Hessen:ISU Course Outline
Energy Efficient and Smart Home Infrastructure Systems

CLASS HOURS
Consult program schedule

PROFESSOR
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1) INFORMATION ON THE COURSE CONTENT

COURSE DESCRIPTION – Part 1: Smart Building
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
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

COURSE DESCRIPTION – Part 2: German Energiewende
The targets of the course German Energiewende can be split into the three targets to reach the German Energiewende - Energy Supply, Energy Distribution and Energy Consumption. The module setup follows this guideline and teaches with a hands-on-seminar and lecture.

Learning Objectives
Energy Supply
- Physical, technical and economical basic knowledge of conventional power generation
- Important regenerative energy sources like geothermal energy, wind energy, solar energy and water power
- 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 combines heat and power plants to become more independent of electricity network

COURSE MATERIALS
Slides and Script

TENTATIVE CLASS SCHEDULE

<table>
<thead>
<tr>
<th>Date</th>
<th>Topic</th>
<th>Reading/ Assignments/ Additional Practice Materials</th>
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<tbody>
<tr>
<td>July 19, 2017</td>
<td>Energy Supply</td>
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<td>July 20, 2017</td>
<td>Energy Distribution</td>
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<td>July 24, 2017</td>
<td>Smart Buildings and Infrastructure Comfort</td>
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<td>July 25, 2017</td>
<td>Smart Buildings and Infrastructure Efficiency</td>
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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.
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This course description was issued on October 25, 2016. The program is subject to change.