



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

<b>Course:</b>	<b>8101105 – Electrical Measurement</b>									
<b>Course type:</b>	EE*						CE*			Credit: 3
	Com	E	P	B	Con	D	SW	HW	IT	
	Required	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" 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 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>	Electrical circuits 1 (8101359)									
<b>Prerequisite(s):</b>	None.									
<b>Prerequisite by topic:</b>	Fundamental of electric circuits, Electromagnetic and linear differential equations									
<b>Textbook(s):</b>	[1] S Tumanski, <i>Principles of Electrical Measurement</i> , 2006									
<b>Coordinator:</b>	Shahin Jafarabadi Ashtiani, Professor, School of ECE									
<b>Goals:</b>	<p>The goal of the course is to</p> <p style="padding-left: 40px;">Present correct form of test results.</p> <p style="padding-left: 40px;">Use correctly electric measurement instruments.</p> <p style="padding-left: 40px;">Measure electric quantities.</p>									
<b>Outcome:</b>	<p>Upon successful completion of the course, students will be able</p> <ol style="list-style-type: none"> <li>1. Estimate deviations in measurements due to the influence of the instrument on the measurement object and due to the accuracy of the instrument.</li> <li>2. Connect common measurement instruments to an electric circuit and to make measurements with the instruments.</li> <li>3. Present test results in correct form.</li> </ol>									
<b>Topics:</b>	<ol style="list-style-type: none"> <li>1) Fundamental concepts</li> <li>2) Deviations in measurements and uncertainty</li> <li>3) Instruments characteristics</li> <li>4) Digital and electromechanical instruments</li> <li>5) Current and voltage measurement</li> <li>6) Impedance and resistance measurement</li> <li>7) Energy and power measurement</li> <li>8) Oscilloscope</li> <li>9) Time and frequency measurement</li> <li>10) Spectrum analysis</li> </ol>									
<b>Computer usage:</b>	MATLAB									

<b>Assignments:</b>	Include 5 Homework after chapter 2, 5, 6, 7 and 8.
<b>Projects:</b>	-
<b>Grading:</b>	Assignments: 10% Quiz: 10% Midterm exams: 30% Final exam: 50%
<b>Further readings:</b>	[1] Thomas Muehl, <i>Einfuehrung in die elektrische Messtechnik, Grundlagen, Messverfahren, Geraete</i> , 3. Auflage, 2008 [2] [2] A.K. Sawhney, <i>Electrical Measurement and Instrumentation</i> , 1988. [3] [3] W.D. Cooper, <i>Electronic Instrumentation Technique</i> , 1992.
<b>Prepared by:</b>	Amir Abbas Shayegani Akmal
<b>Date:</b>	Updated: September 2017