1 Export

1.1 Module: Modelling and Simulation of Li-Ion Batteries [M-MATH-106640]

- Responsible: Prof. Dr. Willy Dörfler
- Organisation: KIT Department of Mathematics

<table>
<thead>
<tr>
<th>Credit</th>
<th>Grading scale</th>
<th>Recurrence</th>
<th>Duration</th>
<th>Language</th>
<th>Level</th>
<th>Version</th>
</tr>
</thead>
<tbody>
<tr>
<td>4</td>
<td>Grade to a tenth</td>
<td>Each summer term</td>
<td>1 term</td>
<td>German/English</td>
<td></td>
<td>1</td>
</tr>
</tbody>
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| Course | Modelling and Simulation of Li-Ion Batteries | 4 LP | Dörfler |

Competence Certificate
oral exam of ca. 20 minutes

Competence Goal
Participends know about the modelling and physical basics that lead to the model equations. They can explain (at least for simplified problems) their well-posedness. They are able to analyze stability and convergence of the presented methods.

Module grade calculation
The grade of the module is the grade of the oral exam.

Prerequisites
None

Content
- Derivation of the model equations,
- Existence for simplified model problems,
- Discretization of the initial boundary value problems,
- Nonlinear diffusion equations, Cahn-Hilliard equation, contact problems,
- Stability and convergence of the discrete models,
- Applications

Recommendation
Basic knowledge in the numerical treatment of differential equations, such as boundary value problems or initial value problems is strongly recommended.

Workload
Total workload: 120 hours
Attendance: 45 h
- lectures, problem classes and examination
Self studies: 75 h
- follow-up and deepening of the course content,
- work on problem sheets,
- literature study and internet research on the course content,
- preparation for the module examination

1.2 Course: Modelling and Simulation of Li-Ion Batteries [T-MATH-113382]

- Responsible: Prof. Dr. Willy Dörfler
- Organisation: KIT Department of Mathematics
- Part of: M-MATH-106640 - Modellierung und Simulation von Li-Ionen Batterien
Type
Oral examination

Credits
4

Version
1

Competence Certificate
oral exam (ca. 20 min)

Prerequisites
None