

## Rocket propulsion

Course code: ARP3

ECTS Credits: 1.5

<b>Department</b>	: ET	<b>Lectures</b>	: 15h00
<b>Lecturers</b>	: C.Bonhomme	<b>Tutorials</b>	:
<b>Year of study</b>	: 2 <sup>nd</sup> year	<b>Laboratory sessions</b>	:
<b>Semester</b>	: 3 <sup>rd</sup> semester	<b>Project</b>	:
<b>Assessment method(s)</b>	: 1 written test	<b>Home works</b>	:
<b>Language of instruction</b>	: English	<b>Total hours</b>	: 15h00
<b>Type of courses</b>	: Compulsory		

### Objective:

### Prerequisites:

### Content:

1. **Introduction to solid propellant rocket motors** (history, classification, application)
2. **Performances of solid propellants**: mixture ratio, colloidal (homogeneous) propellants, heterogeneous (composite) propellants, double-based propellants, theoretical performances calculations, experimental determination of performance
3. **Motor operation**: ignition, burning rate laws, grain cross-section versus thrust profiles,
4. **Steady-state solid propellant combustion**: aerothermochemistry bases, combustion of homogeneous solid propellants (adiabatic and non adiabatic), combustion of components of composite propellants, combustion of heterogeneous solid propellant, and combustion of metal particles
5. **Ignition and extinction** of solid propellants, **erosive burning**, combustion **instability**

### Recommended reading:

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