

Planning and Quality Assurance Affairs

Form (A)

Course Specifications

General Information

Course name	Computer Architecture & Assembly
Course number	ITCS2308
Faculty	
Department	
Course type	College Needs
Course level	2
Credit hours (theoretical)	3
Credit hours (practical)	0
Course Prerequisites	

Course Objectives

- 1 - Identify the major component of a PC-based system, describe the steps involving in assembling, linking, and executing a program
- 2 - The relationship between hardware and software and how they work together to accomplish a task
- 3 - Write programs in assembly language to perform given tasks and run them
- 4 - The characteristics of a computers, and its applications

Intended Learning Outcomes

Knowledge and Understanding	* a1- Discuss issues about the computer performance * a2- List the main syntax of assembly language * a3- Outline fundamentals in computing, including hardware and operating systems * a4- Describe functions of the basic building blocks of a computer system * a5- Discuss how computers execute instructions * a6- Explain the basic operations of cache and main memory, I/O operations, bus, interrupt and peripheral devices as well as analyzing the performance of different designs
Intellectual Skills	* b1- Identify attributes and components * b2- Discuss how computers execute instructions * b3- Identify various architectures and explain the design concepts for analyzing computer systems * b4- Sequence complete computer instructions
Professional Skills	* c1- Simulate micro instruction executions * c2- Operate computing equipment efficiently, taking into account its logical and physical properties * c3- Write programs using the assembly language * c4- Use the assembly language to control the different computer units
General Skill	* d1- Work in stressful environment and within constraints * d2- Communicate effectively * d3- Manage tasks and resources

Course Contents

1 - Introduction to computer organization, Data representation, bits, bytes, words, double words, binary and hexadecimal systems, Computer components: memory systems including caches, CPU registers, x86 instruction set and its modes, encoding instructions, differences between x86 processors, computer arithmetic, processors, controllers, input/ output, buses, DMA, data formats, addressing modes, instruction sets
2 - Fundamental of Assembly Language, Data movement instruction, arithmetic and logic instructions, program control instructions, memory addressing modes
3 - Subroutine calls and return mechanism. I/O and interrupts, linking to subprograms Video and Keyboard Operations: Introduction to Video and Keyboard Processing, Video Systems, Keyboard Operations. Data Manipulation: Processing String data, Processing Binary Data, Processing ASCII and BCD data

Teaching and Learning Methods

1 - Lectures
2 - Labs
3 - Practical Exercises

Teaching and Learning Methods for the Disabled Students

1 - N/A

Students Assessment

<u>Assessment Method</u>	<u>TIME</u>	<u>MARKS</u>
Lab and Quizes	Week 1-12	15%
First Midterm exam	Week No. 7	15%
Second Midterm Exam	Week No. 12	20%
Final Exam	Week No. 16	50%

Books and References

Essential books	The Art of Assembly, Randall Hyde. 2005. Second Edition
Recommended books	IBM PC Assembly Language and Programming. Peter Abel. 2001. Prentice Hall. ISBN: 0-13-030655-X

Knowledge and Skills Matrix

Main Course Contents	Study Week	Knowledge and Understanding	Intellectual Skills	Professional Skills	General Skill
Introduction to computer organization, Data representation, Computer components, memory systems including caches, CPU registers, x86 instruction set and its modes,	4	a1, a3-a6	b1, b2, b3	c1, c2	d1, d2
Fundamental of Assembly Language, Data movement instruction, arithmetic and logic instructions, program control instructions, memory addressing modes	6	a2, a6	b2, b4	c1, c3, c4	d1, d2, d3
Subroutine calls and return mechanism. I/O and interrupts, linking to subprograms Video and Keyboard Operations: Introduction to Video and Keyboard Processing, Video Systems	5	a2,a4	b2,b4	c3,c4	d2,d3