

POWER SYSTEMS I

EE342

5/10/2015

EE342 Lec. 1

Outline

- Course Contents, Objectives, and *Grads.*
- The War of the Currents;
AC vs. DC
- Fundamentals of Power Systems

Course Contents

- Power System Modeling (Ch. 3)
- Power System Analysis (Ch. 6)
- Power System Control (Ch. 12)
- Power System Optimization (Ch. 7)
- Logic ?????????????????????????????????

Course Home Page

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Ahmed Anas Elwogood Helal - Faculty Member Page

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Lecture Notes

Faculty Member
أحمد أناس إلهال

Ahmed Anas Elwogood Helal , Ph.D.
Professor

Biography

Education

Affiliation

Publications

Courses

Office hours

Field Of Interest

Courses Added

Courses Added

Course	Academic year	Term	
EE231 - Electrical Circuits (1)	2015	Spring	View All Content
- Lectures Notes - Exams - Course Outline - Problem Sets - tutorials - Lab Material			
EE342 - Power Systems (1)	2015	Spring	View All Content
- Lectures Notes - Exams - Course Outline - Problem Sets - tutorials - Lab Material			
EE726 - Renewable Energy Systems	2014	Fall	View All Content
- Lectures Notes - Exams - Course Outline - Problem Sets - tutorials - Lab Material			

Course Grading Policy

- 7th Week Exam 20 Marks
- Reports & Assignments (up to week 8) 10 Marks
- 12th Week Exam 10 Marks
- Reports & Assignments (up to week 13) 10 Marks
- Computer Simulation 10 Marks
- **Final Exam 40 Marks**

The War of the Currents: AC vs. DC Power

- Starting in the late 1880s, Thomas Edison and Nikola Tesla were embroiled in a battle now known as the War of the Currents.
- *Edison* developed direct current, current that runs continually in a single direction, like in a battery or a fuel cell. During the early years of electricity, direct current (shorthanded as DC) was the standard in the U.S.
- But there was one problem. Direct current is not easily converted to higher or lower voltages.

Report (1)

The War of the Currents: AC vs. DC Power

- **Tesla** believed that alternating current (or AC) was the solution to this problem. Alternating current reverses direction a certain number of times per second, 60 in the U.S., and can be converted to different voltages relatively easily using a **transformer**.
- **Edison**, not wanting to lose the royalties he was earning from his direct current patents, began a campaign to discredit alternating current. He spread **misinformation** saying that alternating current was more **dangerous**, even going so far as to publicly **electrocute stray animals** using alternating current to prove his point.

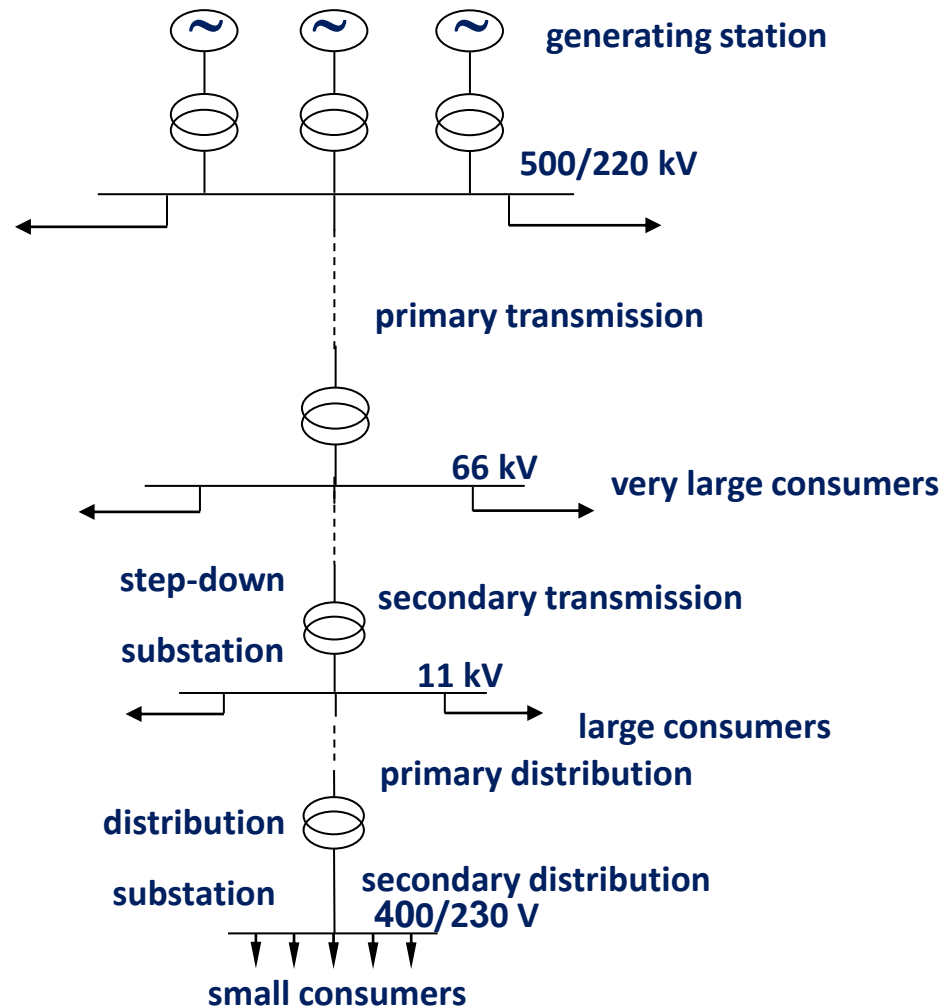
The War of the Currents: AC vs. DC Power

- The Chicago World's Fair, also known as the World's Columbian Exposition, took place in 1893, at the height of the Current War.
- General Electric bid to electrify the fair using Edison's direct current for \$554,000, but lost to George Westinghouse, who said he could power the fair for only \$399,000 using Tesla's alternating current.
- That same year, the Niagara Falls Power Company decided to award Westinghouse the contract to generate power from Niagara Falls.

The War of the Currents: AC vs. DC Power

- Although some doubted that the falls could power all of Buffalo in New York, Tesla was convinced it could power not only Buffalo, but also the entire Eastern United States.
- On Nov. 16, 1896, Buffalo was lit up by the alternating current from Niagara Falls. By this time **General Electric had decided to jump on the alternating current train, too!!!!**

Fundamentals of Power Systems





Any Questions... Just Ask!

