Syrian Arab Republic		الجمهورية العربية السورية
Ministry of Higher Education	SVU	وزارة التعليم العالمي
Syrian Virtual University	الجامعـةالإفتراضيــة السوريــة Syrian Virtual University	الجامعة الافتراضية السورية

Course Description: Expert systems

1- Basic Information:

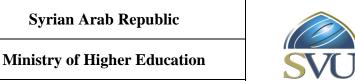
Course Name	Expert systems
Course ID	Ise_es
Contact Hours (Registered Sessions)	8 sessions 12 hours
Contact Hours (Synchronized Sessions)	12 sessions, 18 hours
Mid Term Exam	-
Exam	75 min
Registered Sessions Work Load	12 h
Synchronized Session Work Load	18 h
Credit Hours	3

2- Pre-Requisites:

Course	ID
Artificial Intelligence	AE

3- Course General Objectives:

This course which comes after Artificial Intelligence aims to teach uncertain Knowledge and Fuzzy logic and reasoning using these techniques



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4- Intended Learning Outcomes (ILO):

Code	Intended Learning Outcomes
ILO1	Knowing good expert systems' characteristics
ILO2	Building classic rule-based and frame-based expert systems
ILO3	Knowing Fuzzy logic and fuzzy knowledge representation
ILO4	Learning JESS programming language
ILO5	Learning fuzzification, de-fuzzification, fuzzy expert systems and fuzzy control systems
ILO6	Neural Networks (added this year)
ILO7	Pre-exam session

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- 5- **Course Syllabus** (12 sessions of 1 hour and a half each of total synchronized sessions;8 sessions of 1 hour and a half each of total Recorded Sessions)
 - RS: Recorded Sessions; SS: Synchronized Sessions;

ILO	Course Syllabus	RS	SS	Туре	Additional Notes
	Reminding of Intelligent systems and knowledge base			- Evening	
ILO1	systems, knowledge acquisition and computational. Expert and fuzzy systems (control and reasoning systems). Successful systems (ex.)	3	3 3	 Exercises Assignments Seminars Projects Practices Others 	
ILO2	Uncertainty processing, conflict resolutions, Objects frames and object orienting programming: abstraction, encapsulation, inheritance, Unified modeling language	1.5	1.5	 Exercises Assignments Seminars Projects Practices Others 	

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	(UML), frame based expert				
	systems				
ILO3	Classic logic and fuzzy logic, fuzzy sets, fuzzy prepositions, fuzzy sets' algebra, fuzzy computations	3	3	 Exercises Assignments Seminars Projects Practices Others 	
ILO4	Learning Jess language: fuzzy facts and rules representation, (Mamdani and Sojino methods), multi rules fuzzy expert systems	3	6	 √Exercises ✓Assignments Seminars Projects Practices Others 	
ILO5	Fuzzification and de- fuzzification, fuzzy reasoning: monotonic, downward- monotonic, non-monotonic, approximate reasoning	1.5	1.5	 ✓Exercises ✓Assignments Seminars Projects Practices Others 	
ILO6	Neural networks: perceptron, neural nets, examples, weights updates, multi-layers neural nets. programming		1.5	VExercises Assignments Seminars Projects Practices Others	Added this year
ILO7	Pre-exam session		1.5	VExercises Assignments Seminars Projects Practices Others	

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6- Assessment Criteria (Related to ILOs)

ISC	Interactive Synchronized Collaboration	Ex	Exams		Rpt	Reports
PF2F	Presentations and Face-to-Face Assessments	PW	Practice Wo	rk		

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ILO				Asse	essment	t Type	
Code	ILO	Intended Results	ISC	PW	Ex	PF2F	Rpt
ILO1	Knowing good expert systems' characteristics	Learning essential characteristics that guarantee expert systems' success: possibility of interpretation, updates, low cost, ease of use, reduce uncertainty and difficulty, learning possibility, support the expert,	N		N		N
ILO2	Building classic rule-based and frame-based expert systems	Reminding concepts, building systems using object oriented languages and unified modeling languages	N		N		N
ILO3	Knowing Fuzzy logic and fuzzy knowledge representation	Knowing fuzzy concepts, numbers, sets, rules, and fuzzy computations	7		N		7
ILO4	Learning JESS programming language	Knowing how to represent fuzzy facts and rules using Jess language and building fuzzy expert systems using Mamdani	N		V		V

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		and Sojino methods			
ILO5	Learning fuzzification, de- fuzzification, fuzzy expert systems and fuzzy control systems	Linking language variables with fuzzy functions. Applying fuzzification, de- fuzzification, and fuzzy reasoning	N	N	
ILO6	Neural Networks (added this year)	Understanding Neural nets and building small NN: learning and test	\checkmark	\checkmark	
ILO7	Pre-exam session	heterogeneous systems	\checkmark	\checkmark	

7-Practice Tools:

Tool Name	Description
Jess	Fuzzy systems' programming language

8-Main References

-Adrian HOPGOOD, "Intelligent systems for engineers and scientists", second edition, 2005, CRC press.

- William SILER "Fuzzy expert systems and fuzzy reasoning", 2005m John Wikey & Sons, Inc.

- Kostas METAXIOTIS, Demitris ASKOUNIS and Konstantions NIKOLOPOULOS "Identifying the characteristics of successful expert systems: an empirical evaluation", Int, J. Information Technology and Management, Vol. 5, No. 1, 2006.