



COURSE DESCRIPTION

1. Program Information

1.1 University	“Alexandru Ioan Cuza” University of Iași
1.2 Faculty	Faculty of Computer Science
1.3 Department	Computer Science
1.4 Study Domain	Computer Science
1.5 Study Cycle	Bachelor
1.6 Study Program / Qualification	

2. Course Information

2.1 Course Name	Artificial Intelligence						
2.2 Course Teacher	Prof. Dr. Cristea Dan						
2.3 Seminary Teacher	Lect. Dr. Pistol Ionuț Cristian, Lect. Dr. Răschip Mădălina						
2.4 Study Year	2	2.5 Semester	2	2.6 Evaluation	E	2.7 Course Status	OB

* OB – Compulsory / OP – Optional

3. Total estimated hours (hours per semester and didactic activities)

3.1 Hours per week	4	in which: 3.2 course	2	3.3 seminary/laboratory	2
3.4 Hours in curriculum	56	in which: 3.5 course	28	3.6 seminary/laboratory	28
Time Distribution					hours
Manual study, Course support, Bibliography, and others					16
Supplementary Documentation in library, in electronic forums, and on the field					16
Seminaries/laboratories preparation, homeworks, reports, portfolios and essays					16
Tutoring					
Evaluation					12 E
Other activities (consultations per student)					1 C
3.7 Total hours individual study					48
3.8 Total hours per semester					117
3.9 Credits					5

4. Preconditions (if necessary)

4.1 Of Curriculum	Algorithms and Programming, Object oriented Programming, Java programming, Databases, Graph Algorithms, Probabilities and Statistics
4.2 Of Skills	High level programming, Developing and maintaining software systems, Design and maintenance of databases

5. Conditions (if necessary)

5.1 For Course Operation	Course room must have a vide-projector, internet connection and a blackboard
5.2 For Seminary/Laboratory Operation	Laboratory room must have internet connection and a blackboard. Students need computers with Java.



6. Specific Skills Acquired

Professional Skills	C1. High-level programming language. C2. Development and maintenance of software resources. C3. Design and maintenance of databases.
Transversal Skills	CT1. The efficient organization of inter-disciplinary group activities and development of inter-personal communication and collaboration with diverse groups.

7. Course Objectives (from the grid of specific skills acquired)

7.1 General Objectives	Building a professional vision over the process of software development.
7.2 Specific Objectives	Students obtaining a passing grade will be able to apply elements of Artificial Intelligence in developing various software systems involving human interaction or decision making.

8. General Description

8.1	Course	Teaching Methods	Observations (hours and bibliographic references)
1.	Introduction (definition of the domain, intelligent systems, history, previous projects)	Slide presentation. Course notes and tutorials available as electronic documents.	2
2.	AI domains, recent topics (ICT event 2010, ICT event 2013)	Slide presentation. Course notes and tutorials available as electronic documents.	2
3.	Natural language processing and Computational Linguistics (language and speech, processing tools)	Slide presentation. Course notes and tutorials available as electronic documents.	2
4.	Natural language processing and Computational Linguistics (syntactic, semantic and discourse , applications)	Slide presentation. Course notes and tutorials available as electronic documents.	2
5.	“MappingBooks” project (entity linking, state-of-the-art, entities, relations)	Slide presentation. Course notes and tutorials available	2



