



Direzione Ricerca,
Innovazione e
Internazionalizzazione

**UNIVERSITÀ
DI TORINO**

ID

VP_022_CHIM

Visiting Professor Program Academic Year 2025/2026

TEACHING COMMITMENT: 24 hours

COURSE TITLE

Materials in Optoelectronic Applications for Energy Generation

TEACHING PERIOD

I semester

SCIENTIFIC AREA

Chemistry and Material Science

LANGUAGE USED TO TEACH

English

COURSE SUMMARY

Functional organic materials are nowadays at the forefront of research in many technological applications, and in some cases, they have already entered the market. Within this module, the use of innovative organic and hybrid materials will be reviewed in their application in advanced optoelectronic devices for energy generation. Sensitized photovoltaic cells using organic and organometallic dyes, totally organic solar cells, and perovskite-based and tandem solar cells will be described. Structure-property relationships between the materials and their performances in the devices will be discussed.

LEARNING OBJECTIVES

The teaching is part of the general objective of the course to provide knowledge and skills in the field of organic, polymeric and hybrid materials for smart applications, with particular reference to the knowledge and understanding of the role of the material's design in the device performances. Specifically, within this module, learning objectives are:

- Ability to foresee and understand the role of each functional material within a specific smart application,
- Understand the functional principle of the studied devices and how they are related to technologically meaningful fields.

OTHER ACTIVITIES BESIDE THE COURSE

Seminars and conferences for PhD students and research fellows will complement the teaching activities.

The teaching activity will be deepened in a course (8 hours) for PhD students within the PhD program in Chemical and Material Sciences

Title: Materials

The involvement of the Visiting Professor in the research activity of the Functional Organic Materials of the Department of Chemistry, as well as in other research groups in the Department of Chemistry is encouraged.

VISITING PROFESSOR PROFILE

The Visiting Professor candidate for this course should meet the following requirements:

- Multidisciplinary expertise in Material science, physical chemistry, photo-electrochemistry, material electrochemistry, and renewable energy system. Experience in the optoelectronic characterization of materials, interface, and surface.
- Expertise and experience in applications including optoelectronic applications, photoelectrochemistry, and electrochemistry in particular, emerging photovoltaics (Hybrid heterojunction solar cell, Dye-sensitized solar cell, Perovskite solar cell, Quantum dot solar cell, ETA solar cell, Tandem solar cell), and photoelectrode for water splitting.

CONTACT REFERENT

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