

COURSE DESCRIPTION

Dept., Number	CSci 541	Course Title	Expert Systems and Logic Programming
Semester hours	3	Course Coordinator	H. Conrad Cunningham, Professor

Current Catalog Description

Expert systems and knowledge engineering. Computer systems to emulate human expertise. Rule-based and other knowledge representation techniques. Knowledge engineering as a model for expert systems development; logic programming for expert systems implementation.

Textbook

Ivan Bratko. *Prolog Programming for Artificial Intelligence*, 3rd edition, Addison-Wesley, 2001.
Patrick Blackburn, Johan Bos, and Kristina Striegnitz. *Learn Prolog Now*, free online textbook, <http://www.coli.uni-saarland.de/~kris/learn-prolog-now/>, 2007.

References

Class website: <http://www.cs.olemiss.edu/~hcc/csci541/csci541.html>
SWI Prolog website: <http://www.swi-prolog.org/>

Course Outcomes

Upon successful completion of this course, the students:

1. know the concepts and terminology of the logic programming paradigm,
2. are able to solve problems by writing programs in Prolog,
3. are able to represent knowledge in a suitable form for use with Prolog and typical rule-based expert systems shells.

Relationship between Course Outcomes and Program Outcomes

This is a course taken primarily by beginning computer science graduate students; it is sometimes taken by undergraduate computer science students as an elective to enrich their programs. The course outcomes contribute to the program outcomes as follows: (1) to (a); (2) to (c); and (3) to (b).

Prerequisites by Topic

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| <ol style="list-style-type: none"> 1. Basic discrete mathematics (Math 301) 2. Fundamental programming concepts and skills (CSci 112, 211) 3. Basic data structures and algorithms (CSci 112, 211) 4. Recursion (CSci 112, 211) |
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Major Topics Covered in the Course

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| <ol style="list-style-type: none"> 1. Introduction to logic programming. Facts, rules, and queries. (3 hours) 2. Prolog programming. Matching and proof search. (3 hours) 3. Recursion. (3 hours) 4. Lists and arithmetic (6 hours) 5. Examining terms. (3 hours) 6. Cuts and negation. (3 hours) 7. Controlling backtracking and database manipulation. (3 hours) 8. Input/output and files. (3 hours) 9. Search strategies. (3 hours) 10. Knowledge representation, expert systems, and rule-based programming. (6 hours) 11. Exams (3 hours) |
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Assessment Plan for the Course

<p>This is an elective course offered infrequently (e.g., only once in the past six years) and primarily to computer science graduate students. An offering typically has 4 examinations and 5 homework assignments. Outcome 1 is assessed by several exam questions and 1 homework assignment, outcome 2 by several exam questions and 3 homework assignments, and outcome 3 by several exam questions and 1 homework assignment. The instructor evaluates the student performance informally and makes changes to the course content, organization, and pedagogy as appropriate for subsequent offerings of the course.</p>

How Data in the Course are Used to Assess Program Outcomes (unless adequately covered already in the assessment discussion under Criterion 4)

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Estimate Curriculum Category Content (Semester hours)

Area	Core	Advanced	Area	Core	Advanced
Algorithms			Software design		1
Data structures		1	Concepts of programming languages		1