Syllabus 2022-2023

Teacher: name and affiliation	Luca Bertini, Federica Arrigoni (UNIMIB, Department of biotechnology and biosciences) Claudio Greco (UNIMIB, Department of Earth and Environmental Sciences); Antonio Papagni (UNIMIB, Department of Materials Science)
Title:	Introduction to photochemistry
Language	English
Typology of proposal	Lecture and seminars
CFU	2
Hours (in class)	16
Detailed objectives	The mini-course of photochemistry is an introduction to a selection of general, organic, inorganic, biological, solid state and theoretical photochemical themes with the aim of providing to phd students knowledge in basic principles and application of photochemistry
Table of contents	**The basic principles of Photophysics and photochemistry applied to photocatalisys** ● Electronic excited state decay: radiative and radiationless, unimolecular and bimolecular ● Dyad photosensitizer-catalyst in photocatalysis ● Photoinduced Electron transfer: Markus theory and quantum approach ● Energy transfer: Förster and Dexter mechanism ● *All-in-one* example: $[Ru(bpy)_3]^{2+}$ in electron-transfer and energy transfer photocatalysis ● How to investigate photocatalytic processes: experimental techniques (absorption and emission spectroscopies, photochemical kinetic measurement within Stern-Volmer equation) and computational approaches (Time-dependent DFT) **Photochemical applications** ● Photochemistry applications in sustainable energy: natural and artificial photosynthesis ● Molecular systems related to water splitting ● solar thermal batteries ● tensioned systems to be used as propellants ● Light mediated synthesis for strained molecules: energy storage in chemical bonds ● Storage of light energy in metastable molecules: conversion light in heat with application in thermal batteries (examples of interesting organic systems)

	● Organic light emitting systems for OLED applications;
Evaluation: YES/NO	NO
Specific needs for teaching: projector, computer, internet, software etc.	Projector, Internet
Participants (min/max):	3/10
Calendar:	Second semester
Notes:	