

EE653

## Power distribution system modeling, optimization and simulation

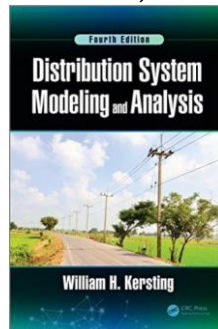
T, R 11:00 am-12:20 pm SWEENEY 1116

**Instructor: Dr. Zhaoyu Wang, Harpole-Pentair**  
**Assistant Professor**  
**Office:** 1113 Coover Hall  
**Office Hours:** Tuesday 2-3 pm or by email  
appointment

**Phone:** 515-294-6305  
**E-mail:** [wzy@iastate.edu](mailto:wzy@iastate.edu)  
**Website:** <http://wzy.ece.iastate.edu>

### Required Texts:

Distribution System Modeling and Analysis, 4<sup>th</sup> edition, William H. Kersting, CRC Press, 2017.



### Course Schedule:

Weeks	Class Dates	Class Topics
1	August 27	Introduction to Distribution Systems
	August 29	Modeling Series Components – Distribution Lines
2	September 3	Modeling Series Components – Distribution Lines
	September 5	Modeling Series Impedance of Overhead and Underground Lines
3	September 10	Modeling Shunt Admittance of Overhead and Underground Lines
	September 12	Modeling Shunt Components –Loads and Caps
4	September 17	Distribution Feeder Modeling and Analysis Part I

	September 19	Modeling Voltage Regulators
<b>5</b>	September 24	Modeling Voltage Regulators
	September 26	Modeling Three-Phase Transformers
<b>6</b>	October 1	Distribution Feeder Modeling and Analysis Part II
	October 3	Various Power Flow Calculation Methods in Distribution Systems
<b>7</b>	October 8	Optimal Power Flow in Distribution Systems
	October 10	Optimal Power Flow in Distribution Systems
<b>8</b>	October 15	Voltage/VAR Optimization and Conservation Voltage Reduction
	October 17	Voltage/VAR Optimization and Conservation Voltage Reduction
<b>9</b>	October 22	Distribution System State Estimation and Smart Meter Data Analytics
	October 24	Distribution System State Estimation and Smart Meter Data Analytics
<b>10</b>	October 29	Microgrids – Introduction and Energy Management
	October 31	Microgrids – Introduction and Energy Management
<b>11</b>	November 5	Microgrids – Dynamic Modeling and Control
	November 7	OpenDSS Tutorial
<b>12</b>	November 12	OpenDSS Tutorial
	November 14	OpenDSS Tutorial
<b>13</b>	November 19	Real Distribution System Modeling and Analysis using OpenDSS
	November 21	Introduction to GridLAB-D
<b>14</b>	November 26	Thanksgiving Break – Happy Holidays!!
	November 28	
<b>15</b>	December 3	Distribution System Resilience: Hardening, Preparation and Restoration
	December 5	Distribution System Resilience: Hardening, Preparation and Restoration
<b>16</b>	December 10	Energy Storage
	December 12	Review and Examples
<b>Final</b>	December 16-20	Final Exams