

Syrian Arab Republic	 الجامعة الافتراضية السورية SYRIAN VIRTUAL UNIVERSITY	الجمهورية العربية السورية
Ministry of Higher Education		وزارة التعليم العالي
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

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	Type	Additional Notes
ILO1	Reminding of Intelligent systems and knowledge base systems, knowledge acquisition and computational. Expert and fuzzy systems (control and reasoning systems). Successful systems (ex.)	3	3	<input checked="" type="checkbox"/> Exercises <input checked="" type="checkbox"/> Assignments <input type="checkbox"/> Seminars <input type="checkbox"/> Projects <input checked="" type="checkbox"/> Practices <input type="checkbox"/> Others	
ILO2	Uncertainty processing, conflict resolutions, Objects frames and object orienting programming: abstraction, encapsulation, inheritance, Unified modeling language	1.5	1.5	<input checked="" type="checkbox"/> Exercises <input checked="" type="checkbox"/> Assignments <input type="checkbox"/> Seminars <input type="checkbox"/> Projects <input checked="" type="checkbox"/> Practices <input type="checkbox"/> 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	<input checked="" type="checkbox"/> Exercises <input checked="" type="checkbox"/> Assignments <input type="checkbox"/> Seminars <input type="checkbox"/> Projects <input type="checkbox"/> Practices <input type="checkbox"/> Others	
ILO4	Learning Jess language: fuzzy facts and rules representation, (Mamdani and Sojino methods), multi rules fuzzy expert systems	3	6	<input checked="" type="checkbox"/> Exercises <input checked="" type="checkbox"/> Assignments <input type="checkbox"/> Seminars <input type="checkbox"/> Projects <input type="checkbox"/> Practices <input type="checkbox"/> Others	
ILO5	Fuzzification and de-fuzzification, fuzzy reasoning: monotonic, downward-monotonic, non-monotonic, approximate reasoning	1.5	1.5	<input checked="" type="checkbox"/> Exercises <input checked="" type="checkbox"/> Assignments <input type="checkbox"/> Seminars <input type="checkbox"/> Projects <input type="checkbox"/> Practices <input type="checkbox"/> Others	
ILO6	Neural networks: perceptron, neural nets, examples, weights updates, multi-layers neural nets. programming		1.5	<input checked="" type="checkbox"/> Exercises <input checked="" type="checkbox"/> Assignments <input type="checkbox"/> Seminars <input type="checkbox"/> Projects <input type="checkbox"/> Practices <input type="checkbox"/> Others	Added this year
ILO7	Pre-exam session		1.5	<input checked="" type="checkbox"/> Exercises <input checked="" type="checkbox"/> Assignments <input type="checkbox"/> Seminars <input type="checkbox"/> Projects <input type="checkbox"/> Practices <input type="checkbox"/> 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 Work		

ILO Code	ILO	Intended Results	Assessment Type				
			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,...	√	<input type="checkbox"/>	√		√
ILO2	Building classic rule-based and frame-based expert systems	Reminding concepts, building systems using object oriented languages and unified modeling languages	√	<input type="checkbox"/>	√		√
ILO3	Knowing Fuzzy logic and fuzzy knowledge representation	Knowing fuzzy concepts, numbers, sets, rules, and fuzzy computations	√	<input type="checkbox"/>	√		√
ILO4	Learning JESS programming language	Knowing how to represent fuzzy facts and rules using Jess language and building fuzzy expert systems using Mamdani	√	<input type="checkbox"/>	√		√

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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	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>		<input type="checkbox"/>
ILO6	Neural Networks (added this year)	Understanding Neural nets and building small NN: learning and test	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>		<input type="checkbox"/>
ILO7	Pre-exam session	heterogeneous systems	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>		<input type="checkbox"/>

7-Practice Tools:

Tool Name	Description
Jess	Fuzzy systems' programming language

8-Main References

<p>-Adrian HOPGOOD, "Intelligent systems for engineers and scientists", second edition, 2005, CRC press.</p> <p>- William SILER "Fuzzy expert systems and fuzzy reasoning", 2005m John Wikey & Sons, Inc.</p> <p>- 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.</p>
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