Summer School

EMIG – Engineers Made in Germany

**University of Massachusetts –
Francis College of Engineering**

**Pforzheim University –
School of Engineering**

January 2014

Prof. Dr.-Ing. Matthias Weyer
Dean School of Engineering / Pforzheim University

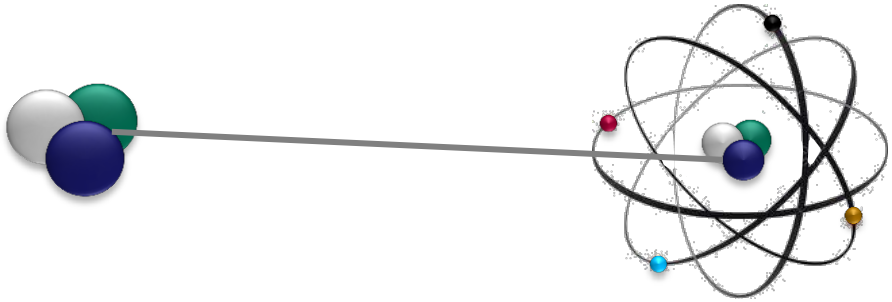
Our fingerprint

personal program
instead of
mass processing

Information Session

- What is the scope of the course?
- What is offered?
- When will it start?
- What will it cost?
- What is included?
- …

Program Overview



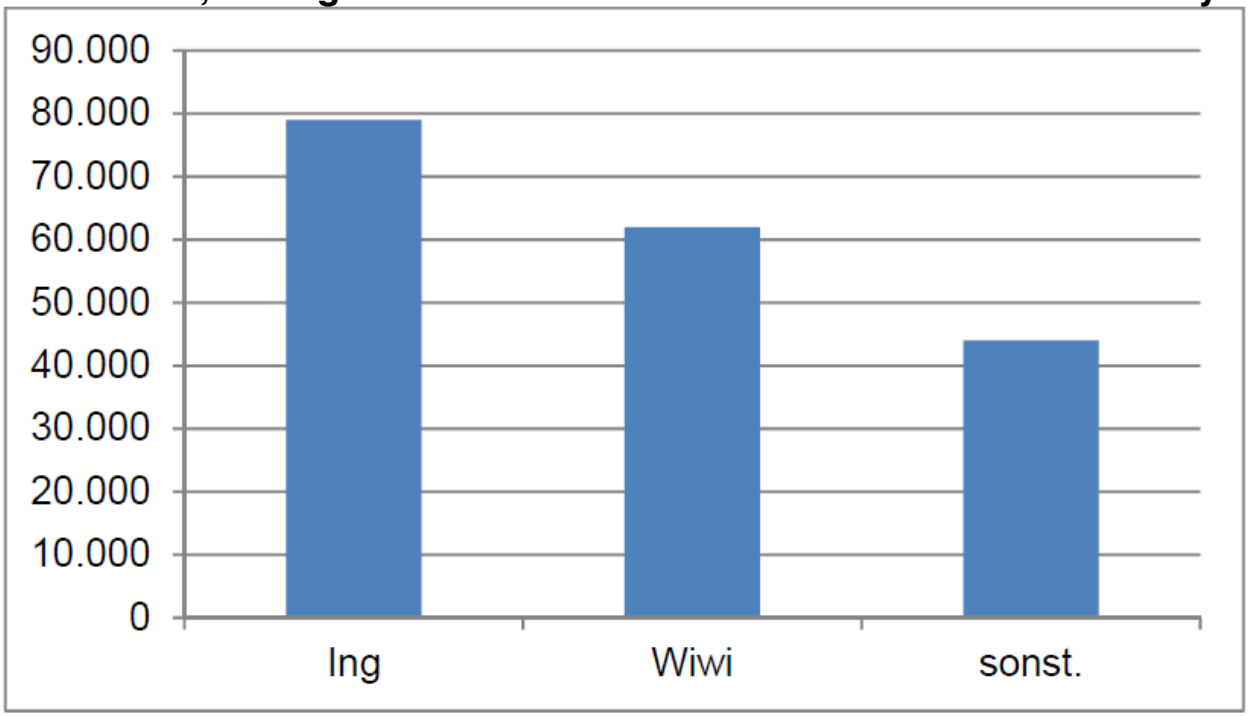
3 Courses with focus on …

- **Production Management** in the German Automotive Industry
- **Production Techniques** in the German Automotive Industry
- **German as a Foreign Language**

