

## Syllabus 2020

### Introduction to Power System Analysis (電力系統導論)

	Week
1. Introduction	1
● Modern power system, System protection, Computer analysis and application	
2. Fundamentals	3
● Phasors	
● Power in single-phase ac circuits,	
● Complex power and balanced three-phase circuits	
● Per phase and balanced three phase system	
3. Power transformers – the per unit system	3
● Ideal transformer and practical transformers in equivalent circuits	
● The per-unit system	
● Two winding transformers and three phase transformer connections	
● Autotransformers and transformers with off-nominal turns ratios	
4. Transmission Line Parameters	4
● Line resistance, inductance, and capacitance	
● Three phase transmission line, Effect of bundling	
● Electric Field strength at conductor surfaces	
● Parallel circuit three-phase lines	
5. Line Model And Performance	3
● Short-line, Medium-line, and Long-line models	
● Transmission line differential equations	
● Equivalent $\pi$ model and loading condition	
● Complex power flow through transmission line	
● Reactive power compensation	
6. Power Flow Analysis	4
● Bus admittance matrix, Solution of non-linear algebraic equations	
● Power flow solution – Gauss-Seidel, Newton-Raphson, Fast-decouple algorithms	

**TEXTBOOK: (English version is REQUIRED)**

**Power System Analysis & Design** Sixth edition

Author: J. D. Glover, T. J. Overbye, and M. S. Sarma

Publisher/Seller: 歐亞書局

**Grading policy:**

**Homework 20%, Three exams 75%, Attendance 5%**

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