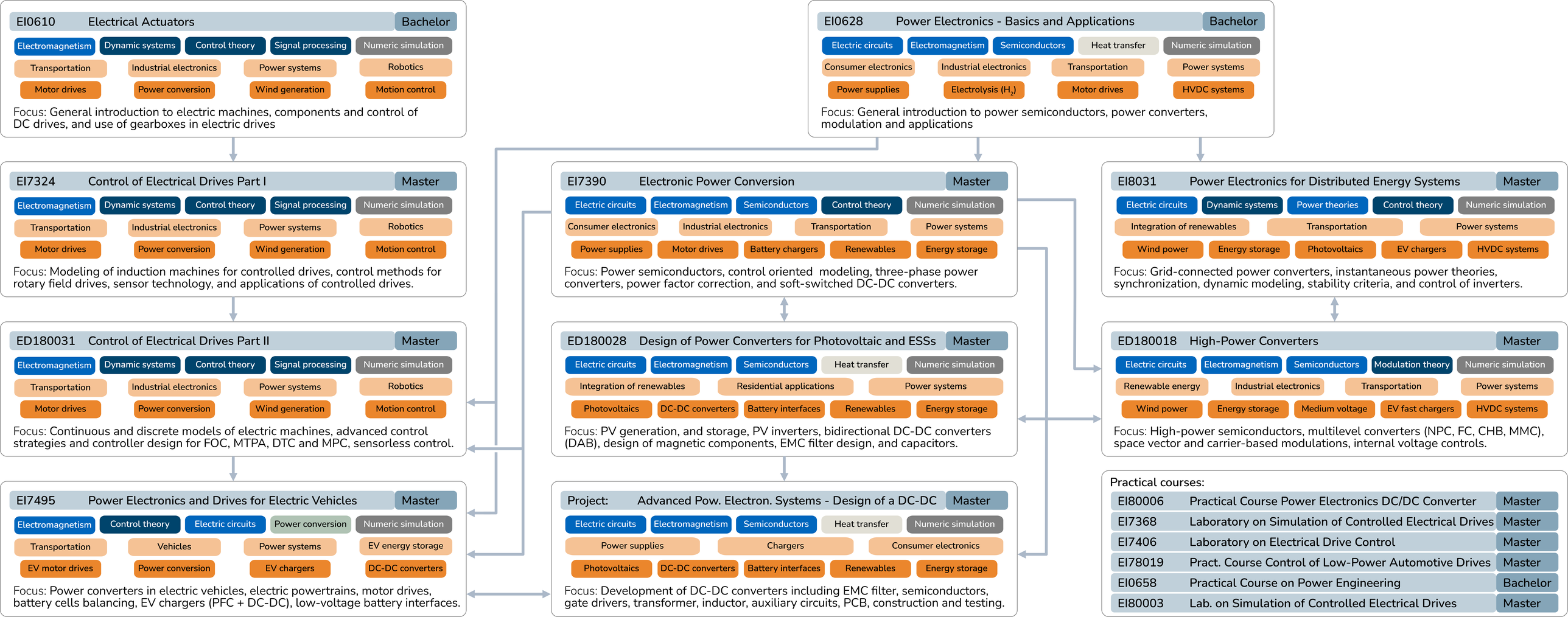
EI0610 Electrical Actuators Bachelor
Electromagnetism Dynamic systems Control theory Signal processing Numeric simulation
Transportation Industrial electronics Power systems Robotics
Motor drives Power conversion Wind generation Motion control
Focus: General introduction to electric machines, components and control of DC drives, and use of gearboxes in electric drives
EI0628 Power Electronics - Basics and Applications Bachelor
Electric circuits Electromagnetism Semiconductors Heat transfer Numeric simulation
Consumer electronics Industrial electronics Transportation Power systems
Power supplies Electrolysis (H_2) Motor drives HVDC systems
Focus: General introduction to power semiconductors, power converters, modulation and applications
EI7324 Control of Electrical Drives Part I Master
Electromagnetism Dynamic systems Control theory Signal processing Numeric simulation
Transportation Industrial electronics Power systems Robotics
Motor drives Power conversion Wind generation Motion control
Focus: Modeling of induction machines for controlled drives, control methods for rotary field drives, sensor technology, and applications of controlled drives.
EI7390 Electronic Power Conversion Master
Electric circuits Electromagnetism Semiconductors Control theory Numeric simulation
Consumer electronics Industrial electronics Transportation Power systems
Power supplies Motor drives Battery chargers Renewables Energy storage
Focus: Power semiconductors, control oriented modeling, three-phase power converters, power factor correction, and soft-switched DC-DC converters.
EI8031 Power Electronics for Distributed Energy Systems Master
Electric circuits Dynamic systems Power theories Control theory Numeric simulation
Integration of renewables Transportation Power systems
Wind power Energy storage Photovoltaics EV chargers HVDC systems
Focus: Grid-connected power converters, instantaneous power theories, synchronization, dynamic modeling, stability criteria, and control of inverters.
ED180031 Control of Electrical Drives Part II Master
Electromagnetism Dynamic systems Control theory Signal processing Numeric simulation
Transportation Industrial electronics Power systems Robotics
Motor drives Power conversion Wind generation Motion control
Focus: Continuous and discrete models of electric machines, advanced control strategies and controller design for FOC, MTPA, DTC and MPC, sensorless control.
ED180028 Design of Power Converters for Photovoltaic and ESSs Master
Electric circuits Electromagnetism Semiconductors Heat transfer Numeric simulation
Integration of renewables Residential applications Power systems
Photovoltaics DC-DC converters Battery interfaces Renewables Energy storage
Focus: PV generation, and storage, PV inverters, bidirectional DC-DC converters (DAB), design of magnetic components, EMC filter design, and capacitors.
ED180018 High-Power Converters Master
Electric circuits Electromagnetism Semiconductors Modulation theory Numeric simulation
Renewable energy Industrial electronics Transportation Power systems
Wind power Energy storage Medium voltage EV fast chargers HVDC systems
Focus: High-power semiconductors, multilevel converters (NPC, FC, CHB, MMC), space vector and carrier-based modulations, internal voltage controls.
EI7495 Power Electronics and Drives for Electric Vehicles Master
Electromagnetism Control theory Electric circuits Power conversion Numeric simulation
Transportation Vehicles Power systems EV energy storage
EV motor drives Power conversion EV chargers DC-DC converters
Focus: Power converters in electric vehicles, electric powertrains, motor drives, battery cells balancing, EV chargers (PFC + DC-DC), low-voltage battery interfaces.
Project: Advanced Pow. Electron. Systems - Design of a DC-DC Master
Electric circuits Electromagnetism Semiconductors Heat transfer Numeric simulation
Power supplies Chargers Consumer electronics
Photovoltaics DC-DC converters Battery interfaces Renewables Energy storage
Focus: Development of DC-DC converters including EMC filter, semiconductors, gate drivers, transformer, inductor, auxiliary circuits, PCB, construction and testing.
Practical courses:
EI80006 Practical Course Power Electronics DC/DC Converter Master
EI7368 Laboratory on Simulation of Controlled Electrical Drives Master
EI7406 Laboratory on Electrical Drive Control Master
EI78019 Pract. Course Control of Low-Power Automotive Drives Master
EI0658 Practical Course on Power Engineering Bachelor
EI80003 Lab. on Simulation of Controlled Electrical Drives Master