

Course name	ECE 53200 Computational Methods for Power System Analysis
Credit and contact hours	(3 cr.) Class 3
Course coordinator's name	Steven Rovnyak
Textbook	J. J. Grainger and W. D. Stevenson, <i>Power System Analysis</i> , McGraw-Hill, 1994. ISBN: 9780070612938
Course information	<p>ECE 53200 Computational Methods for Power System Analysis (3 cr.) P: ECE 43200 or Graduate Standing. System modeling of three-phase power networks. Computational methods and problem formulation related to load flow and fault studies, and economic dispatch of electric power systems. Assigned projects will involve implementing some of the methods and conducting simple studies.</p> <p>Prerequisites/ Co-Requisite P: ECE 43200 or Graduate Standing</p> <p>Required, Elective, or Selected Elective: EE Elective, CE Elective</p>
Goals for the course	<p>Upon successful completion of the course, students should be able to</p> <ol style="list-style-type: none"> 1. Write a program to solve a small power system load flow using the Newton-Raphson method. [1] 2. Calculate network voltages and currents for unsymmetrical faults on symmetrical networks. [1] 3. Calculate economic dispatch of generators in a small network with losses. [1] 4. Apply the weighted least squares method to power system state estimation. [1]
List of topics to be covered	<ol style="list-style-type: none"> 1. Introduction, network models. (2 weeks) 2. Load flow formulations and solution methods. (4 weeks) 3. Fault calculations and power system protection. (3 weeks) 4. Optimization techniques: economic dispatch and optimal power flow formulation. (3 weeks) 5. Power system state estimation. (2 weeks) 6. Exams. (1 week and final exam period)
Syllabi approved by	Steven Rovnyak
Date of approval	08/07/2019