

POWER SYSTEM

Spring Semester, 2023 (Course Number: 4154022, 4303040)

Lecture: Wednesday 10:10AM– 13:00PM, Engr Bld-I 225

Instructor: Dr. Gary W. Chang, Engr-A 349, #33210
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TAs: 楊明翰、高鵬雲 (Room #524)

Office Hours: Wednesday 9:10 – 10:10AM or by appointment

Textbook: Power System Analysis, 2nd Edition
Author: J. J. Grainger, W. D. Stevenson, Jr., and **G. W. Chang**
Publisher: McGraw Hill International, 2016 (新月圖書代理/復文書局)

References: Related articles and hands-out

Objective: To familiarize students with fundamental concepts of modern power system operations and analysis with computer software (e.g. MATLAB/SIMULINK) for hand-on practice.

Prerequisite: Electric circuit, basic electric machinery concepts, differential equations, or permission of the instructor

Topics: Introduction with a general overview on the power system, review of ac circuit theory and definitions of electric quantities, power system component models, power flow analysis, economic dispatch, synchronous machine transient analysis, fault analysis with symmetrical component approach, transient stability, power system control

Field Trips: One field trip to a local electric utility

Class Dates: 02/15, 02/22, 03/01, 03/08, 03/15, 03/22, **03/29**, 04/12, 04/19, 04/26, 05/03, 05/10, **05/17**, 05/24, 05/31, 06/07, **06/14** (28 Lectures, 2 Quizzes & 1 Final Exam)

<u>Grading Policy:</u>	Two Quizzes	30% (15% each)
	Comprehensive final exam	30%
	Weekly homework	20%
	Class participation + Mini Project (optional)	20% (10%+10%)

	Total grade	100%

Weekly homework is **DUE** every **WEDNESDAY** at **5:00 PM** and solution sets will be posted at class LINE Group in a later day. **LATE HOMEWORK WILL NOT BE**

ACCEPTED. Each weekly-homework set is worth 100 points and makes up to **2%** of your final grade.

Academic Integrity

The grade that you receive for the course is based on work that you do. Regarding quizzes and the final exam, this implies that no assistance or collaboration of any kind is permitted. With respect to the homework, you are free to seek assistance from any resources, but make sure that you understand the material as it may appear on an exam. Violations of these rules will result in harsh penalties and the department will be notified for further actions.

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NO PHOTO COPY OF THE TEXTBOOK used in the class. (尊重智財權)

Class Schedule

1. Overview of Power System Fundamental (02/15)
2. Basic Principles (02/22)
3. Generator Models (03/01)
4. Transformer Models (03/08)
5. Per Unit System (03/15)
6. Transmission Line Models (03/22)
7. **Quiz I** (03/29, 2hrs)
8. Power Flow Analysis (3/29)
9. Power Flow Analysis (04/12)
10. Power Flow Analysis (04/19)
11. Optimal Dispatch of Generation (05/03)
12. Optimal Dispatch of Generation (05/10)
13. **Quiz II (One Evening or 5/17)**
14. Synchronous machine Transient Analysis (05/17)
15. Balanced Fault/Symmetrical Components (05/24)
16. Unbalanced Fault (05/31)
17. Transient Stability (06/07)
18. **FIELD TRIP (One morning or afternoon)**
19. Final Exam (06/14)