htw saar

Mobility Innovation Network
htw saar – Facts and Figures
(as of 1. December 2015)

Faculties / Schools
− Business School
− School of Architecture and Civil Engineering
− School of Engineering
− School of Social Sciences

Central academic institutions
− Deutsch-Französisches Hochschulinstitut
  German-French Institute of Higher Education
− Zentrum Mittelstand Saar
  Support centre for regional SMEs
− CDI - Chinesisch-Deutsches Institut @ htw saar
  Chinese-German Institute@htw saar

More than 6000 students
− of which, 400 in German-French degree programmes
− 47 degree programmes (Bachelor’s and Master’s)

− Budget (in € millions) 33.8
− External funding (in € millions) 9.4
− No. of professors 130
− Academic personnel (in FTEs) 130
− Research institutes 22
− Fraunhofer professorships 3
− International co-operations 65
− Member of the European University Association
Mobility of the future

Saarland and the neighbouring French region of Lorraine have a vibrant automotive and automotive supply industry. Both Ford and Smart have major manufacturing plants here. Saarland is also home to numerous companies, large and small, that supply parts, components and software to automotive manufacturers around the world, focusing in particular on vehicle powertrains and their components. ZF, Bosch, Michelin, Dürr, Magna, abat+ and others all have manufacturing sites in Saarland.

As an application-oriented university with strong regional ties, teaching and research at htw saar benefit from a strong collaborative network with regional automotive manufacturers and automotive suppliers. htw saar also cooperates with a large number of industrial partners located outside Saarland – particularly with companies in neighbouring France.

This well-established network with the automotive manufacturing and supply industries forms the basis of the Mobility Innovation Network at htw saar. The university offers academic programmes that meet the demands of today’s automotive and mobility sectors. The great majority of the engineers working in the region are graduates from htw saar and the university acts a bridge between academia and business. Numerous research transfer activities and R&D projects have helped to boost the innovative strength and competitiveness of companies in the region.
There are currently 16 professors at htw saar working within the Mobility Innovation Network at htw saar teaching concepts, developing solutions and providing technological and business expertise to stakeholders in the mobility markets of tomorrow.

Much of the teaching and research work is focused on:

- Automotive engineering
- Digitalization of automotive manufacturing
- Automated non-destructive testing methodologies (‘smart sensors’) for use in quality assurance systems to promote efficient production and digital monitoring throughout the entire product life cycle
- Digitally networked vehicles (C2C and C2I)
- Production logistics and supply chain management

The Zentrum Mittelstand Saar (ZMS) initiative was established by htw saar as a means of pooling knowledge and skills from across the university to promote business entrepreneurship and to strengthen innovation at small and medium-sized companies. FITT gGmbH is the Institute for Technology Transfer at htw saar (www.fitt.de). FITT manages the university’s applied research and development projects and supports and assists young business start-ups.
Academic programmes

htw saar offers a very broad range of programmes in areas relating to vehicle systems engineering, networked mobility, and control, networking and digitalization in automotive manufacturing:

