Instituto Tecnológico y de Estudios Superiores de Monterrey
Campus Estado de México
Escuela de Ingeniería y Ciencias
Departamento de Mecatrónica

Course information

Name	Process Automation Laboratory
Course code	MR2015
Link to course plan	`https://samp.itesm.mx/Materias/VistaPreliminarMateria?clave=MR2015&lang=EN`
Course objective	On completing the course the student will be able to carry out the analysis, design and implementation of automatic control systems for continuous processes and logic control in batch-type processes.
Language	**The course will be given in english**

Course information

Name	Control Engineering Laboratory
Sessions	Wednesday 19.05 — 21:55
Location	Laboratorio de automatización de procesos, CEDETEC 01L07
Teacher	Kjartan Halvorsen
Contact info	`kjartan@tec.mx` , tel. 55 62 19 40 48

Course objective

Upon completion of this course, students will be able to operate and implement control loops based on PID controllers in servo- and regulation-type systems; design and implement HMIs for monitoring and digital control; and design logic control automatisms using diverse industrial software and hardware tools.

Course policy

Rules It is your responsibility as student to know and comply with the rules of ITESM. For instance, work in the laboratory requires wearing a lab coat.

In class In class we work on tasks related to process automation, and nothing else. I expect every student to take an active part in the class.

Punctuality and absence There is a maximum 5 minute tolerance for coming late. If you miss a session, you will not get all the points that your group earn on the lab activity you miss. Writing the report counts as one session, so, if you miss one session of an activity which is scheduled for two sessions (with report due after the second session) you'll get 2/3 of your groups score on that report.

Learning methodology

The course is based on problem-based learning, collaborative learning and project-oriented learning.

Lab activities You will carry out a number of different group activities during the lab sessions. The instructions for the activities are found on Canvas, and each ativity should be documented in a report (one for each group). Make sure to take pictures of your setup and save graphs and results during the work in the lab, so that you have the needed material for the report.

Project The group project takes place in the last partial Students form project groups of up to four (4) members. Progress reports are due at the end of each partial, and a final report at the end.

Project presentation In the final project presentations, the project will be evaluated by external examinors.

Partial exams There are two partial exams. These are 1.5 hours.

Bibliography

Text book	■ Smith, Carlos A, Priciples and practice of automatic process control, 2nd Ed, New York : J. Wiley, 1997.
Reference books	■ Åström, K. J. & Wittenmark, B. Computer-controlled systems – Theory and design, 3rd Ed., Dover publications, 2011. ■ Dorf, R. C., & Robert H. Bishop. Modern control systems. Pearson, 2011.

About the professor

- PhD in Electrical Engineering with specialization in Systems Analysis, 2002, Uppsala University, Sweden. MSc in Vehicle Engineering, 1996, KTH – Royal Institute of Technology, Stockholm, Sweden
- Associate Professor / Senior Lecturer in Systems and Control, 2009-2017, Department of Information Technology, Uppsala University, Sweden
- Researcher, 2017-, Department of Information Technology, Uppsala University, Sweden
- Guest professor, 2012-2013, Department of Mechatronics, CEM, ITESM
- Profesor de cátedra, 2015-, Department of Mechatronics, CEM, ITESM

Course plan and evaluation system

First partial				
Week	Theme	Lab/proj report	Exam	Total
1	Intro, Electrical circuits	5 %		
2	First-order systems			
3	Second-order systems	8 %		
4	PID design			
5	PID implementation	8 %		
6	Proj report, partial exam	6 %	8 %	
		27 %	8 %	**35 %**

Second partial				
Week	Theme	Lab/proj report	Exam	Total
7	Boolean logic	5 %		
8	Pneumatics			
9	Electro-pneumatics	8 %		
10	Programmable Logic Controllers			
11	PLC for controlling pneumatic systems	8 %		
12	Proj report, partial exam	6 %	8 %	
		27 %	8 %	**35 %**

Third partial				
Week	Theme	Project	Exam	Total
13	Instrumentation symbols			
14	Project work			
15	Project work	Report 15 %		
16	Project work	Presentation 15 %		
		30 %		**30 %**
	Final grade			**100 %**