

Environmental sustainability of ICT

Lecturer: **Giovanna Sissa**

Address: DITEN, Via all'Opera Pia 11, Genoa

Duration: 24 hours

PhD in **SCIENCE AND TECHNOLOGY FOR ELECTRONIC AND TELECOMMUNICATION ENGINEERING (STIET)**

Language: English/Italian

PhD STIET Coordinator: Prof. Maurizio Valle

Title: **Interdisciplinary dimension of ICT' environmental sustainability**

CONTENT AND AIMS: The course will introduce the interdependency and link issues among several disciplines - such as, for example, computer science, software engineering, environmental sciences, energy engineering, economics, telecommunications, artificial intelligence and machine learning, electronics, sociology - with a view of digital but ecological transition.

The overall goal is to provide an interdisciplinary research framework for research topics (non-exhaustive list) like:

- ICT life cycle approach:
 - environmental impact of ICT in use phase: Internet, Data Centers, user devices;
 - environmental impact of ICT in the production phase;
 - environmental impact of ICT in the disposal phase;
- Energy efficiency trends: technological improvements as counterbalance of growth in demand?
- Green and sustainable software engineering, algorithms and energy efficiency: sustainability by-design as software quality requirement;
- ICT services in the Public Cloud (Saas, PaaS, IaaS) with related GHG emissions; GHG protocol use in public cloud (vendor and customer sides), accountability and transparency related issues;
- Energy and carbon emissions: use of renewable energy sources and carbon intensity in different geographical area;
- First, second and third order effects of ICT: need for a methodology for assessing the net impact of ICT services and applications;
- Online behaviours: individual and collective awareness of users, psychological ownership;

Dates:

January 12th (14:00-18:00)

January 18th (14:00-18:00)

January 24th (14:00-18:00)

January 31st (14:00-18:00)

February 14th (14:00-18:00)

February 21st (14:00-18:00)

Bibliography: Provided by the teacher (in English)