

Name of programme: International Semester Information Technology / System Engineering

Title of Module	Smart Buildings
Responsible person	Prof. Dr. Arndt
Teacher	Dipl.-Ing. Thomas Petrasch M.A., Prof. Dr. Arndt
Module Code	E2F513
Type of Module	<input type="radio"/> obligatory module (Pflichtmodul), <input checked="" type="radio"/> elective module (Wahlpflichtmodul)
Level (BA / MA)	Bachelor
Language	English (German on demand)
Related Degree Programme/s	General Electrical Engineering
Department	IEM
Location	<input type="radio"/> Gießen, <input checked="" type="radio"/> Friedberg
Availability/frequency of module	<input type="radio"/> every semester, <input type="radio"/> annually in the Winter Semester, <input checked="" type="radio"/> annually in the Summer Semester,
Hours per Week / Workload	4 HpW, contact hours per week 150 H in total
Number of CrP/ECTS	5 ECTS/CrP
Forms of instruction	<input checked="" type="radio"/> lecture <input type="radio"/> seminar <input type="radio"/> supervised training <input type="radio"/> Laboratory Practical Course
Qualifications and Goals	Learning outcomes: Students can assess energy savings potentials, design and implement bus systems in buildings.
Short Description of Contents	Content: bus systems for buildings, management concepts for electrical devices, energy management, automation in buildings.
Description of Contents	<ul style="list-style-type: none"> - DIN 18015-4 (Building systems engineering) and DIN EN 50090 (ESHG) - GA system architecture (management, automation and field level) - Building control technology (management and operating facilities) - Intelligent management concepts for the control of local electrical loads to increase energy efficiency - DIN EN ISO 50001 (energy management systems) - DIN EN 15232 (Energy efficiency of buildings - Influence of building automation and building management) - Certification systems (eg DGNB, LEED, BREEAM, eu.bac Cert) - Remote monitoring and control, remote control technology - DIN EN 13757 (communication systems for meters and their remote reading), M-Bus - metering stations (eg VDE-AR-N 4101) - Smart Metering: Intelligent measuring systems and meters (MessZV, MSysV, BDSG) - Data protection and IT security in smart building - Information security management of control systems of energy supply (DIN ISO / IEC 27001, DIN ISO / IEC 27002, DIN SPEC 27009) - requirements for the functionality, interoperability and security of smart-metering Components (TR-03109) - Communication in the Smart Grid (IEC 61850, DIN EN 60870) - SmartMeter Gateway as storage and firewall - Internet of Things
Prerequisites	English level B2, basics of electrical circuit design, digital communication and networking, control theory
Assessment	<input type="radio"/> oral (<input type="radio"/> examination of xx minutes, <input type="radio"/> presentation), <input checked="" type="radio"/> written (x examination of xx minutes, <input type="radio"/> term paper), other:

Literature/Textbooks	Standards, Buchholz, B.M.; Styczynski, Z.: Smart Grids, Berlin: VDE-Verlag 2014. Köhler-Schute, C.: Smart Metering. 3.Ed. KS-Energy-Verlag 2015. Wosnitza, F.; Hilgers, H.G.: Energieeffizienz und Energiemanagement, Berlin: Springer 2012
Other	