

<b>Faculty</b>	<b>Ingegneria</b>
<b>Bachelor</b>	<b>Mechanical Engineering (La Spezia)</b>
<b>Year/Semester</b>	<b>2/ II</b>

<b>Course Title</b>	<b>Energy Systems</b>
<b>ID Course Code</b>	<b>60219</b>
<b>Course Credits (CFU)</b>	<b>6</b>
<b>Scientific-Disciplinary Sector</b>	<b>ING-IND/09</b>
<b>Course Type</b>	<b>mono-disciplinary course</b>
<b>Lecturer-in-charge</b>	<b>BOSIO Alessandro</b>

#### Learning Outcomes:

The course aims to furnish the student with the mechanical basis to collaborate at a basic qualitative (but correctly learnt) level in the planning and testing of a plant or plant components destined to create or consume significant quantities of energy.

#### Course Organisation Details

Energetic requirements, resources and consumption. Thermodynamic requirements and heat transfer. Thermodynamic cycle and circuit. Efficiency. Internal combustion alternating engines. Combustion and treatment of waste gas. Operating machines: alternating volumetric and rotating pumps, dynamic pumps. Principles for the installation and testing of centrifugal pumps. Alternating volumetric and rotating compressors, dynamic compressors. Principles for the installation and testing of centrifugal compressors.

<b>Assessment</b>	<b>hours</b>
<b>Lectures</b>	<b>50.0</b>
<b>Practice</b>	<b>10.0</b>
<b>Laboratory</b>	<b>0.0</b>
<b>Integrative activities</b>	<b>0.0</b>

#### References

**ACTON O., CAPUTO C.** - (1) Introduzione allo studio delle macchine; (2) Impianti motori; (3) Compressori ed espansori volumetrici; (4) Turbomacchine - UTET  
**BENSON S.** - The Thermodynamics and Gas Dynamics of ICE - Clarendon Press  
**CLUP A.** - Principles of energy conversion - McGraw-Hill  
**DELLA VOLPE R.** - Principi di macchine a fluido - Liguori  
**DIXON S.L.** - Thermodynamics of Turbomachinery - Pergamon  
**MORAN, SHAPIRO** - Fundamentals of Thermodynamics - J.Wiley  
**SANDROLINI S, NALDI G.** - Macchine - Pitagora  
**STECCO S.** - Impianti di conversione energetica - Ed. Pitagora  
**TAYLOR C.** - The Internal Combustion Engine - MIT  
**VAN WYLEN, SONNTAG** - Fundamentals of Thermodynamics - Wiley  
**VARDY A.** - Fluid Principles - McGraw-Hill

#### Organization and examinations

The ination will be an oral exam.

#### Pre-requisites

Fundamentals of Engineering Thermodynamics