

**Course Number & Name** MIME 4450 – Automation Design  
**Credits & Contact hours** 3 Credits – 3 lec, 0 lab  
**Course Number & Name** EET 4550 – Mechatronics II  
**Credits & Contact hours** 4 Credits – 3 lec, 1 lab  
**Coordinator** Wm Ted Evans, PhD, PE

**Textbook** Hybrid Text, Hybrid Lab Text both at [hybridplc.org](http://hybridplc.org)  
youtube videos, other texts, books, manuals as needed (see link)

**Course Information** This course continues with automation topics following MIME 4440. The PLC was the main tool in this first course. In MIME 4450, integration of various control elements is emphasized. The course begins with a study of robotics. Later robots are linked to PLCs. Then vision systems are added. Also included are advanced topics such as speed and position control of single axes servo and stepper motors as well as coordination of multiple axes. The PID algorithm is emphasized. Also, the safety PLC is discussed.

**Topics**

1. Sequential Programming Concepts
2. Process control PLC programming including Faceplate
3. HMI Programming Organization
4. Siemens Function/Function Blocks
5. Motion Control of single axis motion systems
6. PID implementation including HMI
7. Robotic Programming
8. Communications between Robots, PLCs and other devices
9. Robotic Vision Integration into Robot

**Class will be graded:**

<b>Four Labs (5 pts/ea)</b>	<b>20 %</b>
<b>Assignments</b>	<b>10%</b>
<b>Midterm exam</b>	<b>30 %</b>
<b>Report</b>	<b>40 %</b>

**(A >= 90, B >= 80, C >= 70, D >= 60)**

There are no make-up exams for this course. If you have a problem or conflict and cannot attend an exam, let me know beforehand and we will try to work something out. No credit will be given for a missed exam that we haven't made arrangements about beforehand unless you have a **really excusable** emergency. Cell phone use will not be allowed. If you do not have a calculator, buy one and bring it to class.

Cheating is not allowed and will be punished by rules of U of Toledo Student Handbook.

Credit for labs consists of presentation of a finished lab (signed) and a summary statement. Alternatively, if no one is present to sign your lab, you may submit as many screen shots of your lab as you deem sufficient to prove that you in fact performed the lab in a run-time situation. Also, submit a summary of your lab with this option. Three labs must be completed by end of week Nov. 12.

A report will also be required, either of a topic approved by the instructor or a summary report of a lab that was assigned or approved.

## Lectures

	Date	Lecture/Lab Schedule	Assignment/Lab Due Date
Week 1	8/26/25	Introduction	
	8/28/25	Digital Logic I	Week 1 Assn – 9/4/25
Week 2	9/2/25	Digital Logic II	
sn	9/4/25		
Week 3	9/9/25		
	9/11/25		
Week 4	9/16/25		
	9/18/25		
Week 5	9/23/25		
	9/25/25		
Week 6	9/30/25		
	10/2/25		
Week 7	10/7/25		
	10/9/25		
Week 8	10/14/25	Fall Break	
	10/16/25		
Week 9	10/21/25		
	10/23/25		
Week 10	10/28/25		
	10/30/25		
Week 11	11/4/25		
	11/6/25		
Week 12	11/11/25	Veterans Day Break	
	11/13/25		
Week 13	11/18/25		
	11/20/25		
Week 14	11/25/25		
	11/27/25	Thanksgiving	
Week 15	12/2/25		
	12/4/25		
Week 16		Finals	