

Modulbezeichnung: Thin-Film Processing (TFP) **5 ECTS**
(Thin-Film Processing)

Modulverantwortliche/r: Nicolas Vogel

Lehrende: Nicolas Vogel, Andreas Bück, Robin N. Klupp Taylor

Startsemester: WS 2021/2022

Dauer: 1 Semester

Turnus: jährlich (WS)

Präsenzzeit: 75 Std.

Eigenstudium: 75 Std.

Sprache: Englisch

Lehrveranstaltungen:

Thin-Film Processing (WS 2021/2022, Vorlesung, 2 SWS, Andreas Bück et al.)

Thin-Film Processing (Exercises) (WS 2021/2022, Übung, 3 SWS, Andreas Bück et al.)

Empfohlene Voraussetzungen:

Basics of Materials Science, Physics (I+II), Fundamentals of Electrical Engineering, Measurement systems, Interface Engineering and Particle Technology

Inhalt:

Students who participate in this course will learn principles of the different process steps involved in the formation of thin films on solid substrates, both from liquid- and from gas phases. Individual lectures of the course involve the following topics

- Drying Technology: Transformation of liquid precursors and dispersions into solid films
- Self-organisation processes occurring during the film formation
- Industrial coating processes and technologies
- Characterisation of thin-films
- Properties of thin films

Lernziele und Kompetenzen:

Students who participate in this course will become familiar with the different aspects of thin films, from physical principles governing the formation of thin films to their resulting properties. Students who successfully participate in this module can:

- Understand the physical principles of thin film formation
- Correlate the properties of colloidal dispersions and liquid interfaces with the resulting film formation properties
- Control the film structure via the evaporation profile
- Select and explain different industrial coating processes to control film formation
- Assess and explain the optical, electronic and mechanical properties of thin films

Literatur:

Martin, P.M. (2010) Handbook of deposition technologies for films and coatings: Science, applications and technology, 3rd edn, Elsevier, Amsterdam, Boston. Cohen, E.D. and Gutoff, E.B. (1992) Modern coating and drying technology, VCH, New York, NY. Frey, H. and Khan, H.R. (2015) Handbook of Thin-Film Technology, Springer Berlin Heidelberg, Berlin, Heidelberg.

Verwendbarkeit des Moduls / Einpassung in den Musterstudienplan:

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

[1] Clean Energy Processes (Master of Science)

(Po-Vers. 2021w | Gesamtkonto | Specialisation Energy technologies | Specialisation modules 1-4 | Thin-film processing)

[2] Clean Energy Processes (Master of Science)

(Po-Vers. 2021w | Gesamtkonto | Specialisation Energy systems | Elective modules from other specialisation 1-2 | Thin-film processing)

Studien-/Prüfungsleistungen:

Thin-film processing (Prüfungsnummer: 29051)

Prüfungsleistung, mündliche Prüfung, Dauer (in Minuten): 30

Anteil an der Berechnung der Modulnote: 100% Prüfungssprache: Englisch

Erstablesung: WS 2021/2022, 1. Wdh.: SS 2022

1. Prüfer: Robin N. Klupp Taylor

Bemerkungen:

Contact hours: 75 h or 105 h (with practical course) Independent study: 75 h or 45 h (with practical course)