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| <b>Modulbezeichnung:</b> Advanced electrochemistry (CE7)<br>(Advanced electrochemistry) | <b>15 ECTS</b>         |
| Modulverantwortliche/r: Dirk Guldi                                                      |                        |
| Lehrende: Axel Kahnt, Dirk Guldi, Christian Ehli                                        |                        |
| Startsemester: WS 2017/2018                                                             | Dauer: 2 Semester      |
| Präsenzzeit: 200 Std.                                                                   | Eigenstudium: 250 Std. |
|                                                                                         | Turnus: jährlich (WS)  |
|                                                                                         | Sprache: Englisch      |

#### Lehrveranstaltungen:

##### **A. Advanced Electrochemistry (2L/1S)**

Advanced Electrochemistry (WS 2017/2018, Vorlesung, 2 SWS, Axel Kahnt et al.)

Seminar Advanced Electrochemistry (WS 2017/2018, Seminar, 1 SWS, Christian Ehli et al.)

##### **B. Energy-related Advanced Electrochemistry (2L/1S)**

Energy-related Advanced Electrochemistry (SS 2018, Vorlesung, 2 SWS, Christian Ehli et al.)

Seminar Energy-related Advanced Electrochemistry (SS 2018, Seminar, 1 SWS, Dirk Guldi et al.)

##### **C. Lab Course Electrochemistry (8Lab)**

Compulsory attendance!

Lab Course Electrochemistry (WS 2017/2018, Praktikum, 8 SWS, Christian Ehli et al.)

Lab Course Electrochemistry (SS 2018, Praktikum, 8 SWS, Christian Ehli et al.)

#### Inhalt:

**A./B.** lectures on advanced theoretical principles in electrochemistry, e.g. fundamental concepts, physicochemical aspects of electrolytes, transport phenomena on electrode surfaces, kinetics, cyclic voltammetry, pulsed techniques, spectro electrochemistry, electrochemical impedance spectroscopy, nano electrochemistry.

Electrochemical synthesis and procedures on industrial scale, prevention of corrosion.

Modern energy relevant topics applying electrochemistry, e.g. fuel cells and batteries, solar cells, electrocatalysis.

**C.** Electrochemistry lab course (7 experiments, 1-2 days each)

#### Lernziele und Kompetenzen:

Students

- apply advanced knowledge in theoretical and experimental electrochemistry
- explain technological and industrial processes
- discuss the experimental fundamentals of modern electrochemical measurement processes
- review current research topics
- evaluate the results of electrochemical measurements

#### Literatur:

Allen J. Bard: "Electrochemical Methods: Fundamentals and Applications"

#### Verwendbarkeit des Moduls / Einpassung in den Musterstudienplan:

Das Modul ist im Kontext der folgenden Studienfächer/Vertiefungsrichtungen verwendbar:

##### **[1] Chemie (Master of Science)**

(Po-Vers. 2009 | NatFak | Chemie (Master of Science) | Wahlmodul | Advanced Electrochemistry)

#### Studien-/Prüfungsleistungen:

Advanced Electrochemistry (Prüfungsnummer: 67401)

(englische Bezeichnung: Notes or Seminar Presentation: Advanced Electrochemistry)

Prüfungsleistung, mehrteilige Prüfung, Dauer (in Minuten): 90

Anteil an der Berechnung der Modulnote: 100%

weitere Erläuterungen:

PL: W90 EX (SL) LAB (SL) LEC (SL)

Grading procedure: W90 100%

Prüfungssprache: Englisch

Erstablingung: SS 2018, 1. Wdh.: WS 2018/2019

1. Prüfer: Dirk Guldi

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**Organisatorisches:**

Module frequency:

A./B. annually

C. March/April (mandatory registration via **StudOn**)

Please note: module starts only in **winter term**!

**Bemerkungen:**

Module compatibility: M.Sc. Chemie / M.Sc. Molecular Science (Elective module)