<table>
<thead>
<tr>
<th>Degree programme</th>
<th>Brief description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Automotive Engineering</strong></td>
<td>A seven-semester B.Eng. programme aimed at providing students with a comprehensive understanding of motor vehicles as complex engineering systems, with particular focus placed on vehicle structure, drive and chassis systems.</td>
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<tr>
<td>Bachelor of Engineering</td>
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<tr>
<td>(B. Eng.)</td>
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<tr>
<td><strong>Automotive Production Engineering</strong></td>
<td>Master’s degree programme for working professionals designed to teach the engineering and management skills needed to achieve effective, quality-assured production systems in the car manufacturing industry.</td>
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<tr>
<td>Master of Engineering</td>
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<tr>
<td>(M. Eng.)</td>
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<tr>
<td><strong>Engineering and Management</strong></td>
<td>Students acquire an advanced understanding of mechanical engineering or process engineering coupled with management skills for technical managers. They can choose to specialize in either automotive systems or industrial manufacturing.</td>
</tr>
<tr>
<td>Master of Engineering</td>
<td></td>
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<tr>
<td>(M. Eng.)</td>
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<tr>
<td><strong>Mechanical Engineering / Process Technology</strong></td>
<td>A six-semester mechanical engineering programme that focuses on automotive engineering and offers students the opportunity to specialize in automotive systems, industrial manufacturing or product development.</td>
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<tr>
<td>Bachelor of Engineering</td>
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<tr>
<td>(B. Eng.)</td>
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<td>Brief description</td>
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<tr>
<td>Computer Science and Communication Systems Bachelor of Science (B. Sc.)</td>
<td>This programme is designed to teach students the fundamentals of informatics, mathematics and electrical engineering coupled with a solid grounding in the programming skills relevant in telecommunication systems and computer networks.</td>
</tr>
<tr>
<td>Computer Science and Communication Systems Master of Science (M. Sc.)</td>
<td>The objective is to produce graduates who have mastered the technical complexities of today's continually evolving communications networks particularly with regard to network architecture, software development and security issues.</td>
</tr>
<tr>
<td>Mechatronics / Sensor Technology Bachelor of Science (B. Sc.)</td>
<td>Students learn to apply key engineering tools and are taught the skills required to analyse and model mechatronic systems.</td>
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<tr>
<td>Mechatronics / Sensor Technology Master of Science (M. Sc.)</td>
<td>Graduates from the programme have the skills and expertise to solve complex mechatronic problems and are familiar with modern research methodologies.</td>
</tr>
<tr>
<td>Degree programme</td>
<td>Brief description</td>
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<tr>
<td><strong>Business Administration</strong>&lt;br&gt;Bachelor of Arts (B.A.)</td>
<td>This B.A. programme provides a solid grounding in business administration and business economics and offers students a broad range of areas of specialization, such as logistics.</td>
</tr>
<tr>
<td><strong>Industrial Engineering</strong>&lt;br&gt;Bachelor of Science (B.Sc.)</td>
<td>The B.Sc. programme ‘Industrial Engineering’ combines key economic and legal aspects from the field of business studies with technical and scientific aspects of engineering disciplines, such as automation technology, electrical engineering, engineering design and manufacturing engineering.</td>
</tr>
<tr>
<td><strong>Industrial Engineering</strong>&lt;br&gt;Master of Science (M.Sc.)</td>
<td>In addition to producing graduates with specific structured management skills, this M.Sc. programme offers students the opportunity to strengthen their personal career profiles by choosing to specialize in either industrial manufacturing or network economics.</td>
</tr>
<tr>
<td><strong>Supply Chain Management</strong>&lt;br&gt;Master of Science (M.Sc.)</td>
<td>Students acquire the methods, knowledge and skills to coordinate, monitor and control the flows of material, information and financial resources along the entire value chain with the aim of enhancing productivity and efficiency.</td>
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### Research and knowledge transfer

At present, 16 professors at htw saar are undertaking research and development work aimed at boosting innovation at companies operating within the automotive production and automotive supply sectors.

