



SYLLABUS

1. Data about the study program

1.1 Institution	Technical University of Cluj-Napoca
1.2 Eaculty	Faculty of Electronics, Telecommunications and Information
1.2 Faculty	Technology
1.3 Department	Communications
1.4 Field of study	Electronic Engineering, Telecommunications and Information
1.4 Field of Study	Technologies
1.5 Cycle of study	Bachelor of Science
1.6 Program of study / Qualification	Telecommunications Technologies and Systems/ Engineer
1.7 Form of education	Full time
1.8 Subject code	TST-E50.10

2. Data about the subject

2.1 Subject name		Devel	opn	nent	of 2D/3D Interactive	e En	vironments	
Т		Theore	l'heoretical area					
2.2 Subject area Metho		thodological area						
Analyt			ytic area					
2.3 Course responsible			Assist. Prof. Aurelia CIUPE, Ph.D. Aurelia.Ciupe@com.utcluj.ro					
2.4 Teacher in charge with			Assist. Prof. Aurelia CIUPE, Ph.D. Aurelia.Ciupe@com.utcluj.ro					
laboratory / project								
2.5 Year of study	IV	2.6 Semeste	er	1	2.7 Assessment	V	2.8 Subject category	DS/DO

3. Estimated total time

3.1 Number of hours per week	4	of which:	3.2 course	2	3.3 seminar / laboratory	2
3.4 To Total hours in the curriculum	56	of which:	3.5 course	28	3.6 seminar / laboratory	28
Distribution of time						
Manual, lecture material and notes, k	oibliog	raphy				10
Supplementary study in the library, online specialized platforms and in the field					4	
Preparation for seminars / laboratories, homework, reports, portfolios and essays						10
Tutoring						3
Exams and tests						3
Other activities:						
3.7 Total hours of individual study		44				
3.8 Total hours per semester	1	00				

4. Pre-requisites (where appropriate)

3.9 Number of credit points

4.1 curriculum	Basic courses in electrical and electronic engineering from TTS or AE Curricula. Knowledge of digital signal processing, television, software (C based programming), audio-video analog signal handling (acquisition and conversion), Basic processor architecture
4.2 competence	Use of electronic test and measurement instruments and computing technique

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5. Requirements (where appropriate)

5.1. for the course	
5.2. for the seminars / laboratories / projects	

6. Specific competences

Professional competences	C4. Design, implementation and operation of data, voice, video and multimedia services.This is based on the understanding and the application of fundamental concepts in telecommunications and transmission of informationC5. Selecting, installing, configuring and operating fixed or mobile telecommunications equipment. Equipping a site with usual telecommunications networks
Transversal competences	N / A

7. Discipline objectives (as results from the key competences gained)

7.1 General objective	To develop competences in designing 2D/3D interactive 2D/3D environments.		
7.2 Specific objectives	 Designing 2D/3D interactive environments: UI/UX, prototyping, level design, principles of mechanics and dynamics 2D/3D game-specific interactive graphic elements: scene, components, materials, interaction and collisions, UI, particle systems, characters, animations 		

8. Contents

8.1	Lecture (syllabus)	Teaching methods	Notes
1.	Introduction. Themes of DIE2D/3D.		
2.	Taxonomy of game-specific interactive 2D/3D graphic		
	environments.		
3.	Case studies C2.		
4.	Storytelling and narration in game-specific interactive 2D/3D		
	graphic environments.		
5.	Case studies C4.		
6.	Game mechanics and design principles for game-specific	Presentation,	
	interactive 2D/3D graphic environments.	heuristic	
7.	Case studies C6.	conversation,	
8.	Game engines for game-specific interactive 2D/3D graphic	exemplification,	
	environments.	problem	
9.	Case studies C8.	presentation,	Use of .ppt
10.	Interfaces and interaction in game-specific interactive 2D/3D	teaching	presentation,
	graphic environments.	exercise, case	projector,
11.	Case studies C10.	study, formative evaluation	blackboard
12.	Product and project principles in the development of game-		
	specific interactive 2D/3D graphic environments.		





