The University of Georgia

Department of Computer Science

Course Information Sheet

CSCI 4330

Artificial Intelligence and the Web

Brief Course Description
(50-words or less)

The application of artificial intelligence methodologies and algorithms to problems involving the world wide web. Introduction to problem-solving, knowledge representation, learning, and reasoning techniques and exploration of how they are applied to enable information provisioning, social networking, and service provisioning on the web.

Extended Course Description / Comments

This course will explore and study the AI techniques, systems, and concepts relevant to an intelligent WWW. The student will understand the different ways the Web is being used and develop the art of preparing and delivering fluid, concise, and effective talks and presentations.

Pre-Requisites and/or Co-Requisites

CSCI 2720
Data Structures

Approved Textbooks

Author(s): Rajendra Akerkar, Pawan Lingras
Title: Building an Intelligent Web Theory and Practice
Edition: 2nd
ISBN-13: 978-0-7637-4137-2

Author(s): Stuart J. Russell, Peter Norvig
Title: Artificial Intelligence A Modern Approach
Edition: 3rd
ISBN-13: 978-0-13-604259-4

Specific Learning Outcomes (Performance Indicators)

At the end of the semester, all students will be able to do the following:

1. Represent documents using Term-Document Matrix and perform stemming using Porter's Stemming algorithm.
2. Design and implement retrieval models such as Boolean Retrieval Model and Vector Space Model.
3. Evaluate retrieval performance using Precision, Recall and F-Measure.
4. Build Intelligent Web interfaces which include user modeling and Web personalization.
5. Apply resolution-refutation for theorem proving.
6. Develop ontologies using RDF syntax or OWL in Protégé.
7. Represent knowledge using logics in First-Order and Description logic.
8. Implementing Web services in WSDL and understanding technologies, SOAP and REST for Web service development.
9. Compose Web services in BPEL and understand choreography and orchestration models for Web service composition.
10. Prepare and deliver fluid, concise, and effective talks and presentations

Relationship between Student Outcomes and Learning Outcomes

		Student Outcomes										
		a	b	c	d	e	f	g	h	i	j	k
Learning Outcomes	1	•		•								•
	2	•	•	•								
	3			•								
	4	•	•							•	•	•
	5	•										
	6			•						•	•	
	7	•		•								
	8	•	•	•						•	•	•

Student Outcomes

a. An ability to apply knowledge of computing and mathematics appropriate to the discipline.
b. An ability to analyze a problem, and identify and define the computing requirements appropriate to its solution.
c. An ability to design, implement, and evaluate a computer-based system, process, component, or program to meet desired needs.
d. An ability to function effectively on teams to accomplish a common goal.
e. An understanding of professional, ethical, legal, security and social issues and responsibilities.
f. An ability to communicate effectively with a range of audiences.
g. An ability to analyze the local and global impact of computing on individuals, organizations, and society.
h. Recognition of the need for and an ability to engage in continuing professional development.
i. An ability to use current techniques, skills, and tools necessary for computing practice.
j. An ability to apply mathematical foundations, algorithmic principles, and computer science theory in the modeling and design of computer-based systems in a way that demonstrates comprehension of the tradeoffs involved in design choices.
k. An ability to apply design and development principles in the construction of software systems of varying complexity.

Major Topics Covered

Information retrieval (5 hrs)
Web data mining and clustering (2 hrs)
Link analysis (5 hrs)
Natural language processing techniques (2 hrs)
User modeling (1 hr)
Web personalization (1 hr)
Knowledge representation using logic (6 hrs)
Theorem proving (1 hr)
Knowledge representation and trust (1 hr)
Semantic web and social networking (2 hrs)
Ontology modeling (7 hrs)
Ontology reconciliation (2 hrs)
Web services modeling (3 hrs)
Web services discovery and negotiation (3 hrs)
Automatic web service composition (2 hrs)
Web processes: composition and choreography (2 hrs)
Probabilistic modeling of web processes (1 hr)
Single and multi-agent frameworks for Web (1 hr)
Exams (3 hrs)

Assessment Plan for this Course

Each time this course is offered, the class is initially informed of the Course Outcomes listed in this document, and they are included in the syllabus. At the end of the semester, an anonymous survey is administered to the class where each student is asked to rate how well the outcome was achieved. The choices provided use a 5-point Likert scale containing the following options: Strongly agree, Agree, Neither agree or disagree, disagree, and strongly disagree. The results of the anonymous survey are tabulated and results returned to the instructor of the course.

The course instructor takes the results of the survey, combined with sample student responses to homework and final exam questions corresponding to course outcomes, and reports these results to the ABET committee. If necessary, the instructor also writes a recommendation to the ABET committee for better achieving the course outcomes the next time the course is offered.

How Data is Used to Assess Program Outcomes

Each course Learning Outcome, listed above, directly supports one or more of the Student Outcomes, as is listed in "Relationships between Learning Outcomes and Student Outcomes".

Course Master
Course History

Dr. Prashant Doshi