

Course in: MODELS, MACHINES AND SYSTEMS ENGINEERING FOR ENERGY, THE ENVIRONMENT AND TRANSPORT

Curriculum: MACHINE AND SYSTEMS ENGINEERING FOR ENERGY, THE ENVIRONMENT AND PROPULSION (CODE 8028)

Coordinator: Cianci Roberto	
Department of Mechanical, Energetics, Management and Transport Engineering (Dipartimento di Ingegneria meccanica, energetica, gestionale e dei trasporti – DIME)	
Places: 2 – Grants: 0 (*)	
(*) the places are covered by research grant. The amounts provided for, are to be found in the program H2020 MSCA-ITN-2019.	
For both positions, all beneficiaries must be categorised as early-stage researchers (ESR), or they rather must be in their first 4 years of their research career at the date of the recruitment and not to have been already awarded a Phd degree before and satisfy the ‘mobility rule’: they must not have resided or carried out their main activity (work, study etc.) in Italy for more then 12 months in the three years prior to the date of recruitment.	
Comparative assessment procedure	QUALIFICATIONS/PUBLICATIONS
Further information on how to present qualifications/publications	Candidates must declare in the curriculum vitae et studiorum that they are early-stage researchers (ESR), or they rather must be in their first 4 years of their research career at the date of the recruitment and not to have been already awarded a Phd degree before and satisfy the ‘mobility rule’: they must not have resided or carried out their main activity(work, study etc.) in Italy for more then 12 months in the three years prior to the date of recruitment.
Research Themes	<p>Investigation of MGT system configurations for compact light weight applications. Innovative energy storage concepts based on the smart integration of micro gas turbine systems with electrochemical and thermal energy storage devices.</p> <p>Investigation of MGT system configurations for compact light weight applications The main objective is to understand the compromises required between MGT system efficiency, size and weight for automotive range extenders. In-house analytical models will be further developed and used in the thermodynamic and economic analyses. Specifically: (1) identification of the critical components contributing to weight and size of MGT system, (2) establishing accurate correlations between system performance and changes in component size and weight, (3) developing an accurate methodology by which an optimal configuration can be found for an MGT system while accounting for its impact on the overall application performance and economy.</p> <p>Innovative energy storage concepts based on the smart integration of micro gas turbine systems with electrochemical and thermal energy storage devices (1) Identify the most promising electrochemical energy storage devices in terms of reliability and charge/discharge time, (2) investigate the bidirectional power electronics interface between the grid and the system components (micro gas turbine and electrochemical and thermal energy storage systems, including the associated control strategies) in order to ensure maximum efficiency and reliability and minimum disturbance, (3) validate the proposed system using the micro-grid infrastructure at UNIGE laboratories.</p>
Specific requirements	Hold a master degree (or equivalent) in Mechanical, Energy, Heating (Thermal Power), Electric o Industrial engineering and have basic knowledge of Energy engineering in accordance with this specifi topic.
Foreign Languages	English
Further Information	Further Information please contact the Coordinator of the Doctoral Course Prof. Roberto Cianci: roberto.cianci@unige.it , or Prof. Ferrari Mario Luigi (mario.ferrari@unige.it) or Prof. Andrea Cattanei (cattanei@unige.it)