Course Name: Knowledge Base Systems
Course Code: CS465

I. Basic Course Information

Major or minor element of program: Bachelors in CS and IS
Department offering the course: Computer Science Department

Academic level: 400 level
Semester in which course is offered: First (fall) Semester
Course pre-requisite(s): CS361 Artificial Intelligence

Credit Hours: 3
Contact Hours Through:

Lecture	Tutorial *	Practical *	Total
2.5	0.0	1.5	4.00

* 1.5 hours for **either** Tutorial or Practical

Approval date of course specification: September 2014

II. Overall Aims of Course

This course aims to provide principled development and deployment of knowledge-based systems. It offers an extensive reading in the historical literature of rule-based systems and approaches and methodology of knowledge engineering. Also it provides issues in knowledge acquisition, Pattern matching, knowledge modelling. and ontology development

III. Program ILOs covered by course

Program Intended Learning Outcomes (By Code)			
Knowledge & Understanding	Intellectual Skills	Professional Skills	General Skills
K2,K3,K4, K15	I1,I11,I13,I15	P6,P16	G2,G3,G6

IV. Intended Learning Outcomes of Course (ILOs)

a. Knowledge and Understanding

On completing the course, students should be able to:

K.1 Describe basic steps of knowledge system development.
K.2 Label the essential elements of knowledge engineering.
K.3 Define the basic concepts of Knowledge Based Systems.
K.4 Get acquainted with some knowledge based system applications.
K.5 Extrapolate the knowledge based system development life cycle.

b. Intellectual/Cognitive Skills

On completing the course, students should be able to:

I.1 Model and analyze the knowledge intensive tasks.
I.2 Appraise the different KBS modelling techniques.
I.3 Criticize the suitability of modeling techniques for a problem/domain.
I.4 Apply ontology engineering to build real world KBS.
I.5 Analyze and design a KBS for a simple domain.

c. Practical/Professional Skills

On completing the course, students should be able to:

P.1 Implement a KBS for a simple domain.
P.2 Express knowledge of a domain in a suitable knowledge representation formalism like ontology.

d. General and Transferable Skills

On completing the course, students should be able to:

G.1 Deploy communication skills.
G.2 Work effectively within a group to analyze, design and implement a KBS.
G.3 Work to tight deadlines.
G.4 Present the final work in a demo.

V. Course Matrix Contents

	Main Topics / Chapters	Duration (Weeks)	Course ILOs Covered by Topic (By ILO Code)			
			K & U	I.S.	P.S.	G.S.
1-	Introduction to knowledge engineering	1	K1,K2,K3,K5	[ ]	[ ]	G3
2-	Expert systems development	2]	K3,K4	I1,I5	All	All
3	Handling uncertainty in KBS	[2]	K2, K3	I2,I3	[P2]	G2
4-	Knowledge engineering methodologies	1	K1	I2,I3,I4	P1	G3
5-	Ontology development	3	K2,K5	I2	P2	G4
6	Ontology languages	3	[K2,K4,K5]	[I4]	[P1,P2]	[G1,G2,G4]
	Net Teaching Weeks	**12**				

VI. Course Weekly Detailed Topics / hours / ILOs

Week No.	Sub-Topics	Total Hours	Contact Hours	
			Theoretical Hours	Practical Hours *
1	Introduction to knowledge engineering	3	3	
2	Knowledge based systems development life cycle	4	2.5	1.5
3	Introduction to Expert systems Applications and Domains	4	2.5	1.5
4	Expert System components	4	2.5	1.5
5	Methods for reasoning (forward and backward)	4	2.5	1.5
6	Uncertainty management	4	2.5	1.5
7	**Midterm Exam**			
8	Pattern Matching	4	2.5	1.5
9	Ontology Engineering	4	2.5	1.5
10	Ontology building	4	2.5	1.5
11	Ontology languages RDF	4	2.5	1.5
12	Ontology languages owl	4	2.5	1.5
13	Ontology languages owl	4	2.5	1.5
14	Ontology query language SPARQL	4	2.5	1.5
15	**Final Exam**			
Total Teaching Hours		**51**	**33**	**18**

* **No Practical/Tutorial during the first week of the semester**

VII. Teaching and Learning Methods

Teaching/Learning Method	Selected Method	Course ILOs Covered by Method (By ILO Code)			
		K & U	Intellectual Skills	Professional Skills	General Skills
Lectures & Seminars	*	K1,K2,K3,K5	All		
Tutorials					
Computer lab Sessions					
Practical lab Work	*		I4	All	G1,G2,G3
Reading Materials					
Web-site Searches					
Research & Reporting					G4
Problem Solving / Problem-based Learning					
Projects					
Independent Work	*	K3,K4	I5	All	
Group Work	*		I4		G2,G3,G4
Case Studies	*		I3	P1	All
Presentations					
Simulation Analysis					
Others (Specify):					

VIII. Assessment Methods, Schedule and Grade Distribution

Assessment Method	Selected Method	Course ILOs Covered by Method (By ILO Code)				Assessment Weight / Percentage	Week No.
		K & U	I.S.	P.S.	G.S.		
Midterm Exam	*	All	I1,I2,I3,I4			10%	7
Final Exam						60%	15
Quizzes	*	All				8%	
Course Work							
Report Writing	*				G1,G2,G3	2%	3,9,12
Case Study Analysis							
Oral Presentations							
Practical	*		All	All	G1,G2,G3	10%	4,6,8,10
Group Project	*		All	All	All	10%	12,14
Individual Project							
Others (Specify):							

IX. List of References

Essential Text Books	• Simon Kendel, Malcolm Creen, "An Introduction To Knowledge Engineering", Springer-Verlag London limited, 2007 • Joseph Giarratano and Gary Riley. ***Expert Systems Principles and Programming***. 4th ed., PWS Publishing, Boston, MA, 2004 • Rajendra makkar, Priti sajja , **Knowledge-Based Systems,** Jones & Bartlett Learning, 2010 • Lecture slides http://phd.jabenitez.com/wp-content/uploads/2014/03/A-Practical-Guide-To-Building-OWL-Ontologies-Using-Protege-4.pdf • http://www.linkeddatatools.com/introducing-rdfs-owl •
Course notes	• Handout Material and Presentations
Recommended books	• None
Periodicals, Web sites, etc …	• http://clipsrules.sourceforge.net/Version63.html • http://protege.stanford.edu/products.php

X. **Facilities required for teaching and learning**

List the facilities required • Computer Lab.

Course coordinator: Dr. Abeer Mohamed ElKorany

Head of Department: Dr. Abeer Mohamed ElKorany

Date: September 2014