# Industrial Processes Control
# COURSE SYLLABUS

| Course Code | Course Name | Credits | Contact Hours |
|---|---|---|---|
| 0401546 | Industrial Processes Control | 3 | 3 T |

## INSTRUCTOR/COORDINATOR

| | |
|---|---|
| **Name** | Dr.Talal Aljaafreh |
| **Email** | tmjaafreh@mutah.edu.jo |

## TEXTBOOK

| | |
|---|---|
| **Title** | Fundamentals of Industrial Instrumentation and Process Control, Second Edition |
| **Author/Year** | William Dunn, 2018 |

Other Supplemental Materials

| | |
|---|---|
| Title | Instrumentation and Process Control, **6th Edition** |
| Author/Year | Franklyn W. Kirk , 2014 |
| **Electronic Materials** | |

## SPECIFIC COURSE INFORMATION

### A. Brief Description of the Content of the Course (Catalog Description)

Control problem in industrial processes; structure of control system in industry processes; flow of information and flow of product; cascade loops; feed forward; multivariable systems; state space models and differential equation models; root locus and pole placement design; discrete state space models for linear systems; predictive control; noise and disturbance in process control; Matlab and Simulink application in process control.

### B. Pre-requisites (P) or Co-requisites (C)

*Automatic control* (P)

| C. Course Type (Required or Elective) | | |
|---|---|---|
| Elective | | |

**SPECIFIC GOALS**

**A. Specific Outcomes of Instruction**

**By the end of this course, the student should be able to:**

- CLO1- Develop the necessary mathematical tools to understand and analyze the systems dynamics responses [1].
- CLO2- Solve Control problems in industrial processes [7].
- CLO3- Recognize flow of information and flow of product [7].
- CLO4- To apply Matlab and Simulink application in process control [7].

**B. Student Outcomes Addressed by the Course**

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| ✓ | | | | | | ✓ | | | | |

**BRIEF LIST OF TOPICS TO BE COVERED**

| List of Topics | No. of Weeks | Contact Hours |
|---|---|---|
| Introduction, Control problem in industrial processes; structure of control system in industry processes; | 1 | 3 |
| Flow of information and flow of product; cascade loops; | 2 | 6 |
| Feed forward; multivariable systems; | 2 | 6 |
| Sate space models and differential equation models; | 2 | 6 |
| Root locus and pole placement design; | 2 | 6 |
| Discrete state space models for linear systems; | 2 | 6 |
| Predictive control; noise and disturbance in process control; | 2 | 6 |
| Matlab and Simulink application in process control. | 1 | 3 |
| | | |
| | | |
| *Total* | *14* | *42* |

**EVALUATION**

| Assessment Tool | Due Date | Weight (%) |
| --- | --- | --- |
| Mid Exam | According to the university calendar | 30 |
| Course Work (Homeworks, Quizzes, Projects, …etc.) | One week after being assigned | 20 |
| Final Exam | According to the university calendar | 50 |

| ABET's Students Learning Outcomes (Criterion # 3) | | |
| --- | --- | --- |
| | Relationship to program outcome | |
| ABET 1-7 | | |
| 1. | ✓ | an ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics. |
| 2. | | an ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors. |
| 3. | | an ability to communicate effectively with a range of audiences. |
| 4. | | an ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts. |
| 5. | | an ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives. |
| 6. | | an ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions. |
| 7. | ✓ | an ability to acquire and apply new knowledge as needed, using appropriate learning strategies. |