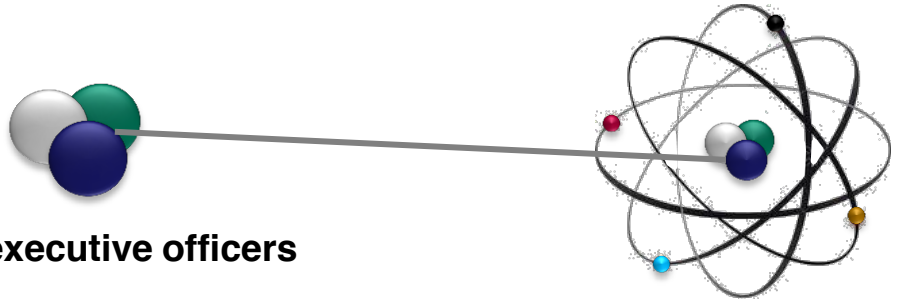
(9 credits in 6 weeks, 120 contact hours, in Germany, in English, written exams, various lecturers)

Program Overview

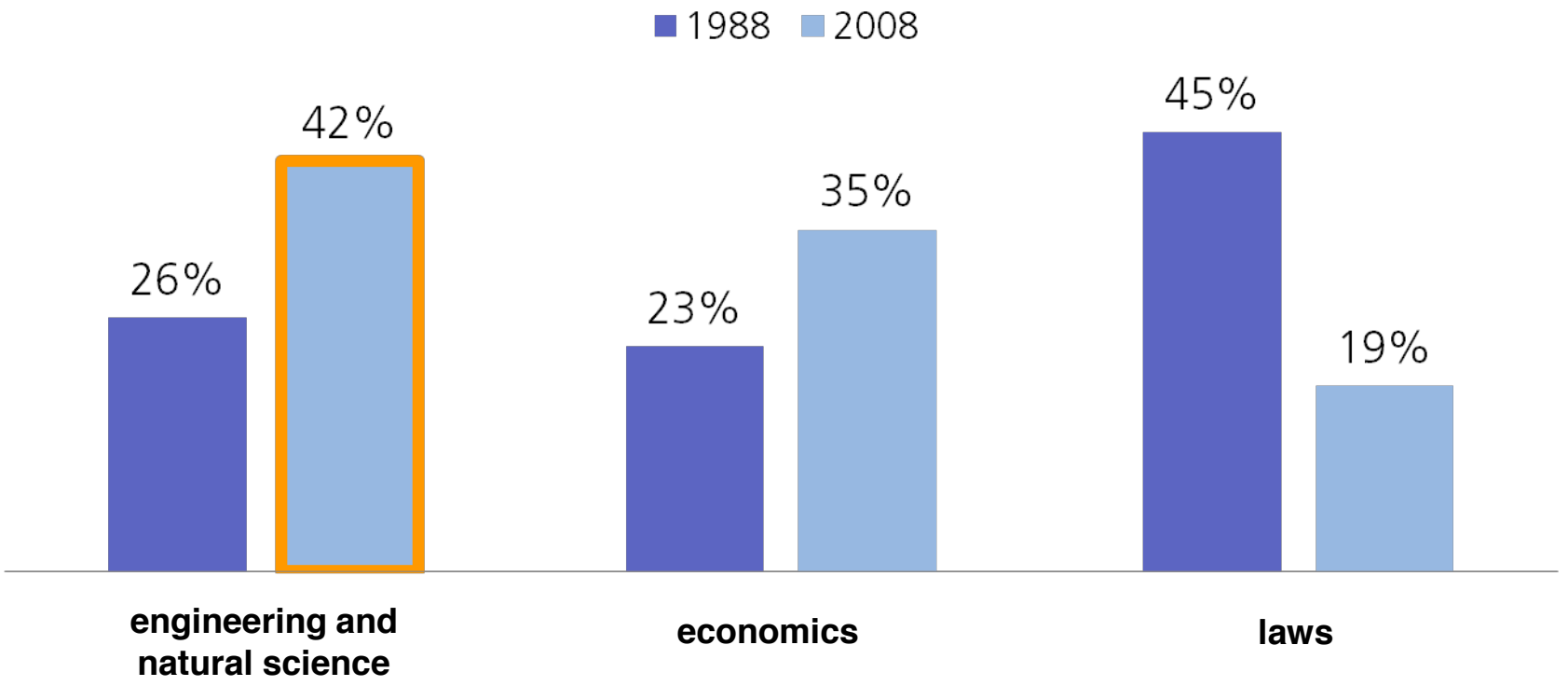
Educational background of the academics who are executives, chairman, manager and executive directors in the German industry



