



**Faculty of Engineering and Technology**  
**Department of Electrical and Computer Engineering**

Course Information	
Course Title	Digital Electronics and Computer Organization Lab
Course Number	ENCS 211
Semester	First Semester 2024/2025
Class Times	As per schedule, Room: Masri 107
	Instructor Teaching Assistant (TA)
Instructor/Time/TA	<ul style="list-style-type: none"> <li>Section 1 / Jamal Seyam W 11:00 - 13:50 Halima Hmeidan</li> <li>Section 2 / Jamal Seyam M 14:00 - 16:50 Halima Hmeidan</li> <li>Section 3 / Qadri Mayyala T 11:00 - 13:50 Raneem AlQadi</li> <li>Section 4 / Ashraf Rimawi W 14:00 - 16:50 Raneem AlQadi</li> <li>Section 5 / Ali Abdo R 11:00 - 13:50 Mohamed Abu Zeinah</li> <li>Section 6 / Al Hareth Zyoud W 08:00 - 10:50 Halima Hmeidan</li> <li>Section 7 / Qadri Mayyala S 14:00 - 16:50 Raneem AlQadi</li> <li>Section 8 / Adnan Yahya R 14:00 - 16:50 Mohamed Abu Zeinah</li> <li>Section 9 / Hakam Shihadeh T 08:00 - 10:50 Mohamed Abu Zeinah</li> </ul>
Office Hours	Please check Ritaj for the office hours of your instructor and TA

Course Objectives
<ul style="list-style-type: none"> <li>To become familiar with basic logic gates and using them to implement digital circuits.</li> <li>To study and implement combinational circuits (comparators, adders, decoders...)</li> <li>To study and implement sequential circuits (flip-flops, registers, counters...)</li> <li>To practice Verilog HDL and Quartus software.</li> <li>To become familiar with FPGA programming.</li> <li>To implement real FPGA based applications.</li> <li>To become familiar with main components and techniques used in computer systems such as ALU, main registers, instruction cycle...</li> <li>To become familiar with assembly programming and "Debug" program</li> </ul> <p><b>ABET OUTCOMES</b></p> <p>B: Ability to design and conduct experiments, analyze and interpret data,</p> <p>C: Ability to design a system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, sustainability political, ethical, health and safety, manufacturability, and</p> <p>K: Ability to use the techniques, skills, and modern engineering tools necessary for engineering practice</p>

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Assessment Policy (minor changes possible)		
Assessment Type	Expected Due Date	Weight
Group	<ul style="list-style-type: none"> <li>Maximum of 3 students can work together in the Lab</li> </ul>	
Reports	<ul style="list-style-type: none"> <li>3 reports, written individually (one per student, not group). No copying no use of AI tools in writing the report. See outline for experiments with a report.</li> </ul>	30%
Quizzes	<ul style="list-style-type: none"> <li>Expect one at the beginning of each lab</li> <li>All should be announced in advance (by TA and coordinated between the assistant and the instructor)</li> <li>5 quizzes per section (all will count)</li> </ul>	20%
Performance/Discussions/Homework/In lab work and participation	<ul style="list-style-type: none"> <li>Student performance during the lab, and results discussion.</li> <li>Post-lab homework will be required in case the report is not required.</li> <li>Attendance and being on time</li> </ul>	20%
Practical Final Exam:	To be announced (after all experiments are done)	30%

Missing an experiment without a reason and not making up will result in reduced credit.

