

Affordable and Clean Energy (SDG 7): Applied Smart Building Systems

Short name	Workload	Credit Points	Preparatory	Face-to-Face	Conclusion and final project work
SBS	90 h	3 ECTS	4 x 3 h (online) + 12 h self-study phase	International Sustainability Week	4 x 3 h (online) + 12 h self-study phase

1	Group size	International students	German students
		3 to 5 (online: up to 10)	4 to 6 (online: up to 12)

2	<p>Contents</p> <p>What is the impact of smart building systems on energy and resource efficiency? The module compares models for sustainable building efficiency from various countries participating in the International Sustainability Week. Bring your examples to our classroom:</p> <p>In this module, we will discuss</p> <ul style="list-style-type: none"> ▪ How smart building systems can contribute to the UN Sustainable Development Goals (SDGs) ▪ Comparative overview of systems used in smart buildings ▪ In-depth view on a selection of established BAS (e.g. KNX, BACnet, DALI) ▪ State-of-the-art building automation systems <p>The module thereby contributes to the UN Sustainable Development Goals “Affordable and clean energy” (SDG 7) and “Climate Action” (SDG 13).</p>
3	<p>Learning outcomes</p> <ul style="list-style-type: none"> ▪ Comparative insight into technical building equipment, focusing on building automation systems (BAS) ▪ Awareness in which ways buildings can be operated in terms of sustainability and energy efficiency ▪ Improvement of the ability to work in international teams
4	<p>Teaching and learning methods</p> <ul style="list-style-type: none"> ▪ Inverted classroom setting: Preparation via online teaching with short lectures and self-study phases (independent reading of assigned course material) before and after the face-to-face phase (International Sustainability Week) ▪ Laboratory work on specific devices and systems; field trip
5	<p>Prerequisites</p> <ul style="list-style-type: none"> ▪ Basic knowledge of technical networks ▪ One or more programming languages, such as Python or C/C++
6	<p>Requirements for the awarding of credits</p> <ul style="list-style-type: none"> ▪ On-time submission of preparatory work: documentation of county-specific examples; independent reading of assigned course material based on questions; short 10-minute presentation of findings based on literature ▪ Active participation in online courses and the International Sustainability Week, including the group assignment and field trip ▪ 8-10 page reflection paper on a selected topic from the course to be submitted on time
7	<p>Module responsible / Lecturer</p> <ul style="list-style-type: none"> ▪ Harald Munding / Heiko Ziefuß + Harald Munding
8	<p>Literature</p> <ul style="list-style-type: none"> ▪ Toth Z. a.o.: Roadmap to climate-proof buildings and construction, 2022, BPIE (Link) ▪ Johnson Control: The Smart Building of the Future, 2023 (Link) ▪ KNX Association: KNX Basics, accessed 2024-05-12 (Link) <p>Further sources depending on the previous knowledge of the participants</p>

9	Additional information (to complete: Link to the associated a Moodle-course)
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