APPENDIX A 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\textsuperscript{nd} year at the partner institution.

<table>
<thead>
<tr>
<th>Semester 1</th>
<th>Semester 2</th>
<th>Semester 3</th>
<th>Semester 4</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Chalmers students at Chalmers</strong></td>
<td><strong>Stuttgart students in Stuttgart</strong></td>
<td><strong>Chalmers students at Chalmers</strong></td>
<td><strong>Stuttgart students in Stuttgart</strong></td>
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<tr>
<td><strong>Compulsory modules see List 1:</strong></td>
<td></td>
<td></td>
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<tr>
<td>C1: Heat and Power Systems Engineering (7,5 ECTS)</td>
<td></td>
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<tr>
<td>C2: Sustainable Energy Futures (7,5 ECTS)</td>
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<tr>
<td>C3: Industrial Energy Systems (7,5 ECTS)</td>
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<tr>
<td>1 module (7,5 ECTS)</td>
<td>2 Specialized Areas: One with practical work, the other one without practical work (according to the Modulhandbuch Energietechnik) (15 ECTS each, whereof 6 ECTS in semester 2)</td>
<td>Completion of the Specialized Areas (6 ECTS)</td>
<td>1 Specialized Area from List 3 (18 ECTS)</td>
</tr>
<tr>
<td></td>
<td>These areas can contain compulsory modules, see List 1</td>
<td>These areas can contain compulsory modules, see List 1</td>
<td>Completion of the required compulsory modules, see List 1</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Industrial Placement (Industriepraktikum) (12 ECTS)</td>
<td>Industrial Placement (Industriepraktikum) (12 ECTS)</td>
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<tr>
<td></td>
<td></td>
<td>Studienarbeit (Student Research Project) (12 ECTS)</td>
<td>Electives from List 2 (7,5 ECTS each)</td>
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<td></td>
<td></td>
<td></td>
<td>preferably completed from July to October in Sweden or in Stuttgart</td>
</tr>
<tr>
<td>Σ ECTS = 30</td>
<td>Σ ECTS = 30</td>
<td>Σ ECTS = 30</td>
<td>Σ ECTS = 30</td>
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</tbody>
</table>

The total ECTS for each semester is balanced, ensuring that the degree requirements are met.
Remarks for Chalmers students:

- The Industrial Placement (Industriepraktikum, 12 ECTS, 12 weeks) can be taken before the lectures start in Stuttgart (in Sweden or in Stuttgart) or between the 3rd and 4th semester. Given that the academic year at Chalmers ends rather early while the one in Stuttgart starts rather late, the time between the second and the third semester is most suitable to perform the Industrial Placement. There are guidelines that have to be followed. These guidelines are accessible online at https://www.iff.uni-stuttgart.de/lehre/praktikantenamt/dokumente-praktikantenamt/Masterrichtlinien-V3.pdf. The students are advised to check the suitability of a given Industrial Placement with the Industrial Placement Office (https://www.iff.uni-stuttgart.de/lehre/praktikantenamt/) in advance.
- 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 the Compulsory Modules C1 through C3 of List 1 at Chalmers unless they already have taken the respective equivalent module in Stuttgart (applies to C1 and C2 only).
- The modules to be absolved at Chalmers are generally accepted as 3 required “Vertiefungsmoduls” in USTUTT, as 1 “Elective” within a Specialized Area (3 ECTS) and as the required “Soft skills”.
- Two Specialized Areas have to be taken at USTUTT (each 15 ECTS, whereas 6 ECTS of one of the Specialized Areas are taken in semester 2). One of the Specialized Areas shall be taken with 12 ECTS lecture modules and 3 ECTS practical work, the other one with 15 ECTS lecture modules and without practical work.
- The Industrial Placement (Industriepraktikum, 12 ECTS, 12 weeks) and the Student Research Project (Studienarbeit) must be performed during the Stuttgart part of the study program.

Annex: Lists of offered modules

<table>
<thead>
<tr>
<th>Chalmers</th>
<th>USTUTT</th>
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</thead>
<tbody>
<tr>
<td>C1 Heat and Power Systems Engineering</td>
<td>Energie- und Umwelttechnik</td>
</tr>
<tr>
<td>C2 Sustainable Energy Futures</td>
<td>Energiewirtschaft und Energieversorgung</td>
</tr>
<tr>
<td>C3 Industrial Energy Systems</td>
<td>No equivalent</td>
</tr>
</tbody>
</table>
List 2: Elective Modules at Chalmers (subject to change)

- Combustion Engineering
- Design of Industrial Energy Equipment
- Gas Turbine Technology
- Compressible flow
- Turbomachinery
- Computational Fluid Dynamics
- Computational Fluid Dynamics for Engineers
- Multiphase Flow
- Waste management
- Biorefinery
- Functional Energy materials
- Advanced Separation Technology

- Heating, Ventilation and Air Conditioning Systems Engineering
- Building Technology Engineering
- Sustainable Building Renovation

- Sustainable Electric Power Systems
- Sustainable Power Production and Transportation
- Power Market Management

- Energy Systems Modelling and Planning
- Variation Management in the Electricity System

- Sustainable Development
- Managing stakeholders for sustainable Development
- Sustainable Transportation

- Environmental Policy Instruments
- Environmental Measurement Techniques
- Science of Environmental Change
- Environmental Risk Assessment in Engineering
- Life Cycle Assessment
- Technical Change and the Environment
List 3: Specialized Areas (Spezialisierungsfächer) at University of Stuttgart including selectable options (subject to change)

The below Specialized Areas are fully offered in English:

- Combustion and Power Plant Technology (Feuerungs- und Kraftwerkstechnik)
- Thermo-Fluid Dynamics (Thermofluiddynamik)
- Energy and Environment (Energie und Umwelt)

The below Specialized Areas are partially offered in English:

- Thermische Strömungsmaschinen (Thermal Turbomachinery)

Any other Specialized Area offered within the MSc Energy Engineering may be chosen as well, according to the respective module handbook. These would then be taught in German.

The below Specialized Areas are offered in German:

- Erneuerbare thermische Energiesysteme
- Feuerungs- und Kraftwerkstechnik
- Gebäudeenergetik
- Kernenergietechnik
- Strömungsmechanik und Wasserkraft
- Techniken zur effizienten Energienutzung
- Thermische Turbomaschinen
- Windenergie
- Elektrische Maschinen und Antriebe
- Energie und Umwelt
- Energiesysteme und Energiewirtschaft
- Festigkeitslehre und Werkstofftechnik
- Methoden der Modellierung und Simulation
- Thermofluiddynamik
- Energiespeicher
- Energieverteilung

For more details, please refer to the online course catalog and make sure that you select the respective Study Year (drop-down menu at the top right): https://campus.uni-stuttgart.de/cusonline/wbstpcs.showSpoTree?pStStudiumNr=&pStpStpNr=381&pStartSemester=&pSjNr=1657
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