21-03-2022

TEACHING ACTIVITY FOR PhD COURSE IN CHEMISTRY A.A. 2021-2022

COORDINATOR Prof. Daniele Passarella

	Title	Date	Hour	Classroom	CFU
Coordinator: Bernardi Anna **Lecturers:** **Siegel Jay**	Physical Organic Chemistry. Elementary Reactions. Orbital vs VB electronic structure. Acid-Base Reactivity. Redox Reactivity. Frontier Orbital Reactivity. Free Energy perturbation by substituents. Isotopic Perturbation. Symmetry Labeling	**October 2021**			**2**
Coordinator: Bernardi Anna **Lecturers:** **Bernardi Anna** **Martinazzo Rocco** **Dragonetti Claudia**	**Literature search in chemistry** Course on the literature in chemistry. The student learns to read, understand and present to a public, in a critical manner, articles in the field of chemistry.	**February** **Date to be decided with the professors**			**2**
Coordinator: Vasile Francesca **Lecturers:** **Vasile Francesca** **Tiana Guido** **Ragona Laura**	**Advanced NMR techniques** The student will acquire skills on the analysis of the structure and conformation of molecules using NMR techniques and computational calculations. During the course, NMR techniques will be presented to study the interactions between molecules and their biological target.	**15-02-2022** **22-02-2022** **23-02-2022** **24-02-2022**	**09:30-17:30** **09:30-12:30** **14:00-16:00** **14:00-16:00**	**109** **109** **209** **109**	**2**

Coordinator: Ceotto Michele **Lecturers:** **Ceotto Michele** **Conte Riccardo** **Mennucci Benedetta**	**Frontiers in theoretical spectroscopy of biological systems** This course aims at presenting some of the most recent advances in the field of theoretical molecular spectroscopy applied to biological systems. During the class, examination of the relevant theoretical aspects and techniques will be integrated with illustration of cutting-edge applications. The main goal of the course is to provide the students with a detailed overview of some theoretical methodologies able to deal with the spectroscopy of molecular systems of biological interest	**09-02-2022** **10-02-2002** **16-02-2022** **17-02-2022** **17-02-2022**	**14:00-16:00** **10:00-12:00** **15:00-17:00** **09:30-11:30** **14:00-16:00**	**109** **109** **109** **209** **209**	**2**
Coordinator: Licandro Emanuela **Lecturers:** **Ghezzi Serena (12 h)**	**Graphic Communication of Scientific Research to make your presentations more incisive** The course goal is to learn graphic language rules and to master them. The main topic is teaching the students how to make the correct graphic choices when they make communication for scientific research. At the beginning of the course, attendees are invited to think about what communication and graphics are and what they mean. After that, students will learn graphic language elements and rules. Attendees will train their critical thinking by means of concrete examples and they will develop their skills through practical exercises.	**28-03-2022** **29-03-2022** **01-04-2022**	**09:00-13:00** **09:00-13:00** **09:00-13:00**	**Online**	**2**
Coordinator: Puglisi Alessandra **Lecturers:** **Puglisi Alessandra (b)** **Zeitler Kirsten (Universitat Leipzig) (a)**	**Innovative Methodologies: Photochemistry, Photocatalysis and Flow Chemistry** The course aims at giving a deep insight at innovative methodologies applied to organic chemistry. In particular, the combination of photochemistry and photocatalysis with flow chemistry	**(a) 16-03-2022** **(a) 17-03-2022** **(b) 18-03-2022**	**09:30-12:30** **09:00-12:30** **09:00-13:30**	**Online**	**2**
Coordinator: Ragaini Fabio **Lecturers:** **Ragaini Fabio (a)** **Petr Štěpnička – Univ. Praga (b)**	**Innovative aspects in the chemistry of ligands for transition metals: synthesis, properties and use in catalysis** To acquire up-to-date competences on metal-ligand interactions and on how to take advantage of them	**(a) 26-04-2022** **(a) 27-04-2022** **(a) 28-04-2022** **(b) 17/05/2022** **(b) 18/05/2022**	**14:30-16:30** **14:30-16:30** **14:30-16:30** **10:30-12:30** **10:30-12:30**	**Aula 209** **Aula 110** **Aula 110** **Aula 110** **Aula 110**	**2**

