

ECE 5042: Power Systems

Course Description

A power system analysis course presenting power systems loads, modeling of transformers and power system model for voltage calculation and faults.

Prior Course Number: 640, 740, 741

Transcript Abbreviation: Power Systems

Grading Plan: Letter Grade

Course Deliveries: Classroom

Course Levels: Undergrad, Graduate

Student Ranks: Junior, Senior, Masters, Doctoral

Course Offerings: Autumn

Flex Scheduled Course: Never

Course Frequency: Every Year

Course Length: 14 Week

Credits: 3.0

Repeatable: No

Time Distribution: 3.0 hr Lec

Expected out-of-class hours per week: 6.0

Graded Component: Lecture

Credit by Examination: No

Admission Condition: No

Off Campus: Never

Campus Locations: Columbus

Prerequisites and Co-requisites: Prereq: 3040 (341), or Grad standing in Engineering, Biological Sciences, or Math and Physical Sciences.

Exclusions: Not open to students with credit for 640, 740, or 741.

Cross-Listings:

Course Rationale: Existing course.

The course is required for this unit's degrees, majors, and/or minors: No

The course is a GEC: No

The course is an elective (for this or other units) or is a service course for other units: Yes

Subject/CIP Code: 14.1001

Subsidy Level: Doctoral Course

Programs

Abbreviation	Description
CpE	Computer Engineering
EE	Electrical Engineering

Course Goals

Develop fundamental understanding of concepts of power systems
Develop ability of analyzing and interpreting real-life problems of power systems, such as, power delivery assets status, power system stability and electricity markets
Develop understanding and ability of applying fundamental techniques of power system operation and design. Power system software such as PowerWorld or PSCAD will be introduced

Course Topics

Topic	Lec	Rec	Lab	Cli	IS	Sem	FE	Wor
Power system modeling	6.0							
Transformers	4.0							
Network matrix	6.0							
Power flow analysis	10.0							
Generator modeling	4.0							
Power system stability	4.0							
Economic dispatch	4.0							

Representative Assignments

Homework

Grades

Aspect	Percent
Exams	60%
Homework	15%
Quizzes	15%
Written papers	10%

Representative Textbooks and Other Course Materials

Title	Author
<i>Power Systems Analysis 2nd Edition</i>	Bergen and Vittal

ABET-EAC Criterion 3 Outcomes

Course Contribution		College Outcome
**	a	An ability to apply knowledge of mathematics, science, and engineering.
*	b	An ability to design and conduct experiments, as well as to analyze and interpret data.
***	c	An ability to design a system, component, or process to meet desired needs.
*	d	An ability to function on multi-disciplinary teams.
**	e	An ability to identify, formulate, and solve engineering problems.
*	f	An understanding of professional and ethical responsibility.
*	g	An ability to communicate effectively.
*	h	The broad education necessary to understand the impact of engineering solutions in a global and societal context.
**	i	A recognition of the need for, and an ability to engage in life-long learning.
*	j	A knowledge of contemporary issues.
**	k	An ability to use the techniques, skills, and modern engineering tools necessary for engineering practice.

Additional Notes or Comments

Updated prereqs, exclusions, and course goals to match university.

Deleted Mohan text, made it notes. per prof Keyani

Put Mohan text back in, as per Prof. Illindala.

Changed text to Glove, Sarma and Overbye, as approved. 5/6/13, ced.

Updated course goals, course topics. Changed textbook 5/14/14/ BLA

Prepared by: Betty Lise Anderson