



**University of Tehran**  
**School of Electrical and Computer Engineering**

<b>Course:</b>	<b>8101224 – Linear Control Systems</b>									
<b>Course type:</b>	EE*						CE*			Credit: 3
	Com	E	P	B	Con	D	SW	HW	IT	
	Required	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
Elective	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
<b>Level:</b>	Undergraduate <input checked="" type="checkbox"/> Graduate <input type="checkbox"/>									
<b>Co-requisite(s):</b>	None.									
<b>Prerequisite(s):</b>	Systems Analysis (8101144)									
<b>Prerequisite by topic:</b>	Differential equation									
<b>Textbook(s):</b>	[1] K. Ogata, Modern Control Engineering, 5th Edition, Prentice Hall, 2010.									
<b>Coordinator:</b>	Abbasian, Professor, School of ECE									
<b>Goals:</b>	To understand the essentials of mathematical system modeling; to be able to assess stability and performance properties of linear systems, and be able to design lead and lag controllers for linear systems using s-domain and frequency domain techniques.									
<b>Outcome:</b>	Upon successful completion of the course, students will be able to 1. Model mechanical systems 2. Express control specifications 3. Determine system performance 4. Analyze stability of a control system 5. Design compensators to meet control specifications									
<b>Topics:</b>	1) System modeling, time-domain and frequency-domain techniques 2) Control specifications (overshoot, rise time, settling time, steady-state error) 3) Stability 4) Root locus method for control design 5) Lead and lag compensation in time-domain 6) PID controllers 7) Frequency response 8) Lead and lag compensation in frequency-domain									
<b>Computer usage:</b>	MATLAB									
<b>Assignments:</b>	6 to 8 homework assignments									

<b>Projects:</b>	1 projects
<b>Grading:</b>	Assignments: 10 % Projects: 10 % Midterm exams: 30% Final exam: 40 % Quiz: 10%
<b>Further readings:</b>	[1] Norman S. Nise, Control Systems Engineering, 4th edition, John Wiley and Sons Inc., United States, 2004. [2] R. C. Dorf and R. H. Bishop, Modern Control Systems. 2011.
<b>Prepared by:</b>	Abassian, Professor, School of ECE
<b>Date:</b>	23 August 2017

*EE: Electrical Engineering		CE: Computer Engineering	
Com	Communications	SW	Software
E	Electronics	HW	Hardware
P	Power	IT	Information Technology
B	Bioelectronics		
Con	Control		
D	Digital System		