# EEE 141: POWER SYSTEM ANALYSIS I

## In Workflow

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## Approval Path

1. Fri, 09 Apr 2021 22:32:01 GMT
   Perry Heedley (pheedley): Approved for EEE Committee Chair
2. Sat, 08 May 2021 00:53:27 GMT
   Mahyar Zarghami (mahyar.zarghami): Approved for EEE Chair
3. Fri, 17 Sep 2021 17:20:58 GMT
   Mohammed Eltayeb (mohammed.eltayeb): Approved for ECS College Committee Chair
4. Fri, 17 Sep 2021 17:36:41 GMT
   Behnam Arad (arad): Approved for ECS Dean

Date Submitted: Fri, 09 Apr 2021 22:31:31 GMT

## Viewing: EEE 141 : Power System Analysis I

## Last edit: Sat, 01 May 2021 02:18:41 GMT

Changes proposed by: Mahyar Zarghami (214200923)

**Contact(s):**

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|---|---|---|
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**Catalog Title:**
Power System Analysis I

**Class Schedule Title:**
Power System Analysis I

**Academic Group: (College)**
ECS - Engineering & Computer Science

**Academic Organization: (Department)**
Electrical and Electronic Engineering

**Will this course be offered through the College of Continuing Education (CCE)?**
No

**Catalog Year Effective:**
Fall 2022 (2022/2023 Catalog)

**Subject Area: (prefix)**
EEE - Electrical and Electronic Engineering

**Catalog Number: (course number)**
141

**Course ID: (For administrative use only.)**
126916

**Units:**
3

**In what term(s) will this course typically be offered?**
Fall, Spring

**Does this course require a room for its final exam?**
Yes, final exam requires a room

**Does this course replace an existing experimental course?**
No

**This course complies with the credit hour policy:**
Yes

**Justification for course proposal:**
The main change in EEE 141 is to make it a required course in the BS EEE program, plus updating its contents to make the course better suited as a common introductory course in modern power systems for all BS EEE students. Modifications are associated with:
- A more thorough introduction to modern power systems and their evolution.
- Explaining the roles of generation, transmission, and distribution systems in the context of AC, DC, and hybrid AC/DC forms.
- Removing the topic of transmission line parameters to open space for modern DC and hybrid AC/DC systems (the transmission line topic has been moved to EEE 142).

**Course Description: (Not to exceed 80 words and language should conform to catalog copy.)**
Introduction to modern electric power systems, fundamentals of AC and DC systems, power definitions, per-unit analysis, steady-state analysis of power systems, models of power system components such as transformers, generators, motors, power electronic converters and loads.

**Are one or more field trips required with this course?**
No

**Fee Course?**
No

**Is this course designated as Service Learning?**
No

**Does this course require safety training?**
No

**Does this course require personal protective equipment (PPE)?**
No

**Does this course have prerequisites?**
Yes

**Prerequisite:**
EEE 117

**Prerequisites Enforced at Registration?**
Yes

**Does this course have corequisites?**
No

**Graded:**
Letter

**Approval required for enrollment?**
No Approval Required

**Course Component(s) and Classification(s):**
Discussion

**Discussion Classification**

CS#04 - Lecture /Recitation (K-factor=1 WTU per unit)

**Discussion Units**

3

**Is this a paired course?**

No

**Is this course crosslisted?**

No

**Can this course be repeated for credit?**

No

**Can the course be taken for credit more than once during the same term?**

No

**Description of the Expected Learning Outcomes: Describe outcomes using the following format: "Students will be able to: 1), 2), etc."**

After completion of this course, students will be able to:
1. Explain characteristics and structure of modern power systems.
2. Apply network laws to find different quantities such as voltages, currents and powers in systems comprising of generators, lines, converters, and loads.
3. Develop models of a power system based on its individual components and find appropriate relationships between the components for a systematic analysis under steady-state conditions.

**Attach a list of the required/recommended course readings and activities:**

EEE 141 Course Syllabus Outline_ABET - Schedule.docx

**Assessment Strategies: A description of the assessment strategies (e.g., portfolios, examinations, performances, pre-and post-tests, conferences with students, student papers) which will be used by the instructor to determine the extent to which students have achieved the learning outcomes noted above.**

Assignment 1: Introduction to Modern Power Systems, ELO 1
Assignment 2: Power Definitions and Phasor Analysis, ELO 2
Assignment 3: Single-Phase and Three-Phase AC Systems, ELO 2
Assignment 4: Power Generators and Motors, ELOs 2 and 3
Assignment 5: Magnetic Circuits and Power Transformers, ELOs 2 and 3
Assignment 6: Per-Unit Analysis: ELOs 2 and 3
Assignment 7: Power Converters: ELOs 2 and 3

Quiz 1: Introduction to Modern Power Systems, ELO 1
Quiz 2: Power Definitions and Phasor Analysis, ELO 2
Quiz 3: Single-Phase and Three-Phase AC Systems, ELO 2
Quiz 4: Power Generators, ELOs 2 and 3
Quiz 5: Moros, ELOs 2 and 3
Quiz 6: Magnetic Circuits ELOs 2 and 3
Quiz 7: Power Transformers ELOs 2 and 3
Quiz 8: Per-Unit Analysis: ELOs 2 and 3
Quiz 9: Power Converters: ELOs 2 and 3

Exam 1: Intro to Modern Power Systems (ELO 1), Power Definitions (ELO 2), Single and Three Phase Systems (ELO 2)
Exam 2: Power Generators, Motors, and Transformers, Per-Unit Analysis (ELOs 2 and 3)
Exam 3: Comprehensive Exam (ELOs 1, 2 and 3)

**Is this course required in a degree program (major, minor, graduate degree, certificate?)**

Yes

**Has a corresponding Program Change been submitted to Workflow?**

No

**Identify the program(s) in which this course is required:**

| Programs: |
| --- |
| BS in Electrical and Electronic Engineering |

**Does the proposed change or addition cause a significant increase in the use of College or University resources (lab room, computer)?**

No

**Will there be any departments affected by this proposed course?**

No

**I/we as the author(s) of this course proposal agree to provide a new or updated accessibility checklist to the Dean's office prior to the semester when this course is taught utilizing the changes proposed here.**

I/we agree

## University Learning Goals

**Undergraduate Learning Goals:**

Competence in the disciplines
Integrative learning
Intellectual and practical skills

**Is this course required as part of a teaching credential program, a single subject, or multiple subject waiver program (e.g., Liberal Studies, Biology) or other school personnel preparation program (e.g., School of Nursing)?**

No

## GE Course and GE Goal(s)

**Is this a General Education (GE) course or is it being considered for GE?**

No

Key: 1688