

6.871
KNOWLEDGE-BASED APPLICATIONS SYSTEMS
SPRING 2006

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Prerequisites: 6.034, 6.824, equivalent course, or equivalent experience.

Work in the course has six main components:

- **Readings:** There are substantial readings from original literature that go with each lecture; you are expected to read them in preparation for the lecture.
- **Reading summary assignments:** These are short written assignments covering the readings for a particular lecture; they will help you focus on important issues and supply a mechanism to give you credit for doing the reading. They will be handed out one class prior to the class during which they are due. You are expected to write about a half page and to turn it in at the *beginning* of the lecture covering the topic.
- **Lectures:** You are expected to have done the reading associated with a lecture and to participate in class discussion. You are responsible for what happens in class; while the course has a web site, not everything announced in class will necessarily appear on the web site.
- **Term project:** Each student is required to build a knowledge-based system in a domain of his or her own choice and to describe the project both orally and in a written term paper. You may work individually or collaborate in groups of size two (no larger).
- **Project reports:** To ensure that the project is done on a timely basis, you will be required to turn in three project reports: an initial proposal and two progress reports. We will comment on these reports to help ensure that a project choice is appropriate in character and scope, and to help give you guidance for any difficulties you're having.
- **Problem sets:** Problems sets give hands-on experience in using ideas developed in the course.

Grades in the course will be determined by the term project (including your paper describing the project and your presentation of it), performance on project reports, problem sets, reading summary assignments, and participation in class.

Knowledge-Based Application Systems
Randall Davis

Class Lecturer* Date Topic*

INTRO & BACKGROUND

1	RD	Tu Feb 7	Course Organization; spirit of the undertaking
2	RD	Th Feb 9	Tell it what to know; search

THE SPIRIT AND PRAGMATICS OF KBS

3	RD	Tu Feb 14	Origins of KBS: MACSYMA and DENDRAL <i>Problem Set 1 Out: Minesweeper</i>
4	RD	Th Feb 16	Application Analysis Case Study: Case Introduction
		Tu Feb 21	No class (virtual Monday)
5	RD	Th Feb 23	Application Analysis Case Study: Class Discussion <i>Problem Set 1 Due</i> <i>Case study write up due; reading summaries start</i>
6	RD	Tu Feb 28	Rule-Based Systems <i>Problem Set 2 Out: Rule based systems (simulated)</i>

KNOWLEDGE REPRESENTATIONS AND REASONING PARADIGMS

7	RD	Th Mar 2	Semantic Nets
8	HES	Tu Mar 7	Logic
9	RD	Th Mar 9	Frame-Based Systems
10	RD	Tu Mar 14	Overview of Knowledge Representation <i>Problem Set 2 Due</i>
11	RD	Th Mar 16	Pragmatic Issues in Knowledge Acquisition <i>Project Report 1 (Proposal) Due</i> <i>Problem Set 3 Out: Rules based systems in Joshua</i>
12	HES	Tu Mar 21	Uncertain Reasoning, Models of Rationality
13	KK	Th Mar 23	Blackboards <i>Problem Set 3 Due</i>
		Mar 28, 30	Spring Vacation

PROBLEM SOLVING PARADIGMS

14	HES	Tu Apr 4	Problem Solving Paradigms: Intro and Examples
15	HES	Th Apr 6	Diagnosis and Assembly <i>Project Report 2 (Progress) Due</i>
16	RD	Tu Apr 11	Model-Based Reasoning
17	KK	Th Apr 13	Case-Based Reasoning
		Tu Apr 18	Patriots' Day Vacation
18	HES	Th Apr 20	Reasoning with Constraints
19	HES	Tu Apr 25	Reasoning about Physical Systems <i>Project Report 3 (Progress) Due</i>

RESEARCH ISSUES

20	tbd	Th Apr 27	Common Sense
21	LPK	Tu May 2	Learning
22	RD	Th May 4	Ontologies and Data Mining
23	You	Tu May 9	Project Presentations and Discussion

PROJECT PRESENTATIONS

24	You	Th May 11	Project Presentations and Discussion
25	You	Tu May 16	Project Presentations and Discussion
26	You	Th May 18	Project Presentations and Discussion <i>Term Project Report Due</i>

* Subject to change.