

CAP 4621

Artificial Intelligence

Subject Material

CAP 4621, Artificial Intelligence

Credits: 3; Prereq: COP 3530.

Introduction to artificial intelligence concepts. Heuristic search, clause form logic, knowledge representation, reasoning and inference, overview of computer vision, planning, natural language, Lisp and Prolog.

This course presents an overview of Artificial Intelligence concentrating on the core concepts of problem solving, heuristic search, and knowledge representation. It examines the application of the core concepts in some of A.I.'s application areas: natural language processing, expert systems, vision, planning, and learning. Lisp, one of the major A.I. languages, will be introduced while Prolog will be deferred to CAP 4680, a following course.

Class Meeting Times

This course meets every MWF during the semester for lecture from 9:35 – 10:25 a.m. (3rd hour) in 222 CSE.

Instructor

Dr. Douglas Dankel II

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Office Hours: 10:40 – 11:30 a.m., (4th Hr) MWF
Other times BY APPOINTMENT ONLY.

Teaching Assistants

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On-Line Materials

Materials (handouts, lecture notes, assignments, etc) will be available on the course's website in Sakai (<http://lss.at.ufl.edu>). It is *your* responsibility to log-on to Sakai **regularly** using your Gator Link account so you do not miss material.

Texts

Ben Coppin's *Artificial Intelligence Illuminated* published by Jones and Bartlett is the required text for the class. All of the reading assignments are from this book. I will roughly follow this text, but will skip some material, greatly supplement some topics, and add others. View it as a highly recommended supplement to the lectures. Do **not** view it as a substitute to attending class since material not discussed in the book will be presented in lecture.

A Lisp text is available on-line: <http://www-2.cs.cmu.edu/Groups/AI/html/cltl/clt12.html>. If you would prefer to have a hard copy text to reference, consult the course's on-line Lisp textbook list to pick one.

Lecture Notes. A copy of all of the overhead slides that will be used during the class is available on-line in both PowerPoint and PDF formats. Students *should print out or use an electronic copy of these* for taking notes in class. Note that material *has been left out* of the notes – this is material for you to fill in during

lecture. I will *not* provide the completed set of notes.

Examinations

Two examinations will be given during the semester. Each examination will be a 24-hour take-home. The first examination is tentatively scheduled half way through the term and will be due in my office by 4 p.m. on the following day. The second examination will be given out on the last day of class (Dec. 5) and will be due in my office no later than 4 p.m. on Friday, December 7. Students are free to use any notes that *you* have taken in class, your text book, and/or reference materials from the library in working the examinations.

No collaboration with others (anyone in the class or not) will be permitted. Note: these take home examinations are a privilege granted to you. Should I discover collaboration (or even hints of it) has occurred on the first examination, one in-class examination and a final will be substituted for the second examination (both closed book and notes) and ***all*** subsequent offerings of this class will have in-class examinations. Do not lose this privilege for yourself, your classmates, and future students in this class like some graduate students did for this course's graduate equivalent.

Assigned Readings

The following is a list of the readings to be completed during the specified weeks of the semester. These readings will not all correspond with the material covered in lecture. They instead act as supplements to the lecture material.

Week	Assignment For The Week
8/20	Chapter 1
8/27	Chapter 1
9/ 3	Chapter 2
9/10	Chapter 3
9/17	Chapter 3
9/24	Chapter 4
10/ 1	Chapter 4 & 5
10/ 8	Chapter 5
10/15	Chapter 6
10/22	Chapter 7
10/29	Chapter 8
11/ 5	Chapter 9
11/12 – 12/ 3	chapters based on coverage

All readings are from *Artificial Intelligence Illuminated*.

Attendance

Attendance during the semester will not be recorded. I will make every attempt to make this class interesting and enjoyable in the hope that you will want to attend. However, all of you are “big boys and girls” and, as a result, are free to make your own decision concerning attendance. One word of caution is in order: Some of the material that I will cover is not documented in texts and on-line materials and some is extremely difficult to locate, so I do recommend that you attend so you do not miss this material.

Cheating

All students admitted to the University of Florida have signed a statement of academic honesty committing them to be honest in all academic work and understanding that failure to comply with this commitment will result in disciplinary action. This statement is a reminder to uphold your obligation as a UF student and to be honest in all work submitted and exams taken in this course and all others.

