

QFO-AP-VA-008	رمز النموذج :	اسم النموذج : خطة المادة الدراسية	 جامعة فيلادلفيا Philadelphia University
2	رقم الإصدار: (Rev)	الجهة المصدرة: نائب الرئيس للشؤون الأكاديمية	
2021-5-4	تاريخ الإصدار:	الجهة المدققة : اللجنة العليا لضمان الجودة	
5	عدد صفحات النموذج :		

Course Title: Computer Architecture		Course code: 750332	
Course Level: 3		Course prerequisite: 750110, 750233	
Lecture Time: 12:45 – 14:00		Credit hours: 3	
UR	☐	FR	☒
DR	☐	C	☐
E	☐		

Academic Staff Specifics

Name	Rank	Office Number and Location	Office Hours	E-mail Address

The Learning Style Used in Teaching the Course

<u>The Learning Style</u>			
Blended Learning		☐	
Electronic Learning		☐	
Face-to-Face Learning		☒	
Face-to-Face	Electronic	Blended	Percentage
100%			

Course/Module Description:

The module emphasizes on the following knowledge areas: Digital components used in the organization and design of digital computer, serial and parallel transfer, Flow of information and timing signals. Designing a micro-programmed control unit, organization and architecture of input-output and memory, interfacing and communication, memory hierarchy, cache memory, Virtual Memory, pipelining data path, pipelining control path, and data hazard.

Course/Module Objectives:

The aim of this course is to introduce organization and architecture of the different computer components, like buses, registers, CPU, and different memories in addition to concepts of pipelining, superscalar, and data hazards.

Course/ Module Components

- Textbook:

Title: Computer System Architecture, M. Morris Mano, Prentice Hall, International edition, 2005.
4rd edition.

- Support material (s)

Teaching methods:

Duration: 15 weeks, 60 hours in total

Lectures: 45 hours, 3 per week + two exams (two hours)

Learning outcomes

A- Knowledge and Understanding

A1. Understand the design and implementation of different computer system, like instruction sets, main memory, cache memory, and other components.

A2. Know and understand the hardware components concepts.

B- Intellectual skills (thinking and analysis)

B1. Recognize the design and implementation of a control unit made of micro-programming.

B2. Know how memory organization can improve the overall computer performance.

C- Practical skills

C1. Compare the basic structure of a typical RISC and CISC processor, Compute the effect of pipelining on the CPU performance, and demonstrate computer specifications.

D- Transferable skills

D1. Prepare structured technical reports for assigned lab works, and deliver verbal communication on the performed Hands-On projects.

Learning outcomes achievement

Assessment : A1, A2, B1, and B2 are assessed by examinations and quizzes;

B2, C1, D1 are assessed by assignments and lab work.

Development: A2, B2, D1 are assessed through Quizzes, written Exams.

B2, D1, C1, and A1 are assessed through home work exam.

Assessment instruments

- Short reports and/ or presentations, and/ or short research projects
- 3 Quizzes.
- Practical works
- Final examination: 40 marks

<u>Allocation of Marks</u>	
Assessment Instruments	Marks
MID examination	30
Final examination	40
Quizzes & Home works	30
Total	100

** Make-up exams will be offered for valid reasons only with consent of the Dean. Make-up exams may be different from regular exams in content and format.*

Practical Submissions

The assignments that have work to be assessed will be given to the students in separate documents including the due date and appropriate reading material.

Documentation and academic honesty

- **Documentation style (with illustrative examples)**

Submit your homework covered with a sheet containing your name, number, course title and number, and type and number of the home work (e.g., tutorial, assignment, and project).

Any completed homework must be handed in to my office by 15:00 on the due date. After the deadline “zero” will be awarded. You must keep a duplicate copy of your work because it may be needed while the original is being marked.

You should hand in with your assignments:

- 1- A printed listing of your test programs (if any).
- 2- A brief report to explain your findings.
- 3- Your solution of questions.

For the research report, you are required to write a report similar to a research paper. It should include:

- **Abstract:** It describes the main synopsis of your paper.
- **Introduction:** It provides background information necessary to understand the research and getting readers interested in your subject. The introduction is where you put your problem in context and is likely where the bulk of your sources will appear.
- **Methods (Algorithms and Implementation):** Describe your methods here. Summarize the algorithms generally, highlight features relevant to your project, and refer readers to your references for further details.
- **Results and Discussion (Benchmarking and Analysis):** This section is the most important part of your paper. It is here that you demonstrate the work you have accomplished on this project and explain its significance. The quality of your analysis will impact your final grade more than any other component on the paper. You should therefore plan to spend the bulk of your project time not just gathering data, but determining what it ultimately means and deciding how best to showcase these findings.
- **Conclusion:** The conclusion should give your reader the points to “take home” from your paper. It should state clearly what your results demonstrate about the problem you were tackling in the paper. It should also generalize your findings, putting them into a useful context that can be built upon. All generalizations should be supported by your data, however; the discussion should prove these points, so that when the reader gets to the conclusion, the statements are logical and seem self-evident.
- **Bibliography:** Refer to any reference that you used in your assignment. Citations in the body of the paper should refer to a bibliography at the end of the paper.

