Mansoura University

Faculty of Computers and Information Sciences

Course Specifications of

Computers Arabization and Language Technologies – CS428P

University: Mansoura University **Faculty**: Computer and Information Sciences

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Program on which the course is given: Computer Science

Department offering the course: Department of Computer Science

Academic year/ Level: Fourth Year – Level 000 **Date of specification approval:**

A- Basic Information

Title : Computers Arabization and Languages Technologies **Code :** CS428P

Credit Hours : 3 **Lecture :** **Tutorial :** **Practical :**

B- Professional Information

1- Overall Aims of the Course This course aims to:

- Synthesize recent research in Arabic linguistics, and natural language processing (NLP) with the aim of introducing students to theoretical and computational models of language.
- Familiarize students with the most important algorithms and data structures that are commonly used to solve many Arabic NLP problems.
- Introduce variety of ways to represent Arabic language as computational systems, and how to exploit those representations to do neat stuff with text and speech data,

like: translation, summarization, extracting information, answering question, natural interfaces to databases, and conversational agents.

2- Intended Learning Outcomes of the course

(ILOs) By completing this course successfully,

the student will be able to:

a- Knowledge and Understanding a1 Understand the essential professional standards relevant to Computer Science.

a4 Criteria and specifications appropriate to specific problems, and plan strategies for their solution.

a10 Current developments in computing and information research. a11 Requirements, practical constraints and computer-based systems.

a13 Use high-level programming languages.

b- Intellectual Skills

b1 Analyze computing problems and provide solutions related to the design and construction of computing systems.

b2 Realize the concepts, principles, theories and practices behind computing and information as an academic discipline.

b4 Analyze, propose and evaluate alternative computer systems and processes taking into account limitations, and quality constraints.

b5 Make ideas, proposals and designs using rational and reasoned arguments for presentation of computing systems.

b9 Evaluate research papers in a range of knowledge areas.

b10 Define traditional and nontraditional problems, set goals towards solving them, and observe results.

b11 Perform comparisons between (algorithms, methods, techniques...etc).

b13 Identify attributes, components, relationships, patterns, main ideas, and errors.

b14 Summarize the proposed solutions and their results.

b15 Restrict solution methodologies upon their results.

b18 Solve computer science problems with pressing commercial or industrial constraints.

b19 Generate an innovative design to solve a problem containing a range of commercial and industrial constraints.

c- Professional and Practical Skills

c4 Apply computing information retrieval skills in computing community environment and industry.

c5 Develop a range of fundamental research skills, through the use of online resources, technical repositories and library-based material

c21 Prepare technical reports, and a dissertation, to a professional standard.

d- General and Transferable Skills

d1 Demonstrate the ability to make use of a range of learning resources and to manage one's own learning.

d2 Demonstrate skills in group working, team management, time management and organizational skills.

3- Contents

No	Course Content	Lecture	Tutorial	Total
1.	Introduction to Computers Arabization	**1**	**1**	**2**
2.	Arabic NLP tools survey	**2**	**2**	**4**
3.	Arabic Morphology and Arabic Computational Morphology Tasks	**2**	**2**	**4**
4.	POS Tagging Methods and Sequence Labeling	**2**	**2**	**4**
5.	Arabic POS Tagging	**2**	**2**	**4**
6.	Context-Free Grammars	**3**	**3**	**6**
7.	Parsing with Context Free Grammars	**1**	**1**	**2**
8.	Evaluation of POS taggers	**1**	**1**	**2**
9.	Representing Meaning	**2**	**2**	**4**
10.	Semantic Analysis	**2**	**2**	**4**
11.	Word Sense Disambiguation	**2**	**2**	**4**
12.	Information Extraction and NER	**2**	**2**	**4**
13.	Relation Extraction	**2**	**2**	**4**
	Total Hours	**24**	**24**	**48**

4- Assessment Schedule

Assessment Method	No.	Description	Week No.	Weight (%)
Assignments	1	Sheets no. 1,2,3	3, 6, 10	+5
Written Exams	2	Midterm Exam	7	10
Practical Exams	3	Lab Assessment	8, 13	10
Oral Exam	4	Oral questions	10	10
Groups Work	5	Groups Projects	Throughout the semester	10

Written Exams	6	Final Exam	14	60
Total				100

5- List of references 5.1 Course Notes 5.2 Essential Books (Text Books)

- Lecture handouts delivered to students at the end of each lecture.
- Introduction to Arabic Natural Language Processing. Nizar Y. Habash, 2010.
- Natural Language Processing of Semitic Languages, 2014
- Speech and Language Processing: An Introduction to Natural Language Processing, Computational Linguistics, and Speech Recognition, Third Edition, 2017.

6- Facilities Required for Teaching and Learning -

Data show.

- Speakers for audio and video files used to practice listening.

Course Content/ILO Matrix

Course Content	a1	a4	a10	a11	a13	b1	b2	b4	b5	b9	b10	b11	b13	b14	b15	b18	b19	c4	c5	c21	d1	d2
Introduction to Computers Arabization	*	*				*	*		*									*		*		
Arabic NLP tools survey	*	*						*												*	*	
Arabic Morphology and Arabic Computational Morphology Tasks	*	*	*	*	*					*		*		*	*					*		*
POS Tagging Methods and Sequence Labeling	*	*	*	*	*		*	*			*		*					*		*		
Arabic POS Tagging	*	*	*	*	*		*	*				*				*						*
Context-Free Grammars	*	*	*	*	*						*			*	*	*		*				*
Parsing with Context Free Grammars	*	*	*	*	*		*	*							*	*		*		*		
Evaluation of POS taggers	*	*	*	*	*			*	*							*		*			*	
Representing Meaning	*	*	*	*	*					*			*	*		*		*			*	
Semantic Analysis	*	*	*	*	*			*				*		*		*		*			*	
Word Sense Disambiguation	*	*	*	*	*													*				
Information Extraction and NER	*	*	*	*	*	*		*			*		*	*			*	*				*

Relation Extraction	*	*	*	*	*																

Learning Method/ILO Matrix

Learning Method	a1	a4	a10	a11	a13	b1	b2	b4	b5	b9	b10	b11	b13	b14	b15	b18	b19	c4	c5	c21	d1	d2
Lectures	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*					
Tutorials						*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Groups Projects						*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Seminars	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*				*	*

Assessment Methods/ILO Matrix

Learning Method	a1	a4	a10	a11	a13	b1	b2	b4	b5	b9	b10	b11	b13	b14	b15	b18	b19	c4	c5	c21	d1	d2
Assignments	*	*	*	*	*													*	*	*	*	*
Midterm Exam	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*					
Practical Exam	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Oral Exam	*	*	*	*	*																	
Groups Projects						*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Final Exam	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*					

Course Coordinator: Dr. Aya Al-Zoghby
Head of Department: Ass. Prof. Samir ElMougy
Date: 6/2/2017