<table>
<thead>
<tr>
<th>Professor</th>
<th>Research and development projects</th>
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<tbody>
<tr>
<td><strong>Prof. Dr.-Ing. Hans-Werner Groh</strong></td>
<td>Development of software and hardware for in-vehicle control systems and data communication solutions; drive systems for electric and hybrid vehicles</td>
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<tr>
<td><strong>Prof. Dr.-Ing. Thomas Heinze</strong></td>
<td>Engines, machines, control and automation engineering</td>
</tr>
<tr>
<td><strong>Prof. Dr.-Ing. Jörg Hoffmann</strong></td>
<td>Car body technology, lightweight vehicle design and vehicle safety</td>
</tr>
<tr>
<td><strong>Prof. Dr.-Ing. Wolfram Seibert</strong></td>
<td>Conceptual design, simulation, development, engineering design and construction, testing, production, end-use and recovery of vehicles</td>
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<tr>
<td><strong>Prof. Dr.-Ing. Horst Wieker</strong></td>
<td>Communication techniques, traffic telematics with focus on C2X architectures</td>
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<tr>
<td><strong>Prof. Dr. rer. nat. Dr. rer. med. habil. Daniel J. Strauss</strong></td>
<td>Systems neuroscience and neurotechnology, human-vehicle interface: cognition, emotion and awareness</td>
</tr>
<tr>
<td><strong>Prof. Dr.-Ing. Jürgen Griebsch</strong></td>
<td>Manufacturing and production engineering, laser technology and 3D printing, additive manufacturing</td>
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<tr>
<td>Professor</td>
<td>Research Focus</td>
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<tr>
<td>-----------------------------------</td>
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<tr>
<td>Prof. Dr. Ralf Oetinger</td>
<td>Industrial informatics, business processes and corporate management</td>
</tr>
<tr>
<td>Prof. Dr.-Ing. Rainer Müller</td>
<td>Assembly and automation engineering for the automotive industry</td>
</tr>
<tr>
<td>Prof. Dr. rer. nat. Martina Lehser</td>
<td>Informatics, internet technologies, programming, operating systems embedded systems and robotics</td>
</tr>
<tr>
<td>Prof. Dr.-Ing. Bernd Valeske</td>
<td>Sensors and fully automated production-integrated, non-destructive testing technologies for use in digital manufacturing processes and for ensuring safe vehicle operation</td>
</tr>
<tr>
<td>Prof. Dr.-Ing. Ahmad Osman</td>
<td>Testing technologies, image processing, data fusion, artificial intelligence for processing and analysing sensor data for quality assurance purposes in production systems and for the safe operation of vehicles in digital environments</td>
</tr>
<tr>
<td>Prof. Dr. rer. pol. Thomas Korne</td>
<td>International logistics management, production and process management, quality management</td>
</tr>
<tr>
<td>Prof. Dr. rer. pol. Steffen Hütter</td>
<td>Production, logistics and RFID technologies</td>
</tr>
<tr>
<td>Prof. Dr. rer. pol. Thomas Bousonville</td>
<td>IT applications in logistics, transport and supply chain management</td>
</tr>
<tr>
<td>Prof. Dr. Teresa Melo</td>
<td>Quantitative methods in logistics and healthcare logistics</td>
</tr>
</tbody>
</table>
Research groups and expert networks

Engine control units

**Automotive Powertrain**

The research group led by Professor Thomas Heinze is concerned with developing and improving the function of engine control units and exhaust treatment systems. The main focus is on achieving emission reductions by using alternative fuels, particularly LPG.

Digitally networked vehicles

**Traffic telematics research group**

The research group headed by Professor Horst Wieker is interested in the use of vehicle information and communications systems and has set up an ITS test platform for research and development purposes. Research is focused on developing comprehensive C2X architectures for telematics systems with the aim of enhancing traffic safety, improving traffic efficiency and leveraging value chains.
htw saar’s own test vehicle being used in the CONVERGE (COmmunication Network VEHICLE Road Global Extension) research initiative – shown here during a wrong-way manoeuvre
Automotive Electronic and Electrical Systems Lab

The research staff and students in this lab, which is managed by Professor Hans-Werner Groh, conduct research aimed at improving the function of in-vehicle control systems and data communication solutions; drive systems for electric and hybrid vehicles and the associated measuring equipment and instrumentation. Another important area concerns simulation-assisted investigations and creating prototype models for wireless-based applications, such as access control systems and GPS navigation.

Neurocognitive Driving Test Field

The neurocognitive test field for analysing driver behaviour is headed by Professor Daniel J. Strauss. It is one of the research labs within the Systems Neuroscience and Neurotechnology Unit (SNN Unit), which is a research unit run jointly by htw saar and the Faculty of Medicine at Saarland University. The neurocognitive test field is used to evaluate and improve the various HMI modalities by observing, testing and analysing the cognitive and emotional states of drivers and front passengers while interacting with smart traffic systems and highly automated vehicles in real traffic situations.
Innovation and optimization of production technology

Excellence Centre for Industrial Production

The research group led by Professor Jürgen Griebsch is focused on the application of modern processes, technologies and tools in the field of manufacturing engineering and on designing process chains, particularly those that use laser technology and additive manufacturing techniques.

