

# MATS9AB INVESTIGATION METHODS OF MATERIALS

<b>MATS9AB</b>	<b>Duration : 21 hours</b>	<b>ECTS Credits : 2</b>	<b>Semester : S9</b>	
<b>Investigation methods of Materials</b>				
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<b>Keywords:</b> Methods of material expertise				
<b>Prerequisites:</b> Mechanical behavior of materials Molecular and atomic arrangements, structures and defects				
<b>Objective</b> Know different analysis and characterization techniques of materials.				
<b>Program and Contents:</b> <ul style="list-style-type: none"> <li>Methods for chemical composition measurement: electron probe microanalysis, X-ray fluorescence, atomic absorption, X-ray energy dispersive spectrometry, Rutherford backscattering spectrometry...</li> <li>Methods for surface analysis: X-ray photoemission spectroscopy, Auger spectroscopy, secondary ion mass spectrometry...</li> <li>Morphology and microstructure: optical microscopy, transmission electron microscopy, secondary electron microscopy...</li> <li>Fourier transform infrared spectroscopy and Raman spectroscopy</li> <li>Image analysis</li> <li>Functional properties: hardness test, wear test, tactile profilometry, ellipsometry, UV-visible spectrophotometry</li> <li>Visit of characterization equipment available in the school</li> </ul>				
<b>Abilities:</b>				
<b>Levels</b>	<b>Description and operational verbs</b>			
<b>Know</b>	The basic principles and potentialities of various methods of analysis and characterization of materials			
<b>Understand</b>	The validation of a material production process			
<b>Apply</b>	Select and implement materials in the context of expertise and / or an industrial survey			
<b>Analyse</b>	Select and assess the relevance of various modern techniques and methods for the characterization of materials.			
<b>Summarise</b>	Solve practical problems of identification, alteration, change, aging of materials commonly used by engineers.			
<b>Assess</b>	Selection criteria such as the size of samples, availability of technology, speed of analysis, cost, etc.			
<b>Evaluation:</b>				
<input checked="" type="checkbox"/> Written Test	<input type="checkbox"/> Continuous Control	<input checked="" type="checkbox"/> Oral Report	<input type="checkbox"/> Project	<input checked="" type="checkbox"/> Written Report