

(COMPUTER ORGANIZATION)

Programme(s) on which the course is given	Computer science & IT
Major or Minor element of programs	Minor
Department offering the program	Information Technology
Department offering the course	Computer science
Academic year / Level	3 rd year / 2 nd Semester

A- Basic Information

Title	Computer Organization			Code	CS312
Credit Hours	Lecture	3	Tutorial	3	Practical -
	Total				6

B- Professional Information

1 – Overall aims of course

- Understand the design of computer hardware from the register level.
- Understand the various components of a computer processor unit and a design of control unit by using hardwired and microprogramming methods.
- Understand the memory organization.
- Understand the interfacing between the processor and the input/output ports and devices.

2 – Intended learning outcomes of course (ILOs)

a- Knowledge and understanding:

A6	The student will know and understand the basic definitions and components of computer networks, network evaluation, and security.
A10	The student will be able to distinguish between data and information, data analysis and retrieval and the principles of knowledge discovery and mining, The student will demonstrate a clear understanding of Artificial Intelligence

b- Intellectual skills

B1	Analyze the methods of parameters estimation, the method of hypothesis testing, the methods used for data analysis to any statistical data, Solve the problem of analyzing and interpreting random variables.
B2	Analyze different information technology problems and be able to implement algorithms to solve the problems.
B5	develop the components of signal and image processing, multimedia system, multimedia applications, computer animation and graphics.
B6	will demonstrate creative thinking in preprocessing the data, analysis, generalize and summarize the data, analyze and contrast different mining association rules, able to mine complex types of data, data and information retrieval.

c- Professional and practical skills

C1	Students will demonstrate the ability to effectively manage Information technology problems and solutions and apply content-knowledge in the specification, analysis, design, implementation and testing of a software solution.
C3	Analyze and interpret statistical data, Apply methods of parameter estimation and implement method o hypothesis testing, design and implement practical programs to estimate statistical parameters and apply different analysis techniques.
C6	Facilitate the collection, storage, security and integrity of electronic; apply a data mining methodology to real data, ability to retrieve and presenting information, programming Intelligence Searching techniques.
C7	Grasp key technical issues of current digital and wireless communications systems, Specify and design key parts of a communication system operating within an existing standard
C8	Programming Intelligence Searching techniques, Design and building Intelligent Agent applications, Analysis Neural, fuzzy and Genetic systems as a new intelligent paradigms.

d- General and transferable skills

D1	Explain the IT problems and their solutions, and effective skills in management of IT projects. Demonstrate a range of basic skills required to work effectively in communications and IT industry, understand the need for continuing professional development and lifelong learning in order to cope with rapidly changing communications technology
D2	Provide effective technology explanations for audio/visual, computer, multimedia, voice, video, and web based applications and services to all areas of the college,
D5	Explain the qualities of the software and software documentation
D8	Describe and explain how parameters of statistical data are calculated and tested, the methods of statistical data analysis, solving problems associated with statistical data.

3- Content

Topic	No Of hours	Lecture	Tutorial/ Practical
1 Introduction	3	3	-
2 Computer Operations <ul style="list-style-type: none"> • Introduction. • Register transfer and Microoperations. • Bus transfer and Processor unit. • Arithmetic, logic, and shifter units. • Control word. 	12	6	6
3 Control Logic Design <ul style="list-style-type: none"> • Introduction. • Microprogramed control. • Processor unit control. • Design of simple computer. 	15	6	9
4 Computer Instructions <ul style="list-style-type: none"> • Introduction. • Address field. • Addressing modes. • Stack organization. • Data transfer instructions. • Data manipulation instructions. • Floating point operations. • Program control instructions. 	12	6	6

<ul style="list-style-type: none"> • Program interrupt. 			
<p style="text-align: center;">5 CPU Design</p> <ul style="list-style-type: none"> • Introduction. • Arithmetic logic shift unit. • Processor unit. • Instruction and microinstruction formats. • Microprogram for computer cycle. • Microprogram routine. • Control unit. 	18	9	9
<p style="text-align: center;">6 Memory Organization</p> <ul style="list-style-type: none"> • Memory hierarchy. • Special types of memory. • Magnetic and optical memories. • Associative memories. • Cache memory. • Virtual memory. • Memory management hardware. 	12	6	6
<p style="text-align: center;">7 I/O Organization</p> <ul style="list-style-type: none"> • Introduction. • Parallel interfacing. • CPU-initiated data transfer. • Interfacing data converters. • I/O-initiated data transfer. • Serial I/O. 	12	6	6
Total sum	84	42	42

4– Teaching and learning methods

4.1	Information collection
4.2	Research assignment
4.3	Lecture
4.4	Class activities
4.5	Case study

5- Student assessment methods

5-a- Methods

5.a.1	Class test (1) <i>to assess</i> ...Understanding...
5.a.2	Class test (2) <i>to assess</i> ...Understanding...
5.a.3	Reports <i>to assess</i> Problem Solving
5.a.4	Mid term exam ... <i>to assess</i> gains of completed topics....

5-b- Assessment schedule

Assessment 1	5 th week.	Mid term Exams
Assessment 2	8 th week.	
Assessment 3	10 th weeks	
Assessment 4	16 th weeks (Oral and Practical Exams).	
Assessment 5	17 th -18 th weeks (final written exam).	

5-c- Weighting of assessments

Semester work	10%
Mid-term examination	10%

Oral examination.	10%
Final-term examination	70%
Total	100%

6- List of references

6-a Course notes

Fawzy Torkey, "computer organization", 2nd semester. 2006.

6-b Essential books (text books)

[1] R. Tocci, L. P., Microprocessors and Microcomputers, Prentice-Hall
Inc., 1996.

6-c Recommended books

[1] B. Holdsworth, Digital Electronic Design, Butterworth-Heinemann
Ltd,
Great Britain, 1993.

[2] Cragon Harvey, Computer Architecture, and Implication, 2000.

6-d Periodicals, Web sites, ... etc

It is recommended for students to search for similar courses in other
universities.

7- Facilities required for teaching and learning

- Teaching rooms with equipments.
- Datashow, screen, and laptop computer.

Course coordinator:

Prof. Dr. Fawzy Torkey

Head of Department:

Prof. Dr. Nabil Abd El-Wahed

Date: