

course program form information	CRN	Semester	Theoretical	Practical	Credits	Duration
	24077	3	1	2	3	3 h/w
instructors	Oğuz Orkun Doma doma@itu.edu.tr		Prof. Dr. Leman Figen Gül fgul@itu.edu.tr			
course description	This course introduces immersive Virtual Reality (VR) and visualization technologies, with a focus on video game engines, level design, gamified interactive experience design in virtual environments, stereoscopic 3D, and VR systems. Students will learn how to create 3D visualizations and gamified experiences, by creating 3d models, textures, and scripts using industry-standard software, and learn to design for better user experience in VR. Through hands-on projects and assignments, students will learn how to create interactive environments and game levels in video game engines, and design basic 3D simulations in Virtual Reality.					
course objectives	In this course, students will explore the world of Virtual Reality and visualization technologies, with the goals and objectives including: <ul style="list-style-type: none"> • Gain knowledge about Virtual Reality and video game engine technologies • Learn the basics of level design in game engine software • Create Virtual Reality experiences in game engines • Use game engine levels effectively for presenting design ideas • Design for better user experience in Virtual Reality 					
assessment criteria	%20 Two weekly assignments (2 x 10%) %30 Midterm Project (non-VR experience) %40 Final Project (VR application) %10 Attendance					
	Students are required to provide thorough documentation and running applications of their project submissions, including screen capture videos, presentations in given formats, design and development documentation, and project files. This documentation will be used for a careful assessment of the quality of the student's work and their understanding of the concepts covered in the course.					
prerequisites	<ul style="list-style-type: none"> • Basic knowledge of programming concepts (e.g., variables, functions, conditional statements) • Basic knowledge of 3D modeling concepts and software (e.g., Blender, Maya, 3ds Max) • Basic knowledge of graphics editor software (e.g., Photoshop, GIMP) • Basic knowledge of game engines (e.g., Unreal Engine, Unity) 					
computer, software, hardware and lab use	For this course, each student must have access to a computer that meets the following minimum specifications (or better): CPU · Intel Core i5+-7500+, GPU · NVIDIA GeForce GTX 1070+/RTX 2060+, RAM · 12+ GB, and Windows 10 or higher. Additionally, students should have access to a VR headset (preferably Oculus Rift/Rift S or Oculus/Meta Quest 2 with a link cable, or HTC Vive Pro), which should be available in the ITU VR labs. While bringing a personal computer to class is not mandatory, it is highly recommended.					
	Students are also recommended to have installed the following software: Unreal Engine 5.1 (with prerequisites), Blender 2.8 or above, PowerPoint and/or InDesign, Notepad++, 7-zip, Adobe Reader or Acrobat, and Audacity.					
course structure	The course will be conducted in a hybrid format due to the current circumstances, combining both online and face-to-face elements until April, in accordance with the announcement made by ITU Rectorate on February 18, 2023 , which states that: <p>“İ, Education in 2022-2023 Spring Semester will start with online education method as of Monday, 20 February 2023 in accordance with the latest decision taken by the Council of Higher Education. İ, In accordance with the Framework Regulation for Applied Education in Higher Education, applied laboratory, studio and workshop studies, which are classified as applied courses, can be conducted face-to-face. İ, At the beginning of April, new practices may be introduced according to CoHE's assessment.”</p> There will be no mandatory in-person sessions before April 2023, and any such sessions will be announced one week in advance to allow for proper planning. Discord and Ninova will be used for course communications.					
	Formal digital submissions must be made via Ninova, ITU's official CMS. Large files can be submitted by uploading them to cloud platforms (such as Google Drive, OneDrive, Yandex.Disk) and sending links via Ninova. It is important to note that email submissions will not be accepted.					

suggested weekly course plan

WEEKS	GAM 509E – VISUALIZATION IN VIRTUAL REALITY	DATE
1	Introduction and Course Overview	2023-02-23
2	<p>Lecture: Introduction to CAD & Computer Graphics</p> <p>Lecture: Architecture & Virtual Environments: Visualization, Creation & More</p> <p>Lecture: A Brief History of Video Games & Game Engines</p> <p>Assignment I: Create a level design for a tropical island with designated interaction locations.</p>	2023-03-02
3	<p>Lecture: Spatio-Temporal Narrative Framework for Video Game Architecture</p> <p>Lecture: Introduction to Game Design Documents and One Page</p> <p>Review: Level design critics on Assignment I</p> <p>Assignment II: Implement a basic 3rd person gameplay on the level designed in Week 2.</p>	2023-03-09
4	<p>Lecture: A Brief History of VR & VR Headsets</p> <p>Tutorial: How to prepare, optimize, and import own models into the game</p> <p>Review: Gameplay videos of Assignment II</p> <p>Assignment II (cont'd): Create presentations for the gameplay, including a GDD one page, playthrough video capture, and pitch slides</p>	2023-03-16
5	<p>Lecture: Designing For Metaverse</p> <p>Presentation: Assignments I & II</p> <p>New Assignment: Midterm Project – Create a first-person non-VR* experience of architectural visualization or furniture assembly simulation in an interior environment (one page and pitch slides).</p>	2023-03-23
6	<p>Lecture: Dreamscape Bricks VR: A VR Design Tool Case Study</p> <p>Lecture: Black Diamond VR: A VR Serious Game Case Study</p> <p>Review: Midterm Project, in terms of design, interactions, and user experience</p>	2023-03-30
<i>Expected CoHE (YÖK) announcement in April</i>		
7	<p>Lecture: Midterm Project, in terms of design, interactions, and user experience</p>	2023-04-06
8	<p>Lecture: Midterm Project, technical review, and performance optimizations</p> <p>Assignment: Create presentation for the Midterm Project, including a GDD one-pager, playthrough video capture, and pitch slides</p> <p>Presentation: Midterm Project (pitch slides, playthrough video, and one page)</p>	2023-04-13
9	<p>New Assignment: Final Project – Create a preliminary design document (one page and pitch slides) for the VR application</p>	2023-04-20
10	<p>Midterm Project Submission</p> <p>Review: Final Project (VR Application), preliminary design overview</p>	2023-04-27
11	<p>Final Project – Design and development of the VR application</p> <p>Review: VR Application</p>	2023-05-04
12	<p>Final Project – Development, user experience and performance optimization of the VR application.</p> <p>Review: VR Application</p>	2023-05-11
13	<p>Final Project – Preparing the presentation for the Final Project and demo preview of the VR application.</p> <p>Review: VR Application</p> <p>Assignment: Create presentation for the Final Project, including a GDD one-pager, playthrough video capture, and pitch slides</p>	2023-05-18
14	<p>Final Project Submission</p> <p>Presentation: and evaluation of the Final Project.</p>	2023-05-25
<i>End of Spring Term (updated, subject to change)</i>		2023-05-26

* The Midterm Project is a first-person experience which can be either non-VR or VR based on your personal preference and the availability of VR headsets. Your choice will not affect your assessment in any way, as we value creativity and technical proficiency equally.