

The University of Jordan
School of Engineering
Department of Mechatronics Engineering
2nd Semester – A.Y. 2017/2018



Course: Mechatronics Systems Design Lab–0908562 (1 Cr. – Core Course)

Instructor: Eng. Osama Fuad
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Course Website: <https://elearning.ju.edu.jo>

Catalog Data: This course is designed to teach students through practical sessions and case studies designing basic systems and components of a Mechatronics System. Gathering technical information about different types of components used in Mechatronic Systems including transducers, controllers and actuators. Collecting information and selecting components to satisfy some design requirements, involves reading data sheets and extracting information from them.

Prerequisites by Course: Mechatronics Systems 0908353

Prerequisites By Topic: The student should have the basic knowledge of measurement systems, control systems, electronics, programming and mechanics.

Textbook: • Lab Manual

References:

- Mechatronics: An integrated approach”, Clarence W. de Silva, CRC Press, 2005.
- Introduction to Mechatronics and Measurement Systems”, Third Edition, David G. Alciatore and Michael B. Histan, McGraw Hill International Edition, 2007.

Schedule & Duration: 15 Weeks, 12 lab (180 minutes each) plus exams.

Minimum Student Material: Textbook, class handouts, scientific calculator, and an access to a personal computer.

Minimum College Facilities: Lab with proper equipment and instrumentation facilities.

Course Objectives: The course is designed to practice collecting information and selecting components to satisfy some design requirements, involving reading data sheets and extracting information from them.

Course Learning Outcomes and Relation to ABET Student Outcomes:

Upon successful completion of this course, a student should:

1. Gathering technical information about different types of components used in Mechatronic Systems, analyse and interpret the results. [b]
2. Collecting information and selecting components to satisfy some design requirements, involves reading data sheets and extracting information from them. [b]

3. Ability to design basic systems and components of a Mechatronics System. [c]
4. Student, through group assignments and discussions, will gain the skills necessary to function effectively as a member of a team. [d]

Mapping to Student Outcomes

ABET SO	a	b	c	d	e	f	g	h	i	j	k
		Yes	Yes								

Course Topics:

Topic Description	Hrs
1. Principles of Switching and Driving: Practising Datasheets and Practical sessions.	6
2. Control of stepper motors.	3
3. Design of Temperature Control System: Design and Implementation.	6
4. Pump Sizing of a Hydraulic System: Design: Case Study.	3
5. Design of Simple Shaft Encoder.	3
6. Actuator sizing and selection, Motion Control and Variable Speed Drive of a Conveyor Systems.	3
7. Introduction to Mechanical Design using ANSYS.	3
8. Visit To Industry	3

Ground Rules: **Attendance is required** and strictly enforced. To that end, attendance will be taken every lecture; Absence of more than 7 hours will result in the expulsion of the student from the course.

Assessments: Exams, Quizzes, and Assignments.

Grading	Quizzes & Assignments	30%
Structure:	Midterm Exam	30 %
	Final Exam	40 %
		Total 100%

Last updated: Feb 2018