

University of Puerto Rico
 Mayagüez Campus
 College of Engineering
 Department of Electrical and Computer Engineering
 Bachelor of Science in Electrical Engineering

Course Syllabus

1. General Information:		
Alpha-numeric codification: INEL 5506 Course Title: PROCESS INSTRUMENTATION AND CONTROL ENGINEERING Number of credits: 3 Contact Period: 3 hours of lecture per week Elective in INEL 5506		
2. Course Description:		
English: Design of process instrumentation and control systems, based on analog and digital instruments and mini or microcomputers. Standards and practical considerations emphasized.		
Spanish: Diseño de sistemas de instrumentación y control de procesos basados en instrumentación analógica y digital y en mini o microcomputadoras. Énfasis en normas establecidas y consideraciones prácticas.		
3. Pre/Co-requisites and other requirements:		
INEL 4505 Y INEL 4206		
4. Course Objectives:		
Design of practical process instrumentation and control systems using computers and analog and/or digital instruments. Selection of measurement systems, controllers, and final control elements necessary to achieve system design specifications while satisfying standards and established practices.		
5. Instructional Strategies:		
<input checked="" type="checkbox"/> conference <input checked="" type="checkbox"/> discussion <input checked="" type="checkbox"/> computation <input checked="" type="checkbox"/> laboratory <input type="checkbox"/> seminar with formal presentation <input type="checkbox"/> seminar without formal presentation <input type="checkbox"/> workshop <input type="checkbox"/> art workshop <input type="checkbox"/> practice <input type="checkbox"/> trip <input type="checkbox"/> thesis <input type="checkbox"/> special problems <input type="checkbox"/> tutoring <input type="checkbox"/> research <input type="checkbox"/> other, please specify:		
6. Minimum or Required Resources Available:		
Electrical measurement equipment, electronic components, personal computers with data acquisition boards and software.		
7. Course time frame and thematic outline		
	Outline	Contact Hours
	Elements in process control standards and practical consideration	9
	Transducers	12
	Analog and digital signal conditioning	4
	PID control: practical considerations for both analog and digital controllers	10
	Discrete-state process control programmable controllers and industrial applications	9
	Mid-term exam	1
	Total hours: (equivalent to contact period)	45
8. Grading System		
<input checked="" type="checkbox"/> Quantifiable (letters) <input type="checkbox"/> Not Quantifiable		
9. Evaluation Strategies (Suggested): The faculty member teaching the course will provide the student with the evaluation strategy he/she will be using throughout the semester. This will be done within the first week of classes.		
	Quantity	Percent
<input checked="" type="checkbox"/> Exams	1	20
<input checked="" type="checkbox"/> Final Exam	1	20
<input type="checkbox"/> Short Quizzes		

<input type="checkbox"/>	Oral Reports		
<input type="checkbox"/>	Monographies		
<input type="checkbox"/>	Portfolio		
<input checked="" type="checkbox"/>	Projects	2	60
<input type="checkbox"/>	Journals		
<input type="checkbox"/>	Other, specify:		
TOTAL:			100%

10. Bibliography:

Johnson, CD, Process Control Instrumentation Technology, 8th Ed., Prentice Hall, New Jersey.

11. According to Law 51

Students will identify themselves with the Institution and the instructor of the course for purposes of assessment (exams) accommodations. For more information please call the Student with Disabilities Office which is part of the Dean of Students office (Chemistry Building, room 019) at (787)265-3862 or (787)832-4040 extensions 3250 or 3258.

12. Contribution of Course to meeting the requirements of Criterion 5:

Math	Basic Science	General	Engineering Topic
			√

13. Course Outcomes

Map to Program Outcomes

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|---|---|
| <ol style="list-style-type: none"> 1. Analyze and design signal conditioning and transmission circuits. 2. Understand the principles of operation of various types of transducers. 3. Design of practical process instrumentation and control systems using computers and analog and/or digital instruments. 4. Selection of measurement systems, controllers, and final control elements necessary to achieve system design specifications while satisfying standards and established practices. 5. Preparation of an oral and written report about the final project. 6. Work as part of a team. 7. Learn about the role and scope of regulating agencies such as the Occupational Safety and Health Administration (OSHA), the National Fire Protection Association (NFPA), and the Food and Drug Administration (FDA). 8. Learn about the role and scope of professional societies such as Instrumentation, systems and Automation (ISA) society and the Institute of Electrical and Electronics Engineers (IEEE). 9. Implementation and testing of a process control and instrumentation system. 10. Understanding of professional and ethical responsibility. 11. Use modern engineering tools (MATLAB, LabVIEW, PSPICE...) for the design and implementation of a process control and instrumentation system. | <ol style="list-style-type: none"> (e) (a) (c) (e) (g) (d) (j) (i) (b) (f) (k) |
|---|---|

Person(s) who prepared this description and date of preparation: Eduardo J. Juan,
Submitted by: Eduardo J. Juan, Feb 2007