| Form: Course Syllabus | | |
|---|---|---|
| | **Form Number** | EXC-01-02-02A |
| | **Issue Number and Date** | 2/3/24/2022/2963 05/12/2022 |
| | **Number and Date of Revision or Modification** | |
| | **Deans Council Approval Decision Number** | 2/3/24/2023 |
| | **The Date of the Deans Council Approval Decision** | 23/01/2023 |
| | **Number of Pages** | 06 |

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|---|---|---|
| **1.** | **Course Title** | Mechatronics Systems Design Lab |
| **2.** | **Course Number** | 0908577 |
| **3.** | **Credit Hours (Theory, Practical)** | **(0-Theory, 1-Practical)** |
| | **Contact Hours (Theory, Practical)** | **(0-Theory,3- Practical)** |
| **4.** | **Prerequisites/ Corequisites** | 0908484 + 0908435 + (0908576 or co-requisite) |
| **5.** | **Program Title** | B.Sc. Mechatronics Engineering |
| **6.** | **Program Code** | 08 |
| **7.** | **School/ Center** | Engineering |
| **8.** | **Department** | Mechatronics |
| **9.** | **Course Level** | 5th Year |
| **10.** | **Year of Study and Semester (s)** | 5th Year (1st, 2nd, or 3rd) |
| **11.** | **Other Department(s) Involved in Teaching the Course** | N/A |
| **12.** | **Main Learning Language** | English |
| **13.** | **Learning Types** | ■Face to face learning ☐Blended ☐Fully online |
| **14.** | **Online Platforms(s)** | ■Moodle ■Microsoft Teams |
| **15.** | **Issuing Date** | 3/13/2024 |
| **16.** | **Revision Date** | --- |

**17. Course Coordinator:**

Name: Eng. Hisham Mohammad Contact hours: Sun, Thu (9:30 - 10:30)

Mon, Wed (10:30 - 11:30)

Office number: -116 Phone number:23034

Email: h_mohamamd@ju.edu.jo, hishamhatem89@gmail.com.

**18. Other Instructors:**

**N/A**

**19. Course Description:**

The Lab continues the concepts learned in the Mechatronics Systems course about selection and sizing of various elements in mechatronics systems. The course is designed to teach students through practical sessions and case studies how to design basic systems and select components of a mechatronics system. the lab methodology aims to make students involve more in the design process and to develop the skills of collecting information and selecting components to satisfy some design requirements, involves reading data sheets and extracting information from them.

**20. Program Intended Learning Outcomes:** (To be used in designing the matrix linking the intended learning outcomes of the course with the intended learning outcomes of the program)

**1.** Take up leading local and global positions in system building companies, manufacturers and contracting firms that have a major impact on the economic performance of the country and the region and contribute positively to the welfare of society.

**2.** Fulfil leadership roles in civic society, local government, and professional engineering associations to contribute to the mechatronics engineering profession and how its members practice it in society; become a public figure in providing guidance and advice to the younger engineers.

**3.** Have a track record in making presentations to large audiences in a convincing manner as well as engaging in industrial negotiations; have a track record in conceiving and implementing suitable organization structures for modern institutions to make them more effective and efficient.

**4**. Become cutting edge researchers in academia participating and leading research and development teams to produce original research that contributes to solving the problems in society and bridging the gap between academia and industry.

**21. Course Intended Learning Outcomes:** (Upon completion of the course, the student will be able to achieve the following intended learning outcomes)

**1.** Ability to design basic systems and components of a Mechatronics System.

**2.** Self -Directed Learning: researching a topic of intersect.

**3.** Developing a new skill of gathering technical information about different types of components used in Mechatronic Systems.

**4.** Ability to use and benefit from learning media and available resources to collect information and selecting components to satisfy some design requirements involves reading datasheets and extracting information from them.

**5.** Learning-by-Doing from the tasks performed in the Lab and project.

**6.** Gain the skills necessary to function effectively as a member of a team.

| Course ILOs | The learning levels to be achieved | | | | | |
|---|---|---|---|---|---|---|
| | **Remembering** | **Understanding** | **Applying** | **Analysing** | **evaluating** | **Creating** |
| 1 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| 2 | ✓ | ✓ | ✓ | | ✓ | |
| 3 | ✓ | ✓ | ✓ | | ✓ | |
| 4 | | ✓ | ✓ | | ✓ | |
| 5 | | | ✓ | ✓ | ✓ | ✓ |
| 6 | | | | | ✓ | ✓ |

