**The Hashemite University**
**Faculty of Engineering**
**Course Syllabus**

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| **Course Title:** | Process Control Laboratory | **Course Number:** | 110405541 |
| **Department:** | Mechatronics Engineering | **Designation:** | Compulsory |
| **Prerequisite(s):** | 110405541 | | |
| **Instructor:** | Dr. Samer Mutawe<br>Eng. Sarah Nabhan | **Instructor's Office:** | E3127 |
| **Instructor's e-mail:** | samerk@hu.edu.jo | | |
| **Office Hours:** | Announced on the office door | | |
| **Time:** | Tuesday 1-4 | **Class Room:** | E2072 |
| **Course description:** | This course aims to introduce students to design of industrial automated systems with PLC. Emphasis is on integration of components, process developments and programming. | | |
| **Textbook(s):** | Automation Laboratory Manual | | |
| **Other required material:** | Petruzella, Frank D. (2005). Programmable Logic Controllers. McGraw Hill Companies Inc. | | |
| **Course objectives:** | *The student should be able to:*<br>• Apply the knowledge of digital systems to analyze and manipulate PLC-based systems. (a)<br>• Identify and formulate PLC-based system to meet industrial requirements. (e)<br>• Communicate effectively such as writing laboratory reports. (g)<br>• Broad education to understand the impact of engineering solutions in a global and societal context. (h)<br>• Comprehend contemporary issues in industrial automation. (j)<br>• Use of digital logic tools such as timers, counters, and logic gates to manipulate and build PLC programs. (k) | | |
| **Topics covered:** | • Introduction to electro-pneumatic<br>• Introduction to PLC Stations and Components<br>• Basics of PLC Programming 1<br>• Basics of PLC Programming 2<br>• Programming Timers<br>• Programming Counters | | |
| **Class/laboratory schedule:** | 1 Laboratory session each week | | |
| **Grading Plan:** | Lab work and Quizzes (30 Points) During lab<br>Mid Term Exam (30 points) See Course Schedule<br>Final Exam (40 Points) See Course Schedule | | |

**Prepared by:** Dr. Samer Mutawe
Eng. Sarah Ahmad

**Date:** 22/2/2021

The Hashemite University
Faculty of Engineering
Mechatronics Engineering Department

## Course Schedule
## Process Control Laboratory

| Notes | Week No. | Group A | Group B | Experiment | Session # | On campus/ Online | Assignment |
|---|---|---|---|---|---|---|---|
| | 1 | 23/2/2021 | | electro-pneumatic system application | 1 | Online | -- |
| | 2 | 1/3/2021 | | electro-pneumatic system application | 1 | On Campus | Lab Work #1 |
| | 3 | 9/3/2021 | | *Introduction to PLC<br>*Basics of PLC Programming 1 ( self-latch) | 2 and 3 | On Campus | Lab Work #2 and Lab Work #3 |
| | 4 | | 16/3/2021 | | | | |
| | 5 | 23/3/2021 | | Basics of PLC Programming 2 (internal relay) ( Set/Reset coils) | 4 | On Campus | Lab Work #4 and Lab Work #5 |
| 1st exams | 6 | | 30/3/2021 | | | | |
| | 7 | 6/4/2021 | | Programming with Counters | 5 | On Campus | Lab Work #6 |
| Mid exams | 8 | | 13/4/2021 | | | | |
| | 9 | 20/4/2021 | | Free Lab | --- | Online | --- |
| | 10 | 27/4/2021 | | **Mid Practical Exam** | **2+3+4+5** | **On Campus** | |
| 2ed exams | 11 | 4/5/2021 | | Programming with Timers | 6 | On Campus | Lab Work #7 |
| | 12 | | 11/5/2021 | Programming with Timers | 6 | On Campus | Lab Work #8 |
| | 13 | 18/5/2021 | | عيد فطر مبارك | | | |
| | 14 | 25/5/2021 | | عيد الاستقلال | | | |
| Lab Final exams | 15 | 1/6/2021 | | **Lab Final exam** | **2+3+4+5+6** | **On Campus** | |
| | 16 | 8/6/2021 | | --- | | | |

Eng. Sarah AL-Bargothi
8/3/2021