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HOCHSCHULE DARMSTADT
UNIVERSITY OF APPLIED SCIENCES

Hessen:ISU Course Outline
German Energiewende – Impact on Buildings and their Inhabitants

CLASS HOURS

75 contact hours. Please consult programme schedule for more details.

PROFESSORS

Academic Advisor:

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1) INFORMATION ON THE COURSE CONTENT

COURSE DESCRIPITON

The targets of building automation can be split into the topics comfort, efficiency and security/safety. The module setup follows this guideline and teaches with a hands-on-seminar and lecture.

Learning Objectives

Smart Living in the house of the future

Comfort

- Improvement of living comfort by building automation.
- Individuality and measurability of comfort
- Usability and human machine interface
- State of the art and further research and link to other technologies (i.e. automotive)

Efficiency

- Definition and metric of efficiency, types of efficiency
- How building automation can influence efficiency among the supply/consumer chain
- Interaction of house, car and smart grid and its impact on efficiency

Security and Safety

- Opportunities for the Increase of Safety with building automation
- Simulation and Validation of Security and Safety Concepts
- State of the art security measures and current risks

Influence of renewable energies on the power system

Energy Supply

- Physical, technical and economical basic knowledge of conventional power generation
- Composition of the German electricity
- Further research

Energy Distribution

- Structure, Technology and behavior of electrical supply networks

- Global differences in the design and operation of electrical power supply networks
- Integration of volatile regenerative energy sources into existing network structures

Energy Consumption

- Changes in energy consumption in Germany
- changed function of consumption as a pure electricity (consumer) to the temporary producer
- Examples of using battery systems or combined heat and power plants to become more independent of electricity network

Options of renewable power generation for family houses

- Important regenerative energy sources like geothermal energy, wind energy, solar energy and water power

Climate communication – impact of 'Energiewende' on individual behavior

- Sustainability, climate change and climate impact
- Public perception of renewable energies
- Analysis in the view of an environmental journalist

E-mobility and its interaction with the house

- Examples of using battery systems and car battery systems to become more independent of electricity network
- Quarter networking – interaction of car, house and additional storage systems

Academic excursion

- Ski Resort in the Alps: how does a ski resort deal with climate change, its impact and how it makes use of renewable energies

COURSE MATERIALS

Slides and Script

TENTATIVE CLASS SCHEDULE

Date	Topic	Reading/ Assignments/ Additional Practice Materials
July 18, 2018	Renewable Energies	Preparation by reading the script
July 19, 2018	tbd	Preparation by reading the script
July 20, 2018	E-mobility and its interaction with the house	Preparation by reading the script
July 23, 2018	Smart Living in the house of the future: Comfort, efficiency and safety/security	Preparation by reading the script

July 24, 2018	Influence of renewable energies on the power system: Power Distribution	Preparation by reading the script
July 25, 2018	tbd	Preparation by reading the script
July 26-30, 2018	Focus on architecture, civil engineering and economy and their perspective on the topic	Preparation by reading the script
August 1 – August 7, 2018	Academic excursion	
August 8 & 9, 2017	Poster preparation & presentation	

2) INFORMATION ON CLASS PARTICIPATION, ASSIGNMENTS AND EXAMS

ASSIGNMENTS
Active participation and group work on a regular basis.

EXAMS
Exam in total 90 minutes and poster presentation

PRACTICE MATERIALS
Handouts and Slides

PROFESSIONALISM & CLASS PARTICIPATION
Students are expected to attend the classes and dedicate 1-2 hours a day for preparation through reading and self-study. The participation and self-study will enable the students to answer questions, lead discussions and to contribute with own ideas and opinions.

MISSED CLASSES
No more than 10% of the contact hours can be missed for successful completion of the course module. If students miss a lecture it is their own responsibility to obtain information on the topics. In the event of sickness a medical certificate must be presented to the ISU coordinator.

3) INFORMATION ON GRADING AND ECTS

ACADEMIC STANDARDS
Upon successful completion, 6 ECTS will be awarded for the class.
According to the rules of ECTS, one credit is equivalent to 25-30 hours student workload.

GRADING SCALE:

Percentage	Grade		Description
81-100%	15 points	1.0	very good: an outstanding achievement
	14 points		
	13 points	1.3	
64-80%	12 points	1.7	good: an achievement substantially above average requirements
	11 points	2.0	
	10 points	2.3	
47-63%	9 points	2.7	satisfactory: an achievement which corresponds to average requirements
	8 points	3.0	
	7 points	3.3	
40-46%	6 points	3.7	sufficient: an achievement which barely meets the requirements
	5 points	4.0	
0-39%	4 points	5.0	not sufficient / failed: an achievement which does not meet the requirements
	3 points		
	2 points		
	1 point		
	0 points		

This course description was issued on January 24, 2018. The programme is subject to change.