

Curriculum Proposal Cover Sheet - University-Wide Undergraduate Curriculum Committee

Contact Person	SOUNDARARAJAN EZEKIEL	Email Address	EZEKIEL
Proposing Department/Unit	COMPUTER SCIENCE	Phone	7-6102

Check all appropriate lines and complete information as requested. Use a separate cover sheet for each course proposal and for each program proposal.

1. Course Proposals (check all that apply)
- New Course Course Prefix Change Course Deletion
 Course Revision Course Number and/or Title Change Catalog Description Change

COSC405 ARTIFICIAL INTELLIGENCE

<u>Current</u> Course prefix, number and full title	<u>Proposed</u> Course prefix, number and full title, if changing
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2. Additional Course Designations: check if appropriate
- This course is also proposed as a Liberal Studies Course. Other: (e.g., Women's Studies, Pan-African)
 This course is also proposed as an Honors College Course.

3. Program Proposals
- New Degree Program Catalog Description Change Program Revision
 New Minor Program Program Title Change Other
 New Track

<u>Current</u> program name	<u>Proposed</u> program name, if changing
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4. Approvals

		Date
Department Curriculum Committee Chair(s)	<i>[Signature]</i>	5 Dec 06
Department Chair(s)	<i>Wm. Ogilby</i>	12/7/06
College Curriculum Committee Chair	<i>[Signature]</i>	05/17/07
College Dean	<i>Yvonne Bick</i>	9/24/07
Director of Liberal Studies *		
Director of Honors College *		
Provost *		
Additional signatures as appropriate: (include title)		
UWUCC Co-Chairs	<i>Gail S. Seixas</i>	10/30/07

* where applicable

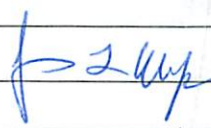
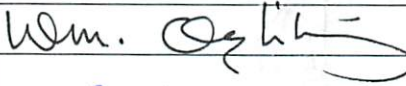

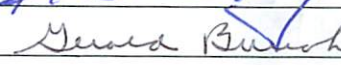
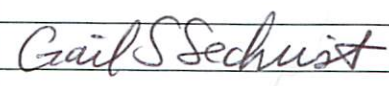
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LSC Use Only No: <u>07-16j</u>	LSC Action-Date:	UWUCC USE Only No.	UWUCC Action-Date: <u>AP-10/30/07</u>	Senate Action Date: <u>App-12/4/07</u>
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3. Program Proposals <input type="checkbox"/> New Degree Program <input type="checkbox"/> Program Title Change <input type="checkbox"/> Other <input type="checkbox"/> New Minor Program <input type="checkbox"/> New Track <input type="checkbox"/> Catalog Description Change <input type="checkbox"/> Program Revision		
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Department Curriculum Committee Chair(s)		Date <u>5 Dec 06</u>
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UWUCC Co-Chairs		<u>10/30/07</u>

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Liberal Studies

Part-II Description of the Curriculum Change

1. New Syllabus of Record

I. Catalog Description

COSC 405 Artificial Intelligence

3c-01-3cr

Prerequisite: COSC 310

An introduction to the field of artificial intelligence, i.e., the study of ideas that enable computers to process data in a more intelligent way than conventional practice allows. Covers many information representation and information processing techniques. Explores the underlying theory including matching, goal reduction, constraint exploration, search, control, problem solving, and logic.

II. Course Outcomes

Upon successful completion of this course, the student should be able to

- Discuss AI terminology, progress and issues
- Assess strength and weakness of blind search algorithms.
- Assess strength and weakness of heuristic search algorithms.
- Solve problems regarding knowledge and reasoning.
- Formulate and solve simple problems in logic inference.
- Assess strength and weakness in game searching algorithms.
- Assess strength and weakness in AI algorithms in planning.
- Formulate and solve problems in machine learning.
- Formulate and solve problems in vision or natural language processing.
- Understand the basics of robotics or expert systems.
- Write programs in functional or logical paradigms.
- Implement software solutions to AI problems.