13.	Case studies C12.					
14.	Review of the course themes and exam preparation					
Ref	References					
1.	Tekinbas, K. S., & Zimmerman, E. (2003). Rules of play: Game design fundamentals. MIT press.					
2.	Foley, J. D. (1996). <i>Computer graphics: principles and practice</i> (Vol. 12110). Addison-Wesley Professional.					
3.	Gregory, J. (2018). Game engine architecture. AK Peters/CRC P	ress.				
4.	A. Ciupe, et al,. (2023, May). From Speaking Skills to Virtual Mobilities: Challenges of VR Technologies					
	in Communication from the European University of Technology. In 2023 IEEE Global Engineering					
_	Education Conference (EDUCON) (pp. 1-4). IEEE.					
5.	G. Ciucă, A. Ciupe, B. Orza, (2022, November). Exploring Edi	ucational Scenarios th	rough Interactive			
	Environments and Agile User Stories: a Gamified Assessme	ent Case Study. In 2	022 International			
6	A M Ruscanu A Ciune S N Meza (2022 March) " arPcTECH	U. I-4). IEEE. Iture"—a gamified edu	cational 3D virtual			
0.	world for introductory concepts in computer architecture. In	2022 IFFF Global Engi				
	Conference (EDUCON) (pp. 1437-1442), IEEE.					
7.	A. Ciupe, S. Meza, B. Orza, B. (2021). Systematic assessment	of interactive instructi	onal technologies			
	in higher engineering education. In Educating Engineers for Fu	ture Industrial Revolut	ions: Proceedings			
	of the 23rd International Conference on Interactive Collabor	rative Learning (ICL20	20), Volume 1 23			
_	(pp. 797-804). Springer International Publishing.					
8.	Vajdea, B., Ciupe, A., Orza, B., & Meza, S. (2020). Education	onal Driving Through	Intelligent Traffic			
	June 8–12, 2020, Proceedings 16 (np. 420-426), Springer International	national Publishing	, Athens, Greece,			
9.	Stroe, I. P., Ciupe, A., Meza, S. N., & Orza, B. (2019, April), Firel	Escape: a gamified coc	ordinative aproach			
	to multiplayer fire-safety training. In 2019 IEEE Globa	I Engineering Educa	ition Conference			
	(EDUCON) (pp. 1316-1323). IEEE.					
10.	. Salomia, A., Ciupe, A., Meza, S., Orza, B., & Trifan, G. (2018, May). Assistive AR technology for hearing					
	impairments in driving lessons. In 2018 IEEE International Conference on Automation, Quality and					
0	Testing, Robotics (AQTR) (pp. 1-6). IEEE.					
	Digital Workspace Misrosoft Teams					
1. 0 7		Tooching mothods	Notos			
0.2 1	Introduction in laboratory concents, Lab organization	reaching methous	Notes			
2	2D/3D game engines. Introduction in the project workspace.					
3.	2D/3D game engines. Scene and assets.					
4.	2D/3D game engines. Scene interaction.					
5.	2D/3D game engines. UI Elements.					
6.	Requirements for game-specific interactive 2D/3D graphic		Use of			
	environments. Agile methodologies.	Didactic and	instrumentation			
7.	Portofolio evaluation.	experimental	experimental			
8.3	Project	proof, didactic	boards,			
1.	Introduction in project tasks. Project organization.	exercise, team	computers,			
2.	Rapid prototyping for game-specific interactive 2D/3D	work	multimedia			
	graphic environments.		board			
3.	User experience in game-specific interactive 2D/3D graphic					
1	environments.					
4.	Project development (1/3).					
э.	Project development (2/3).					





7. Project evaluation.

Bibliography

1. Digital Workspace Microsoft Teams

9. Bridging the course contents with the expectations of the representatives of the community, professional associations and employers in the field

Competences acquired will be used in the following COR occupations (Electronics Engineer; Telecommunications Engineer; Electronics Design Engineer; System and Computer Design Engineer; Communications Design Engineer) or in the new occupations proposed to be included in COR (Sale / Support Engineer; Multimedia Applications Developer; Network Engineer; Communications Systems Test Engineer; Project Manager; Traffic Engineer; Communications Systems Consultant).

10. Evaluation

Activity type	10.1 Assessment criteria	10.2 Assessment	10.3 Weight in			
		methods	the final grade			
10.4 Course	The level of acquired theoretical knowledge	Written assignment				
	and practical skills	(theory and case	T 50%			
		studies)				
10.5 Seminar/		l abouatou aoutofolio (1 250/			
Laboratory	The level of acquired knowledge and abilities		L 25%			
,		Project evaluation	P 25%			
10.6 Minimum st	10.6 Minimum standard of performance					
Qualitative level	:					
Minimal knowled	lge:					
🗸 To know	the basics of					
✓ Knowled	ge of the most important generic architectures i	n media processing				
\checkmark Use of simulation (Minimal competencies:						
✓ To conne	\checkmark To connect the development					
\checkmark Use of computer equipment to control and setup of embedded applications						
Ouantitative lev	el:					
✓ Attendar	\checkmark Attendance of all laboratory and project sessions					
✓ Evaluatio	$\sqrt{-Evaluation in over (T)}$ and practical activities (1+D)/2 at least 4.5 points (out of 10					
	$\int E \operatorname{Valuation} \operatorname{II} \operatorname{Control} \operatorname{Valuation} Valuat$					

✓ Final grade is computed with the formula: 0,5*T+0,25*L+0.25*P

Date of filling in:	Responsible	Title First Name SURNAME	Signature
20.06.2024	Course	Assist. Prof. Aurelia CIUPE, Ph.D.	
	Applications	Assist. Prof. Aurelia CIUPE, Ph.D.	

Date of approval in the Council of the Communications	Head of Communications Department
Department	Prof. Virgil DOBROTA, Ph.D.
10.07.2024	
Date of approval in the Council of the Faculty of Electronics,	Dean
Telecommunications and Information Technology	Prof. Ovidiu POP, Ph.D.
11.07.2024	