

EE303 — Energy Systems and Power Electronics

Lecture 4. Three-phase circuit analysis

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Today's objectives

- COMPUTE** impedance of circuit elements
- DERIVE** single-phase power equation
- IDENTIFY** apparent, active and reactive power
- INFER** equation of complex power (using phasors)
- DEFINE** leading/lagging power factor

Example 7.4, p. 157

Example

A load is composed of a $4\ \Omega$ resistance in series with a $3\ \Omega$ inductive reactance. The load is connected across a $120\ \text{V}$ source. Compute:

- The current of the circuit
- The voltage across the resistance
- The voltage across the inductive reactance

Plot a phasor diagram, showing voltages and current.

Reading material

The material we covered today corresponds to:

- Chapter B3.1, pp. 7–13 of class notes
- Chapter 7, pp. 147–178 of textbook