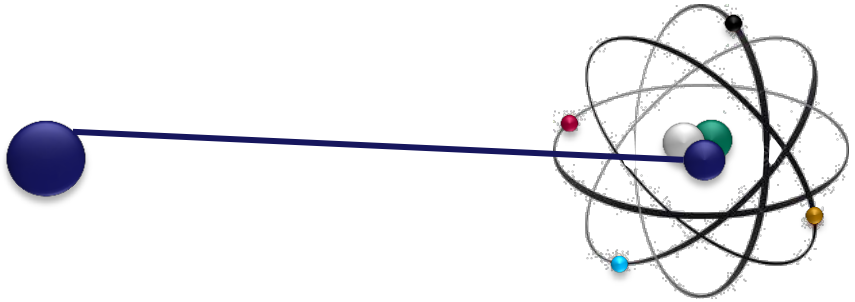
Program Overview



subject of study of the DAX- chief executive officers



Program Details



Course A (3 Credits)

Production Management & Supply Chain Management

(with focus on the German Automotive Industry)

Lecturer:	Dean Prof. Dr.-Ing. Matthias Weyer
Contact hours:	45
Assessment:	Written exam
Methodology:	Interactive lectures with exercises, laboratory, and related field trips

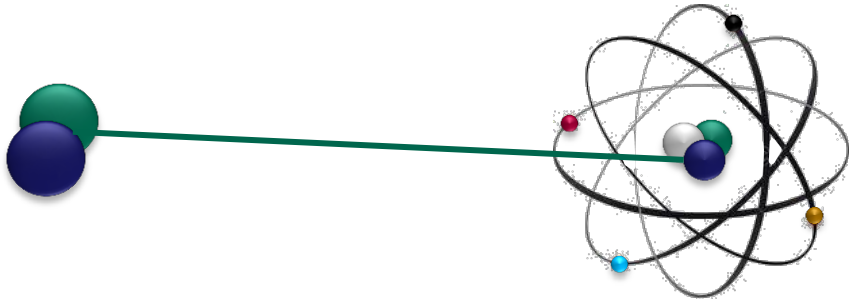
Objectives:

After joining the course, you...

- … will have an **idea about the mindset**, the **problems**, and the **tasks** of **production** and **logistics management** in the automotive industry, and **discover trade-offs** like those between **product design**, custom orientation, logistics, and production.
- … will **enlarge** your **habitual concentration on pure engineering**, **design**, or **development contents**, so that dependencies and effects of your engineering work on other functions can be internalized.
- … have discussed specific tasks and problems concerning production and supply chain management and **learn how to use well-chosen methods** to break concerning tasks and to prevent concerning problems.
- … have gained a **deeper understanding** about **management tasks and skills** in a technical environment, consider how the dilemmas and polylemma have to be balanced, and speculate about an optimization of production systems.
- ... have **visited** production plants of companies like **Mercedes-Benz**, **Audi**, **Porsche**, or **BMW** as well as institutions like the **European Patent Office**, or technology-oriented museums as the German Museum in Munich.

