



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

<b>Course:</b>	<b>8101108 – Operation Studies in Power Systems</b>		
<b>Course type:</b>	Elective	EE*	Credit: 3
<b>Level:</b>	Graduate		
<b>Co-requisite(s):</b>			
<b>Prerequisite(s):</b>	Power System Analysis		
<b>Prerequisite by topic:</b>	Power Flow Studies		
<b>Textbook(s):</b>	<p>[1] A. J. Wood, B. F. Wollenberg, B. Shabele, <i>Power generation, Operation and Control</i>, 3rd ed., New York: John Wiley and Sons, 2014.</p> <p>[2] K. Bhattacharya, M. Bollen, and J. E. Daalder, <i>Operation of restructured power systems</i>, Springer Science &amp; Business Media, 2012.</p>		
<b>Coordinator:</b>	Moein Moeini-Aghaie		
<b>Goals:</b>	<ol style="list-style-type: none"> <li>1. An introduction with operation studies in power systems</li> <li>2. Mathematical modeling of operation studies including economic dispatch (ED) of thermal units, unit commitment (UC), optimal power flow (OPF) studies, state estimation (SE).</li> <li>3. Introducing efficient algorithms for solving operation problems</li> <li>4. Introducing main issues in operation studies of restructured power systems</li> </ol>		
<b>Outcome:</b>	<ol style="list-style-type: none"> <li>1. Learn the main goals of running operation studies in power systems</li> <li>2. Learn how to extract the mathematical model of power system operation problems</li> <li>3. Become familiar with main issues and concerns in operation of power systems</li> <li>4. Learn the main applications of optimization tools in power system operation studies</li> </ol>		
<b>Topics:</b>	<ol style="list-style-type: none"> <li>1. Overview of Power System Operation and Control</li> <li>2. Economic Dispatch of Thermal Units and Methods of Solution</li> <li>3. Unit Commitment</li> <li>4. Optimal Power Flow</li> </ol>		

	<ul style="list-style-type: none"> <li>5. Transmission System Effects</li> <li>6. Power System Security</li> <li>7. Introduction to State Estimation in Power Systems</li> <li>8. Control of Generation</li> </ul>
<b>Computer usage:</b>	MATLAB, GAMS
<b>Assignments:</b>	5 series
<b>Projects:</b>	Simulation project
<b>Grading:</b>	<ul style="list-style-type: none"> <li>Assignment (10%)</li> <li>Project (20%)</li> <li>Midterm (30%)</li> <li>Final (40%)</li> </ul>
<b>Further readings:</b>	[1]
<b>Prepared by:</b>	Moein Moeini-Aghtaie
<b>Date:</b>	10 Oct. 2017

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