

Modelling of energetic systems

Subject Information	
Code	UE3 S2
Credits (ECTS)	7
Semester	2 (mid-January - June)
Time Allocation (Lec. / Prac. / Lab/ Project)	18 h / 32 h / 0 / 50 h
Lecturer	Dr. Erwin FRANQUET, Dr Sylvain SERRA.
Pre-requisites	
Assessment	Final exam and final project (simulation+report)

Lec. : Lectures

Prac. : Practical works ("small classes")

Lab.: Laboratories

Subject Description	
Introduction	<p>Nowadays, many studies involve numerical modelling, often via dedicated softwares. Practically, one always find the same key ingredients: transcription of the geometry, meshing of the corresponding domain, physical phenomena to consider, numerical resolution.</p> <p>Even if these tasks are usually done with a software, it is important to have a fair view of these steps so as to produce relevant results.</p> <p>This lecture is devoted to give the basic knowledges to a future engineer who might one day realize, analyse or order an industrial simulation.</p>
Learning outcomes	<p>After this course the students should:</p> <ul style="list-style-type: none"> - be able to address a complex industrial problem. - be able to perform its simulation. - know how to analyse each behaviour and step of the simulation. - know how present interesting and relevant results
Content	<p>Introduction and basics</p> <ol style="list-style-type: none"> 1. History and interests 2. Basic principles 3. Software's overview <p>Part I: Domain of study</p> <ol style="list-style-type: none"> 1. Geometrical description 2. Meshing <p>Part II: Physical modelling</p> <ol style="list-style-type: none"> 1. Basics 2. Compressibility

3. Turbulence
4. Multi-phase
5. Chemistry

Part III: Numerical scheme

1. Forewords
2. Convective terms
3. Diffuse terms
4. Source terms

Part IV: Post-treatment

Projects (50 h)

Literature