⇨ **With that you are able to deal with problems and tasks and have the ability and knowledge to act with self-assurance in production and supply chain environments**.

Program Details



Course B (3 Credits)

Lecture Series Engineering in Manufacturing

(with focus on the German Automotive Industry)

Lecturer:	Various
Contact hours:	45
Assessment:	Written assignment, team presentations, participation/performance
Methodology:	Interactive lectures with various professors and industry experts, related field trips, preparation/linkages through case studies and discussion, academic journal with appropriate citations

Outline:

Production Techniques in the German Automotive Industry
(lectures with laboratory)

- **Robotics** in the Automotive Industry
- **Laser Materials Processing** in Automotive Production
- **Sustainable Mobility** in the Automotive Sector

ASIIN

Management Skills in the German Automotive Industry
(lectures with exercises)

- **Intercultural Engineering**
- **Business Game**
- **Marketing** for Engineers in the Automotive Supply Industry
- **Innovation Management** in the Automotive Industry

AQAS

AACSB ACCREDITED

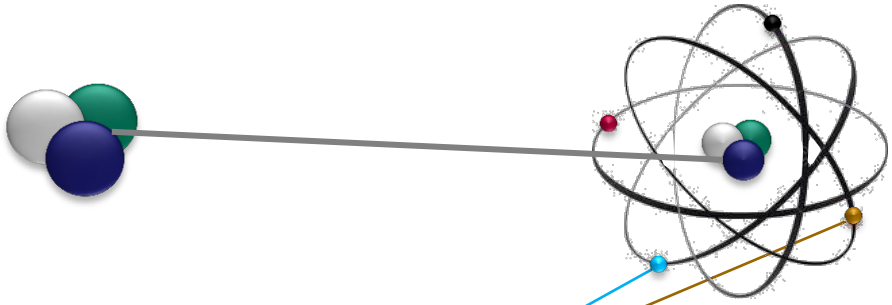
Program Details

Course C (3 Credits)
German as a Foreign Language

Lecturer:	different lecturers from our Institute of Foreign Languages (IFL)
Contact hours:	30
Assessment:	Written and oral exam (internationally recognized exam)
Methodology:	Interactive lectures, role-plays, simulation games

Course levels:
Placement test and allocation to beginner's (level A1) or advanced (levels A2, B1, B2, C1) German course according to CEFR (Common European Framework of Reference for Languages).

Program Overview



3 Courses with focus on …

- **Production Management** in the German Automotive Industry
- **Production Techniques** in the German Automotive Industry
- **German as a Foreign Language**

(9 credits in 6 weeks, 120 contact hours, in Germany, in English, written exams, various lecturers)

