

**The University of Jordan**  
**School of Engineering**  
**Mechatronics Engineering Department**  
2nd Semester – A.Y. 2020/2021



**Course:** Graduation Project – MX0908599 (3 Cr. – Required Course)

**Instructor:** Dept Faculty Members

**Course website:** [www.elearning.ju.edu.jo](http://www.elearning.ju.edu.jo)

**Catalog description:** In part one, a problem will be assigned to the student in one of the different mechatronics engineering tracks. He will be asked to rely on himself to find a solution for the problem (which could be practical or theoretical). It is expected from the student to develop the abilities of research and independent work and to train himself to observe a time table to perform his project and to be capable to explain and express his findings in a professional manner. In the second part, the student is required to finish the work he started in the first part. The student is required, whenever it is possible, to use the appropriate and available software to solve his problem, simulate his solution, to build a prototype and perform all needed measurements. The student will be required to write down his final year project as a complete report (dissertation) according to the department instructions.

**Prerequisites by course:** **Finishing successfully 120 Credits** (pre-requisite)

**Prerequisites by topic:** Students are assumed to have a background in:  
•Basic principles of various Mechatronics engineering fields.  
•Mathematical modeling of Mechatronics engineering problems.

**Textbook:** **Senior Design Project Guidelines (available on the course website)**

- References:**
1. Engineering Design: A Project-Based Introduction 4th Edition by Clive L. Dym, Patrick Little and Elizabeth Orwin, Wiley, 4 edition, 2013.
  2. Electronic Project Design and Fabrication by Ronald A. Reis, Prentice Hall, 6 edition, 2004.
  3. Mechatronics: An Integrated Approach, Clarence W. de Silva, CRC Press, 2004.
  4. LabVIEW: A Developer's Guide to Real World Integration by Ian Fairweather (Editor), Anne Brumfield (Editor), Chapman and Hall/CRC, 2011.
  5. Introduction to MATLAB for Engineer, William Palm, McGraw-Hill Education; 3 edition, 2010.
  6. Engineering Design: An Introduction by John R. Karsnitz, Stephen O'Brien and John P. Hutchinson, Cengage Learning, 2nd Edition, 2012.
  7. Project Management: A Systems Approach to Planning, Scheduling, and Controlling by Harold Kerzner, Wiley, 11 edition, 2013.
  8. Project Management: A Quick Start Beginner's Guide For The Serious Project Manager To Managing Any Project Easily by Donald J. Scott, CreateSpace Independent Publishing Platform, 1 edition, 2016.

**Schedule:** Two semesters, 16 weeks each, 16 contact hours per semester.

- Course goals:** The following are the main objectives of this course:
- Introduce the engineering design process under constraints.
  - Develop the student's soft skills, including oral and written communication skills, and the ability to function in a team.
  - Ability to engage in life-long learning (literature review and data collection).

**Course learning outcomes (CLO) and relation to ABET student outcomes (SO):**

- Upon successful completion of this course, a student should:
- |   |                           |
|---|---------------------------|
| 1. Know how to use library resources and learn needed skills to complete literature survey    | <b>[SO]</b><br><b>[7]</b> |
| 2. Practice the Oral communication in a form of presentation                                  | <b>[3]</b>                |
| 3. Practice the written communication skills in a form of report                              | <b>[3]</b>                |
| 4. Understand the ethical role in Engineering projects  | <b>[4]</b>                |
| 5. Apply mathematics, scientific and engineering principles in solving engineering problems   | <b>[1]</b>                |
| 6. Know the social, economic, commercial, and environmental impact of engineering decisions.  | <b>[2]</b>                |
| 7. Design a system or part of a system that fulfils a certain requirement                     | <b>[2]</b>                |
| 8. An ability to function on multidisciplinary teams  | <b>[5]</b>                |
| 9. An ability to analyze, interpret data, discuss the results and use engineering judgment to | <b>[6]</b>                |

**Course topics:**

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| <b>Course topics:</b>  | <b>Hrs</b> |
| 1. Orientation: How to write log books and reports, Teamwork and distributing work, etc. |            |
| 2. Selecting the design challenge.   |            |
| 3. Design Process.   |            |
| 4. Practical Implementation.   |            |
| 5. System Tesing.  |            |
| 6. Optimization.   |            |
| 7. Writng the report and preparing the oral presentation.                                |            |

**Ground rules:** It is expected from the student to develop the abilities of research and independent work and to train himself to observe a time table to perform his project and to be capable to explain and express his findings in a professional manner. The student is required, whenever it is possible, to use the appropriate and available software to solve his problem, simulate his solution, to build a prototype and perform all needed measurements. The student will be required to write down his final year project as a complete report (dissertation) according to the department instructions. Team members should be considerate to each other, and adhere to their ethical responsibilities.

<b>Assessment &amp; grading policy:</b>	Report1	20%	Final Report	30%
	Logbook	10%	Presentation	20%
	Ethics	10%		
	Exit Exam	10%		
			<b>Total</b>	<b>100%</b>

**Last Revised:** September 1, 2019