Embedded Robotics Lab

Key areas of interest at the Embedded Robotics Lab, headed by Professor Martina Lehser, are real-time control of production flows and the use of mobile robots in production processes based on universal software and hardware platforms.

AutomatIQ Research Group

This research group is a joint undertaking involving htw saar and the Fraunhofer Institute for Non-Destructive Testing (IZFP). The group works on automated signal and image processing techniques for innovative NDT sensors that are used for quality assurance management in tomorrow’s flexible production systems. The goal of the group, which is headed by Professor Ahmad Osman, is to achieve software-controlled, automated and process-integrated component testing and process monitoring.
AQS - Fraunhofer Innovation Cluster 'Automotive Quality Saar'

The innovation cluster ‘Automotive Quality Saar’, headed by Professor B. Valeske from the Fraunhofer Institute for Non-Destructive Testing (IZFP), is a research and development centre that is concerned with issues of relevance to the automotive production and automotive supply sectors. AQS aims to be a single-source provider of innovative NDT solutions for material and component quality assurance procedures, developing and improving these solutions to meet future industry needs. htw saar is a founding member of AQS. Activity is primarily focused on material and quality-related issues concerning major vehicle modules and on developing means to optimize the use of materials and make production processes more efficient.

Further information is available at: http://www.izfp.fraunhofer.de/de/AQS.html

ZeMA

The Center for Mechatronics and Automation Technology (ZeMA) is a collaborative undertaking involving the Saarland regional government, htw saar and Saarland University. Work at ZeMA is on technologically advanced industrial projects, such as application-driven research into assembly and fabrication processes and the deployment of actuators and sensors in the automotive industry. The Center’s Scientific Director is Professor Rainer Müller.
Production management, logistics and IT systems

**Qbing**

The Qbing research group led by Professor Steffen Hütter builds demonstrators and prototypes in the field of RFID for use in the automotive supply industry. Applying innovative sensor technology coupled with in-house ERP systems can significantly enhance material-flow visualization and process control for leaner and more transparent manufacturing and logistics processes.

**IBO – Institute for Industrial Informatics and Business Organization**

IBO, whose director is Professor Ralf Oetinger, focuses on the ongoing digitalization of product development and production processes through the use of application software and IT systems such as ERP, PLM and MES. The institute has developed a modular, open-source and licence-free business platform for SMEs.
AKJ Automotive

AKJ Automotive comprises experts and executives from the automotive industry and functions as a platform for members to engage in an open and honest exchange of ideas and information concerning all aspects of the automotive value chain (producers, suppliers, service providers). The objective of the AKJ Automotive working group is to jointly develop concepts and solutions aimed at optimizing processes and structures in the automotive production and supply industries.

Institute for Supply Chain and Operations Management – ISCOM

ISCOM is headed by Professor Thomas Bousonville and Professor Teresa Melo and focuses on the IT-assisted application of quantitative methods for analysing the supply chain. The institute has extensive experience in the planning and management of logistics processes in road freight transport sector. The results from several research projects in this field were used to establish the spin-out company Qivalon GmbH, which provides fuel management solutions for commercial vehicle fleets based on Logistics 4.0 technologies. Another area of expertise at ISCOM is in the field of healthcare logistics.

Institute for Production and Logistics Systems

Most of the work at the Institute for Production and Logistics Systems is R&D projects conducted on behalf of the automotive manufacturing and component supply sectors. The Institute, headed by Professor Klaus-J. Schmidt and Professor Thomas Korne, conducts analyses and develops new methods for assessing and designing processes, structures and systems. Industry projects benefit from the introduction of performance benchmarks, best practices and by driving innovation.
Contacts

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