

## Annex 2 to the Addendum for Double Master's Degrees between Chalmers tekniska högskola and Universität Stuttgart

### Double Master's Degree Scheme

The attached MACROPLAN depicts the 2-year MSc double degree structure in **Sustainable Energy Systems at Chalmers** and in **Energietechnik (Energy Engineering) at the U Stuttgart**. It shows the compulsory and elective modules in each semester as well as the prerequisites for students wishing to spend their 2<sup>nd</sup> year at the partner institution.

Semester 1		Semester 2		Semester 3		Semester 4	
Chalmers students at Chalmers	Stuttgart students in Stuttgart	Chalmers students at Chalmers	Stuttgart students in Stuttgart	Chalmers students in Stuttgart	Stuttgart students at Chalmers	Chalmers students in Stuttgart	Stuttgart students at Chalmers
Compulsory modules see List 1:  C1: Heat and Power Systems Engineering (7,5 ECTS)  C2: Sustainable Energy Futures (7,5 ECTS)  C3: Industrial Energy Systems (7,5 ECTS)  -----  1 Elective module (7,5 ECTS)	Compulsory module see List 1:  C4 Grundlagen der Heiz- und Raumlufttechnik (6 ECTS)  -----  2 Specialized Areas: One with practical work, the other one without practical work (according to the module handbook Energietechnik) (15 ECTS each, but 6 ECTS in semester 2)  These areas can contain compulsory modules, see List 1	Compulsory module see List 1:  C4: Heating, Ventilation and Air Conditioning Systems Engineering (7,5 ECTS)  -----  3 Elective modules (7,5 ECTS each)	Completion of the Specialized Areas (6 ECTS)  These areas can contain compulsory modules, see List 1  -----  Industrial Placement (Industriepraktikum) (12 ECTS)  -----  Studienarbeit (Student Research Project) (12 ECTS)	1 Specialized Area from List 3 (18 ECTS)  -----  Industrial Placement (Industriepraktikum) (12 ECTS)  preferably completed from July to October in Sweden or in Stuttgart	Completion of the required compulsory modules, see List 1  -----  Electives from List 2 (7,5 ECTS each)	Master Thesis (30 ECTS)	Master Thesis (30 ECTS)
<b>Σ ECTS = 30</b>	<b>Σ ECTS = 30</b>	<b>Σ ECTS = 30</b>	<b>Σ ECTS = 30</b>	<b>Σ ECTS = 30</b>	<b>Σ ECTS = 30</b>	<b>Σ ECTS = 30</b>	<b>Σ ECTS = 30</b>
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### Remarks for Chalmers students:

- The industrial placement (12 ECTS) should be taken before the lectures start in Stuttgart (in Sweden or in Stuttgart) or between the 3rd and 4th semester. The "Guidelines for the industrial placement" have to be recognized.
- The Student Research Project (12 credits) required within the USTUTT regulations is accepted as part in the compulsory courses taken at Chalmers (there is no need to carry out such at USTUTT).

### Remarks for USTUTT students:

- Stuttgart students have to absolve the 4 Chalmers Compulsory Modules of List 1.
- The modules to be absolved at Chalmers are generally accepted as 3 required "Vertiefungsmodule" in USTUTT, as 1 "Elective" within a Specialized Area (3 ECTS) and as the required "Soft skills".
- "Grundlagen der Heiz- und Raumluftechnik" as fourth "Vertiefungsmodul" has to be taken at USTUTT as Chalmers Compulsory C4 since this C4 module is offered at Chalmers only in Summer Semester when Stuttgart students are not there.
- 2 Specialized Areas have to be taken at USTUTT, one with 3 ECTS practical work and 12 ECTS lecture modules, the other one without practical work (according to the module handbook "Energietechnik"), (15 ECTS each, whereas 6 ECTS of one module are taken in semester 2))
- The Industrial Placement (Industriepraktikum) (12 ECTS, acc. 12 weeks) and the student research project (Studienarbeit) have to be absolved within the study program in Stuttgart.

### Annex: Lists of offered modules

#### List 1: Chalmers Compulsory Modules and Stuttgart Equivalents to these Compulsories

	<b>Chalmers</b>	<b>USTUTT</b>
<b>C1</b>	Heat and Power Systems Engineering	Energie- und Umwelttechnik
<b>C2</b>	Sustainable Energy Futures	Energiewirtschaft und Energieversorgung
<b>C3</b>	Industrial Energy Systems	No equivalent
<b>C4</b>	Heating, Ventilation and Air Conditioning Systems Engineering	Grundlagen der Heiz- und Raumluftechnik

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#### List 2: Elective Modules at Chalmers

- Combustion Engineering
- Design of Industrial Energy Equipment
- Gas Turbine Technology
- Compressible flow
- Turbomachinery
- Computational Fluid Dynamics
- Computational Fluid Dynamics for Engineers
- Multiphase Flow
- Introduction to Nuclear Reactors
- Waste management
- Biorefinery
- Energy related materials
- Fuel Cells - function and materials
- Nanotechnology for Sustainable Energy
- Advanced Separation Technology
  
- Introduction to Power Systems Analysis
- Sustainable Power Production and Transportation
- Power Market Management
  
- Energy Systems Modelling and Planning
- Sustainable Development
- Managing stakeholders for sustainable development
- Environmental Aspects of Transport
- Sustainable Aspects of Logistics
  
- Environmental Policy Instruments
- Environmental Measurement Techniques

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- Environmental Risk Assessment in Engineering
- Life Cycle Assessment
- Technical Change and the Environment
- Building Technology and Building Services Engineering – Design (I and II)

### **List 3: Specialized Areas (Spezialisierungsfächer in English) at University of Stuttgart including selectable options**

1. Combustion and Power Plant Technology (English)
  2. Thermo-Fluid Dynamics (English)
  3. Energy and Environment (English)
- (Or another specialized area from the module handbook)

**The content of the Specialized Areas is listed in the study plan. Each module can be chosen only once.**