

Course Title	MECH 4346 Mechatronics	Spring/2016
INSTRUCTOR:	Angel Flores-Abad Office: Engineering Building, Room E331, afloresabad@utep.edu	
ASSISTANTS:	<ul style="list-style-type: none"> • Jesus de la Torre, Email: jadelatorrerayas@miners.utep.edu • Juan Yepez, Email: jpyepez@miners.utep.edu 	
OFFICE HOURS:	11:00 AM to 12:00 pm MWs	
Lecture:	Chemistry Computer Sci Bldg G.0208	
LAB:	E-102B Intelligent systems laboratory	
COURSE DESCRIPTION:	System modeling; system stability; time-domain performance analysis; root-locus technique; frequency-domain analysis; control system design, and electronic control of a Mechanical System.	
PREREQUISITES:	ME 2342 Electromechanical systems or consent of the instructor	
Software	<ul style="list-style-type: none"> • Matlab 2012 <ul style="list-style-type: none"> ○ Robotics simulator by Peter Corke at http://petercorke.com/Robotics_Toolbox.html ○ Ardupilot toolbox at http://www.mathworks.com/matlabcentral/fileexchange/39037-apm2-simulink-blockset • Adams • Multisim • Arduino software 	
TEXTBOOKS:	<p>[1] <i>Mechatronics: A Multidisciplinary Approach</i>, W. Bolton, Prentice Hall .</p> <p>[2] <i>Introduction to robotics: mechanics and control</i>, J. J. Craig. Pearson Education.</p> <p>[3] <i>Robotics vision and control: Peter Corke</i>. Springer.</p> <p>[4] <i>Ogata, K., & Yang, Y. Modern control engineering</i>. Pearson Education.</p>	
GRADING:	<p>Class assignments (Paper-based and software-based homework) 30%</p> <p>Test 1 (Midterm) - March 2 25%</p> <p>Teat 2 (Midterm) - April 27 25%</p> <p>Final Project (includes the labs): 20%</p> <p>Final Exam (Comprehensive):</p> <ul style="list-style-type: none"> • Only for students with a final overall grade below 70%. It is not optional. • Will replace the grade of your lowest midterm. <p>ESCALE</p> <p>A ≥ 90</p> <p>B ≥ 80 but <90</p> <p>C ≥ 70 but <80</p> <p>D ≥ 60 but <70</p> <p>F <60</p>	

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TOPICS COVERED:	<ul style="list-style-type: none"> • Introduction to mechatronics • Spatial Descriptions and Transformations. • Mathematical modeling of Dynamics Systems <ul style="list-style-type: none"> ○ Transfer function ○ State space representation. • Transient response <ul style="list-style-type: none"> ○ First-order systems ○ Second-order systems • Control design <ul style="list-style-type: none"> ○ Open loop-control ○ Closed-loop control 	
OBJECTIVES / EXPECTATIONS	<ul style="list-style-type: none"> • Students should have understanding on how to model and simulate mechatronic systems. • Students should be able to apply automatic control techniques in a simulation environment as well as in real time implementation. 	
MATERIAL FOR CLASS	<ul style="list-style-type: none"> • Calculators: Simple scientific calculators are allowed. For example: TI-30X, HP33S and HP35S. Programmable calculators or those with advanced functions (\int , dx, vectors and matrices) are not allowed. Those are the same calculators that are currently being allowed in the Fundamental of Engineering (FE) and Professional Engineering (PE) exams (http://ncees.org/exams/calculator-policy/) • Laptop. 	
LAB POLICIES	<ul style="list-style-type: none"> • No drinks and food. • Use safety glasses (they will be provided) if you have already yours, please bring them. • Wearing: closed-toe-shoes and trouser. • Without exemption, nobody will be allowed to be in the lab if these rules are not followed. 	
ATTENDANCE POLICIES:	Attending to the labs is mandatory.	
AUTHOR/DATE:	Angel Flores-Abad	1/20/2016