COURSE SYLLABUS

Academic year 2024-2025

1. Programme Information

Higher education institution	**Lucian Blaga University of Sibiu**
Faculty	Faculty of Engineering
Department	Department of Computer Science and Electrical and Electronics Engineering
Field of study	Computer Science and Information Technology
Level of study	Master
Programme of study/qualification	ADVANCED COMPUTING SYSTEMS

2. Course Information

2.1. Name of course	Artificial Intelligence in Computer Games			Code	ACS.201.RO
2.2. Course coordinator	Assist. Prof. Antoniu Gabriel PITIC, PhD				
2.3. Seminar/laboratory coordinator	Assist. Prof. Antoniu Gabriel PITIC, PhD				
2.4. Year of study[1]	1	2.5. Semester[2]	2	2.6. Evaluation form[3]	E
2.7. Course type[4]	O	2.8. The formative category of the course[5]			R

3. Estimated Total Time

3.1. Course Extension within the Curriculum – Number of Hours per Week					
3.1.a. Lecture	3.1.b. Seminar	3.1.c. Laboratory	3.1.d. Project	3.1.e. Other	Total
2		2			**4**
3.2. Course Extension within the Curriculum – Total Number of Hours within the Curriculum					
3.2.a. Lecture	3.2.b. Seminar	3.2.c. Laboratory	3.2.d. Project	3.2.e. Other	Total[6]
28		28			**56**

Time Distribution for Individual Study[7]	**Hours**
Learning by using course materials, references and personal notes	28
Additional learning by using library facilities, electronic databases and on-site information	30
Preparing seminars / laboratories, homework, portfolios and essays	56
Tutorial activities[8]	2
Exams[9]	3
3.3. Total Individual Study Hours[10] *(NOSI$_{sem}$)*	**119**
3.4. Total Hours in the Curriculum *(NOAD$_{sem}$)*	**56**
3.5. Total Hours per Semester[11] *(NOAD$_{sem}$ + NOSI$_{sem}$)*	**175**
3.6. No. of Hours / ECTS	**25**
3.7. Number of credits[12]	**7**

4. Prerequisites (if needed)

4.1. Courses that must be successfully completed first (from the curriculum)[13]	Knowledge of artificial intelligence and machine learning
4.2. Competencies	knowledge in some programming languages

5. Conditions (where applicable)

5.1. For course/lectures[14]	Active participation in classes, lecture + discussion, video-projector, whiteboard
5.2. For practical activities (lab/sem/pr/app)[15]	Develop and support the planned labs

6. Specific competencies acquired[16]

Number of credits assigned to the discipline[17]		7	Credits distribution by competencies[18]
6.1. Professional competencies	PC9	defines technical requirements	2
	PC13	develop open source software	2
	PC25	designs prototypes	3
6.2. Transversal competencies			

7. Course objectives (resulted from developed competencies)

7.1. Main course objective	Knowledge and understanding the general principles for the subject Knowledge and work adequately with notions Attainment capacity for integrate obtained knowledge from other classes Identity the main information sources Critical analysis form theoretical models, ideas and usually used broach. Capacity to realize a concrete project and a afferent report
7.2. Specific course objectives	Stimulation moral attitude and fairness in evaluating and auto evaluating. Appreciation of work into a team and a work of each member from the team

8. Content

8.1 Lectures[19]		**Teaching methods[20]**	**Hours**
Lecture 1	Introduction. Games design. Concepts of games. Games clasification.	Lecture	2
Lecture 2	Games structure	Lecture	2
Lecture 3	Elements of mathematical theory of games.	Lecture	2
Lecture 4	Games programming basis.	Lecture	2
Lecture 5	3D games engines	Lecture	2
Lecture 6	Artificial intelligence techniques for games programming	Lecture	2
Lecture 7	Games implementation for Internet	Lecture	2
Lecture 8	Scenography basics	Lecture	2
Lecture 9	Commercial programs of games	Lecture	2
Lecture 10	Game testing and repairing	Lecture	2

Lecture 11	Case studies: computer chess	Lecture	2
Lecture 12	Case studies: computer chess	Lecture	2
Lecture 13	Case studies: backgammon	Lecture	2
Lecture 14	Case studies: backgammon	Lecture	2
		Total lecture hours:	**28**

8.2 Practical activities

8.2.c. Project		**Teaching methods**[21]	**Hours**
Project 1	Each student chooses a subject on the area of the course and start doing research; On every week I coordinate their activities and direct them in a direction. At the end they must do a program to simulate something in the subject studied and to present to the other students, the theory and the results.	debates and conversation	28
		Total project hours:	

9. Bibliography

9.1. Recommended Bibliography	Mike McShaffry, David Graham – Game Coding Complete, Fourth Edition 4th Edition, publisher: Cengage Learning PTR, 2012, ISBN: 978-1133776574
	Stuart Russel, Peter Norvig – Artificial Intelligence: a modern approach (4th edition), Prentice-Hall, 2020
	Mat Buckland – AI Techniques for Games, publisher: Premier Press, 2002, ISBN: 193184108X
	David M. Bourg, Glenn Seeman – AI for Game Developers, publisher: O'Reilly, Julz 2004
9.2. Additional Bibliography	Jason Schreier - Blood, Sweat, and Pixels, publisher: Harper Paperbacks, 2017, ISBN: 978-0062651235
	Roger E. Pedersen – Game Design Foundations, publisher: Worlware Publishing, 2003, ISBN: 1556229739

10. Conjunction of the discipline's content with the expectations of the epistemic community, professional associations and significant employers of the specific study program[22]

Periodical discussions with representatives of companies in the area of Computer Engineering.

