INSA INSTITUT NATIONAL DES SCIENCES APPLIQUÉES TOULOUSE

Liste d'éléments pédagogiques

Practical info

Location(s)

Toulouse

Process control & optimization

ECTS
5 crédits

Hourly volume
63h

Toulouse

Introducing

Objectives

At the end of this module, the student will have understood and be able to explain (main concepts):
1. how to proceed for the simulation and regulation of dynamic systems via an open programming platform and a dynamic system analyzer (Simulink)
2. how to formulate and solve an optimization problem (single-objective or multi-objective) through suited methods (derivative-based or evolutionary)

The student will be able to:
3. compare different methods for the regulation and optimization of a dynamic industrial case study (Waste Water Treatment Plant ¿ WWTP)

Necessary prerequisites

Process control
Balance equations in reactive systems
Programming (Matlab)

Practical info

Location(s)

Reactor design and multiphase flow modelling

ECTS
5 crédits

Hourly volume
63h

Toulouse

Introducing

Objectives

At the end of this module, the student will have understood and be able to explain the use and the development of conservation equations describing multiphase systems. He will be initiated to the multiscale approach for process engineering in three steps:
- Knowledge integration from local entity (inclusion, pore, interface) to the multiphase process.
- Development of closure relations from isolated object to dense media with interactions.
- Sensitivity to scale up and scale down criteria in function of time and space range (heterogeneity, one way/two way or no coupling problems).

The student will be able to ;
- Choose the right scale to describe the multiphase process and the appropriate tool to design the reactor.
- Incorporate transport phenomena and couple them in consistency with the chosen scale
- Simulate the multifunctional behaviour of multiphase system (work project) and insure the value of the results by balance estimation.

Practical info

Location(s)