

COMPUTER GAMES AND SIMULATION

1	Course Title:	COMPUTER GAMES AND SIMULATION	
2	Course Code:	BMB2018	
3	Type of Course:	Optional	
4	Level of Course:	First Cycle	
5	Year of Study:	2	
6	Semester:	4	
7	ECTS Credits Allocated:	5.00	
8	Theoretical (hour/week):	3.00	
9	Practice (hour/week):	0.00	
10	Laboratory (hour/week):	0	
11	Prerequisites:	None	
12	Language:	Turkish	
13	Mode of Delivery:	Face to face	
14	Course Coordinator:	Dr. Öğr. Üyesi CEYDA NUR ÖZTÜRK	
15	Course Lecturers:	Öğr. Gör. Koray AKİ	
16	Contact information of the Course Coordinator:	ceydanur@uludag.edu.tr	
17	Website:		
18	Objective of the Course:	To examine software frameworks, timing techniques, design patterns, two dimensional and three dimensional graphics, fundamental mathematical, physical and statistical models, user interfaces, sound and camera management, and processes such as lighting and shading, which are used for the development of games and simulations.	
19	Contribution of the Course to Professional Development:	Develops skills to design, mathematically and physically model and program artificial environments, which involve realistic visual and aural elements, change depending on time, or are controllable with interaction.	
20	Learning Outcomes:		
		1	Being able to decide the programming pattern that is suitable for a game
		2	Being able to truly specify and manage the needed concepts to develop game and simulation
		3	Being able to derive geometric, pyhsical, or statistical models for game and simulation elements
		4	Being able to properly use graphics primitives and techniques to produce 2-D and 3-D renderings
		5	Being able to explain commonly used input and sound technologies as well as interaction interfaces
		6	Being able to design and implement games and simulations to satisfy different requirements
		7	Being able to write programs with at least one game or simulation software
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		10	
21	Course Content:		
		Course Content:	
Week	Theoretical	Practice	

1	Introduction, the game loop, timing, and game objects, game and simulation software, examination of sample games and simulations	
2	Game programming patterns: sequencing patterns, behavioural patterns, decoupling patterns, optimization patterns	
3	Mathematical modelling: vectors and matrices, transformations, coordinate systems	
4	Physical modelling: planes, rays, and line segments, collision geometry and collision detection, physics-based movement, physics middleware	
5	2-D rendering basics: sprites, scrolling, tile maps, 3-D rendering basics: lighting, shading, visibility	
6	Cameras, the view frustum, perspective projections, camera implementations	
7	Shaders: diffuse and specular reflections, texture mapping, bump mapping, parallax mapping, horizon mapping	
8	Lighting and shadows: point, spot, and infinite lights, shadow maps, stencil shadows, fog	
9	Visibility and occlusion: polygon clipping, bounding volumes, frustum culling, light culling, shadow culling, occluders	

Activites		Number	Duration (hour)	Total Work Load (hour)
Theoretical	display elements, networked games, protocols, topology, and cheating	14	3.00	42.00
Practicals/Labs		0	0.00	0.00
Self study and preparation	advance algorithm, list processing	14	2.00	28.00
Homeworks	Statistical models in simulation: discrete and continuous distributions, queueing models	1	36.00	36.00
Projects		0	0.00	0.00
Field Studies		0	0.00	0.00
Midterm exams	performance estimation of simulation models	1	16.00	16.00
Others		0	0.00	0.00
Final Exam	Materials: Techniques: A Platform-Agnostic Approach	2	22.00	44.00
Total Work Load				144.00
Total work load/ 30 hr		Genever Benning, ISBN: 978-0990582908.		4.80
ECTS Credit of the Course				5.00

		LLC, ISBN: 978-0985811747. 4. Lengyel, E., 2016, Foundations of Game Engine Development: Volume 2: Rendering. Terathon Software LLC, ISBN: 978-0985811754. 5. Discrete-Event System Simulation, Banks, J., Carson II, J. S., Nelson, B. L., Nicol, D. M., 2010, Pearson Education, 5th Edition, ISBN: 978-8131796993.
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23	Assesment		
TERM LEARNING ACTIVITIES		NUMBE R	WEIGHT
Midterm Exam		1	20.00
Quiz		0	0.00
Home work-project		1	20.00

Final Exam	1	60.00
Total	3	100.00
Contribution of Term (Year) Learning Activities to Success Grade	40.00	
Contribution of Final Exam to Success Grade	60.00	
Total	100.00	
Measurement and Evaluation Techniques Used in the Course	project, written exam	
24	ECTS / WORK LOAD TABLE	

25	CONTRIBUTION OF LEARNING OUTCOMES TO PROGRAMME QUALIFICATIONS															
	PQ1	PQ2	PQ3	PQ4	PQ5	PQ6	PQ7	PQ8	PQ9	PQ10	PQ11	PQ12	PQ13	PQ14	PQ15	PQ16
ÖK1	5	4	5	4	1	3	3	1	3	2	2	0	0	0	0	0
ÖK2	5	5	3	3	2	3	3	1	2	1	1	0	0	0	0	0
ÖK3	5	4	3	3	1	3	2	1	2	0	0	0	0	0	0	0
ÖK4	5	5	3	4	2	4	2	3	3	1	0	0	0	0	0	0
ÖK5	4	2	1	2	0	2	3	1	4	0	0	2	0	0	0	0
ÖK6	3	5	4	5	4	5	4	3	5	4	4	3	0	0	0	0
ÖK7	2	3	2	5	2	4	2	3	5	1	1	1	0	0	0	0
LO: Learning Objectives PQ: Program Qualifications																
Contribution Level:	1 very low		2 low		3 Medium		4 High		5 Very High							