



University/Academy: Arab Academy for Science and Technology & Maritime Transport
Faculty/Institute: College of Computing and Information Technology
Program: Computer Science / Information Systems / software Engineering

Form No. (12)
Course Specification

1- Course Data

Course Code: CE243	Course Title: Introduction to computer architecture	Academic Year/Level: Year 2 / Semester 4
Specialization: Computer Science	No. of Instructional Units: 2 hrs lecture 2 hrs practical	Lecture:

2- Course Aim	This course exposes the student to computer design & organization. It aims for the student to understand the software/hardware interface, instructions, processor, modules & performance issues.
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3- Intended Learning Outcome:

a- Knowledge and Understanding	<p>Students will be able to demonstrate knowledge of:</p> <p>K4. Criteria and specifications appropriate to specific problems, and plan strategies for their solution.</p> <p>K5. The extent to which a computer-based system meets the criteria defined for its current use and future development.</p> <p>K6. The current and underlying technologies that support computer processing and inter-computer communication.</p> <p>K11. Requirements, practical constraints and computer-based systems.</p> <ul style="list-style-type: none">• Define essential facts, concepts, principles and theories relevant to comp. eng. (K6)• Define engineering principles in the fields of logic design, circuit analysis, machine and assembly languages, computer organization and architectures, memory hierarchy, advanced computer architectures, embedded systems, signal processing, operating systems, real-time systems and reliability analysis. (K6,K11)• Demonstrate inductive reasoning abilities, figuring general rules and conclusions about seemingly unrelated events. (K4,K5)• Understand quality assessment of computer systems. (K5)• Related research methods and approaches to create more advanced products. (k5,k6,k11)• Define principles of design specific to computer engineering; (k4)• Show broad general education necessary to understand the impact of computer engineering solutions in a global and societal context. (K5,K6)• Identify and use symbols for digital logic gates and blocks (k4)• Understand clock speed, PC buses, and CPU components(K4)• Explain interfaces and ports(k4)
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b- Intellectual Skills	<p><u>By the end of the course, the student acquires high skills and an ability to understand:</u></p> <p>I4. Analyze, propose and evaluate alternative computer systems and processes taking into account limitations, and quality constraints.</p> <p>I13. Identify attributes, components, relationships, patterns, main ideas, and errors.</p> <p>(Equivalent to I12 in the IS and SE departments)</p> <ul style="list-style-type: none"> • Apply knowledge of computing, mathematics, physics and logical skills appropriate to the computer engineering discipline. (I13) • Apply the Object-Class-Constructor-Primitive data casting-Array(i13) • Apply the Access Modifiers(I13) • Select and apply appropriate mathematical tools, computing and methods.(I4) • Select and apply design techniques and tools in computer engineering disciplines(I4) • Competence in identifying the major issues in designing processors. (I13) • Evaluate different techniques and strategies for solving computer engineering problems. (I4)
c- Professional Skills	<p><u>By the end of the course the student will have the ability to:</u></p> <p>P1. Operate computing equipment, recognizing its logical and physical properties, capabilities and limitations.</p> <p>P7. Assess the implications, risks or safety aspects involved in the operation of computing equipment within a specific context.</p> <ul style="list-style-type: none"> • Use laboratory and field equipment competently and safely. • Use appropriate specialized computer software, computational tools and packages. • Write computer programs. • Solve computer engineering problems.
d- General Skills	<p>Students will be able to:</p> <p>G1. Demonstrate the ability to make use of a range of learning resources and to manage one's own learning.</p> <p>G3. Show the use of information-retrieval.</p> <ul style="list-style-type: none"> • Apply skills learned to undertake small-scale research projects • Effectively present and defend research orally in front of professors and peers
4- Course Content	<ul style="list-style-type: none"> • Introduction to Computer Systems Organization & Architecture. • Digital Components. • Register Transfer Organization & Micro-operation. • Basic computer Organization and Design. • Central Processing Unit. • Memory Organization. • Input-Output Organization.

5- Teaching and Learning Methods	Lectures, Labs, Projects, Individual study & self-learning.
6- Teaching and Learning Methods for Students with Special Needs	<ul style="list-style-type: none"> • Students with special needs are requested to contact the college representative for special needs (currently Dr Hoda Mamdouh in room C504) • Consulting with lecturer during office hours. • Consulting with teaching assistant during office hours. • Private Sessions for redelivering the lecture contents. • For handicapped accessibility, please refer to program specification.
7- Student Assessment:	
a- Procedures used:	Exams and Individual Projects
b- Schedule:	Week 7 exam Week 12 exam Week 16 Final exam
c- Weighing of Assessment:	7 th week exam 30% 12 th week exam 20% Lab work 10% Final exam 40%
8- List of References:	
a- Course Notes	From the Moodle on www.aast.edu
b- Required Books (Textbooks)	Linda Null and Julia Lobur, <i>The Essentials of Computer Organization And Architecture</i> , 2 nd edition, Jones & Bartlett Pub, 2006
c- Recommended Books	<ul style="list-style-type: none"> • David A. Patterson, John L. Hennessy, <i>Computer Organization and Design: The Hardware/Software Interface</i>, fourth Edition, Morgan Kaufmann, 2008 • Morris Mano, <i>Computer System Architecture</i> (3rd Edition), Prentice Hall, 1995 • Patterson, Hennessy, David A. Patterson, <i>Computer Architecture: A Quantitative Approach</i>, third edition Morgan Kaufmann, 2002.
d- Periodicals, Web Sites, ..., etc.	

Course Instructor:

Head of Department: Dr Samah Senbel

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