

# PEES9AC COMBUSTION

PEES9AC		Duration : 21 hours	ECTS Credits : 2	Semester : S9
Combustion				
Person(s) in charge :				
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Keywords :				
combustion, flame, aerothermochemistry				
Prerequisites :				
Transport Phenomena, Fluid Mechanics, Thermodynamics				
Objective :				
Get the basics of combustion				
Program and contents :				
<p>Introduction, presentation of the phenomena</p> <ul style="list-style-type: none"><li>• Combustion thermodynamics: First principle in an open system with a chemical reaction, study of thermal combustion (PCI, PCS, combustible power, fumigant power, flame temperature)</li></ul> <p>Ostwald diagram</p> <ul style="list-style-type: none"><li>• Chemical kinetics applied to combustion</li><li>• Transport phenomena: Aero-thermo-chemical balance equations Simplified calculation of a laminar diffusion flame Turbulent transport Propagation of a flame, inflammation temperature, flammability limit, deflagration speed, flame stability.</li><li>• Application to furnaces</li></ul>				
Abilities :				
Levels	Description and operational vocabulary			
Know	the products of a combustion reaction, the effects of a reaction kinetics, the different types of flame, the transport phenomena involved in a combustion			
Understand	the propagation and the shape of a flame, the methods of NOx reduction, the adjustment of a flame			
Apply	choose a fuel and size a combustion room			
Analyse	the model that fits a real problem and at least find the orders of magnitude of the phenomena involved			
Summarise	be able to suggest innovative solutions about issues such as reducing energy consumption as far as combustion is concerned			
Assess				
Evaluations :				
<input checked="" type="checkbox"/> Written test	<input checked="" type="checkbox"/> Continuous Control	<input type="checkbox"/> Oral Report	<input type="checkbox"/> Project	<input checked="" type="checkbox"/> Written report