CS 431/CMPE 431 : Advanced Topics in AI

Instructor's Name:	Asim Karim	**Year:**	2002-2003
Office No. & Email:	**132** akarim@lums.edu.pk	**Quarter:**	Winter
Office Hours:	**MW 10.30 AM to 12.00**	**Category:**	Senior
TA for the Course:	**TBA**		

Course Code (Units)	**CS 431/CMPE 431 : Advanced Topics in AI (3 Units)**
Course Description	A survey of selected advanced topics in AI. Emphasis on reasoning under uncertainty, machine learning, evolutionary computing, data mining, and natural language processing.
Core/Elective	Elective
Pre-requisites	CS 231; introductory course in Probability
Goals	**1.** To introduce advanced techniques in machine reasoning and learning **2.** To train students in the design and implementation of intelligent systems **3.** To expose students to practical challenges in AI (data mining and NLP) **4.** To provide a foundation for research and development and advanced courses in AI
TextBooks, Programming Environment, etc.	A. Artificial Intelligence: A Modern Approach by S. Russell and P. Norvig, Prentice Hall, NJ, 1995 B. Data Mining: Concepts and Techniques by J. Han and M. Kamber, Morgan Kaufmann Publishers, San Francisco, 2001. C. Handouts
Lectures	*Two Sessions of 75 Minutes each*
Grading	Quizzes 20% Assignments 10% Term paper 15% Mid-Term Exam 25% Final Exam 30%

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Module	Topics	Weeks	Readings
1	**Intelligent Agents** • Overview and review • Intelligent agents	*1*	***A. Chapters 1 and 2***
2	**Handling Uncertainty** • Uncertainty • Bayesian theory • Belief nets • Decision making under uncertainty • Introduction to other approaches (fuzzy logic, Dempster-Shafer theory)	*2.5*	***A. Chapters 14-16***
3	**Machine Learning** • Introduction to machine learning • Learning in belief nets • Reinforcement learning	*2*	***A. Chapters 19-20***
	MIDTERM EXAM		
4	**Evolutionary Computing** • Genetic algorithms • Genetic programming	*1*	***A. Chapter 20.8*** ***C. Handout***
	Data Mining and Knowledge Discovery • Concepts • Preprocessing • Mining association rules • Classification and prediction • Cluster analysis	*2.5*	***B. Chapters 1, 3, 6-8*** ***C. Handout***
5	**Natural Language Processing**	*1*	***A. Chapter 23***
	FINAL EXAM		