

<b>Course Unit Title</b>	<b>MES511 Power Generation Technologies</b> <b>MOE511 Power Generation Technologies</b>
<b>Programme of study</b>	MSc in Energy Systems and the Built Environment MSc in Oil and Gas and Offshore Engineering
<b>Lecturer</b>	Dr.-Ing. Paris A. Fokaides
<b>Type of course unit</b>	Technical Elective
<b>ECTS</b>	7
<b>Year of study:</b>	1
<b>Semester(s) offered</b>	Spring Semester 2013, 2014
<b>Course content</b>	<ul style="list-style-type: none"> <li>▪ Types and operation of power generation technologies based on fossil fuels</li> <li>▪ Factors influencing performance of thermal power plants, via calculation of thermodynamic data, construction of graphs of thermodynamic cycles and energy balance of various types of gas turbines, steam turbines and combined cycle plants.</li> <li>▪ Methodologies for test, assessment and design of thermal power plants and basic components configuration.</li> </ul>
<b>Course modules:</b>	<ol style="list-style-type: none"> <li><u>1. Energy analysis of closed systems</u> <ul style="list-style-type: none"> <li>▪ Moving boundary work</li> <li>▪ Energy balance for closed systems</li> <li>▪ Internal energy, enthalpy and specific heat</li> </ul> </li> <li><u>2. Mass and energy analysis of controlled volumes</u> <ul style="list-style-type: none"> <li>▪ Energy of a flowing fluid</li> <li>▪ Energy analysis of steady flow systems</li> <li>▪ Energy analysis of unsteady flow systems</li> </ul> </li> <li><u>3. Thermal engines</u> <ul style="list-style-type: none"> <li>▪ Thermal energy reservoirs</li> <li>▪ Heat engines</li> <li>▪ The Carnot Cycle</li> </ul> </li> <li><u>4. Entropy and power generation</u> <ul style="list-style-type: none"> <li>▪ The increase of entropy principle</li> <li>▪ Isentropic processes</li> <li>▪ Reversible steady flow work</li> <li>▪ Isentropic efficiencies of steady flow devices</li> </ul> </li> <li><u>5. Thermal power plants</u> <ul style="list-style-type: none"> <li>▪ Components and different types of gas turbines</li> <li>▪ Components and different types of steam turbines</li> <li>▪ Components and different types of combined cycle power plants</li> <li>▪ Components and different types of internal combustion engines for power generation</li> </ul> </li> </ol>
<b>Textbooks:</b>	Yunus, A. C., & Michael, A. B. (2006). Thermodynamics: An engineering approach. McGraw-Hill, New York.
<b>Instruction language</b>	English
<b>External reference</b>	<a href="#">link</a>