

# Course Manual TED

Theoretical Electro Dynamics

Version: 5 | Last Change: 02.11.2019 16:14 | Draft: 0 | Status: vom verantwortlichen Dozent freigegeben

## – General information

<b>Long name</b>	Theoretical Electro Dynamics
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<b>Approving CModule</b>	<u>TED_MaET</u>
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<b>Responsible</b>	Prof. Dr. Karl Kohlhof Professor Fakultät IME
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<b>Valid from</b>	summer semester 2021
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<b>Level</b>	Master
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<b>Semester in the year</b>	summer semester
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<b>Duration</b>	Semester
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<b>Hours in self-study</b>	78
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<b>ECTS</b>	5
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<b>Professors</b>	Prof. Dr. Karl Kohlhof Professor Fakultät IME
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<b>Requirements</b>	Vector analysis
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<b>Language</b>	German
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<b>Separate final exam</b>	Yes
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### Literature

Lehner: "Elektromagnetische feldtheorie für Ingenieure", Springer-Verlag

Wunsch: "Elektromagnetische Felder", Verlag technik

### Final exam

<b>Details</b>	normally written ( low number of candidates: oral)
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<b>Minimum standard</b>	grade 4.0
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<b>Exam Type</b>	EN Klausur
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## – Lecture / Exercises

### Learning goals

Goal type	Description
Knowledge	Introduction into Electro Dynamics Charges, currents Forces, fields
Knowledge	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 electromagetic fields Electromagnetic wves Reflection and diffraction
Skills	Knowledge of meaning of Maxwell- and material equations
Skills	Dervation of electric/magnetic potential/field from charge/current distributions
Skills	Development of potential / field to monopole, dipole, quadropole and higher moments
Skills	Caculation of capacity/inductivity to charge/current distributions from energy balance
Skills	Derivation of Continuity equation, Kirschhoff Laws from Maxwell equations
Skills	Derivation and solving of diffusion/wave equations from Maxwell equations

### Special requirements

Mathematics, Linear algebra, Vetor analysis

**Accompanying material**      electronic pdf script of lecture/presentation, electronic pdf file with training examples

**Separate exam**                      No

Skills	Solving of macroscopic problems by intergration of microscopic/differential description
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Skills	Solving of training examples
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### Expenditure classroom teaching

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