11. Evaluation

Activity Type	11.1 Evaluation Criteria	11.2 Evaluation Methods		11.3 Percentage in the Final Grade	Obs.[23]
11.4a Exam / Colloquy	• Theoretical and practical knowledge acquired (quantity, correctness, accuracy)	Tests during the semester[24]:	50%	70%	
		Homework:	15%		
		Other activities[25]:	5%		

		Final evaluation:	0%		
11.4d Project	• The quality of the project, the correctness of the project documentation, the appropriate justification of the chosen solutions	• Self-evaluation, project presentation • Critical evaluation of a project		30%	
11.5 Minimum performance standard[26] Minimum grade equal with 5,00					

The Course Syllabus will encompass components adapted to persons with special educational needs (SEN – people with disabilities and people with high potential), depending on their type and degree, at the level of all curricular elements (skills, objectives, contents, teaching methods, alternative assessment), in order to ensure fair opportunities in the academic training of all students, paying close attention to individual learning needs.

Filling Date: 13.09.2024

Department Acceptance Date: 16.09.2024

	Academic Rank, Title, First Name, Last Name	Signature
Course Teacher	Assist. Prof. Antoniu Gabriel PITIC, PhD	
Study Program Coordinator	Prof. Adrian FLOREA, PhD	
Head of Department	Assoc. Prof. Radu George CREȚULESCU, PhD	
Dean	Prof. Maria VINȚAN, PhD	

[1] *1-4 for bachelor, 1-2 for master*
[2] *1-8 for bachelor, 1-3 for master*
[3] *Exam, colloquium or VP A/R - from the curriculum*
[4] *Course type: R = Compulsory course; E = Elective course; O = Optional course*
[5] *Formative category: S = Specialty; F = Fundamental; C = Complementary; I = Fully assisted; P = Partially assisted; N = Unassisted*
[6] *Equal to 14 weeks x number of hours from point 3.1 (similar to 3.2.a.b.c.)*
[7] *The following lines refer to individual study; the total is completed at point 3.37.*
[8] *Between 7 and 14 hours*
[9] *Between 2 and 6 hours*
[10] *The sum of the values from the previous lines, which refer to individual study.*
[11] *The sum (3.5.) between the number of hours of direct teaching activity (NOAD) and the number of hours of individual study (NOSI) must be equal to the number of credits assigned to the discipline (point 3.7) x no. hours per credit (3.6.)*
[12] *The credit number is computed according to the following formula, being rounded to whole neighbouring values (either by subtraction or addition*

$$No.credits = \frac{NOCpSpD \times C_C + NOApSpD \times C_A}{TOCpSdP \times C_C + TOApSdP \times C_A} \times 30\ credits$$

Where:

- NOCpSpD = Number of lecture hours / week / discipline for which the credits are calculated
- NOApSpD = Number of application hours (sem./lab./pro.) / week / discipline for which the credits are calculated
- TOCpSdP = Total number of course hours / week in the Curriculum
- TOApSdP = Total number of application hours (sem./lab./pro.) / week in the Curriculum
- C_C/C_A = Course coefficients / applications calculated according to the table

Coefficients	**Course**	**Applications (S/L/P)**
Bachelor	2	1
Master	2,5	1,5
Bachelor - foreign language	2,5	1,25

[13] *The courses that should have been previously completed or equivalent will be mentioned*
[14] *Board, video projector, flipchart, specific teaching materials, online platforms, etc.*
[15] *Computing technology, software packages, experimental stands, online platforms, etc.*
[16] *Competences from the Grids related to the description of the study program, adapted to the specifics of the discipline*
[17] *From the curriculum*
[18] *The credits allocated to the course are distributed across professional and transversal competences according to the specifics of the discipline*
[19] *Chapter and paragraph titles*
[20] *Exposition, lecture, board presentation of the studied topic, use of video projector, discussions with students (for each chapter, if applicable)*
[21] *Case study, demonstration, exercise, error analysis, etc.*
[22] *The relationship with other disciplines, the usefulness of the discipline on the labour market*
[23] *CPE – Conditions Exam Participation; nCPE – Does Not Condition Exam Participation; CEF - Conditions Final Evaluation; N/A – not applicable*
[24] *The number of tests and the weeks in which they will be taken will be specified*
[25] *Scientific circles, professional competitions, etc.*
[26] *The minimum performance standard in the competence grid of the study program is customized to the specifics of the discipline, if applicable*