



MARMARA UNIVERSITY - FACULTY OF ENGINEERING

2017-2018 Fall

CSE 4083 Computer Graphics

**COURSE DESCRIPTION FORM**

<b>Offering Department</b>		Department of Computer Engineering		Technical Elective						
<b>Course Code</b>		CSE 4083								
<b>Course Name</b>		Computer Graphics								
<b>Language of Instruction</b>		English								
<b>ECTS</b>		5								
<b>Contact Hours</b>		Theoretical (T): 3		Practice (P): 0		Laboratory(L): 0				
<b>Pre-requisites</b>										
<b>Instructor</b>		<b>Name</b>		Mehmet Baran						
		<b>E-mail</b>		crom.baran@gmail.com						
<b>Course Materials</b>		<b>Mandatory</b>		Computer Graphics with OpenGL; D. Hearn, P. Baker; Prentice Hall						
		<b>Recommended</b>								
<b>Course Objectives</b>		This course is about the basic algorithms of Computer Graphics.								
<b>Course Content</b>		Software and hardware components of Computer Graphics. 2D/3D geometric transformations.3D representation: , viewing parameters, projections, viewing transformations, clipping. Visibility. Illumination models and surface representations.								
<b>Learning Outcomes</b>		<b>LO1</b>		To know basic computer graphics math.						
		<b>LO2</b>		To know basic properties of CG Hardware.						
		<b>LO3</b>		To know camera and illumination models.						
		<b>LO4</b>		To be capable of writing programs in OpenGL						
		<b>LO5</b>		To apply concepts of texture mapping.						
		<b>LO6</b>		Understanding the theory of Ray tracing						
<b>Program Outcomes</b>				<b>LO1</b>	<b>LO2</b>	<b>LO3</b>	<b>LO4</b>	<b>LO5</b>	<b>LO6</b>	
<b>PO1</b>		Adequate knowledge in mathematics, science (a) and computer engineering subjects (b) pertaining to the relevant discipline (1); ability to use theoretical and applied information in these areas to model and solve engineering problems (2).		1a	1b	1a	2	1a	1a,2	
<b>PO2</b>		Ability to identify, formulate, and solve complex engineering problems (a); ability to select and apply proper analysis and modelling methods for this purpose (b).					a			
<b>PO12</b>		Knowledge of advanced mathematics subjects including differential equations, integral calculus (a), linear algebra (b), statistics and probability (c), and discrete mathematics (d).		b		b		b	b	
<b>Subjects (Knowledge, Skills and Behaviours), Contributions of Subjects to Learning Outcomes, Assessment Methods</b>	<b>No</b>	<b>Week</b>	<b>Subjects</b>	<b>LO1</b>	<b>LO2</b>	<b>LO3</b>	<b>LO4</b>	<b>LO5</b>	<b>LO6</b>	
	<b>S1</b>	1-2	Mathematical Foundations, Affine transformations. Translation and rotation matrices.	MF, H						
	<b>S2</b>	3	Computer Graphics Hardware. Pixels, Monitors ve Frame Buffers.		MF					
	<b>S3</b>	4	Cameras.			MF				
	<b>S4</b>	5-6	Introduction to OpenGL.				MF, H			
	<b>S5</b>	7-8	Phong model. Lambertian and specular reflections.			MF, H				
	<b>S6</b>	9	Texture Mapping. Mipmaps					MF, H		
	<b>S7</b>	10	Rasterization. Graphics pipeline.	MF, H	MF, H	MF, H	MF, H		MF, H	
	<b>S8</b>	11	Motion models, Soft tissue movements.		MF, H					

	S9	12-14	Ray tracing.					MF, H															
<b>Assessment Methods and Weights</b>	<b>No</b>	<b>Type</b>	<b>Weight</b>	<b>Implementation Rule</b>	<b>Make-up Rule</b>																		
	MF	Midterm, Final	80%	All exams are closed book. No calculators or cellphones are allowed.	Marmara University regulations will be followed for make-up exams.																		
	H	Homeworks	20%	Homeworks are on OpenGL programming.																			
	<b>TOTAL</b>		100%																				
<b>Determining Letter Grades</b>	<ul style="list-style-type: none"> <li>The letter grades will be determined based on the 2 midterm and final exams and homeworks.</li> <li>In order to determine the letter grade, a curve or catalog based method will be followed based on the total average scores of the students.</li> <li>The final exam score and the total average score of the student must be at least 35 to pass the course.</li> <li>According to Marmara University Undergraduate regulations, the weight of the final exam must be at least 40 out of 100.</li> </ul>																						
	<table border="1"> <thead> <tr> <th>Assessment</th> <th>Midterm 1</th> <th>Midterm 2</th> <th>Homework</th> <th>Final</th> <th>TOTAL</th> <td colspan="2"></td> </tr> </thead> <tbody> <tr> <td>Weight</td> <td>20</td> <td>20</td> <td>20</td> <td>40</td> <td>100</td> <td colspan="2"></td> </tr> </tbody> </table>								Assessment	Midterm 1	Midterm 2	Homework	Final	TOTAL			Weight	20	20	20	40	100	
Assessment	Midterm 1	Midterm 2	Homework	Final	TOTAL																		
Weight	20	20	20	40	100																		
<b>Teaching Method, Student Work Load</b>	<b>Time Applied by the Instructor</b>																						
	<b>No</b>	<b>Method</b>	<b>Explanation</b>					<b>Hours</b>															
	1	Lectures	Lectures are given in class using the board or via presentations. Example questions are solved to enhance the concepts.					14x3=42															
	2	Problem Session/ Practice	Problems related to the course topics are solved on the board.																				
	3	Laboratory	Experiments are done in the laboratory or theoretical concepts covered during the lectures are practiced using computer exercises.					6															
	4	Interactive Courses	Questions are asked to students during lectures and they are encouraged to guess the answers (peer learning is also in this category)																				
	5	Field Work	Students attend activities outside the campus.																				
	6	Midterm	Midterm exam is given during the midterm week.					2x2=4															
	7	Final	Final exam is given during the final exam week.					2															
	<b>Estimated Time to be Allocated by a Student</b>																						
	8	Project	The students carry out research about the problem given in the project, design and implement their solution and prepare a report.																				
	9	Homeworks	The students solve the problems given as homework.					20															
	10	Pre-class learning of Course Material	The students study and learn the new subjects from course materials.					14															
	11	Review of Course Material	Students review the course subjects from course materials to prepare for the exams and homeworks.					36															
12	Office Hour	Students ask questions to the instructor or the assistant during office hours.					2																
<b>Total</b>							126																
<b>Academic Honesty</b>	Violations of scholastic honesty include, but are not limited to cheating, plagiarizing, fabricating information or citations, facilitating acts of dishonesty by others, having unauthorized possession of examinations, submitting work of another person or work previously used without informing the instructor, or tampering with the academic work of other students.																						
	In case academic dishonesty is observed, the first authority is the instructor of the course. The instructor may decide to give the student zero for the homework(s)/lab(s)/exam(s), give the letter grade FF, or may take disciplinary action.																						