TED UNIVERSITY, COURSE SYLLABUS

Course Code & Number	CS 572	**Course Title**	Virtual Reality
Type of Course	☐ Compulsory ☑ Elective	**Semester**	2021-2022 ☐Fall ☑Spring ☐ Summer
Course Credit Hours	(3+0+0) 3	**Number of ECTS Credits**	7.5
Pre-requisite	N/A	**Co-requisite**	N/A
Mode of Delivery	☑ Face-to-face ☐ Distance learning	**Language of Instruction**	☑ English ☐ Turkish
Course Coordinator	Asst. Prof. Ulaş Güleç	**Course Lecturer(s)**	Asst. Prof. Ulaş Güleç
Required Reading		**Recommended Reading**	

Course Catalog Description	Virtual scene modeling, Three dimensional user interfaces, Three-dimensional perception, Stereoscopic display technologies, Virtual and augmented reality technologies, Mobile virtual reality, Applications of virtual reality. Research projects that can be employed for real world applications of virtual reality.
Course Objectives	The goal of the course is to provide graduate students with the state of the art virtual reality (VR) technologies, and principal concepts and technologies needed to develop and setup a virtual ecosystem including 3D audio, 3D graphics, modeling and novel Human Computer Interface (HCI) interfaces. In addition, the computation models of input and VR display systems such as stereoscopic, head-mounted, holographic, force displays, and head tracking technologies are discussed. It is also expected to develop applications about virtual reality, augmented reality and their mobile versions.
Course Learning Outcomes	By the end of this course, students will be able to: 1.Underline how the design of VR technology relates to human perception and cognition. 2.Discuss applications of VR to conduct scientific research, training, and industrial designs. 3.Devise first-hand experience using virtual environment technology, including 3D rendering software, tracking hardware, and input/output functions for capturing user data. 4.Analyze the fundamental aspects of designing rigorous empirical experiments using VR. 5.Analyze multimodal virtual displays for conveying information for evaluating good and bad virtual interfaces.

Learning Activities & Teaching Methods[1]	☒ Brainstorming ☒ Case Study/Scenario Analysis ☒ Collaborating ☐ Concept Mapping ☒ Demonstrating ☐ Discussions / Debates ☐ Drama / Role Playing ☒ Experiments ☐ Field Trips ☒ Guest Speakers	☒ Hands-on Activities ☐ Inquiry ☐ Microteaching ☒ Oral Presentations / Reports ☐ Peer Teaching ☐ Predict-Observe-Explain ☒ Problem Solving ☐ Questioning ☒ Reading	☐ Scaffolding / Coaching ☐ Seminars ☐ Service Learning ☒ Simulations & Games ☐ Telling / Explaining ☐ Think-Pair-Share ☒ Video Presentations ☒ Web Searching ☐ Other(s):……

Assessment Methods & Criteria[2]	☒ Case Studies / Homework	(30%)	☒ Presentation (Oral, Poster)	(10%)
	☐ Lab Assignment	(...%)	☒ Project	(60%)
	☐ Observation	(...%)	☐ Quiz	(...%)
	☐ Oral Questioning	(...%)	☐ Self-evaluation	(...%)
	☐ Peer Evaluation	(...%)	☐ Test/Exam	(...%)
	☐ Performance Project (Written, Oral)	(...%)	☐ Other(s):……	(...%)
	☐ Portfolio	(...%)		

Student Workload[3]	☒ Case Study Analysis	(27 hrs)	☐ Online Discussion	(... hrs)
	☒ Course Readings	(10 hrs)	☒ Oral Presentation	(8 hrs)
	☐ Debate	(... hrs)	☐ Poster Presentation	(... hrs)
	☒ Demonstration	(5 hrs)	☐ Report on a Topic	(... hrs)
	☐ Exams/Quizzes	(... hrs)	☐ Research Review	(… hrs)
	☐ Field Trips/Visits	(... hrs)	☐ Resource Review	(... hrs)
	☒ Hands-on Work	(20 hrs)	☒ Team Meetings	(10 hrs)
	☐ Lab Applications	(... hrs)	☐ Web Designs	(... hrs)
	☒ Lectures	(42 hrs)	☐ Work Placement	(... hrs)
	☐ Mock Designs	(... hrs)	☐ Workshop	(... hrs)
	☐ Observation	(... hrs)	☒ Other(s): Project	(65 hrs)
			Total Workload[4]	187