- **Protection by copyright**

1. Coursework, laboratory exercises, reports, and essays submitted for assessment must be your own work, unless in the case of group projects a joint effort is expected and is indicated as such.
2. Use of quotations or data from the work of others is entirely acceptable, and is often very valuable provided that the source of the quotation or data is given. Failure to provide a source or put quotation marks around material that is taken from elsewhere gives the appearance that the comments are ostensibly your own. When quoting word-for-word from the work of another person quotation marks or indenting (setting the quotation in from the margin) must be used and the source of the quoted material must be acknowledged.
3. Sources of quotations used should be listed in full in a bibliography at the end of your piece of work.

- **Avoiding plagiarism.**

1. Unacknowledged direct copying from the work of another person, or the close paraphrasing of somebody else's work, is called plagiarism and is a serious offence, equated with cheating in examinations. This applies to copying both from other students' work and from published sources such as books, reports or journal articles.

2. Paraphrasing, when the original statement is still identifiable and has no acknowledgement, is plagiarism. A close paraphrase of another person's work must have an acknowledgement to the source. It is not acceptable for you to put together unacknowledged passages from the same or from different sources linking these together with a few words or sentences of your own and changing a few words from the original text: this is regarded as over-dependence on other sources, which is a form of plagiarism.
3. Direct quotations from an earlier piece of your own work, if not attributed, suggest that your work is original, when in fact it is not. The direct copying of one's own writings qualifies as plagiarism if the fact that the work has been or is to be presented elsewhere is not acknowledged.
4. Plagiarism is a serious offence and will always result in imposition of a penalty. In deciding upon the penalty, the Department will take into account factors such as the year of study, the extent and proportion of the work that has been plagiarized, and the apparent intent of the student. The penalties that can be imposed range from a minimum of a zero mark for the work (without allowing resubmission) through caution to disciplinary measures (such as suspension or expulsion).

Course/module academic calendar

Week	Basic and support material to be covered	Homework/ reports and their due dates
1, 2	Review of Basic Computer Organization - Register Transfers. - Bus and Memory Transfers. - Computer Instruction. - Memory Organization	Homework/ Quiz
3, 4, 5	Micro-programmed Control Unit - Control Memory. - Address Sequencing and Control Branching. - Mapping of instruction. - Design of Control Unit using Micro-programming.	Homework/ Quiz
6, 7	Input-Output Organization - Peripheral Devices. - Input-output Bus and Interface Modules. - Input-output Bus Versus Memory Bus. - Priority Interrupt: Daisy-Chaining and Parallel interrupt. - Direct Memory Access (DMA).	/Homework Quiz
8	▪ Mid Exam	Exam
9, 10, 11	Memory Organization - Memory Hierarchy. - Main Memory: RAM and ROM Chips. - Memory Address Map. - Cache Memory. - Virtual Memory.	Homework/Quiz
10, 11	Combinational Logic Circuit with MSI and LSI	/Homework Quiz
12, 13, 14	Pipelining and Vector Processing - Parallel Processing. - Pipelining. - Instruction Pipeline. - Pipeline data path and Control path. - Data Hazard.	/Homework Quiz
15	RISC and CISC Architecture - Characteristics of RISC and CISC.	Homework/ Quiz
16	Final Exam	Exam

Expected workload:

On average students need to spend 2 hours of study and preparation for each 50-minute lecture/tutorial.

Attendance policy:

Absence from lectures and/or tutorials shall not exceed 15%. Students who exceed the 15% limit without a medical or emergency excuse acceptable to and approved by the Dean of the relevant college/faculty shall not be allowed to take the final examination and shall receive a mark of zero for the course. If the excuse is approved by the Dean, the student shall be considered to have withdrawn from the course.

Module references

Books

1. The Architecture of Computer Hardware and System Software, Irv Englander, John Wiley and Sons, 2005, 3rd edition.
2. Fundamentals Of Computer Organization And Architecture. Mostafa Abd-El-Barr, Hesham El-Rewini. John Wiley and Sons, 2008, 3rd edition.

Journals

Article title COMPUTER ARCHITECTURE AND ORGANIZATION IN THE MODEL
COMPUTER ENGINEERING CURRICULUM
Author Nelson, V. P. Theys, M. D. Clements, A.
Journal title FRONTIERS IN EDUCATION CONFERENCE

Websites

<https://www.philadelphia.edu.jo/academics/iqabaja/>