Specialized Support and Students with Disabilities

Students who may require specialized support due to a disability affecting mobility, vision, hearing, learning, mental or physical health should consult with Specialized Support and Disability Coordinator, Asst. Prof. Emrah Keser E-mail: emrah.keser@tedu.edu.tr, or visit the website at https://www.tedu.edu.tr/tr/main/engelsiz-tedu

o Student Counseling Centre

The Student Counseling Centre is a service mandated with providing crisis intervention and supportive listening services to the campus community. A major part of fulfilling that mandate is raising awareness of our service so that students know they are never alone in dealing with problems. For further information and/or questions, you can contact Sıla Deniz Beyarslan, sdeniz.beyarslan@tedu.edu.tr, Office 165, or visit SCC website at http://csc.tedu.edu.tr/

o TEDU COPeS

TED University Coronovirus Psychosocial Support Team was established in order to facilitate coping with the psychological, social, familial, academic, and professional difficulties that may arise due to adverse conditions associated with COVID-19 pandemic for TEDU students and employees. TEDU COPeS aims to provide psychosocial support for TED University students and employees during the coronavirus outbreak. To this end, the team aims to provide support at the early stages of a possible crisis, activate and strengthen your coping strategies, and provide information on support resources. For further information and/or questions, visit their website at https://copes.tedu.edu.tr/

Note: This syllabus is tentative, and should only be used to give a rough guide to the course schedule. Additional readings may be assigned, and dates may be changed if necessary.

SCHEDULE		
Date	**Topic**	**Content**
Week 1 Session 1 (19/02/2024)	Technology in Mathematics Education	Introduction
Week 1 Session 2 (22/02/2024)	Technology in Mathematics Education	Introduction
Week 2 Session 1 (26/02/2024)	The Geometers Sketchpad (GSP)	Introducing interfaces and tools of GSP https://www.mheducation.com/prek-12/program/geometer-s-sketchpad-software/MKTSP-HGA01M0.html https://sketchpad.keycurriculum.com
Week 2 Session 2 (29/02/2024)	The Geometers Sketchpad (GSP)	In-Class Activities-1 (GSP- Perimeter and Area)
Week 3 Session 1 (04/03/2024)	The Geometers Sketchpad (GSP)	In-Class Activities-2 (GSP-dynamic geometry)
Week 3 Session 2 (07/03/2024)	The Geometers Sketchpad (GSP)	In-Class Activities-3 (GSP-Parallelpairs) In-Class Activities-4 (GSP-twistandshrink)
Week 4 Session 1 (11/03/2024)	Desmos	Desmos https://student.desmos.com/?prepopulateCode=vrdnwt&lang=en
Week 4 Session 2 (14/03/2024)	Math City Map	Math City Map https://mathcitymap.eu/en/ https://www.youtube.com/watch?v=2jL2Dal_GL8
Week 5 Session 1 (18/03/2024)	GeoGebra	Introducing interfaces and tools of GeoGebra
Week 5 Session 2 (21/03/2024)	GeoGebra	In-Class Activities-5 (GeoGebra- Triangle Inequalities) In-Class Activities-6 (GeoGebra-Midpoints)
Week 6 Session 1 (25/03/2024)	GeoGebra	In-Class Activities-7(GeoGebra-enlargement) In-Class Activities-8 (GeoGebra- integer addition)
Week 6 Session 2 (28/03/2024)	GeoGebra	In-Class Activities-9 (GeoGebra-spreadsheet view)
Week 7 Session 1 (01/04/2024)	GeoGebra	GeoGebra Activities
Week 7 Session 1 (04/04/2024)	GeoGebra	In-Class Activities-10 (GeoGebra-Evaluation of exam scores)

Week 8 **Session 1** **(08/04/2024)**	**HOLIDAY!**	
Week 8 **Session 2** **(11/04/2024)**	**HOLIDAY!**	
Week 9 **Session 1** **(15/04/2024)**	GeoGebra	In-Class Activities-11 (GeoGebra-Mode, Mean, Median) In-Class Activities-12 (GeoGebra- creating dynamic worksheet)
Week 9 **Session 2** **(18/04/2024)**	Cabri 3D	Geogebra AR Activities https://www.geogebra.org/m/pafx6xfu#material/upa8nkn5 https://www.geogebra.org/ar https://www.youtube.com/playlist?list=PLtN4Hcxd3KanI6A8IM0COj0cZ3Qy1PyI2
Week 10 **Session 1** **(22/04/2024)**	Cabri 3D	In-Class Activities-13 (Geogebra AR)
Week 10 **Session 2** **(25/04/2024)**	Cabri 3D	Introducing interfaces and tools of Cabri3D
Week 11 **Session 1** **(29/04/2024)**	Cabri 3D	In-Class Activities-14
Week 11 **Session 2** **(02/05/2024)**	Cabri 3D	In-Class Activities 15 **Due date for Take-Home Homework (GeoGebra)**
Week 12 **Session 1** **(06/05/2024)**	Cabri 3D	In-Class Activities 16
Week 12 **Session 2** **(09/05/2024)**	GeoGebra/GeoGebra AR	**Due Date for Project (GeoGebra)** GROUP_1 Presentation GROUP_2 Presentation
Week 13 **Session 1** **(13/05/2024)**	GeoGebra/GeoGebra AR	GROUP_3 Presentation GROUP_4 Presentation
Week 13 **Session 2** **(16/05/2024)**	GeoGebra/GeoGebra AR	GROUP_5 Presentation GROUP_6 Presentation
Week 14 **Session 1** **(20/05/2024)**	GeoGebra/GeoGebra AR	GROUP_7 Presentation GROUP_8 Presentation
Week 14 **Session 2** **(23/05/2024)**	GeoGebra/GeoGebra AR	GROUP_9 Presentation GROUP_10 Presentation
Week 15 **Session 1** **(27/05/2024)**	GeoGebra/GeoGebra AR	GROUP_11 Presentation GROUP_12 Presentation
Week 15 **Session 2** **(30/05/2024)**	GeoGebra/GeoGebra AR	Exit Ticket Activity