

Course Title	<b>Material Measurements and Testing</b>				
Course Code	<b>MME 457</b>				
Course Type	Technical Elective Course				
Level	Undergraduate				
Year / Semester	4 <sup>th</sup> year / 7 <sup>th</sup> or 8 <sup>th</sup> Semester				
Teacher's Name	Theodora Kyratsi				
ECTS	6	Lectures / week	3+1 hours	Laboratories / week	0
Course Purpose and Objectives	The objectives of the course include the understanding of the methodology of a wide range of techniques for measurements and testing as well as limitations and applications. Emphasis is also given on metrology issues.				
Learning Outcomes	<ul style="list-style-type: none"> <li>• Understand the basic principles of metrology and standards.</li> <li>• Describe typical measurement/testing procedure and significant digits.</li> <li>• Select the suitable technique for studying the mechanical properties based on capabilities and limitations of each technique.</li> <li>• Select the suitable technique for studying the thermal properties based on capabilities and limitations of each technique.</li> <li>• Select the suitable technique for studying the electrical properties based on capabilities and limitations of each technique.</li> <li>• Select the suitable testing procedure in corrosion and wear cases.</li> <li>• Combine different measurements/testing procedures when required.</li> </ul>				
Prerequisites	None	Required	None		
Course Content	Measurements methodology. Metrology. Quality in measurements and testing. Reference materials. Accreditation. Measurements of mechanical properties - elasticity, plasticity, hardness, strength, fracture – standards – applications – limitations. Measurements of thermal properties - thermal conductivity, heat capacity, enthalpy, thermal expansions – standards – applications – limitations. Measurements of electrical properties - electrical conductivity, measurements in metals and semiconductors – standards – applications – limitations. Nondestructive testing and reliability evaluation – standards – applications – limitations. Materials testing for corrosion – standards – applications – limitations. Materials testing for friction and wear – standards – applications – limitations. The course includes labs on selected techniques.				
Teaching Methodology	<ul style="list-style-type: none"> <li>• Lectures</li> <li>• PowerPoint presentations</li> <li>• Laboratory demonstrations</li> <li>• Communicative, Collaborative</li> <li>• During the first week of the semester, the course syllabus is given to students, which includes information on the course content, expected learning outcomes, assessment and office hours.</li> </ul>				

Bibliography	<ul style="list-style-type: none"> <li>• <i>Handbook of Introduction to Metrology and Testing</i> / Editors H. Czichos, T. Saito, L. Smith. Springer.</li> </ul>
Assessment	<ul style="list-style-type: none"> <li>• Midterm exam            35%</li> <li>• Final exam                55%</li> <li>• Presentation              10%</li> </ul>
Language	Greek