Unfortunately, it is necessary to mention the subject of cheating. While the following discusses cheating

involving programming, *the general ideas apply to any assignment given within the course*. 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 A.I. 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, other students (who are, have or have not taken the class), or any other individual(s). 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 **discuss** the assigned problem so they both *understand what is being asked*. But once any 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 are working too closely and should stop – go off and work by yourself.

All faculty, staff and student of the University are required and expected to obey the laws and legal agreements governing software use. Failure to do so can lead to monetary damages and/or criminal penalties for the individual violator. Because such violations are also against University policies and rules, disciplinary action will be taken as appropriate. We, the members of the University of Florida community, pledge to uphold ourselves and our peers to the highest standards of honesty and integrity.

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 any computer or the computer lab!**

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 Catalog* for more details. Ignorance of these Guidelines is no excuse!

Grading

Grading for students in this course shall be weighted approximately:

Midterm Examination	25%
Final Examination	30%
Project	30%
Homework	15%

The grading of the main project will be according to the following scale:

Initial Demonstration	10%
Intelligence Report	15%
Tournament Play	15%
Final Demonstration	25%
Final Report	35%

Any of these values can be changed by $\pm 5\%$.

Note: A "C-" will not be a qualifying grade for critical tracking courses. To graduate, students must have an overall GPA and an upper-division GPA of 2.0 or better (C or better). Note: a C-average is equivalent to a GPA of 1.67, and therefore, it does not satisfy this graduation requirement. For more information on grades and grading policies, please visit:

<https://catalog.ufl.edu/ugrad/current/regulations/info/grades.aspx>

The following chart identifies grade guarantees (if you make above 92 you are guaranteed a grade no lower than “A”). The percentages required for each grade category might be lowered based on the distribution of grades at the end of the semester.

Total Point Percentage Range	Letter Grade
$TP \geq 92$	A
$92 > TP \geq 90$	A-
$90 > TP \geq 88$	B+
$88 > TP \geq 82$	B
$82 > TP \geq 80$	B-
$80 > TP \geq 78$	C+
$78 > TP \geq 72$	C
$72 > TP \geq 70$	C-
$70 > TP \geq 68$	D+
$68 > TP \geq 62$	D
$62 > TP \geq 60$	D-
$60 > TP$	E

Recommended Lisps

If you elect to use Lisp for your semester project, a Lisp text is available on-line: <http://www-2.cs.cmu.edu/Groups/AI/html/cltl/cltl2.html>. If you would prefer to have a hard copy text to reference, consult the course’s on-line Lisp textbook list to pick one. Those who elect to use Lisp will receive a 10% bonus on their project (given at the end of the term when the project is completed).

The following recommendations are aimed at students interested in obtaining a version of Lisp to use at home on their own PC. There are three versions of Lisp that I recommend for you to use on your class project.

1. **Allegro Common Lisp.** Most likely the best implementation of Common Lisp for PCs. It has an excellent development environment with an outstanding debug facility. They have made a *free* time-limited version of this system available on their web site – once the time limit is exceeded, you can renew your copy! If you wish to purchase a copy you should recognize that an excellent system can be expensive -- the cost of this system is ~\$1000! Their home page is: <http://www.franz.com>! Highly recommended!
2. **CLisp.** CLISP is a Common Lisp (CLtL1 + parts of CLtL2) implementation by Bruno Haible of Karlsruhe University and Michael Stoll of Munich University, both in Germany. This is available on the department’s Unix machines. It runs on microcomputers (DOS, OS/2, Atari ST, Amiga 500-4000) as well as on Unix workstations (Linux, Sun4, Sun386, HP9000/800, SGI, Sun3 and others) and needs only 1.5 MB of RAM. It is free software and may be distributed under the terms of GNU GPL. CLISP includes an interpreter, a compiler, a subset of CLOS (the Common Lisp Object System), and, for some machines, a screen editor. Available for free downloading by anonymous ftp from the CLISP Organization where versions are available for many different platforms and pointers are provided to Lisp documentation.

3. For those of you that are using Linux, consider using GCL (GNU Common Lisp). This is an excellent implementation that has been around for many years.

Accommodation for Students with Disabilities

Students requesting classroom accommodation must first register with the Dean of Students Office. That office will provide the student with documentation that he/she must provide to the course instructor 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:

- UF Counseling & Wellness Center, 3190 Radio Rd, 392-1575, psychological and psychiatric services.
- Career Resource Center, Reitz Union, 392-1601, career and job search services.