		as electronic documents.	
6.	“MappingBooks” (system functionalities, technologies, modules, organisation)	Slide presentation. Course notes and tutorials available as electronic documents.	2
7.	IA problems and solutions (formalisation, solutions, classic games, states and transitions, tentative strategies, <i>backtracking</i> , <i>hill-climbing</i> , systematic search, <i>best-first search</i>)	Slide presentation. Course notes and tutorials available as electronic documents.	2
8.	Games Theory (tic-tac-toe, game tree, states evaluation, MIN-MAX, ALPHA-BETA)	Slide presentation. Course notes and tutorials available as electronic documents.	2
9.	“MappingBooks” design: use –case – processing a travel guide (entities and relations identification)	Slide presentation. Course notes and tutorials available as electronic documents.	2
10.	“MappingBooks” design: modules details (text analysis, name-entity detection, relation detection, regular expressions and Grammar Graphical Studio (GGS))	Slide presentation. Course notes and tutorials available as electronic documents.	2
11.	“MappingBooks” design : module details (crawling for entity data, mobile device data)	Slide presentation. Course notes and tutorials available as electronic documents.	2
12.	“MappingBooks” design : module details (maps and trajectories, geographic systems and data)	Slide presentation. Course notes and tutorials available as electronic documents.	2
13.	“MappingBooks” design : module details (augmented reality, user interface, client-server, resources, project management, evaluation)	Slide presentation. Course notes and tutorials available as electronic documents.	2
14.	Knowledge representation, semantic networks (daemons, descriptive and evenimental networks.	Slide presentation. Course notes and tutorials available as electronic documents.	2

Bibliography**Main references:**

[1] CRISTEA D., IONITA M., PISTOL I. C. – INTELIGENTA ARTIFICIALA, EDITURA UNIVERSITATII “ALEXANDRU IOAN CUZA” IASI, 2005

Supplementary references:

[2] BARR, A., FEIGENBAUM, E. 1981. THE HANDBOOK OF ARTIFICIAL INTELLIGENCE. WILLIAM KAUFMANN, INC. S POATE CONSULTA LA BIBLIOTECA SEMINARULUI MATEMATIC DE LA FACULTATEA DE MATEMATICA UNIVERSITATII “AL.I.CUZA”.

[3] PENROSE, R. 1989. THE EMPEROR'S NEW MIND: CONCERNING COMPUTERS, MINDS AND THE LAWS PHYSICS, OXFORD UNIVERSITY PRESS, NEW YORK. TRADUSA ÎN LIMBA ROMÂNĂ DE CORNELIA C. RUS SI MIRCEA V. RUSU CA "MINTEA NOASTRA... CEA DE TOATE ZILELE: DESPRE GÂNDIRE, FIZICA CALCULATOARE", ED. TEHNICA, BUCURESTI 1996.

[4] PENROSE, R. 1994. SHADOWS OF THE MIND, OXFORD UNIVERSITY PRESS. TRADUSA ÎN LIMBA ROMÂNĂ D DANA JALOBEANU CA "INCERTITUDINILE RANIUNII (UMBRELE MINNII). ÎN CAUTAREA UNEI TEORII STIINŢIFICE CONSTIINNEI", ED. TEHNICA, BUCURESTI, 1999.



[5] SEARLE, J. R. 1980. MINDS, BRAINS AND PROGRAMS. ÎN „THE BEHAVIOUS AND BRAIN SCIENCES”, VOL. CAMBRIDGE UNIVERSITY PRESS.

[6] SEARLE, J. R. 1992. THE REDISCOVERY OF THE MIND. MIT PRESS, CAMBRIDGE UNIVERSITY PRESS, MASSACHUSETTS.

8.2	Seminary / Laboratory	Teaching methods	Observations (hours and bibliographic references)
1.	Turing test. Dialog systems, AIML	Formulating the problem. Discussion and solution overview.	2
2.	Developing IA problem models	Formulating the problem. Discussion and solution overview.	2
3.	Problem space navigation strategies	Formulating the problem. Discussion and solution overview.	2
4.	Knowledge representation. Ontologies	Formulating the problem. Discussion and solution overview.	2
5.	Machine learning	Formulating the problem. Discussion and solution overview.	2
6.	Interactive decision problems	Formulating the problem. Discussion and solution overview.	2
7.	Project work organisation	Formulating the problem. Discussion and solution overview.	2
8.	Recapitulation	Formulating the problem. Discussion and solution overview.	2
9.	Project work: standards and resources	Formulating the problem. Discussion and solution overview.	2
10.	Project work: implementation and documentation	Formulating the problem. Discussion and solution overview.	2
11.	Project work: implementation and documentation	Formulating the problem. Discussion and solution overview.	2
12.	Project work: integration	Formulating the problem. Discussion and solution overview.	2
13.	Project work: testing and evaluation	Formulating the problem. Discussion and solution overview.	2
14.	Project work: final evaluation	Formulating the problem. Discussion and solution overview.	2

