



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

<b>Course:</b>	<b>8101687 –Automation, Dispatching, and SCADA in Power Systems</b>		
<b>Course type:</b>	<b>Elective</b>	EE*	Credit: 3
<b>Level:</b>	Graduate		
<b>Co-requisite(s):</b>			
<b>Prerequisite(s):</b>	Power System Analysis I		
<b>Prerequisite by topic:</b>	Power Flow Studies – Transmission System Modeling		
<b>Textbook(s):</b>	<p>[1] A. Phake and J. S. Thorp, Synchronized Phasor Measurements and Their Applications. Springer, 2008</p> <p>[2] K. P. Brand, V. Lohmann, and W. Wimmer, Substation Automation Handbook. Utility Automation Consulting Lohmann Publisher, ۲۰۰۳</p>		
<b>Coordinator:</b>	Majid Sanaye-Pasand and Farrokh Aminifar		
<b>Goals:</b>	To be familiar with power system and substation conventional and modern automation, dispatching centers structures and applications, and supervisory control and data acquisition (SCADA) architecture and functionalities, wide-area measurement system (WAMS) technology, and communication medias used in power systems.		
<b>Outcome:</b>	<p>Be able to</p> <ol style="list-style-type: none"> <li>1. Know how automation promotes performance of power systems and substations</li> <li>2. Describe structure of dispatching centers and list of applications</li> <li>3. Conceive how the fundamental applications of dispatching centers work</li> <li>4. Know SCADA infrastructure tailored for the power industry and their new generation known as WAMS</li> <li>5. Know various communication technologies employed in power industry and compare their pros and cons</li> </ol>		
<b>Topics:</b>	<ol style="list-style-type: none"> <li>1- Introduction to power system automation and dispatching</li> <li>2- Communication technologies and medias used in power system</li> <li>3- HV substation automation</li> <li>4- Convention automation of power systems</li> <li>5- Power system dispatching</li> <li>6- Modern automation of power systems with PMU and wide-area measurement systems</li> <li>7- Control and protection applications of power system automation</li> </ol>		
<b>Computer usage:</b>	MATLAB, GAMS, and DIgSILENT		
<b>Assignments:</b>	4 HWs		
<b>Projects:</b>	1 Project		

<b>Grading:</b>	<ul style="list-style-type: none"> <li>• Final exam 50%</li> <li>• Homeworks 25%</li> <li>• Project 25%</li> </ul>
<b>Further readings:</b>	<p>[1] IEEE Standard for Synchrophasor Measurements for Power Systems, IEEE Std. C37.118.1-2011 (Revision of IEEE Std C37.118-2005).</p> <p>[2] IEEE Standard for Synchrophasor Data Transfer for Power Systems, IEEE Std. C37.118.2-2011 (Revision of IEEE Std C37.118-2005).</p>
<b>Prepared by:</b>	Farrokh Aminifar
<b>Date:</b>	Nov. 18, 2017

\*EE: Electrical Engineering CE: Computer Engineering IT: Information Technology