

Annex 1 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 **Automotive Engineering at Chalmers** and in **Fahrzeug- und Motorentechnik (Vehicle and Internal Combustion Engine Engineering at U Stuttgart)**. It shows the compulsory and elective courses in each semester as well as the prerequisites for students wishing to spend their 2nd year at the partner institution.

Version 2014-09-11 (LJ and Bå)

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
Engineering of Automotive Systems (7.5 ECTS) (C)	Basic Module Specialisation 1 (Grundfach Spez. 1) ¹ (6 ECTS) (C and E)	Road Vehicle Aerodynamics (7.5 ECTS) (SC)	Core / Supplementary Modules Specialisation 1 (Kern- / Ergänzungsfach Spez. 1) ² (12 ECTS) (C and E)	Studienarbeit (Student research project) (12 ECTS) (C)	Vehicle and Traffic Safety (7.5 ECTS) (C)	Master-Thesis (30 ECTS)	Master Thesis (30 ECTS)
Internal Combustion Engines (7.5 ECTS) (C)	Core / Supplementary Modules Specialisation 1 (Kern- / Ergänzungsfach Spez. 1) ² (6 ECTS) (C and E)	Hybrid Vehicles and Control (7.5 ECTS) (SC)	Core / Supplementary Modules Specialisation 3 (Kern- / Ergänzungsfach Spez. 3) ² (12 ECTS) (C and E)	FMT-Seminar (3 ECTS) (C)	Active Safety (7.5 ECTS) (SC) or Powertrain Mechanics (7.5 ECTS) (SC)		
Vehicle and Traffic Safety (7.5 ECTS) (C)	Basic Module Specialisation 3 (Grundfach Spez. 3) ¹ (6 ECTS) (C and E)	Internal Combustion Engines Advanced (7.5 ECTS) (SC)	Elective Compulsory Module (Pflichtfach mit Wahlmöglichkeit) ³ (6 ECTS) (C and E)	Industriepraktikum (Industrial internship) (12 ECTS) (C)	Automotive Engineering Project (15 ECTS) (C)		
Vehicle Dynamics (7.5 ECTS) (C)	Core / Supplementary Module Specialisation 3 (Kern- / Ergänzungsfach Spez. 3) ² (6 ECTS) (C and E)	Vehicle Dynamics Advanced (7.5 ECTS) (SC)		Automobiltechnisches Fachpraktikum (3 ECTS) (E) or Vehicle Aerodynamics I (3ECTS) (E) or Engine Combustion and Emissions (3 ECTS) (E)			
	Elective Compulsory Module (Pflichtfach mit Wahlmöglichkeit) ³ (6 ECTS) (C and E)	Impact Biomechanics (7.5 ECTS) (SC)					
Σ ECTS = 30	Σ ECTS = 30	Σ ECTS = 30	Σ ECTS = 30	Σ ECTS = 30	Σ ECTS = 30	Σ ECTS = 30	Σ ECTS = 30

Course code: C = compulsory; E = elective; SC = semi compulsory; R = recommended; else: ^{1, 2, 3} = see following pages

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Appendix

Specifications of University of Stuttgart's Course Modules

1)

Grundfach Spezialisierungsfach 1: Kraftfahrzeuge (*Basic Module Specialisation 1: Vehicle Engineering*)

Kraftfahrzeuge I und II (*Vehicles I and II*) (C and E)

Grundlagen der Fahrzeugdynamik (*Fundamentals of Vehicle Dynamics*) (C and E)

Fahreigenschaften des Kraftfahrzeuges I+II (*Vehicle Driving Characteristics I + II*)

Kfz-Aerodynamik II (*Vehicle Aerodynamics II*)

Windkanal-Versuchs- und Messtechnik (*Wind Tunnel Testing and Measurement Technology*)

Grundfach Spezialisierungsfach 3: Verbrennungsmotoren (*Basic Module Specialisation 3: Internal Combustion Engines*)

Grundlagen der Verbrennungsmotoren (*Fundamentals of Internal Combustion Engines*) (C and E)

Motorische Verbrennung und Abgase (*Engine Combustion and Emissions*) (C and E)

2)

Kern- / Ergänzungsfächer Spezialisierungsfach 1: Kraftfahrzeuge (*Core / Supplementary Modules Specialisation 1: Vehicle Engineering*)

Kernfach „Grundlagen der Fahrzeugtechnik“ (*Core Module “Basics of Vehicle Technology”*)

Kfz-Aerodynamik I (*Vehicle Aerodynamics I*) (C)

Kfz Komponenten (*Vehicle Elements*) (C)

Ergänzungsfach „Spezielle Kapitel der Fahrzeugtechnik“ (*Supplementary Module “Special Topics of Automotive Technology”*)

Fahreigenschaften des Kraftfahrzeuges I+II (*Vehicle Driving Characteristics I + II*) (C and E)

Fahrzeugdynamik (*Vehicle Dynamics*) (C and E)

Kfz-Aerodynamik II (*Vehicle Aerodynamics II*) (E)

