

<b>Department of Mechanical Engineering</b>			
<b>Robotics &amp; Automation Lab. (67683)</b>			
<b>Total Credits</b>	<b>1</b>		
<b>major compulsory</b>			
<b>Prerequisites</b>	<b>P1 : Robotics (67682)</b>		
<b>Course Contents</b>			
This course looks at the programming and simulation of robot industrial operations. Particularly, it looks at programming with practical applications of the CNC-Lathe and CNC milling machines and the simulation of industrial processes using a standard PLCs. It uses practical experiments on industrial automation with applications to assembly stations and product sorting laboratory equipments.			
<b>Intended Learning Outcomes (ILO's)</b>		<b>Student Outcomes (SO's)</b>	<b>Contribution</b>
1	Conduct experiments in common serial robot programming	B	30 %
2	Conduct experiments in PLC programming in industrial fields	B	30 %
3	Write proper laboratory reports following laboratory report instructions and format	K	30 %
4	work in team	D	10 %
<b>Textbook and/ or References</b>			
Laboratory Manuals, Handouts and Data Sheets			
<b>Assessment Criteria</b>		<b>Percent (%)</b>	
Mid. Term Exam		20 %	
Laboratory Work		40 %	
Final Exam		40 %	
<b>Course Plan</b>			
<b>Week</b>	<b>Topic</b>		
1	Introduction to Control System Laboratory		
2	Explanation of the Automation Experiments		
3	Experiment No. 1: Distribution Station		
4	Experiment No. 2: Testing Station		
5	Experiment No. 3: Processing Station		
6	Experiment No. 4: Sorting Station		
7	Experiment No. 5: Handling Station		
8	Experiment No. 6: Pick and Place Station		
9	Midterm Exam		
10	Explanation of the Laboratory Experiments (Robot Experiment)		
11	Experiment No. 7: Pick and place with sorting basing on Gripper Size		
12	Experiment No. 8: Pick and Place on I/O Experimental Table Using Loops and If Statement		
13	Experiment No. 9: Conveyor Belt with Sensor If Statement , Loops and Counters		
13	Experiment No. 10: Creating a Robotic cell Using Cell Setup Experiment No. 11: Introduction to Image Processing in Robot Experiment No. 12: Use image Processing in Robocell		
14	Final exam		