

**SYSTEM ENGINEERING**

Tutored projects	4 credits	60h
Object oriented and real time programming	6 credits	89h
Modelling and Optimization	4 credits	48h
Systems Engineering processes	5 credits	76h
QSE , Projet mécatronique et APS		55h
Improve your management abilities	4 credits	45h

## Tutored projects



ECTS  
4 credits



Component  
INSTITUT  
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DES SCIENCES  
APPLIQUEES  
TOULOUSE



Number of  
hours  
60h

## Presentation

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### Description

The work is composed of two parts :

- \* a bibliographical study dealing with a research theme in relationship with the project. This study is concluded by the writing of a document whose content and form have to follow the recommendations given by the tutors,
- \* a technical realization which is performed during a full semester.

Organisation:

4 hours of documentary research teaching then 10 hours of project management teaching, then 30h of project.

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### Objectives

The module is aimed at motivating students with research activities by means "tutored projects" involving groups of several students and directed by an academic or an industrial tutor. Those projects are completed by a formation to documentary research. A course of project management allows guiding the realisation part of the project.

At the end of this module, the student will have understood and be able to explain (main concepts):

- \* the concepts, norms and techniques related to the building of a state of the art in relationship with the subject of the project subject,
- \* the concepts and techniques in relationship with the management of the project involving several persons.

The student will be able to:

- \* elaborate a state of the art dealing with a domain in relationship with the project,
  - \* manage a project involving several persons,
  - \* integrate techniques of different scientific domains to reach the realization goals of the project.
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### Pre-requisites

Depends of the subject of the project.

## Useful info

## Contacts

### Education manager

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## Place

➤ Toulouse

# Object oriented and real time programming

 **ECTS**  
6 credits

 **Component**  
INSTITUT  
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TOULOUSE

 **Number of  
hours**  
89h

## Presentation

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### Description

Program (detailed contents):

The module addresses the specification and design of real time systems, an introduction to main real-time operating systems services, method to program and to test a real-time application.

### Objectives

This module presents real time systems, concepts, attributes, constraints, applications, and teach how to program these systems using object oriented languages and using real time operating systems.

## Useful info

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### Place

› Toulouse

# Modelling and Optimization

 **ECTS**  
4 credits

 **Component**  
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APPLIQUEES  
TOULOUSE

 **Number of  
hours**  
48h

## Presentation

### Objectives

At the end of this module, the student will have understood and be able to explain (main concepts) :

- Various approaches to analyse and evaluate the performance of discrete event

system DES,

- Various types of modelling for these systems (deterministic or stochastic models, numerical and combinatorial optimisation models, models of

concurrency)

- Algorithms to solve these problems.

The student will be able to:

Model and solve operational research problems (optimisation, graphs, stochastic

process) and discrete-event systems problems.

Model stochastic systems, such as a network of queues using Markov chains,

compute the stationary measures, and compute its capacity.

Model a DES with Petri nets, analyse the properties of the Petri net using various methods

of analysis (exhaustive and structural).

### Pre-requisites

Linear Algebra, Probabilities, Dynamic systems, Basic concepts in logics and in Petri Nets.

## Useful info

### Place

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# Systems Engineering processes

 **ECTS**  
5 credits

 **Component**  
INSTITUT  
NATIONAL  
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APPLIQUEES  
TOULOUSE

 **Number of  
hours**  
76h

## Presentation

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### Objectives

At the end of this module, the student will have understood and be able to explain (main concepts) :

Learn to define, gather, analyse and express the needs and expectations of

involved parties in order to design and implement a system, a product, a service.

Learn to translate the needs and expectations into technical requirements, define

and analyse technical requirements in order to design and implement a

system, a product, a service.

## Useful info

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### Place

> Toulouse

## QSE , Projet mécatronique et APS



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Number of  
hours  
55h

## Useful info

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### Place

> Toulouse



## Improve your management abilities

 **ECTS**  
4 credits

 **Component**  
INSTITUT  
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APPLIQUEES  
TOULOUSE

 **Number of  
hours**  
45h

## Presentation

### Objectives

At the end of this module, the student will have understood and be able to explain :

- \* The basic rules of business law
- \* The objectives, principles and means of marketing
- \* The principles and procedures of financial diagnosis and / or investment

The student will be able to :


Apply principles and rules of management and law in simple situations. Take into account the parameters of the management (customer needs, cost effectiveness and legal compliance).


## Useful info

## Contacts

### Education manager

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## Place

> Toulouse