Windkanal-Versuchs- und Messtechnik (*Wind Tunnel Testing and Measurement Technology*) (E)

Planung und Konzeption von Prüfständen I+II (*Planning and Conceptual Design of Test Benches I + II*) (E)

Projektmanagement in der KFZ-Industrie (*Project Management in the Automotive Industry*) (E)

Fahr- u. Bremsmechanik d. Nutzfahrzeuge im Straßeneinsatz (*Driving and Braking Mechanics of Commercial Vehicles*) (E)

Fahrzeugakustik I (*Vehicle Acoustics I*) (E)

Fahrzeugakustik II (*Vehicle Acoustics II*) (E)

Fahrzeugkonzepte I+II (*Vehicle Concepts I + II*) (E)

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- Karosserietechnik (*Car Body Technology*) (E)
- Elektrochemische Energiespeicherung in Batterien (*Electrochemical Energy Storage in Batteries*) (E)
- Hybridantriebe (*Hybrid Propulsion Systems*) (E)
- KFZ-Recycling (*Vehicle Recycling*) (E)
- Nutzfahrzeug-Aerodynamik (*Commercial Vehicle Aerodynamics*) (E)

Kern - / Ergänzungsfächer Spezialisierungsfach 3: Verbrennungsmotoren (*Core / Supplementary Modules Specialisation 3: Internal Combustion Engines*)

Kernfach „Simulations- und Versuchstechnik“ (*Core Module “Simulation and Testing Technology”*)

- Berechnung und Analyse innermotorischer Vorgänge (*Calculation and Analysis of Combustion Chamber Processes*) (C)
- Versuchs- und Messtechnik an Motoren (*Testing and Measuring Technology in Engines*) (C)

Ergänzungsfach „Spezielle Kapitel der Verbrennungsmotorentechnik“ (*Supplementary Module “Special Topics of IC Engine Technology”*)

- Dynamik der Kolbenmaschinen (*Dynamics of Piston Engines*) (E)
- Elektrochemische Energiespeicherung in Batterien (*Electrochemical Energy Storage in Batteries*) (E)
- Planung und Konzeption von Prüfständen I+II (*Planning and Conceptual Design of Test Benches I + II*) (E)
- Turbo-Chargers (E)
- Einspritztechnik (*Injection Technology*) (E)
- Abgasnachbehandlung in Fahrzeugen (*Exhaust Gas Aftertreatment in Vehicles*) (E)
- Hybridantriebe (*Hybrid Propulsion Systems*) (E)
- Numerische Berechnung motorischer Verbrennungsvorgänge (*Numerical Computation of IC Engine Combustion Processes*) (E)
- Abgase von Verbrennungsmotoren (*Exhaust Gases of Internal Combustion Engines*) (E)
- Ausgewählte Kapitel der Dieselmotorentechnik (*Selected Topics of Diesel Engine Technology*) (E)
- International Engineering (E)
- Sport- und Rennmotorentechnik (*Sports and Racing Engine Technology*) (E)
- Kleinvolumige Höchstleistungsmotoren (*Small-Displacement High-Performance Engines*) (E)

3)

Pflichtfach-Module mit Wahlmöglichkeit (*Elective Compulsory Modules*)

- 1 Leichtbau (*Lighweight Design*)
- 2 Boundary Element Methods
- 3 Brennstoffzellentechnik (*Fuel Cell Technology*)

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- 4 Design und Fertigung mikro- und nanoelektronischer Systeme (*Design and Production of Micro and Nano Electronic Systems*)
- 5 Elektrische Antriebe (*Electric Drives*)
- 6 Energie- und Umwelttechnik (*Energy and Environmental Engineering*)
- 7 Grundlagen der Heiz- und Raumluftechnik (*Basics of Heating, Ventilation and Air Conditioning*)
- 8 Energetische Anlagenbewertung und Lüftungskonzepte (*Energetic Facility Assessment and Ventilation Concepts*)
- 9 Grundlagen der Keramik und Verbundwerkstoffe (*Fundamentals of Ceramic and Compound Materials*)
- 10 Grundlagen der Kunststofftechnik (*Fundamentals of Plastics Engineering*)
- 11 Partikeltechnik in der Mehrphasenströmung (*Particle Methods in Multi-Phase Flows*)
- 12 Methoden der finiten Elemente in Statik und Dynamik (*Finite Element Methods in Statics and Dynamics*)
- 13 Grundlagen der Mikrosystemtechnik (*Fundamentals of Microsystems Technology*)
- 14 Grenzflächenverfahrenstechnik und Nanotechnologie (*Bounding Surface Process Engineering and Nanotechnology*)
- 15 Biologische und chemische Verfahren für die industrielle Nutzung von Biomasse (*Biological and Chemical Processes for Industrial use of Biomass*)
- 16 Grundlagen der thermischen Strömungsmaschinen (*Thermal Turbomachinery Fundamentals*)
- 17 Methoden der Werkstoffsimulation (*Material Simulation Methods*)
- 18 Festigkeitslehre I (*Strength of Materials I*)