III. Detail Course Outline

A. Introduction	3 hours
a. What is AI	
b. The foundations of AI	
c. The History of AI	
d. Intelligent agents	
e. Agent based system	
B. Search	6 hours
a. Searching for solution	
b. Uninformed/Blind search	
c. Informed/ Heuristic search	
d. A* search	
e. Hill-climbing search	
f. Genetic algorithms	
g. Constraint satisfaction problems	
C. Game	5 hours
a. Games	
b. Optimal decision in games	
c. Minimax algorithm	
d. Alpha-Beta pruning	
e. Imperfect real time decision	
f. Games that include an element of chance	
D. Logic	6 hours
a. Knowledge based agents	
b. Syntax of First Order Logic	

- c. Semantics of First Order Logic
- d. Reasoning patterns in propositional logic
- e. First order logic
- f. Inference in first order logic
- g. Unification and lifting
- h. Forward and backward chaining
- i. Resolution

E. Planning 5 hours

- a. The planning problem
- b. Planning with state space search
- c. Partial order search
- d. Planning with proportional logic
- e. Planning and acting in the real world

F. Learning 5 hours

- a. Learning from observation
- b. Knowledge in learning
- c. Statistical learning methods
- d. Reinforcement learning

Choose any two of the following:

G. Robotics 5 hours

- a. Robotics hardware
- b. Perception
- c. Planning to move and moving
- d. Software architecture

H. Vision 5 hours

- a. Digitization
- b. Low-level processing
- c. Noise removal
- d. Feature detection
- e. Segmentation and the Hough transformation
- f. Recovering 3d information
- g. The waltz algorithm
- h. Active vision
- i. Object recognition
- j. Scene recognition

I. Natural Languages 5 hours

- a. Signal processing
- b. Syntax
- c. Parsing
- d. Semantics
- e. Meaning
- f. Pragmatics
- g. Natural language generation

J. Expert Systems 5 hours

- a. Examples
- b. History
- c. Advantages of expert system
- d. AI as an experimental discipline

Midterm Exams 2 hours

Total = 42 hours

Final Exam During Final Exam Week

IV. Evaluation Methods

The final grade for the course is determined as follows:

Midterm exam	15%
Final Exam	25%
Homework	10%
Projects	30%
Quizzes	20%

V. Grading Scale: 90-100% A, 80-89% B, 70-79% C, 60-69% D, 0-59% F

VI. Attendance:-

The attendance policy will conform to the University wide attendance criteria.

VII. Required Textbook

Stuart Russell and Peter Norvig. *Artificial Intelligence: A Modern Approach*. 2nd Edition. Prentice Hall, Jan 2003, ISBN 0130803022.

VIII. Special Resource Requirements

None.

IX. Bibliography

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Li, Daoliang, Wang, Baoji, Artificial Intelligence Applications and Innovations, Springer, 2005.

Pylyshyn, Z.W, 'Computing and cognitive science' in M. Posner ed., Foundations of Cognitive Science, MIT Press, 1989.

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Rutkowski , Leszek, Artificial Intelligence and Soft Computing -- Icaisc 2004: 7th International Conference, Springer, 2004.

Turing, Alan, 'Computing Machinery and Intelligence', in John Haugeland, Mind Design II, MIT Press, Cambridge 1997.

Yanushkevich, Svetlana N., Artificial Intelligence in Logic Design, Springer, 2004.

2. Summary of the proposed revisions

None

3. Justification/rationale for the revision

Department could not find any old syllabus of record. Hence, it is required that we make a new syllabus of record because it is an elective course for Language and System track (LAS) to meet the ABET criteria.

4. The old syllabus of record

Does not exist. We are applying under the provision of Syllabus of Record Amnesty for expedited review.

Part-III Letters of Support or Acknowledgement

Not applicable