**Bybliography****Main references:**

[1] CRISTEA D. IONITA M, PISTOL I C – INTELIGENTA ARTIFICIALA, EDITURA UNIVERSITATII “ALEXANDRU IOAN CUZA” IASI, 2005

Supplimentary references:

[2] BARR, A., FEIGENBAUM, E. 1981. THE HANDBOOK OF ARTIFICIAL INTELLIGENCE. WILLIAM KAUFMANN, INC. S POATE CONSULTA LA BIBLIOTECA SEMINARULUI MATEMATIC DE LA FACULTATEA DE MATEMATICA UNIVERSITATII “AL.I.CUZA”.

[3] PENROSE, R. 1989. THE EMPEROR'S NEW MIND: CONCERNING COMPUTERS, MINDS AND THE LAWS OF PHYSICS, OXFORD UNIVERSITY PRESS, NEW YORK. TRADUSA ÎN LIMBA ROMÂNĂ DE CORNELIA C. RUS SI MIRCEA V. RUSU CA "MINEA NOASTRA... CEA DE TOATE ZILELE: DESPRE GÂNDIRE, FIZICA CALCULATORARE", ED. TEHNICA, BUCURESTI 1996.

[4] PENROSE, R. 1994. SHADOWS OF THE MIND, OXFORD UNIVERSITY PRESS. TRADUSA ÎN LIMBA ROMÂNĂ DE DANA JALOBEANU CA "INCERTITUDINILE RĂNIUNII (UMBRELE MINII). ÎN CAUTAREA UNEI TEORII ȘTIINȚIFICE CONSTIINNEI", ED. TEHNICA, BUCURESTI, 1999.

[5] SEARLE, J. R. 1980. MINDS, BRAINS AND PROGRAMS. ÎN „THE BEHAVIOUS AND BRAIN SCIENCES”, VOL. CAMBRIDGE UNIVERSITY PRESS.

[6] SEARLE, J. R. 1992. THE REDISCOVERY OF THE MIND. MIT PRESS, CAMBRIDGE UNIVERSITY PRESS, MASSACHUSETTS.



9. Course content synchronization with the expectations of the community representatives, professional associations and employers from the program domain

Applications such as dialogue systems, help desk, games, ontologies for semantic web are just a few examples of industry-relevant topics discussed in the course of artificial intelligence. In addition, this course prepares students for the study of machine learning and computational linguistics, two areas of interest in industry and research.

10. Evaluation

Activity Type	10.1 Evaluation criteria	10.2 Evaluation methods	10.3 The weight of each evaluation form (%)
10.4 Course	Written exam at the end of the semester, short tests during courses. PC = (exam grade)x3 + course test points. Bonus (B1) for remarkable activity and solutions.	Written test	35%
10.5 Seminary/ Laboratory	Points accumulated from lab tasks (first 7 weeks) and work for a project (weeks 8-14). PL = total points for lab tasks (maximum 30) PP = total points for the project work (maximum 30) Bonus (B1) for remarkable activity and solutions.	6 weekly homeworks and 1 project assignment during the semester	65% (of which 50% is the project score)

10.6 Minimal performance standards

Students will know the fundamentals of Artificial Intelligence, such as the domain description and its objectives and working knowledge of knowledge representation, state space search, semantic inference networks, planning issues and games. Students collaborate to implement a project which applies the concepts studied.

To graduate a minimum of 50 points are required, accumulated from PC+PL+PP+B1+B2. Final grades are established using the formula: ROUND(PC+PL+PP+B1+B2).

A student that takes the final written exam will receive a grade, otherwise he/she will be considered as absent. If the graduation criteria is not met the student will receive a grade equal or smaller than 4.

Date
21.03.2018

Course Teacher
Prof. Dr. Cristea Dan

Seminary/Laboratory Teacher
Conf. Dr. Răschip Mădălina
Lecturer Dr. Pistol Ionuț Cristian

Department Date of Approval

Director of the Department
Prof. Dr. Lucanu Dorel