COURSE DETAIL

HETEROGENEOUS CATALYSTS FOR SUSTAINABLE ENERGY APPLICATION
Country Germany
Host Institution Technical University Berlin
Program(s) Technical University Berlin
UCEAP Course Level Upper Division
UCEAP Subject Area(s) Chemical Engineering
UCEAP Course Number 110
UCEAP Course Suffix
UCEAP Official Title HETEROGENEOUS CATALYSTS FOR SUSTAINABLE ENERGY APPLICATION
UCEAP Transcript Title CAT SUST ENERGY
UCEAP Quarter Units 5.50
UCEAP Semester Units

3.70

Course Description

In this course, students learn and apply core principles and concepts in heterogeneous catalysis. Students learn the most important catalytic materials and how to describe their functions, including important applications of heterogeneous catalysts in sustainable energy conversion. Course topics include the scope of future energy supply and its significance for industry and society as well as the environment and various synthetic methods for the preparation of heterogeneous catalysts using various solid-state, solution-and molecular-based approaches. Students learn how to define crystalline and amorphous materials and thin-film technology and gain a basic understanding of the characterization techniques and systematic evaluation of catalysts/thin films using diffraction, microscopic, and analytics. The course covers fundamentals of electrochemistry and how to correlate and explain activity parameters to differentiate catalyst's performances in catalytic oxidation and reduction processes in the rapidly growing fields of water electrolysis, fuel cells, CO2 activation, biomass reforming, and paired electrolysis. Course readings include relevant scientific literature and key publications of leading female and male scientists of the field.

Language(s) of Instruction
English

Host Institution Course Number
#20781 / #1

Host Institution Course Title
HETEROGENEOUS CATALYSTS FOR SUSTAINABLE ENERGY APPLICATION

Host Institution Campus

Host Institution Faculty

Host Institution Degree

Host Institution Department
Institut für Chemie

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