[1] Multiple options possible.
[2] Multiple options possible. A percentage must be stated for the selected assessment method & criteria.
[3] Multiple options possible. The student workload is found by multiplying the number and duration (hour) of the activity involved.
[4] Computing the ECTS credits of a course: Total workload / 25 or 30 hours = ECTS credit and1 ECTS credit = 25-30 hours

COURSE POLICIES

Attendance:

At least 70% of class attendance is mandatory. Course attendance will be assessed based on answers to hands-on activities (you are expected to upload your answers to Moodle for online sessions, or submit your work for face-to-face lectures; otherwise that lecture will not be counted towards your attendance.)

Class Readings

Class readings are necessary but not mandatory. The material covered in class by your instructor will only provide a fundamental understanding of the general context. If you are willing to effectively learn a topic, you must actively work on it yourself. Reading is one of the most successful ways of learning about a topic.

Missed Work

Make ups for midterm and final exams will be provided if the student can provide a legal document confirming a significant health issue at the time of the examination or with the approval of the instructor.

Assignment Rules

All assignment works must be done individually, unless explicitly stated in the homework assignment. A student can submit only one work. In case of multiple submissions, only the latest submission will be considered. Students cannot submit work on other students' behalf.

Late Assignment Submission

Assignments are expected to be completed by due date. For every day that the assignment is late after due date, 20% of the maximum will be deducted from the assignment score. No assignments will be accepted once they are four or more days late.

Extra Credits

Extra credits will not be provided.

Plagiarism

All of the following are considered plagiarism:

- turning in someone else's work as your own
- copying words or ideas from someone else without giving credit
- failing to put a quotation in quotation marks
- giving incorrect information about the source of a quotation
- changing words but copying the sentence structure of a source without giving credit

- copying so many words or ideas from a source that it makes up the majority of your work, whether you give credit or not" (www.plagiarism.org)

Plagiarism is a very serious offense and will be penalized accordingly by the university disciplinary committee. The best way to avoid accidentally plagiarizing is to work on your own before you ask for the help of other resources.

Cheating

Cheating has a very broad description which can be summarized as "acting dishonestly". Some of the things that can be considered as cheating are the following:

- Copying answers on examinations, homework and laboratory works,
- Using prohibited material on examinations,
- Lying to gain any type of advantage in class
- Providing false, modified or forged data in a report
- Plagiarizing
- Modifying graded material to be regraded.
- Causing harm to colleagues by distributing false information about an examination, homework or laboratory

COURSE ASSIGNMENTS
A. Case Studies [30%]
B. Presentation [10%]
C. Project [60%]

W	Day	Topics	Readings
1	14.02-18.02	Introduction	
2	21.02-25.02	Definition and Goal of Virtual Reality, Usage Areas of Virtual Reality and Technologies in Virtual Reality	
3	28.02-04.03	Birds Eye View	
4	07.03-11.03	Geometric Modelling, Transforming Models	
5	14.03-18.03	Rotations and Quaternions	
6	21.03-25.03	Rotations and Quaternions	
7	28.03-01.04	Transforms	
8	04.04-08.04	Lighting	
9	11.04-15.04	Lighting	
10	18.04-22.04	Depth and Motion Perception	
11	25.04-29.04	Unity Engine	
12	02.05-06.05	**RAMADAN FEAST: no class**	
13	09.05-13.05	Unity Engine	
14	16.05-20.05	Unity Engine	
15	23.05-27.05	Unity Engine	
16	30.05-03.06	**FINAL EXAMS WEEK**	
17	06.06-10.06	**FINAL EXAMS WEEK**	

Prepared By & Date	Assist. Prof. Dr. Ulaş GÜLEÇ 08/02/2022	**Revision Date**	08/02/2022