Detailed Course Description - Course Plan Development and Updating Procedures/ ..... Department	QF01/0408-3.0E

Faculty	Science & Information Technology	Department	Computer Science
Course number	**112232**	Course title	**Computer Organization and Design**
Number of credit hours	3	Pre-requisite/co-requisite	Digital logic design

Brief course description
Computer organization and design is concerned with computer architecture, operating systems, networks, and many other materials. This course introduces the following topics: **Introduction to PC architecture, Organization of computers based on 8086 family, Assembly language and instructions which affect memory, Introduction to keyboard and screen processing, Arithmetic flags and operations, Jumps and loops, Structured programming, The stack and its role in subroutine mechanism, Logical, shift, and rotate families.**

	Course goals and learning outcomes
Goal 1	Recognizing PC architecture and organization.
Learning outcomes	1.1 Understand the PC architecture (microprocessor : EU, BIU, registers). 1.2 Understand the Organization of computers based on 8086 family. 1.3 Understand Memory addressing (flat and segmented memory).
Goal 2	Learning about assembly language and instructions which affect memory.
Learning outcomes	2.1 Trace a program. 2.2 Write programs in Assembly language which affect memory. 2.3 Allocate storage space in data segment.
Goal 3	Providing knowledge of keyboard and screen processing, arithmetic flags and operations.
Learning outcomes	3.1 Write programs with interrupts and some I / O operations. 3.2 Use flags (ZF, SF,…) to monitor the results of arithmetic operations. 3.3
Goal 4	Understanding jumps and loops programming, stack and its role in subroutine mechanism.
Learning outcomes	4.1 Write programs with Jumps and loops. 4.2 Write programs on the stack and understand its role in subroutine mechanism. 4.3
Textbook	1.- Richard C. Detmer, "**Introduction to 80 × 86 Assembly Language and Computer Architecture" , third ed.,** Jones & Bartlett Pub, 2015 .

	2.-
Supplementary references	1.- William Stallings, "**Computer Organization and architecture**", 9th ed., Prentice Hall, 2013. 2.- John L. and David A**.,** "**Computer Organization and Design",** 4th ed., Morgan Kaufmann , 2011. 3.- David A. Patterson & John L. Hennessy, " **Computer Organization & Design: The Hardware / Software Interface**" , 4th, ed. , Elsevier, 2009 .

Course timeline				
Week	**Number of hours**	**Course topics**	**Pages (textbook)**	**Notes**
01	**1** **1** **1**	**Introduction to PC architecture**. PC hardware. Processor : execution unit and bus interface unit.	29 – 37	
02	**1** **1** **1**	8086 microprocessors and Pentium Registers. **Organization of computers based on 8086 family.**	37 – 45	
03	**1** **1** **1**	Memory and input / output organization. Data bus, address bus, control bus. Memory locations and addresses.		
04	**1** **1** **1**	**Assembly language.** Number systems used in assembly. Some simple instructions.	45- 87	
05	**1** **1** **1**	Making traces. Jumps. Storing and retrieving data from memory.		
06	**1** **1** **1**	Programs which affect memory. Defining segments in assembly program. **First Exam.**		
07	**1** **1** **1**	**Introduction to keyboard and screen processing.** Allocating storage space. Interrupts.	87 – 110	
08	**1** **1** **1**	Interrupt 21H. Interrupt 10H. **Arithmetic flags and operations.**	110 – 143	
09	**1**	Using flags to monitor the outcome of operations.		

	1 1	ADD, ADC, SUB, SBB, NOT, NEG. INC, DEC, MUL,IMUL, DIV, IDIV, CBW, CWD.		
10	1 1 1	**Jumps and loops.** Conditional jumps. Implementing loops.	143 – 189	
11	1 1 1	The loop family: loop, loopz, loopnz. Controlling program development. **Structured programming.**	189 – 200	
12	1 1 1	Subroutines. **The stack and its role in subroutine mechanism.** **Second Exam.**	201-220	
13	1 1 1	CALL and RET. PUSH and POP. **Logical, shift, and rotate families.**	220 – 238	
14	1 1 1	Logical instructions. Shift instructions. Rotate instructions.		
15	1 1 1	General problems and applications. Review of previous chapters.		
16	1 1 1	**Final Exam.**		

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Theoretical course evaluation methods and weight	Participation = 10% First exam 20% Second exam 20% Final exam 50%	**Practical (clinical) course evaluation methods**	Semester students' work = 50% (Reports, research, quizzes, etc.) Final exam = 50%

Approved by head of department		**Date of approval**	

Extra information (to be updated every semester by corresponding faculty member)

Name of teacher	Dr. Maher Nabulsi	Office Number	**9332**
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Office hours			