



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

<b>Course:</b>	<b>8101234 –Adaptive Control</b>									
<b>Course type:</b>	EE*						CE*			Credit: 1
	Com	E	P	B	Con	D	SW	HW	IT	
	Required	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
	Elective	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>Level:</b>	Undergraduate <input type="checkbox"/> Graduate <input checked="" type="checkbox"/>									
<b>Co-requisite(s):</b>	None.									
<b>Prerequisite(s):</b>	None.									
<b>Prerequisite by topic:</b>	Modern control theory									
<b>Textbook(s):</b>	<p>[1] Robust Adaptive Control, By: Petros A. Ioannou, Jing Sun, Prentice Hall PTR 1995</p> <p>[2] Adaptive Control Tutorial, By: Petros Ioannou and Barış Fidan, SIAM, 2006</p> <p>[3] Nonlinear and Adaptive Control with Applications, By: A. Astolfi, D. Karagiannis, and R. Ortega, Springer, 2008</p> <p>[4] Adaptive Control, By: K. J. Astrom and B. Wittenmark, Wesley, 1989</p> <p>[5] Adaptive Filtering, Prediction, and Control, By: Goodwin and Sin, Prentice-Hall, Englewood Cliffs, NJ, 1984.</p> <p>[6] Adaptive Control: Stability, Convergence, and Robustness, By: S. Sastry &amp; M. Bodson, Prentice-Hall, 1989</p> <p>[7] Stable Adaptive Systems, By: K. S. Narendra and A. M. Annaswamy, Prentice Hall, Inc., New Jersey, 1988.</p>									
<b>Coordinator:</b>	Yazdanpanah, Professor, School of ECE									
<b>Goals:</b>	To familiarize the audience with different techniques of synthesis of adaptive control systems.									
<b>Outcome:</b>	<p>Upon successful completion of the course, students will be able to</p> <p>to</p> <ol style="list-style-type: none"> <li>1. Get familiar with Parametric Models and Parameter Identification</li> <li>2. Design Adaptive Pole Placement Control</li> <li>3. Design Model Reference Adaptive Control</li> </ol>									
<b>Topics:</b>	<ol style="list-style-type: none"> <li>1) Big picture: From feedback to robustness and adaptation</li> <li>2) Parametric Models</li> <li>3) Parameter Identification</li> <li>4) Model Reference Adaptive Control</li> <li>5) Adaptive Pole Placement Control</li> </ol>									

	6) Adaptive Control of Nonlinear Systems 7) Robust Adaptive Laws 8) Immersion and Invariance Adaptive Control
<b>Computer usage:</b>	MATLAB
<b>Assignments:</b>	4 to 6 homework assignments
<b>Projects:</b>	None.
<b>Grading:</b>	Assignments: 20 % Midterm exams: 30 % Final exam: 50 %
<b>Further readings:</b>	
<b>Prepared by:</b>	Yazdanpanah, Professor, School of ECE
<b>Date:</b>	23 August 2017

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