Course title	*Electromagnetic Fields*
Course code	*EEIB230*
Module coordinator	*Miriam Heinrich*
Lecturer	*Prof. Dr. Markus Graf*
Level of course	*Bachelor*
Recommended prerequisites	
Type of course	*Lecture*
Weekly lecture hours (SWS)	*4*
ECTS credits	*4*
Workload	*in total 120 h, 60 h course attendance, 60 h self-study*
Assessment (grading; pass/fail)	*graded*
Regular cycle	*Summer Semester*
Language of instruction	*English*
Contents:	*• Basic Terms: electric charge, potential energy, electric field strength, electric displacement density, magnetic field strength, magnetic flux density, magnetic flux, field lines, forces in electric and magnetic fields, electric potential, voltage, current, power* *• Passive dipoles (resistances, capacitances, inductances), phasor systems* *• Static and dynamic response of circuits with resistances, capacitances and inductances,* *• Magnetic circuits, magnetic reluctance, magnetisation loops* *• Law of induction, Lenz's law* *• Self-inductance and mutual inductance, transformers* *• Calculation of electric and magnetic fields based on Maxwell's equations in integral form*
Learning outcome (competencies):	*The students obtain a profound comprehension of electric and magnetic fields by* *• studying basic concepts and terms of electric and magnetic fields,* *• analysing and calculating magnetic circuits,* *• understanding the law of induction and Lenz's law,* *• defining the terms capacity, inductance and mutual inductance,* *• understanding the static and dynamic response of circuits with resistances, capacitances and inductances,* *• knowing and applying the four Maxwell's equations in integral form, to be able to solve practical electromagnetic assignments based on Maxwell's equations in integral form*
Teaching methods	☒Lecture ☐Group work ☐Exercises ☐Simulation ☐Video feedback ☐Others: Please click here for inserting text
Assessment methods	*Written exam*
Recommended reading	*• Hacker, V.; Sumereder, C.: Electrical engineering: Fundamentals, DeGruyter Oldenbourg, 2020* *• Lehner, G.: Electromagnetic Field Theory for Engineers and Physicists, Springer, 2010*

	• *Halliday, D.; Resnick, R.; Walker, J.: Fundamentals of Physics Extended; 10th Edition, Wiley, 2014* • *Tipler, P.; Mosca, G.: Physics for Scientists and Engineers; 6th edition, W.H. Freeman*
Additional information	
Recognition of credits	