

CAP 6685 - Expert Systems
CAP 4680 - Knowledge Based Systems
Spring 2013

SUBJECT MATERIAL

This course presents an in-depth examination of expert or knowledge-based systems. Topics to be covered include architectures, knowledge representation structures, building techniques, and design tools and shells for constructing expert systems; the life-cycle of expert systems; and evaluating expert systems. Details of specific expert systems and expert system shells will be covered.

TEXTS

Engineering Knowledge-Based Systems: Theory and Practice, by Avelino Gonzalez and Douglas Dankel II. This is the main text for the course and all of the assigned readings will come from it. It will be provided on-line in Sakai to all students.

LECTURE NOTES. This is a copy of all of the overhead slides that will be used during the class. A copy of these notes is available on-line in both Powerpoint and PDF formats for students to print. Parts of these notes have been left out for students to fill in during the lecture. I will not provide a copy of the completed notes to students.

INSTRUCTOR

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SUPPLIES

It is recommended that you have a version of Lisp available. Note that you will *not* be programming using Lisp; there are, however, several coded examples in the book that use Lisp so if you wish to execute these code fragments, you will need Lisp. The CISE lab has CLISP Common Lisp on the SUN workstations (just type: `gc1` to get it). For a PC use Allegro Common Lisp (limited use download available at www.allegro.com).

The course will involve a project using CLIPS. A copy of Version 6.2 this system is available in our class space on e-Learning System. This program runs on PCs and the source code (written in C) is provided should you desire to execute this system on some other platform (SUNs, etc.). Locally, you execute CLIPS in the SUN workstations by typing `clips` or by executing the version created by Ken Watford that you can download from our class space.

Additional software will be distributed which will require access to a PC. There might be homework assignments requiring the execution of this software.

EXAMINATIONS

Two take-home examinations will be given during the semester. The first examination will be given out approximately 1/2 way through the semester. Students will be given 24 hours for this examination (unless an exception is granted by the instructor). The second examination will be given out on the last day of class and will be due on Friday of that week. Each examination will concentrate on the newly presented material, but I reserve the right to ask questions over the

previous material. Everyone is expected to do their own work on the take-homes. No assistance from anyone, from within or outside class, will be allowed. Failure to comply with this rule will result in a minimum penalty of a grade of zero (0) on that examination. Any suspicion of collaboration by anyone in the class will result in the second exam being replaced with one in-class examination and a final examination on the date of our scheduled final.

PROJECT

Each student will develop a project during the semester. This project will involve the creation of rule-based system. The domain of the project will be discussed in a later handout. The completed project will be due on the last day of class. Periodic deadlines involving the creation of some portion of the project and written reports will be specified in this later handout.

GRADING

Grading for this course shall be weighted approximately:

| | |
|---------------|-----|
| Examination 1 | 25% |
| Examination 2 | 35% |
| Project | 30% |
| Homework | 10% |

The percentages for the homework and project might vary by, at most, 5% and will be determined by the number of homework assignments given.

ASSIGNED READINGS

The following is a list of the readings to be completed during the specified weeks of the semester. These readings will correspond very approximately with the lecture material.

| Week | Assignment For The Week |
|------|---------------------------------|
| 1 | Chapter 1 |
| 2 | Chapters 2 and 3 |
| 3 | Chapters 6 & 7 |
| 4 | Chapter 4 |
| 5 | Chapter 5 |
| 6 | Chapter 9 |
| 7 | Chapter 10 |
| 8 | Chapter 11 |
| | No Readings - Spring Break Week |
| 9 | Chapter 12 |
| 10 | Chapters 16 and 17 |
| 11 | Chapters 18 and 19 |
| 12 | Chapters 20 and 21 |
| 13 | Chapter 22 |
| 14 | Chapter 23 |
| 15 | No reading |

All assigned chapter readings are from *Engineering Knowledge-Based Systems: Theory and Practice* which is provided on-line.

CHEATING

Unfortunately, it is necessary to mention the subject of cheating. Some of the exercises given in this class require the development of short programs or program fragments, and there are always *many* correct solutions to any non-trivial programming problem. It is sometimes difficult for students and instructors to determine what constitutes cheating or academic dishonesty in this setting. Each exercise, if carried out by the student, will give the student understanding, or will reinforce the student's understanding, of an important knowledge-based system concept. Hence,

the student is permitted to *inspect* related problems and ask questions of the instructor and others in the class about the problem and related problems, but the student is **not** permitted to **copy** the work of *any* others, *including but not limited to* the instructor, previous TAs, or other students who are taking the class or who previously took the class. Likewise, students allowing others to copy their own work are guilty of cheating.

The exercises assigned for this course are **not** team projects unless the instructor **explicitly** tells you so. You may consult with others when attempting to develop your solutions to assignments. It is legitimate for two individuals to **plan** together the general approach, which they will **individually** use in solving a problem. But once any **significant** details of the development and coding of the program starts, collaboration should cease. This does not mean that students may not help each other, there are just limits to "helping". You cannot develop a single solution working together as a team with other students. Two identical or *nearly identical* solutions to the same problem will be regarded as evidence of over- collaboration and will be dealt with as cheating. The borderline where simply consulting with others becomes working as a team or copying is a gray area. If you have any doubts, you probably are working too closely and should stop – go off and work by yourself.

Because computer resources are shared, it is essential that all students use them in a way that respects the rights of others. Any attempt to copy other people's assignments, destroy other people's data or code, or deny the use of the computer to others is unethical and is considered a violation of academic honesty guidelines. The bottom line is, ***do not misuse the computer!***

Do not cheat! Do not copy others work! Immerse yourself in the class. Learn the material. The benefit and enjoyment you will receive will be much more valuable than any consequences of cheating. **Do not even think about cheating!** You do not realize how easy it is for us to identify who has cheated and to prove it to others. Individuals who have misrepresented work as being their own **or** who have *assisted* another will receive as a **minimum**: a grade of *zero* on that assignment **and** a decrease of *one letter grade* on their final course grade. This is *in addition* to any other penalties given by Student Affairs. Every one of you should examine the Academic Honesty Guidelines and Student Conduct Code in the *University of Florida Undergraduate/Graduate Catalogs* for more details. ***Ignorance of these Guidelines is no excuse!***

STUDENTS WITH DISABILITIES

Students requesting classroom accommodation must first register with the Dean of Students Office. The Dean of Students Office will provide documentation to the student who must then provide this documentation to the course coordinator when requesting accommodation.

UF COUNSELING SERVICES

Resources are available on-campus for students having personal problems or lacking clear career and academic goals. The resources include:

- University Counseling Center, 301 Peabody Hall, 392-1575, Personal and Career Counseling.
- SHCC mental Health, Student Health Care Center, 392-1171, Personal and Counseling.
- Center for Sexual Assault/Abuse Recovery and Education (CARE), Student Health Care Center, 392-1161, sexual assault counseling.
- Career Resource Center, Reitz Union, 392-1601, career development assistance and counseling.