**22. The matrix linking the intended learning outcomes of the course with the intended learning outcomes of the program:**

| Program ILOs / Course ILOs | ILO (1) | ILO (2) | ILO (3) | ILO (4) |
|---|---|---|---|---|
| 1 | | | ✓ | ✓ |
| 2 | ✓ | | | ✓ |
| 3 | ✓ | | | ✓ |
| 4 | ✓ | | | ✓ |
| 5 | ✓ | | | ✓ |
| 6 | | ✓ | | |

**23. Topic Outline and Schedule:**

| Week | Lecture | Topic | ILO/s Linked to the Topic | Learning Types (Face to Face/ Blended/ Fully Online) | Platform Used | Synchronous / Asynchronous Learning | Learning Resources |
|---|---|---|---|---|---|---|---|
| 1 | 1 | Principles of Switching and Driving: - Practicing Datasheets and Practical sessions. | 1-6 | Face to Face | Class + Lab | Synchronous | Lab Sheets |
| 2 | 2 | | | | | | |
| 3 | 3 | Control of stepper motors. | 1,3,4 | | | | |
| 4 | 4 | | | | | | |
| 5 | 5 | Design of Temperature Control System: - Design and Implementation. | 1-6 | | | | |
| 6 | 6 | | | | | | |
| 7 | 7 | Pump Sizing of a Hydraulic System: - Design Case Study. | 1,2,3 | | | | |
| 8 | 8 | Midterm | 1,3,4 | | | | |
| 9 | 9 | Design of Simple Shaft Encoder | 1,2 | | | | |
| 10 | 10 | Actuator sizing and selection, Motion Control and Variable Speed Drive of a Conveyor System. | 1,4 | | | | |
| 11 | 11 | Project | 1-6 | | | | |
| 12 | 12 | | | | | | |
| 13 | 13 | | | | | | |
| 14 | 14 | | | | | | |
| 15 | 15 | Final Exam | 1,3,4 | | | | |

**24. Evaluation Methods:**

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

| Evaluation Activity | Mark | Topic(s) | ILO/s Linked to the Evaluation activity | Period (Week) | Platform |
|---|---|---|---|---|---|
| Project | 30 | All Topics | 1,2,3,4,5,6 | 11-14 | Class |
| Midterm | 30 | 1-7 | 1,3,4 | 8 | Class |
| Final exam | 40 | All Topics | 1,3,4 | 15 | Class |

**25. Course Requirements:**

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

**26. Course Policies:**

**A- Attendance policies:**

Students are expected to attend EVERY CLASS SESSION and they are responsible for all materials, announcements, schedule changes, etc., discussed in class.

**B- Absences from exams and submitting assignments on time:**

There will be no make-up exams for any exam or missed assignment, which will be taken during the course. Exceptions to this rule is restricted only to the following cases:

- Death of only first order relatives (father, mother, sister, or brother).
- Hospital entry (inpatient) during the time of the examination. Any other cases will be given a zero mark in the corresponding exam or assignment.

**C- Health and safety procedures:**

Students are responsible for:

- Keeping themselves informed of conditions affecting their health and safety.
- Participating in safety training programs.
- Following health and safety practices in their workplace, classroom.
- Advising or reporting unsafe practices or serious hazards in the classroom or laboratory.

**D- Honesty policy regarding cheating, plagiarism, misbehavior:**

Follow the UJ guidelines that provide definitions, procedures, and recommendations for promotion and violation of academic honesty and integrity.

**E- Grading policy:**

Follow the UJ guidelines that provide definitions of undergraduate grading policy.

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

Lab-sheet, class handouts, Laboratory, and an access to Personal Computer with office software

**27. References:**

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| A- Required book(s), assigned reading and audio-visuals:<br>1. Mechatronics: An integrated approach, Clarence W. de Silva, CRC Press, 2005.<br>2. Introduction to Mechatronics and Measurement Systems", Third Edition, DavidG. Alciatore and Michael B. Histand, McGraw Hill International Edition, 2007<br>B- Recommended books, materials, and media:<br>Lab sheets |

**28. Additional information:**

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| N/A |

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|---|---|---|
| Name of the Instructor or the Course Coordinator:<br>Eng. Hisham Mohammad | Signature: | Date:<br>3 / 13 / 2024 |
| Name of the Head of Quality Assurance Committee/ Department<br>…… | Signature:<br>……..…… | Date:<br>……..…… |
| Name of the Head of Department<br>…… | Signature:<br>……..…… | Date:<br>……..…… |
| Name of the Head of Quality Assurance Committee/ School or Center<br>…… | Signature:<br>……..…… | Date:<br>……..…… |
| Name of the Dean or the Director<br>…… | Signature:<br>……..…… | Date:<br>……..…… |