Educational and Research Partnership between Audi Hungaria Motor Ltd.
and
Széchenyi István University

Dr. Csaba Tóth-Nagy
Associate Professor
Kay Schintzel
Associate Professor

Széchenyi István University
Audi Hungaria Faculty of Automotive Technologies
Department of Internal Combustion Engines
Széchenyi István University

Overview of Széchenyi István University (as of Fall 2014):

- Number of students 11,617
- Faculty of technical sciences 7,508
- Mechanical engineering major 1,553
- ME with emphasis on IC engines + Automotive engineering (B.Sc.) 831
- Automotive engineering major (B.Sc.) 603
- Automotive engineering major (M.Sc. Deutsch) 19

- ca. 3/4 of the graduates find a job at AUDI Hungaria Motor Kft.
- ca. 2/3 Automotive Engineering major M.Sc. Are coming from Győr
# AUDI Hungaria Faculty of Automotive Technologies

## Internal combustion engines major M.Sc. Curriculum

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<th>2nd SEMESTER</th>
<th>3rd SEMESTER</th>
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**Education**

**AUDI Hungaria,** Faculty of Automotive Technologies

**Internal combustion engines major M.Sc. Curriculum**

**Dr. Kay Schintzel, Lehrstuhl für Verbrennungsmotoren**
AUDI Hungaria Faculty of Automotive Technologies

Strategy Research

Vision – World wide recognized Competence cluster for Tribology

Department of Material Science and Technology
1. Development of tribologically optimized material combinations (Materials, Surface coatings, and lubricants /Nano-additives/)
2. Chemical and topological analysis of surfaces

Department of Automotive Production Technologies
3. Effect of manufacturing technologies on frictional partners (Engine components and tools)
4. Mechanical and geometrical evaluation of contact surfaces

Department of Internal Combustion Engines
5. Tribological behaviour of engine components under chemical-physical influences
6. Optimisation of tribological friction partners under real life conditions

Department of Vehicle Development
7. Tribological behaviour of vehicle components
8. Optimisation of Tribological friction partners

Department of Environmental Engineering

Department of Logistics

Dr. Kay Schintzel, Lehrstuhl für Verbrennungsmotoren
Department of Internal Combustion Engines

Strategic areas of teaching

- Tribology
- IC Engines basics
- Thermodynamics
- Application of controllers in the driveline
- Trends in engine design
- Softskills
- Simulation
- Measurement technologies
- Alternative drive systems
- Racing engines
- Failure analysis

Schwerpunkte Lehre Verbrennungsmotor

40 subjects in B.Sc. and M.Sc.
Department of Internal Combustion Engines
Strategic research topics

- Cylinder liner technology
- Timing belts
- Wear simulation
- Turbochargers
- Oil / Nano-additives
- Cylinder liner technology
- Timing belts
- Wear simulation
- Turbochargers
- Oil / Nano-additives

Tribologie im Verbrennungsmotor

- Slide bearings
- Auxiliary units
- Valve systems
- Roll bearings
Cooperation activities with universities
National

- **Technical University Budapest** (Prof. Penninger) alternative fuels, Algie to fuel
- **Technical University Debrecen / Fa. Atomki** Activating componenten for RNT-Measurements
- **Technical University Miskolc** Surface analysis
- **College of Kecskemét** TÁMOP project
- **College of Óbuda** TÁMOP project
Cooperation activities with universities
International

• **Technical University Wien** (Prof. Geringer, Prof. Winter) Kondensatbildung und Messung von säurebestandteilen im Abgas eines Dieselmotors in unterschiedlichen Betriebspunkten und mit unterschiedlichen Kraftstoffen / **IFT** (Prof. Bleicher, Hr. Zemann) alternative Motorwerkstoffe und Fertigungsmethoden (3-D Druck)

• **Technical University Magdeburg** (Prof. Bartel) zur Betreuung der Dissertation von Dudás, Alexander (Thema: Optimierung von Zylinderlaufbahnen für besondere tribologische Anforderungen (RDW Märkte))

• **College Coburg** (Prof. Gnuschke, Prof. Krahl, Hr. Öttinger) studentischer Austausch / Duales Studium / MSC Kraftstoffsystemingenieur

• **Technical College Ingolstadt** (Prof. Huber) zum Thema studentischer Austausch / Einzylindermotor

• **Technical University Stuttgart** (Prof. Gadow) Zusammenarbeit im Bereich europäische Förderprogramme im Bereich Beschichtungen

• **University Huddersfield** (Prof. Baron / Allenport) zum Thema ATL

• **Tallinn University** (Trinn, Henri) ???
Phase 1:
► Implementation of a dynamometer with on-line wear measurement technique
► Implementation of a cold test dynamometer

Phase 2:
► Implementation of laboratories for tribological experiments
► Implementation of an office building

Phase 3:
► Implementation of another dynamometers
► Implementation of component dynamometers

Financing (AHM, City, Government, Uni) Opening April 2011
Financing (Government, Uni) Opening Mai 2012
Financing open Planning started in 2013 Goal is to finish till 2015 / 2016
Department of Internal Combustion Engines
Staff

![Staff Growth Chart]

- **Mechaniker**
- **Prüfstandsingenieure**
- **Doktoranden**
- **Ingenieure**
- **Dozenten (inkl. LSL)**
- **Sekretärin / Assistenz**

Years: 2011 to 2020

Anzahl Mitarbeiter [-]
# Department of Internal Combustion Engines

**Highlights - Mobility of the future presentation series**

**Spring 2015**

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<td>Von Effizienz bis Hochleistung - das Spannungsfeld der R-Ottomotoren von Audi</td>
<td>19.02.2015</td>
<td>Dr. Thomas Heiduk (AUDI AG)</td>
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<td>High Performance und Low Consumption  TİGDI</td>
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<td>02.04.2015</td>
<td>Dr. Erich Blümcke (AUDI AG)</td>
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<td>RDE - A Game Changer?</td>
<td>30.04.2015</td>
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<td>Eigenschaftsentwicklung Gesamtfahrzeug</td>
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<td>Dr. Rüdiger Chmielewski (AUDI AG)</td>
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<td>Führung in japanischen Lean-Unternehmen</td>
<td>04.06.2015</td>
<td>Dr. Roman Ditzer (RD interlogue)</td>
<td>Audi Akademie PTC</td>
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<td>25</td>
<td>IT in der Automobilindustrie</td>
<td>18.06.2015</td>
<td>Mosch, Sven (AUDI Hungaria Motor Kft.)</td>
<td>Audi Akademie PTC</td>
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Department of Internal Combustion Engines
3. Győrer Tribologietagung (3rd Tribological Conference of Győr)
131 participant from 6 Countries

Topics: Tribology, Coating technologies, Tribosystems, Chain drives, Frictional systems, Friction and wear reduction, Simulation of wear and friction, Tribology of tools

Goal: High quality presentations
Sponsored student and Ph.D. candidate participation
Connecting industry and academia

VIP guests: Herr Thomas Faustmann
Herr Antal Mihalicz
Herr Oliver Hoffmann
Department of Internal Combustion Engines

Highlights - SZEngine / Formula Student
Köszönöm a figyelmet!