Summary
The objective is to enable students to design advanced digital solutions for the control and the coordination of distributed dynamic systems, such as production or distribution energy systems, as well as intelligent transportation systems.

Content
Selected chapters in dynamic coordination:
- Modeling of complex dynamic systems using state-space representation
- Analysis of dynamic properties of complex systems
- Optimal control with and without actuator constraints
- State estimation
- Dynamic coordination

Keywords
Multivariable systems, complex systems, state-space methods, optimal control, LQR, dynamic programming, state-space observer, state estimation, coordination, navigation functions

Learning Prerequisites
Important concepts to start the course
- Linear Algebra
- Dynamic Systems

Learning Outcomes
By the end of the course, the student must be able to:
- Choose analysis, control or estimation approaches
- Design state-space controllers or estimators
- Justify selected approaches
- Argue on their pros and cons

Transversal skills
• Use a work methodology appropriate to the task.
• Take responsibility for environmental impacts of her/his actions and decisions.
• Assess one’s own level of skill acquisition, and plan their on-going learning goals.
• Manage priorities.
• Use both general and domain specific IT resources and tools
• Write a scientific or technical report.

Teaching methods
Lectures and case studies carried out in teams

Assessment methods
Written exam and case study reports

Resources
Notes/Handbook
Dynamic Coordination, Denis Gillet, September 2014