Tentative Schedule		
Meeting Number	Experiment	Report required?
1	Experiment 1: Combinational Logic Circuits	No
2	Experiment 2: Comparators, Adders and Subtractors	<b>One report for 2 experiments Yes</b>
3	Experiment 3: Encoders, Decoders, Multiplexers and Demultiplexers	
4	Experiment 4: Digital Circuit Implementations Using Breadboard	No
5	Experiment 5: Sequential Logic Circuits	<b>Yes</b>
6	Experiment 6: Sequential Logic Circuits using breadboard and Integrated Circuits	No
7	Experiment 7: Constructing Memory Circuits Using Flip-Flops	<b>No</b>
8	Experiment 8: Introduction to Quartus Software	No
9	Experiment 9: A Simple Security System Using FPGA	No
10	Experiment 10: Simple Computer Simulation Using FPGA	<b>Yes</b>

11	Experiment 11: Arithmetic Elements	No
12	Make-up session	
13	Final exam	

**Good Luck**

## Report Format

3 reports are required from each student. The reports are individual and the report mark will only be given to one student. Copying reports or extensive usage of AI tools for report generation is considered a violation of academic integrity and may result in losing grades or referral to the discipline committee.

Your report must include:

Content	Points
Cover letter	1
Objectives	1
Brief theoretical review	2
Prelab	2
All experimental results and circuit schematics.	3
Solutions for tasks involved	3
Discussion and Evaluation	3
Conclusions	2
Figure and page numbering, Text size and references	2
Time took you to do the experiment (in lab ) and feedback about the experiment	1
Total points	20

## ميثاق شرف الأمانة الأكاديمية

بموجب التسجيل في هذا المساق يلتزم الطالب باحترام أنظمة وقوانين الجامعة وخاصة تلك المتعلقة بالأمانة العلمية وعدم الغش. ويتحمل الطالب مسؤولية ذاتية، أدبية وقانونية، عن المحافظة على الأمانة العلمية وذلك بالامتناع عن الغش في الامتحانات والوظائف والتقارير، وعدم السماح لغيره من الطلاب بأن ينقلوا عنه في الامتحانات والوظائف والتقارير.

يستوجب الغش أو محاولة الغش التوبيخ والإجراءات القانونية المنصوص عليها في تعليمات الأمانة الأكاديمية التي أقرها مجلس الجامعة، وتشمل ما يلي:

1. العقوبة الأكاديمية: يقررها مدرس المساق وقد تصل إلى علامة رسوب في المساق.
2. العقوبة التأديبية: تقررها لجنة النظام في الكلية وقد تصل إلى الفصل المؤقت أو النهائي من الجامعة.

بموجب تسجيلي في هذا المساق واستلامي لهذا الميثاق أتعهد أمام الله أن أحافظ على الأمانة الأكاديمية بأن أمتنع عن الغش، وأن لا أتسامح مع أي محاولة للغش من قبل الآخرين.

## **ENCS2110-Digital Lab: Guidelines for Students: First Semester Semester 2024/2025:**

**Dear Students; Please note that you are required to observe the following guidelines for this lab:**

- 1- Students work in groups of 3 but never in groups of more than 3.
- 2-To **make up** an experiment with another section the student needs **advance** permissions from **both** his own instructor and the host instructor.
- 3- Attendance **from the start of the lab** is essential and late arrival may be penalized. This is needed to listen to the instructor/TA instructions/explanations and to avoid delaying your team. We will take attendance each session. Being late for more than 10 minutes for no acceptable reason will be recorded. Quizzes are usually given at the start of the lab.
- 3- Missing an experiment and not making it up will result in **losing all evaluation points** for the missed experiment.
- 5- Missing more than 2 experiments without excuse will result in a course W request.
- 6- Please submit your report by the announced deadline. Late submission will result in reduced credit. The report needs to be in the proper format as per the guidelines. Plagiarism (copying) will not be tolerated and will be severely penalized.
- 7- Please bring with you a printed experiment manual (one per team).
- 8- Please observe the safety instructions in the lab.
- 9- Students are evaluated on their preparation, performance during the lab and post lab activities, so all students of each team need to prepare carefully and actively participate in the lab work and submit the needed material on time.
10. Please use the instructor and TA office hours announced on Ritaj for any questions/concerns related to this lab.

We believe that adhering to the above guidelines will improve student achievement in the lab.

Thank you and best wishes of great success.

ENCS2110 Team.