



An introduction to Green Chemistry

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21 May 2024 15.30-17.30 AULA C

22 May 2024 14.30-16.30 AULA C

23 May, 15.30-18.30 AULA N

Dipartimento di Scienze Chimiche
Via Marzolo 1 - Padova

This course will present the fundamentals of green chemistry and connect the science behind sustainability issues with efforts that can be taken to create solutions. Green Chemistry is the design of chemical products and processes that reduce or eliminate the use and generation of hazardous substances. While there are many mechanisms and tools available to assess the impact of materials and processes on human health and the environment, there are few tools available to help design and create products as such. This course will explore examples from a wide spectrum of industrial sectors including construction, personal care, pharmaceuticals and electronics. Through examples, students will be presented with the premise that green chemistry offers organizations a boost to innovation and faster time to market. Course content will include online lectures, some face to face discussions, and some readings.

Topics to be covered

The 12 Principles of Green Chemistry
Solvent Selection and Alternative greener Reaction conditions
Green Chemistry addressing the UN Sustainable Development Goals
Case Study applications in Green Chemistry/selected sectors eg Agriculture
Green Chemistry and Circular Economy
Renewable biomass feedstocks

Learning Objectives:

1. Have a broader and deeper understanding of the twelve principles of green chemistry.
2. Investigate and apply the methods and tools to recognise green chemistry criteria in the practice of chemistry. eg Green solvent selection
3. Explain how the application of green chemistry principles can address the UN Sustainable Development Goals
4. Critique the various options and potential of biomass derived chemical feedstocks for the synthesis of fine chemicals, polymers and commodity chemicals.
5. Evaluate green chemical approaches and design in Circular Economy applications

Prof.ssa Silvia Gross
Dipartimento di Scienze Chimiche

Prof. Stefano Mammi
Direttore del Dipartimento di Scienze Chimiche

Brief CV of the teacher

Professor Antonio Patti

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Qualifications:

BSc(Hons), PhD (Uni of Melb), Grad Dip Ed., FRACI

Tony Patti is a Professor in the School of Chemistry at Monash University. Tony has over 35 years of experience in tertiary education and as a university researcher. His research interests are focused on green chemistry approaches for the utilisation of biomass feedstocks for extraction, processing and production of valuable chemicals for numerous applications. Applications of green chemistry in agriculture are of particular interest and he has undertaken several projects involving soil chemistry, fertiliser development and understanding the role of natural organic matter in the soil. He has also undertaken extensive consulting research and development with numerous companies in areas related to organic amendments for agriculture and food waste valorisation. In early 2020 he was appointed Director of the ARC funded Industrial Transformation Training Centre for “Green Chemistry in Manufacturing”. He is also the Course Director for the Monash Master of Green Chemistry and Sustainable Technologies; a course which he had a major role in designing. Professor Patti has also previously held positions of responsibility in the Faculty of Science; Associate Dean (Graduate Studies) – Jan 2001- March 2013 and Associate Dean International (2017- June 2020) Published 150 papers and scholarly reports including 2 book chapters. Research income as a Chief Investigator in several ARC Hubs, the ARC ITTC – Green Chemistry in Manufacturing and other research grants totalling over A\$10M in the past 10 years. Supervised or co-supervised 30 PhDs and 3 MSc candidates to completion (19 PhDs and 3 MSc as main), 6 post-docs and mentored/supported several younger academics.