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EUROPEAN UNIVERSITY OF TECHNOLOGY

Hessen International Summer University 2026

https://isu.h-da.de/

Course: *Sustainable and Climate-Friendly Societies: Energy Policy, Management & Engineering*

CLASS HOURS
Consult preliminary program schedule on the website.

ACADEMIC DIRECTORS
- Professor Dr. Dominik Gager, Darmstadt University of Applied Sciences
- Professor Dr. Matthew Turner, Purdue University

1) INFORMATION ON THE COURSE CONTENT

COURSE DESCRIPTION
The course offers a comprehensive exploration of fostering climate-friendly transitions within societies. It initiates with an in-depth analysis of the United Nations' Sustainable Development Goals (SDGs) as a foundational framework and subsequently delves into the pivotal role of energy (SDG 7) in driving sustainable societal transformations. This exploration spans across global contexts, encompassing transformation strategies for both the global south and the global north and discussing matters of justice and fairness in north-south-relationships.

The course intricately examines the interconnections between energy, water (SDG 6), food (SDG 2), and climate change (SDG 13), establishing a comprehensive understanding of their interdependent relationship within the transformation process. Emphasizing the significance of technical solutions, the course aims to equip students with essential knowledge pertinent to power and energy systems, particularly focusing on electrical energy systems. This includes an in-depth exploration of topics such as power generation, electric grids, system operation and control, and the integration of renewable energy sources.

Moreover, it illuminates the governance structures prevalent at various political levels, commencing from international entities like the UN Framework Convention on Climate Change (UNFCCC) and global climate partnerships, progressing through state alliances such as the European Union, and extending down to the national and local levels. Students gain insights into the multifaceted dimensions of governance necessary for orchestrating societal transformations, fostering a nuanced understanding of change mechanisms across different scales, from the global policy landscape to transformational endeavours within local cities.

LEARNING OBJECTIVES
By the end of this course students will be able to:
1. describe solutions for sustainable and climate-friendly societies in developed as well as in developing countries.
2. analyse the concept of Planetary Boundaries and explain the guardrails it entails for sustainable development.
3. give a comprehensive overview of renewable energy as a means for sustainable transformation and climate-friendly societies.
4. describe the theory of development cooperation, and sustainable development.

5. apply basic principles of sustainability to engineering and development projects.
6. apply basic principles of sustainability at different political levels, i.e. international cooperation, national policies and the transformation of cities.
7. identify linkages and interdependences between the energy sector and other relevant sectors.
8. describe the operation of electrical power systems in terms of generation, transmission, end use, and operational performance.
9. demonstrate awareness of emergent technologies and industry practices to improve environmental sustainability as well as the importance of safety and reliability in power system operation.
10. communicate using the technical language and concepts specific to electric power system technologies and operation in order to engage in informed discussion and collaborate within the field.
11. understand the global dimension of welfare production and related justice issues.

COURSE MATERIALS
Slides and script on the online learning platform Moodle.

TENTATIVE CLASS SCHEDULE
Class hours virtual: 10 contact hours
Class hours on-site: 80 contact hours
Self-study (virtual & on-site; including virtual group work): 40 contact hours
Total: 130 contact hours (1 contact hour = 45 minutes)

COURSE CONTENT AND THEMATIC AREAS
- Energy justice and equity in energy systems
- Electrical power system technologies
- Power system operation and management
- The role of cities in sustainable transformation: fundamentals and case studies
- Future electric power technologies and infrastructure: selected case studies

The topics listed above are indicative and may be expanded or adjusted as the detailed course syllabus is finalized by the professors.

EXCURSIONS
In previous years, excursions included visits to institutions such as the Federal Foreign Office, Agora Energiewende (energy transition think tank), Germanwatch (NGO), GIZ – German Development Cooperation, and Bread for the World (development and relief agency).
Comparable excursions are planned for 2026. The final selection of excursion partners is subject to confirmation and will be communicated during the course.

2) INFORMATION ON CLASS PARTICIPATION, ASSIGNMENTS AND EXAMS

ASSIGNMENTS
Active and continuous participation in class sessions, including regular engagement in group work, is required.

EXAMS/ASSESSMENT METHOD
Assessment is based on a group project, culminating in a group presentation and the ability to respond to questions related to the project work.

LEARNING MATERIALS
Course materials, including online manuscripts and supplementary resources, will be prepared by the academic directors and made available to students via Moodle (online learning platform).

PROFESSIONALISM & CLASS PARTICIPATION
Students are expected to attend all scheduled sessions and to engage in regular preparation through reading and independent study. On average, students should allocate approximately 1–2 hours per day for preparation and self-study. Active participation and independent preparation are essential for meaningful contributions to discussions, collaborative work, and critical engagement with course topics.

MISSED CLASSES
To successfully complete the course module, students must attend at least 90% of the contact hours. Students who miss a lecture, seminar, or tutorial are responsible for independently obtaining the relevant course content and information. In cases of illness, a medical certificate must be submitted to the program coordinator in accordance with program regulations.

3) INFORMATION ON GRADING AND ECTS

ACADEMIC STANDARDS
Upon successful completion of the course, students will be awarded 6 ECTS credits.
In accordance with ECTS regulations, one credit corresponds to an estimated student workload of 25–30 hours, including contact hours, self-study, group work, and assessment-related activities.

GRADING SCALE

Percentage	Grade		Description
90-100%	15 points	1.0	very good: an outstanding achievement
	14 points		
	13 points	1.3	
80-90%	12 points	1.7	good: an achievement substantially above average requirements
	11 points	2.0	
	10 points	2.3	
70-80%	9 points	2.7	satisfactory: an achievement which corresponds to average requirements
	8 points	3.0	
	7 points	3.3	
60-70%	6 points	3.7	sufficient: an achievement which barely meets the requirements
	5 points	4.0	
0-60%	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 December 09, 2025. The program is subject to change.