Coordinator: Passarella Daniele **Lecturers:** **Fasano Valerio**	**Recent Strategies in Organoboron Chemistry** The course goal is to learn about new synthetic methodologies based on the reactivity of boron derivatives according to recent and relevant reported results. Outline on the use of automated synthesis will be presented	**22-03-2022** **25-03-2022** **28-03-2022** **29-03-2022** **30-03-2022**	**14:30-16:30** **14:30-16:30** **14:30-16:30** **14:30-16:30** **14:30-16:30**	**Aula G09** **Aula 204** **Aula 204** **Aula G09** **Aula 204**	**2**
Coordinator: Licandro Emanuela **Lecturers:** **Allegrini Pietro** **Martinelli Ernesto Marco** **Appendino Giovanni** **Boero Emanuele**	**Natural compounds for pharmaceutical industry** The course is aimed to provide information related to natural products used as active pharmaceutical ingredients. After a historical introduction highlighting the therapeutic use of natural products, the course will analyze the different kinds of natural pharmaceutical products, with a peculiar focus on botanical derivatives. The quality definition criteria supporting the safety and efficacy of natural APIs will be described. Several case histories will be presented to show different approaches in the production of natural pharmaceutical ingredients.	**06-05-2022** **13-05-2022** **27-05-2022** **10-06-2022**	**14:30-17:00** **14:30-17:00** **14:30-17:00** **14:30-17:00**	**Aula G15** **Aula G15** **Aula G15** **Aula G15** **https://zoom.us/j/3189623937**	**2**
Coordinator: Mussini Patrizia **Lecturers:** **Benincori Tiziana (UNINS) (a)** **Guazzelli (UNIPI) (a)** **Mussini Patrizia (b)** **Arnoboldi Serena (b)** **Longhi Giovanna (UNIBS) (c)** **Gasparrini (UNIROMA) (d)** **Mazzoccanti (UNIROMA) (d)**	**Enantiodiscrimination in analytical techniques** The course is aimed to provide an overview on strategies, instruments, and methods for identification, quantification, separation of enantiomers of chiral molecules, a fascinating subject from the fundamental point of view, as well as of great applicative importance. Guidelines will be presented for development and implementation of highly efficient chiral selectors (molecules, materials, media), then more specifically focusing on enantioselective chromatography techniques, chiroptical spectroscopies, and chiral electroanalysis (including impressive recent achievements based on bipolar electrochemistry)	**(a) 24-05-2022** **(b) 27-05-2022** **(c) 08-06-2022** **(d) 09-06-2022**	**14:00-17:00** **08:30-10:30** **14:30-16:30** **14:00-17:00**		**2**
Coordinator: Emanuela Licandro **Lecturers:** Peter Brueggeller **Institut für Allgemeine, Anorganische und Theoret. Chemie** **Leopold-Franzens-Universität Innsbruck,**	**1) Possibilities to overcome the problem of greenhouse gas emissions and Sustainable production of hydrogen (2 hours)** **2) Photoinduced water splitting, its half reactions and the possibility of combining them (1hour)** **3) Organometallic compounds as chromophores containing classical but expensive elements (2 hours)** **4) Copper-based photosensitizers showing the possibility to tune**	**a) 02-05-2022** **b) 03-05-2022** **c) 09-05-2022** **d) 10-05-2022** **e) 16-05-2022**	**14:30-17:00** **14:30-17:00** **14:30-17:00** **14:30-17:00** **14:30-17:30**	**Bs (Biologia)** **Bs (Biologia)** **Bs (Biologia)** **Bs (Biologia** **Aula 204**	**3**

Austria	**photophysics (2 hours)** **5) Water reduction catalysts (WRC) showing highly active but expensive elements (2 hours)** **6) Replacement of rare by earth abundant elements in the case of WRC (2 hours)** **7) Water oxidation catalysts (WOC) consisting of rare and expensive components (1hour)** **8) Introduction of copper as an element for WOC using sophisticated new ligands (1hour)** **9) The concepts of proton relays and concerted proton electron transfer (CPET) (2 Hours)** **10) The production of other sustainable energy carriers in addition to the hydrogen economy (1hour)**	**f) 23-05-2022**	**14:30-17:30**	**Bs (Biologia)**	