Technology
Arts Sciences
TH Köln

Course Manual 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
Valid from	winter semester 2020/21
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

Literature

Zarko Filipovic, Elektrische Bahnen Springer Verlag, 1989, ISBN 3-540-55093-3

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	EN mündliche Prüfung, strukturierte Befragung

− Lecture / Exercises

Learning goals

Goal type	Description
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
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

Special requirements

none

Accompanying material	- Electronic lecture notes - Detailed exercise task collection with solutions
Separate exam	No

Expenditure classroom teaching

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

− Practical training

Learning goals

Goal type	Description
Knowledge	Working out various aspects of railway operation using computer simulations

Expenditure classroom teaching

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

Special requirements

none

Accompanying material	Lab exercise manual
Separate exam	Yes

Separate exam

Exam Type	EN praxisnahes Szenario bearbeiten (z.B. im Praktikum)
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