

Course Title	<b>Energy systems</b>				
Course Code	<b>MME417</b>				
Course Type	<b>Technical Elective Course</b>				
Level	Undergraduate				
Year / Semester	4 <sup>th</sup> year /				
Teacher's Name	Dimokratis Grigoriadis				
ECTS	6	Lectures / week	3+1	Laboratories / week	1.5 hr
Course Purpose and Objectives	<ul style="list-style-type: none"> <li>Identifying and understanding various systems and Mechanisms involved in Energy Conversion.</li> <li>Familiarity with the potential and types of Renewable Energy Sources.</li> <li>Analysis and solution of energy – related problems.</li> <li>The capability to power and power conversion systems.</li> </ul>				
Learning Outcomes	<ol style="list-style-type: none"> <li>Identify different modes of energy conversion</li> <li>Explain the difference between conventional and renewable energy conversion mechanisms</li> <li>Identify the potential of different renewable energy resources</li> <li>Classify and evaluate the potential of renewable energy resources</li> <li>Analyse, measure and report the curves of performance of solar, wind and hydroelectric systems</li> <li>Select, design, plan and inspect renewable and hybrid power systems to meet specific power needs</li> </ol>				
Prerequisites	<b>MME315</b>	Required			
Course Content	<p>Energy and power, energy balance, conversion efficiency. Conventional, renewable energy sources. Steam &amp; gas turbines, Electric Motors, Generators. Cogeneration. Thermoelectrics and applications, fuel cells, operating principle and types, hydrogen as a fuel. Solar Energy and calculation of solar potential, solar geometry. Solar thermal systems. Photovoltaics, formulas, curves and operating performance. Wind energy and wind power, wind turbines, wind farms. Hydro energy. Biomass, Biogas. Geothermal, wave energy and marine currents. The course includes laboratory exercises</p>				
Teaching Methodology	<p>Lectures, tutorials, examples, exercises, seminars, Labs</p> <p>Communicative, Collaborative</p> <p>During the first week of the semester, the Syllabus of the course is given by the teacher, which includes information on the course content, expected learning outcomes, assessment and office hours</p>				
Bibliography	<ol style="list-style-type: none"> <li>Gilbert M. Masters "Renewable and Efficient Electric Power Systems", ISBN 0-471-28060-7, John Wiley &amp; Sons, (2004).</li> <li>Bent Sørensen, "Renewable Energy", Second Edition, Academic Press.</li> </ol>				
Assessment	One midterm exam (30%), Labs (15%), Final exam (55%)				

Language	Greek
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