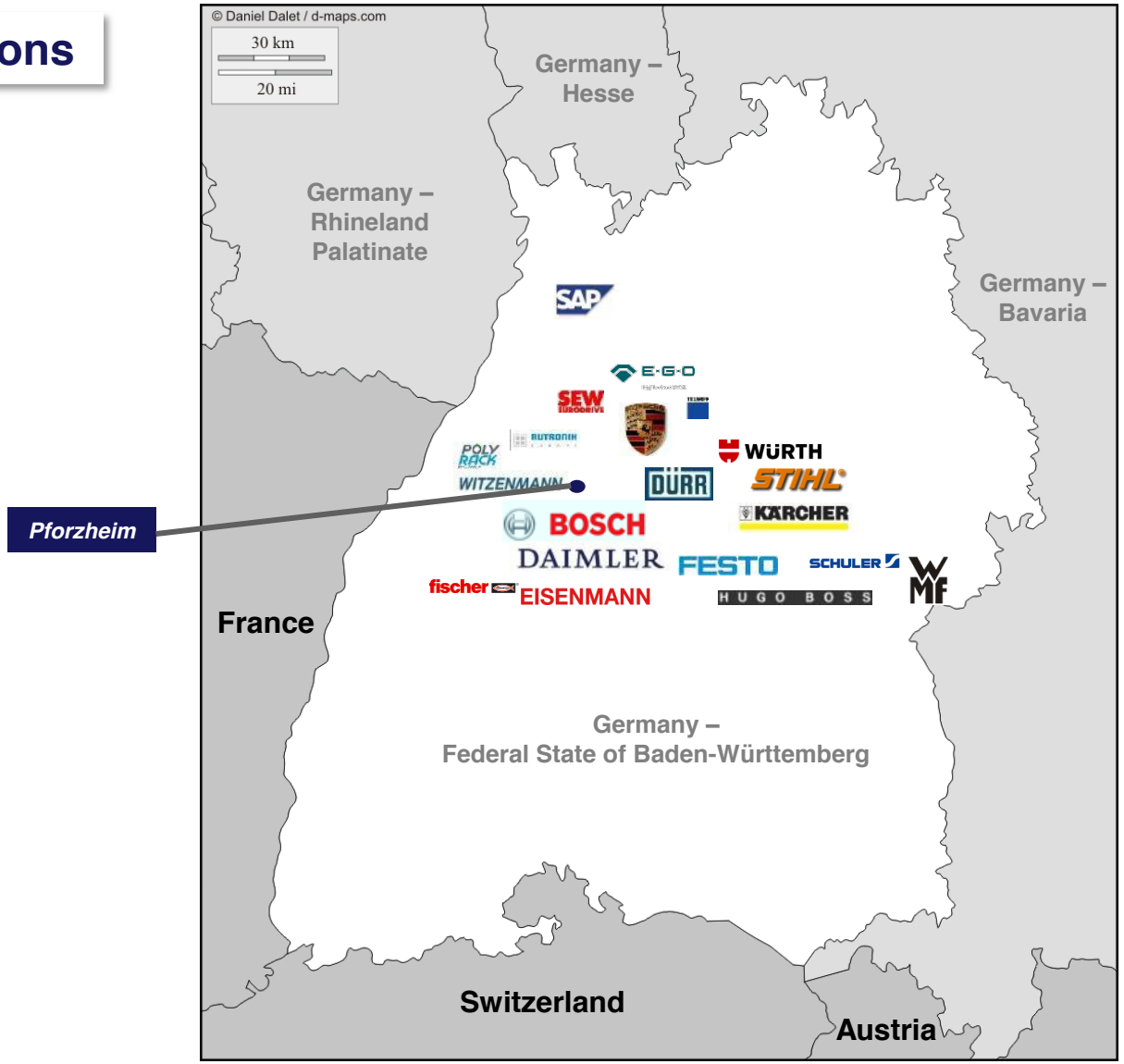
Company visits with focus on production and SCM in the German Automotive Industry
(e.g. visits of Mercedes, BMW, Porsche, Bosch, SAP, …)

Excursions with technical focus
(e.g. trip to European Patent Office, Technic Museum, German Museum, …)

Company Visits - Impressions

Home of Famous World Headquarters

- Bosch
- Daimler
- Dürr
- E.G.O.
- Eisenmann
- Festo
- Fischer
- Hugo Boss
- Kärcher
- La Biosthétique
- PolyRack Tech-Group
- Porsche
- Rutronik
- SAP
- Schuler
- SEW-Eurodrive
- Steiff
- Stihl
- Trumpf
- Witzenmann
- WMF
- Würth Group
- ...



