Hessen International Summer University 2023 – Course Syllabus
https://isu.h-da.de/

In Transition to a Pure Green Energy Economy

ACADEMIC DIRECTORS
Professor Dr. Sebastian Herold (Hochschule Darmstadt)
Professor Kevin Taylor (Purdue University)

1) INFORMATION ON THE COURSE CONTENT

COURSE DESCRIPTION

The prospects of an energy system and a whole economy relying solely on renewable energy is the topic of the Hessen:ISU **„In Transition to a Pure Green Energy Economy"** at h_da Darmstadt University of Applied Sciences. It combines scientific knowledge taught in English with hands-on experiences during field trips to companies and public institutions. The International Summer University brings together technical and business perspectives and focuses especially on three challenges on the way towards a green energy economy:

1. **Transforming supply:** Technology as driver for real competitive renewable energies.
2. **Transforming demand:** Smart homes and smart cars for smart people.
3. **Transforming business:** Strategic impacts for business models.

Students will have the opportunity to establish **valuable contacts** for their future careers. To complement the classroom work, **company visits** and **excursions** to near and distant sights, cultural learning and many **leisure activities** outside the classroom are included in the program.

Due to the interdisciplinary approach of economic and technical aspects, the International Summer University appeals to students of economics and business administration as well as technical subjects.

LEARNING OBJECTIVES

A pure green energy economy
- Driving forces, ingredients and status quo
- International and national political aims
- Technological and economical transition pathways

Transforming supply
- Competitiveness of renewable energies and regimes of promoting them
- Potentials for different renewable technologies
- Challenges of an ever-increasing share of renewables for the energy system

Transforming demand
- Flexibilities of different consumer groups and demand side management as business case
- Smart grids, meters and devices: Redesigning the electric infrastructure
- Electric mobility as changing factor for the energy industry

Transforming business
- New players, new roles, new business models in the power industry

- The future of gas in a pure green energy economy
- The "prosumer" as new ideal of the energy system of the future?

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

TENTATIVE CLASS SCHEDULE

Date	*Topic*	*Location*
May 20, 2023	**Virtual Opening Ceremony**	Online
May 26, 2023	**(Online) Seminar: Towards a Pure Green Energy Economy** Contexts, concepts and challenges	Online
June 2, 2023	**(Online) Seminar: Renewable Energies – A Technological Perspective**	Online
June 09, 2023	**Arrival in Darmstadt**	
June 10, 2023	**Opening Ceremony in Darmstadt**	Darmstadt
June 11, 2023	**Intercultural Training**	Darmstadt
June 12, 2023	**Seminar: Integrating Renewables Into the Energy System**	Darmstadt
June 13, 2023	**Seminar: How do we want to live?** Urban development and energy saving	Darmstadt
June 14, 2023	**Transfer to Berlin**	
June 15, 2023	**Excursion Berlin:** **1) German Parliament (tour & discussion) - confirmed** **2) EUREF Campus - confirmed**	Berlin
June 16, 2023	**Excursion Berlin:** **1) GreenTech Festival (conference & exhibition) – confirmed** **2) Technology tour of the Olympic stadium - tbc**	Berlin
June 17, 2023	**Free time in Berlin**	Berlin
June 18, 2023	**Transfer to Darmstadt**	
June 19, 2023	**Seminar: Promoting renewable energies** The German experience	Darmstadt
June 20, 2023	**Seminar: Biogas, carbon capture & storage, hydrogen** Options for gas in a pure green energy economy	Darmstadt
June 21, 2023	**Excursion: Deutsche Bahn (tbc)**	Frankfurt a. M.
June 22, 2023	**Seminar: Consumers offering flexibility** Demand side management for big industry and everyone's home	Darmstadt

June 23, 2023	**Excursion: Merck (tbc)**	Darmstadt
June 24, 2023	**Cultural Excursion: Heidelberg**	Heidelberg
June 25, 2023	**Cultural Excursion: Rüdesheim (Rhine River Valley)**	Rüdesheim
June 26, 2023	**Excursion: Lufthansa (tbc)**	Frankfurt a. M.
June 27, 2023	**Self-sufficient or delivering energy to neighbors** Prosumers in the new energy system	Darmstadt
June 28, 2023	**Seminar: How does it all fit together** Sector coupling, costs and outlook	Darmstadt
June 29, 2023	**Tutorial: Preparing final presentations**	Darmstadt
June 30, 2023	**Final Presentations & Closing Ceremony**	Darmstadt
July 01, 2023	**Departure**	

ACADEMIC EXCURSIONS (subject to change)

- **EUREF-Campus, Berlin:** A real-world 'laboratory' for the energy revolution with over 150 companies and startups working on the campus area with its own, innovative and CO2-neutral energy concept
- **German Parliament, Berlin:** Discussion about green energy with the member of parliament for the city of Darmstadt
- **GreenTech Festival, Berlin:** conference and exhibition on the topic of sustainable business ideas, products and strategies
- **Olympic Stadium Berlin:** Tour of the plympic stadium with a focus on energy management and sustainability at major events (tbc)
- **Merck, Darmstadt:** One of the globally leading pharmaceutical companies (tbc)
- **Lufthansa, Frankfurt:** German airline (tbc)
- **Deutsche Bahn:** German Railway (tbc)

2) INFORMATION ON CLASS PARTICIPATION, ASSIGNMENTS AND EXAMS

ASSIGNMENTS

Active participation and group work on a regular basis

EXAMS

Students will work in groups of three or four on one of the course's aspects and present their results at the end of the summer university. Each group can choose the topic of its project in consent with the lecturers during the first week and then continue its research during the summer university. Subsequent to each lesson, there will be time for the groups to work on the projects and to discuss findings with the lecturers. The examination takes place as combination of the presentation of the project-findings and their defense by all group members.

PRACTICE MATERIALS

Handouts, slides and additional literature.

PROFESSIONALISM & CLASS PARTICIPATION

Students are expected to attend the classes and dedicate 1-2 hours a day for their projects and the preparation of classes.

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 International Summer University 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
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/updated on January 20, 2023. The program is subject to change.