SPIM-MM-906 Non metallic materials

Master Degree : Mechanical Engineering and Material sciences

Reference number: SPIM MM 906

Title of the subject : Non metallic materials

Department : *Applied Mechanics and Mechanical engineering*

Coordinating lecturer L. Germain, lionel.germain@univ-lorraine.fr

Course is given each year
Semester : *Autumn*

Total hours of classes : *60 h* ECTS Credits : 6

Teaching language : French or English.
The course is proposed in English for exchange students : Yes and No

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Course composition	Coef.	Number of hours				
		Lectures	Tutorials	Practicals	Others	
Glass and ceramics		16	8			
Polymers		8	8			
Composite materials (can be in English)		12		8		

Aim :

During their master degree, students will have mostly work with metallic alloys. So this course is given to provide an overview of the mechanical behaviour of non metallic materials like glass, ceramic materials, polymers and composites

Prerequisites

Continuum mechanics.

Course syllabus

Glass and Ceramics
Structures of glass and ceramics
Manufacturing processes
Mechanical, electrical properties
Damage process in ceramics

Polymers :
Processing
Thermoset and thermoplastic polymers : difference
Rheology, simple model
Long term behaviour

Composite :
Composite with short of long fibers.
Glass re-imforced composite : mechanical behaviour
Ply behaviour, assembly with different orientation

Composite with inclusions, modelling, overview

Assessment system :

Continuous evaluation is generalized in this Master Degree. Students will obtain information concerning the evaluation at the beginning of each semester.

When not passed, a second exam is planned after the end of the semester so the student has a second opportunity to obtain the ECTS credit

Mark is a composite between evaluation elements, which are listed below. The relative percentage of each item is provided on due time.

Mid Exam
Final Exam
Practicals