RATIONAL AND COURSE DESCRIPTION:

Artificial Intelligence has come out of the closets of the scientists and has found increasing appli-
cation in the engineering and business world. While design and manufacture of hardware is generally asso-
ciated with the engineering attribute, the concept of engineering of knowledge has only recently come un-
der discussion. Principles of engineering have been applied to the planning and development of software,
i.e. software engineering has evolved as a discipline in computer science that uses such methods as analysis
of requirements, specifications, planning and modular design, prototyping, and implementing the design in
appropriate programming languages, and finally, operational application.

Knowledge Engineering goes beyond software engineering in that Knowledge bases are created
that incorporate know-how and knowledge of experts in domain-specific knowledge stores which, in con-
trast to simple data bases, have learning and reasoning power.

This course develops two parallel approaches to knowledge engineering: For one, the lecture is
designed to discuss the fundamentals of artificial intelligence as it applies to knowledge engineering and
the development of expert systems.

The second part of this course is devoted to the practical application of the concepts: The students,
under the guidance of the professor, will learn to develop mini-expert systems of their choice that will in-
corporate the concepts of expert systems and the techniques of knowledge engineering to assist practition-
ers in different fields (e.g. auto mechanic, medical doctors, etc.) in diagnosing malfunctions and/or project-
ing potential solutions to problem

LEARNING OBJECTIVE:

The main objective of this course is to provide the students with an understanding of the prin-
ciples of knowledge engineering and the design and development, planning, and management of an expert
system

MODES OF LEARNING INTERACTIONS AND SOURCES OF INFORMATION:

The recommended textbooks and notes are considered merely as an introduction to this course. The
students are encouraged to develop a broad outlook. Thus, all students are required to participate in the
collection and interpretation of information that expands beyond the horizons of the computer science dis-
cipline. The students should use traditional resources (books, journals, libraries, etc.) as well as global elec-
tronic communication facilities (Internet, telecommunication, multimedia, etc.). The knowledge acquired
will be collated electronically in a hypertext-hypermedia and multimedia environment that can multi-

dimensionally be accessed and transmitted via communication networks.

PREREQUISITES:

CPSC 660 Introduction to Artificial Intelligence or instructor’s permission
CPSC 390/820 Software Engineering

INTENDED AUDIENCE:

Computer Science Majors and Advanced Computer Programmers

TEXTBOOKS, AUTHORING & READING MATERIAL:

Required:

Jcafe, inc.: Guide Author Electronic Multimedia Publishing Tool, Student Edition 5.0

ACTIVITIES:

This course requires a strong sense of independence on the part of the students. As an impor-
tant initiation into the subject matter, students should read the recommended material and get some feeling
about the subject matter. However, this course is primarily a participatory effort to study implications of
new technology on the process of conveying ideas to a professional audience in a multi-dimensional ap-
proach. Specifically, the students are encouraged to get familiar with Guide Author™ as an electronic au-
thoring tool for their project development and presentations.

The students are encouraged to actively research the subject matter using traditional as well as
state-of-the-art channels of communication. The results may be presented in colloquia, as written reports,
co-authored papers, proposals etc. that may have the potential for contributions in professional publica-
tions. The faculty is essentially tutoring the learning process as primus inter pares, first among equals, ra-
ther than exclusively lecturing ex cathedra, and learning is done in the triangular configuration of student-
instructor-computer interaction.

COURSE EVALUATION:

Homework and Class Participation 10%
Midterm Exam 30%
Final Exam 30%
Project 30%

Letter grades will be given based on a statistical evaluation of the overall number grades.
**TENTATIVE CLASS SCHEDULE**

NOTE: Numbers in parenthesis refer to the chapters in our Guide Author™ Notes. The scheduled material may be subject to change.

<table>
<thead>
<tr>
<th>Date</th>
<th>Topics</th>
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<tbody>
<tr>
<td>05 May</td>
<td>Prologue: Cogito, ergo sum: I think, therefore I am Review of Artificial Intelligence (WKR: 1, 2, 3)</td>
</tr>
<tr>
<td>07 May</td>
<td>Formalized Symbolic Logics (WKR: 4)</td>
</tr>
<tr>
<td>12 May</td>
<td>Dealing with Inconsistencies and Uncertainties (WKR: 5)</td>
</tr>
<tr>
<td>14 May</td>
<td>Probabilistic Reasoning (WKR: 6)</td>
</tr>
<tr>
<td>19 May</td>
<td>Structured Knowledge</td>
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<td></td>
<td>Object-Oriented Representations (WKR: 7 &amp; 8)</td>
</tr>
<tr>
<td>21 May</td>
<td>Search and Control Strategies (WKR: 9)</td>
</tr>
<tr>
<td>26 May</td>
<td>Matching Techniques</td>
</tr>
<tr>
<td></td>
<td>Knowledge Organization and Management (WKR: 10 &amp; 11)</td>
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<tr>
<td>28 May</td>
<td><strong>Midterm Exam</strong></td>
</tr>
<tr>
<td>02 Jun</td>
<td>Natural Language Processing (WKR: 12)</td>
</tr>
<tr>
<td>04 Jun</td>
<td>Pattern Recognition</td>
</tr>
<tr>
<td></td>
<td>Visual Image Understanding (WKR: 13 &amp; 14)</td>
</tr>
<tr>
<td>09 Jun</td>
<td>Expert Systems Architecture (WKR: 15)</td>
</tr>
<tr>
<td>11 Jun</td>
<td><strong>Presentation of Projects</strong></td>
</tr>
<tr>
<td>16 Jun</td>
<td><strong>Presentation of Projects</strong></td>
</tr>
<tr>
<td>18 Jun</td>
<td><strong>Final Exam</strong></td>
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**Note:** This Syllabus may be downloaded in pdf-form from our website:  
http://faculty.govst.edu/science/faculty/rudloff/wkr.htm

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