

Course Syllabus

1.	Course title	Computer Architecture and Assembly Language
2.	Course number	1911231
3.	Credit hours (theory, practical)	3
	Contact hours (theory, practical)	3
4.	Prerequisites/corequisites	Discrete Mathematics (1901101), Fundamentals of Information Technology (1904101)
5.	Program title	Cybersecurity
6.	Year of study and semester (s)	Second year
7.	Final Qualification	Bachelor degree
8.	Other department (s) involved in teaching the course	None
9.	Language of Instruction	English
10.	Date of production/revision	February 26, 2023
11.	Required/ Elective	Required

12. Course Coordinator:

Dr. Khair Eddin Sabri

Office numbers: KASIT 117

Office hours:

Monday: 11:30 – 12:30

Tuesday, Thursday: 11:30 – 12:30

Phone number: 22557

Email addresses: k.sabri@ju.edu.jo

13. Other instructors:

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14. Course Description:

This course introduces students to basic concepts about computer architecture from security perspectives. Its emphasis is on the lower level abstraction of a computer system. Topics included: digital logic, instruction set, ALU design, memory and assembly language programming. The course offers programming practice with an assembly language to provide practical application of concepts presented in class.

15. Course aims and outcomes:

A- Aims:

Goal:

The main goal of this course is to provide students with the knowledge related to digital design, computer architecture and assembly language.

Objectives:

- *Understand Logic gates*
- *Design Combinational and Sequential Circuits*
- *Write and Analyze Assembly programs*

B- Intended Learning Outcomes (ILOs): Upon successful completion of this course students will be able to ...

A-Knowledge and understanding: with the ability to ...

- A1) Understand the Boolean algebra theorems and properties.*
- A2) Understand the main concepts of gate-level minimization.*
- A3) Understand the combinational logical circuits.*
- A4) Understand the sequential logical circuits.*
- A5) Understand the main components of a computer system.*
- A6) Understand the information representation in a computer*
- A7) Understand the main structure of an assembly language.*
- A8) Understand the main concept of a virtual memory.*

B- Intellectual skills: with the ability to ...

- B1) Simplify Circuits*
- B2) Convert Boolean functions into standard and canonical forms*
- B3) Link truth table, Boolean functions and circuit diagrams together.*
- B4) Identify the different types of circuits.*
- B5) Identify the different types of registers.*
- B6) Relate C programs into Assembly language.*
- B7) Identify the different parts of a virtual memory.*
- B8) Identify the different encoding of information.*
- B9) Identify different types of overflow attacks.*

C- Subject specific skills – with ability to ...

- C1) Design combinational circuits*
- C2) Design sequential circuits.*
- C3) Develop an assembly program.*
- C4) Analyze and Debug a C and Assembly programs.*

D- Transferable skills – with ability to

- D1) Debug and Analyze programs in Linux OS*

16. Topic Outline and Schedule:

Topic	Week	ILOs	Student Outcomes	TLA (teaching, learning and Assessment)
Digital Systems and Binary Numbers	1	A1, A2	1	T: Lectures and discussion L: [1] CH 01 A: Project, Midterm
Boolean Algebra and Logic Gates	2	A1, B2, B3	1	T: Lectures and discussion L: [1] CH 02 A: : Project, Midterm
Gate Level Minimization	3	A2, B1	1	T: Lectures and discussion L: [1] CH 03 A: Project, Midterm
Combinational Circuits	4	A3, B4, C1	1	T: Lectures and discussion L: [1] CH 04 A: Project, Midterm
Sequential Circuits	5	A4, B5, C2	1	T: Lectures and discussion L: [1] CH 05 A: Project, Midterm
Register and Memory	6	A4, B5	1	T: Lecture and discussion L: [1] CH 06 and CH07 A: Project, Midterm
Midterm	7			
Introduction to Computer System	8	A5	1, 6	T: Lectures and discussion L: [2] CH 1 A: Practical Assessment, Final
Information Representation: String	9	A6, B8, D1	2	T: Lectures and discussion L: [2] CH 2 A: Practical Assessment, Final
Information Representation: Integer and Float	10	A6, B8, B9, D1	2, 6	T: Lectures and discussion L: [2] CH3 A: Practical Assessment,, Final
Program Representation: Data Movement and Control	11	A7, B6, C3, C4, D1	2, 6	T: Lecture and discussion L: [2] CH 3 A: Practical Assessment, Final
Program Representation: Function and Virtual Memory	12	A7, A8, B6, B7, B9, C3, C4, D1	2, 6	T: Lectures and discussion L: [2] CH 03 and CH09 A: Practical Assessment, Final
Program Representation: Heap and Data	13	A7, A8, B6, B7, C3, C4, D1	2, 6	T: Lecture and discussion L: [2] CH03 and CH09 A: Practical Assessment, Final
System Calls	14	A5, A7, C3, C4	1, 2, 6	T: Lecture and discussion L: [2] CH10 A: Practical Assessment, Final
Revision	15			
Final	16			

17. Evaluation Methods and Course Requirements (Optional):

Opportunities to demonstrate achievement of the ILOs are provided through the following assessment methods and requirements:

There will be several assessment methods of evaluation the performance of the students such as project design, Practical Assessment, midterm and final exams.

18. Course Policies:

A- Attendance policies:

Deliberate abstention from attending 1911231 classes and any other similar acts will lead to student deprivation from the course according to the UJ regulations

B- Absences from exams and handing in assignments on time:

If you miss the midterm, then a makeup exam will not be provided unless you submit a valid absence excuse, within three days from the midterm, to your lecturer. This excuse must be signed and stamped from the UJ hospital in order to be valid. If your lecturer accepts the excuse, then you will be able to take the makeup. You need to follow up the departmental announcements regarding the makeup date and time. Please note that the lecturer may either accept or reject your excuse based on UJ regulations

C- Health and safety procedures:

N/A

D- Honesty policy regarding cheating, plagiarism, misbehavior:

All students in this course must read the University policies on plagiarism and academic honesty

http://registration.ju.edu.jo/RegRegulations/Forms/All_Regulations.aspx

E- Grading policy:

- Midterm Exam:	30%
- Project	10%
- Practical Assessment	10%
- Final Exam:	50%

F- Available university services that support achievement in the course:

N/A

G- Statement on Students with disabilities

Students with Disabilities: Students with disabilities who need special accommodations for this class are encouraged to meet with the instructor and/or their academic advisor as soon as possible. In order to receive accommodations for academic work in this course, students must inform the course instructor and/or their academic advisor, preferably in a written format, about their needs no later than the 4th week of classes.

19. Required equipment:

Logisim Tool

Linux OS with gcc and gdb tools

20. References:

A- Required book (s), assigned reading and audio-visuals:

1. *Digital Design, M. Mano and Michael D. Ciletti, Pearson, 6th edition, 2019*
2. *Randal E. Bryant and David R. O'Hallaron, Computer Systems A Programmer's Perspective, 3rd edition, Pearson, 2016.*

21. Additional information:

Course website:
elearning.ju.edu.jo

Date: -----

Name of Course Coordinator: Dr. Khair Eddin Sabri Signature: -----

Head of curriculum committee/Department: ----- Signature: -----

Head of Department: ----- Signature: -----

Head of curriculum committee/Faculty: ----- Signature: -----

Dean: ----- -Signature: -----

Copy to:

Head of Department

Assistant Dean for Quality Assurance

Course File