

Course

EBA - Electric Railways

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^ General information

Long name	Electric Railways
Approving CModule	EBA MaET
Responsible	Prof. Dr. Wolfgang Evers Professor Fakultät IME
Level	Master
Semester in the year	winter semester
Duration	Semester
Hours in self-study	78
ECTS	5
Professors	Prof. Dr. Wolfgang Evers Professor Fakultät IME
Requirements	Fundamentals of electrical engineering, electronics and mechanics Basic understanding of electrical machines
Language	German
Separate final exam	Yes

Final exam

Details

In an oral exam, the students explain system correlations of electric trains and draw conclusions from the knowledge learned to situational issues.

Minimum standard

60 % correct answers

Exam Type

^ Lecture / Exercises

Learning goals

Knowledge

- Railway vehicles with commutator motors
 - * DC railways
 - * Alternating current railways
 - Railway vehicles with three-phase motors
 - * Asynchronous machine
 - * Power converter for the asynchronous machine
 - * Synchronous machine
 - Linear drives
 - Magnetic levitation systems
 - * Static-catching levitation
 - * Dynamic-repulsive hovering
 - * Static-repulsive hovering
 - Executed and projected magnetic levitation trains
 - * Transrapid
 - * MagLev system
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Skills

- Discuss and evaluate the advantages and disadvantages of different systems (power systems, wheel / rail vs. magnetic levitation)
- Classification of electrotechnical solutions in interdisciplinary concepts

Expenditure classroom teaching

Type	Attendance (h/Wk.)
Lecture	2
Exercises (whole course)	1
Exercises (shared course)	0
Tutorial (voluntary)	0

Separate exam

^ Practical training

Learning goals

Knowledge

Working out various aspects of railway operation using computer simulations

Expenditure classroom teaching

Type	Attendance (h/Wk.)
Practical training	1
Tutorial (voluntary)	0

Separate exam

Exam Type

working on practical scenarion (e.g. in a lab)

Details

The students must be sufficiently prepared for the lab excercises in order to be able to carry out the simulations, or to be able to ask technically well-founded questions and subsequently classify the work done.

Minimum standard

60% simulation performed correctly

80% of the discussion makes sense