



Catalysis...

Catalysis contributes 20-30% of the gross domestic products of industrialized countries. Catalysts play a vital role in the production of transportation fuels, bulk and fine chemicals in a sustainable way. Many more improvements are expected for the next years.

... a fascinating discipline

NIOK, the Dutch school of research in catalysis, with about 200 PhD students involved in research, offers the opportunity to gain a deeper insight into various aspects of this fascinating discipline: fundamental, theoretical, homogeneous, heterogeneous, industrial catalysis and biocatalysis. The main theme of this course is the molecular approach of catalysis in view of its applications, from catalyst preparation and characterization to reactor engineering.

Target audience

The course is designed for graduates and polytechnic (HBO) levels, either as a first introduction or as a refresher course. Especially graduates preparing a doctoral dissertation related to catalysis are potential attendants, but also those who are already working in industry and feel the need to deepen their insights into catalytic processes.

Subjects to be treated

Introductory part

- history of catalysis: homogeneous, heterogeneous and biocatalysis
- chemical and technological aspects of a number of important industrial processes
These processes will also form the framework for the subjects to be treated in the fundamental and applied parts of the course.
- chemical kinetics of catalyzed reactions

Fundamental catalysis

- chemical bonding to surfaces, in metal complexes and in enzymes
- elementary reaction steps in catalysis
- kinetic and mechanistic processes of catalysis

Applied catalysis

- catalytic reaction engineering
- preparation of catalyst supports including zeolites
- preparation of supported catalysts

Catalyst characterization

- rapid screening techniques and backgrounds
- spectroscopic techniques
- temperature programmed techniques
- adsorption methods

Modern developments seen from two angles:

- from the process technology side: more efficient and cleaner processes
- from the theoretical side: development of fundamental catalysis towards an independent science within chemistry and physics.

Course teachers

Heterogeneous Catalysis
Homogeneous Catalysis
Reaction Engineering & Kinetics
Biocatalysis
Materials & Catalyst Preparation
Characterization/Spectroscopy
Industrial Catalysis
Evening program

Prof.dr.ir. E. Hensen, Eindhoven University of Technology
Prof.dr. B. Klein Gebbink, Utrecht University
Prof.dr.ir. F. Kapteijn, Delft University of Technology
Dr. F. Hollmann, Delft University of Technology
Prof.dr. K.P. de Jong, Utrecht University
Prof.dr. G. Mul, Twente University of Technology
To be announced
Prof.dr. J.H. Bitter, Wageningen UR

Catalysis: An Integrated Approach

*A molecular approach
to all aspects of catalysis*

20 – 25 November, 2016
Schiermonnikoog, NL

Annual course organized by NIOK,
Netherlands Institute for Catalysis Research

Place and time

The course is held on the island Schiermonnikoog. The lectures take place in "Het Dorpshuis", Torenstreek 18a. Lodging is in Hotel Van der Werff, Reeweg 2, Schiermonnikoog.

The course starts Sunday 20 November (afternoon arrival) and ends Friday 25 November after lunch.

Textbook

The text book will be '*Catalysis, an integrated approach*', edited by Prof.dr U. Hanefeld and Prof.dr ir L. Lefferts, with contributions from many experts.

Test

There will be a test early 2017, in Utrecht. The test is obligatory for NIOK graduates. There are a number of requirements for obtaining the Certificate of Proficiency, one of them being completing the CAIA test. Consulting the text book during the test is permitted. ('open book test').

Certificate

A *Certificate of Attendance* is available. A *Certificate of Proficiency* is available for those who successfully take the test. Obtaining the Certificate of Proficiency is one of the requirements that need to be met before NIOK graduates can apply for a NIOK diploma accompanying their doctor's degree certificate. For the complete set of requirements please contact the NIOK office or ask your supervisor.

Registration

The registration form for the course can be downloaded from the NIOK website www.niok.nl. The number of participants is limited to 55.

Course fee

The course fee amounts to

	Registration before July 1 st 2016	Final registration after Sept. 1 st 2016
Graduate students and postdocs working with NIOK members	€ 650	€ 750
All other graduate students and postdocs	€ 1000	€ 1100
All other participants*	€ 2800	€ 3000

* VIRAN members can send one employee of a member company's own staff at a reduced rate of € 650/750.

The fee includes:

- (full board) accommodation (20 November arrival, 25 November departure)
- several course materials and hand-outs, not including the book.

Cancellation fees

Cancellation fees are applicable:
- cancellation between 23 October – 6 November: 50% of the course fee.
- cancellation after 6 November: the full fee will be charged.

Course leader

Prof.dr.ir. E. Hensen

Contact

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