

Scuola Superiore di Catania

Corso Interdisciplinare

a.a. 2021-2022

Lo sviluppo sostenibile: visioni, conoscenza e azioni per realizzare la transizione a società sostenibili, vivibili, giuste e a emissioni zero entro il 2060

Sustainable development: visions, knowledge and actions for Making the Transition to Sustainable, Livable, Equitable, Carbon Neutral Societies by 2060

Il corso, della durata di 35 ore (26 ore di didattica frontale, 9 ore di laboratorio, inclusa la verifica finale di apprendimento, tramite la produzione di un elaborato, relativo agli argomenti trattati durante il corso) è rivolto agli allievi di discipline sia della classe di Scienze Sperimentali sia della classe delle Scienze Umanistiche e Sociali. Tale corso è finalizzato alla comprensione degli obiettivi dello sviluppo sostenibile, a partire dalla evoluzione della visione ed obiettivi. Successivamente, tenendo conto del presente contesto internazionale ed, in particolare, Europeo e degli obiettivi finanziati attraverso Next Generation EU, si presenterà l'importanza dell'acquisizione di dati e della loro gestione, finalizzata alla valutazione del rischio ambientale e della sua gestione. Tale tema riveste una speciale rilevanza per i sistemi produttivi e le aziende nella produzione delle dichiarazioni non-finanziarie, in ragione delle richieste espresse dalla Banca Centrale Europea per la minimizzazione dei rischi di shock negli assets finanziari nella gestione di transizione ecologica e digitale, nonché per garantire il valore dei green bonds ed evitare il fenomeno del green washing. I medesimi strumenti, standardizzati attraverso la Global Reporting Initiative (GRI), sono utili per conoscere i modelli di consumo a scala domestica, che causano numerosi impatti ambientali e, spesso, rappresentano un cattivo esempio di uso corretto delle risorse (materia, energia) disponibili. La conoscenza di tali flussi di risorse è indispensabile per orientare i consumatori verso modelli più sostenibili, attraverso una presa di coscienza del valore delle proprie scelte. Infine, si presenteranno gli strumenti di analisi sistemica, utili per quantificare e rappresentare in maniera sintetica i flussi di risorse (materiali, energia, impatti), combinando così, all'approccio quantitativo precedentemente descritto, un approccio sintetico-visuale, utile sia per rappresentare l'uso delle risorse sia per identificare quali fasi di processo di produzione e consumo possano essere critici per il raggiungimento degli obiettivi di sviluppo sostenibile.

The course has the following goals:

- Discuss the historical evolution regarding the idea of sustainable development, its underlying policy goals;
- Explore the current practices and challenges related to sustainable development goals;
- Learning the structure and contents of Global Reporting Initiative (GRI) environmental standards for the non-financial disclosure, aimed at producing sustainability reports for enterprises
- Learning how to apply GRI environmental standards to assess the consumption patterns at household scale
- Producing a simple reporting of consumption at household scale, aimed at understanding the resources and environmental footprint of people taking part to the course.
- Learning how to produce a systemic graphical representation of resources flows, aimed at understanding the dynamics of resources production and consumption at different scales

1) Sustainable societies: visions, objectives, practices, crises and opportunities (Donald Huisingh)

The evolution of human awareness of the challenges of the concepts of sustainability and truly sustainable development, as a multi-dimensional vision, to help to guide our transitions to sustainable, livable and equitable societies that function within the ecosystem and other planetary boundaries. These and related concepts will be addressed in this part of the course.

Starting from a holistic perspective, the need of a transition toward a post-fossil carbon, equitable and sustainable societies will be presented. The urgency of such a transition will be analysed, based on climate changes, human population growth, rapidly expanding inequities and eco-system degradation. Multi-generational ethical will be used to challenge the students to seek for ways of integrating ethics with ecological, technological, economic aspects of present and future societies. The sense of urgency will be underscored in the context of climate changes, Pandemics and other crises..

Driven by such motivations, key challenges and policy goals will be introduced. In parallel, the evolution of practices, that can catalyse the urgently needed positive changes in production and consumption patterns, will be considered with goal of achieving truly sustainable societies on our planet.

2) From data collection to environmental sustainability reporting: From individual footprint to enterprises' supply chain (Marco Casazza)

Environmental accounting plays a key role in the sustainable management of resources. In fact, it enables consumers to understand their material footprint, as well as to change production and consumption patterns into a sustainable way, in relation to Sustainable Development Goal number 12. New approaches, built upon an holistic, preventive paradigm, can be used as a basis for an informed approach to management and policy-making for effecting the transitions to truly sustainable societies.

The first instrument, which can be applied both to individuals and households and enterprises, is learning how to build an inventory to assess the resources footprints and impacts, generated by production and consumption choices. This is relevant for two reasons. It is known that households generate a relevant percentage of consumed and wasted materials, causing the generation of adverse impacts on the biosphere and the

environment. The same is true for enterprises along the whole supply chain. This is why the Global Reporting Initiative (GRI) defined a set of standards (section GRI 400) to be applied to the non-financial disclosure of enterprises. These standards can be useful to derive consumption patterns at household level too.

The relevance of environmental inventories will be discussed in the context of non-financial disclosure procedures for enterprises, based upon the new European taxonomy of economic sectors and the 'Next Generation EU', as well as the Global Reporting Initiative (GRI) standardized practices.

Basic data collection exercises will be given and discussed to produce a simple reporting of consumption at household scale, aimed at understanding the resources and environmental footprint of people taking part to the course.

3) A system's view of the environment for a sustainable management of resources (Francesco Gonella)

Moving away from an anthropocentric perspective, Earth processes, including biogeosphere ones, are driven by physical/ecological constraints and are inter-dependent upon the availability of energy and, other resources.

By using a holistic approach, this part of the course will build upon the foundations of system dynamics, as a general tool for understanding the structure of complex systems and as an analytical tool for describing and simulating the systems dynamics. Energy theory, developed by H. T. Odum and based on a dynamic modelling of resources, will be introduced and discussed. Basic theoretic tools and methods of graphical representation will be used. Practical examples, group exercises and homework assignments will be proposed, adapted to the diverse backgrounds and interests of the students.