

Course

TED - Theoretical Electro Dynamics

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^ General information

Long name	Theoretical Electro Dynamics
Approving CModule	<u>TED MaET</u>
Responsible	Prof. Dr. Karl Kohlhof Professor Fakultät IME
Level	Master
Semester in the year	summer semester
Duration	Semester
Hours in self-study	78
ECTS	5
Professors	Prof. Dr. Karl Kohlhof Professor Fakultät IME
Requirements	Vector analysis
Language	German
Separate final exam	Yes

Final exam

Details

normally written (low number of candidates: oral)

Minimum standard

grade 4.0

Exam Type

normally written (low number of candidates: oral)

^ Lecture / Exercises

Learning goals

Knowledge

Introduction into Electro Dynamics

Charges, currents

Forces, fields

Classical Electro Dynamics

Electrostatics

Field, potential

Polarization

Electrostatic energy

Capacity

Multi pole development

Interaction of charge distributions

Stationary electrical field

Magnetostatics

Stationary magnetical field

Vector potential

Magnetization

Magetostatic energy

Inductivity

Quasi stationary electromagnetic fields

Induction effects

Skin effect

Rapidly changing electromagnetic fields

Electromagnetic waves

Reflection and diffraction

Skills

Knowledge of meaning of Maxwell- and material equations

Derivation of electric/magnetic potential/field from charge/current distributions

Development of potential / field to monopole, dipole, quadrupole and higher moments

Calculation of capacity/inductivity to charge/current distributions from energy balance

Derivation of Continuity equation, Kirschhoff Laws from Maxwell equations

Derivation and solving of diffusion/wave equations from Maxwell equations

Solving of training examples

Expenditure classroom teaching

Type	Attendance (h/Wk.)
Lecture	3
Exercises (whole course)	1
Exercises (shared course)	0
Tutorial (voluntary)	0

Separate exam

none