

Module/Course Unit Descriptions

Course title: Heterogeneous Catalysis

• **Course code:** SM682

• **Type of course:** Elective

• **Level of course:** Advanced

• **Year of study:** first year

• **Semester/trimester:** second semester

• **Number of credits allocated** (workload based): 4 CFU

• **Name of lecturer:** Paolo Fornasiero

• **Objective of the course** (expected learning outcomes and competences to be acquired):

Knowledge of the principle of heterogeneous catalysis. Understand with the concept of catalyst preparation, characterization and testing. Understand the relation structure-properties. Have an overview of selected application of heterogeneous catalysis.

• **Prerequisites:** Inorganic Chemistry and Solid State Chemistry (Eurobachelor)

• **Course contents:**

Introduction to heterogeneous catalysts. Catalyst preparation, structural and functional characterization. Activity, selectivity and stability. Enantioselectivity and heterogeneous catalysis. Environmental catalysis: car converters, DeNOx catalysts, catalytic filters. Catalyst for hydrogen production and purification.

• **Recommended reading:** Heterogeneous Catalysis, J.M. Thomas and W.J. Thomas, WCH, Pollution, Causes, Effects and Control, R.M. Harrison. Students will also be directed towards relevant articles in the media.

• **Teaching methods:** Lectures-power point-black board. Tutorials with exercises and bibliographic search.

• **Assessment methods:** Oral examination, discussion of a literature paper and question on topics presented in the course.

• **Language of instruction:** Italian, English if needed.