Summary
This course focuses on the dynamic behavior of a power system. It presents the basic definitions, concepts and models for angular stability analysis with reference to transient stability, steady state stability and long term stability. Fundamentals related to voltage stability are introduced as well.

Content
Role of simulation for power systems operation and planning
Long-term stability: Simulation of the dynamic behavior of the electric power system at the scale of minutes or several minutes after a disturbance. Modeling: primary and secondary frequency control, generators and loads.
Design and operation of simulation software: Case studies using an industrial simulation software (Eurostag).

Keywords
Load-Flow calculation, steady state - transient - long term stability, direct/time domaine methods, classical model, equal area criterion, primary/secondary frequency control, eigenvalues and eigenvectors.

Learning Prerequisites
Required courses
Electric power systems, Electromecanics, Energy conversion

Learning Outcomes
By the end of the course, the student must be able to:
• Formulate appropriate simulation model according to the nature of the stability under study
• Choose appropriate models of the power system components according to the nature of the stability under study
• Choose appropriate numerical methods
• Interpret the simulation results

Teaching methods
Ex cathedra lectures with exercises and case studies

**Expected student activities**
attendance at the lectures; completing exercises

**Assessment methods**
Continuous control

**Resources**
- Bibliography
- lecture slides