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Company Visits - Impressions

Mercedes Benz Plant

Porsche Museum

SAP

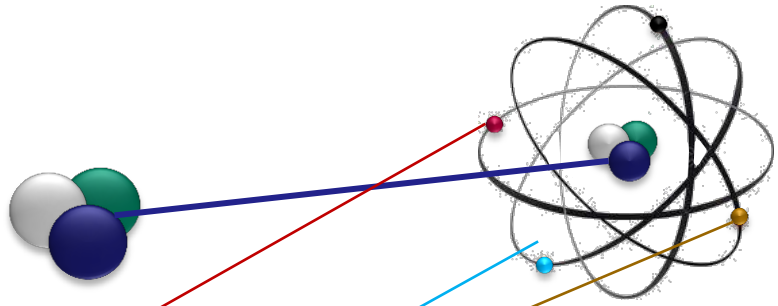
Daimler Museum

Audi Plant

European Patent Office

HUGO BOSS

Program Overview



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German and European culture / cultural excursions
(e.g. trip to Berlin, Munich, Heidelberg, Neuschwanstein Castle, …)

Company visits with focus on production and SCM in the German Automotive Industry
(e.g. visits of Mercedes, BMW, Porsche, Bosch, SAP, …)

Excursions with technical focus
(e.g. trip to European Patent Office, Technic Museum, German Museum, …)

Trips - Impressions

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Day Trips - Impressions

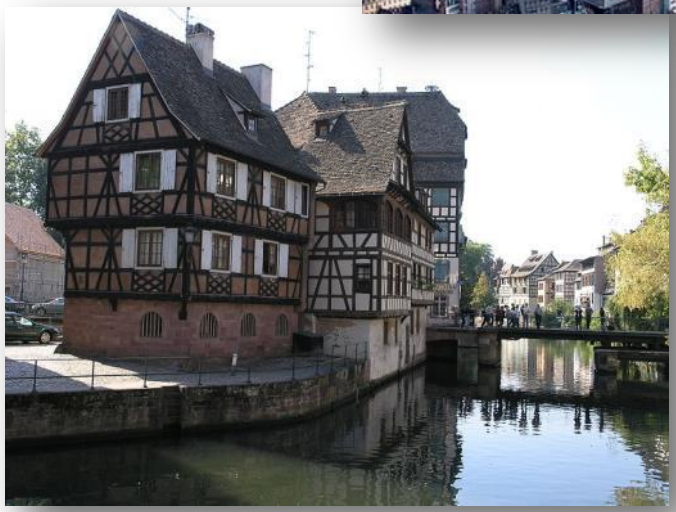
Karlsruhe

Day Trips - Impressions

Heidelberg

Day Trips - Impressions

Strasbourg (France)

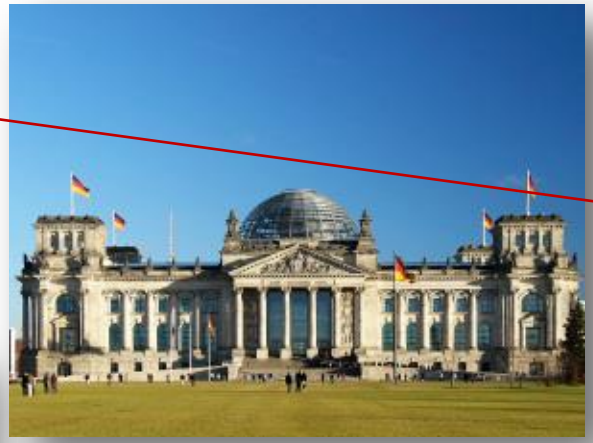


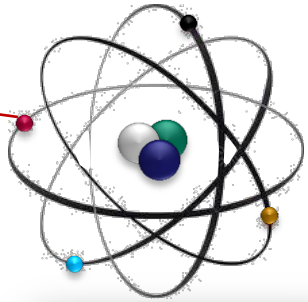
Munich - Impressions

2 days in May

Berlin - Impressions

4 days in June





21 Penn State students of the SMEAL College meeting chancellor Merkel during their business summer school in Pforzheim

Program Overview

3 Courses with focus on …

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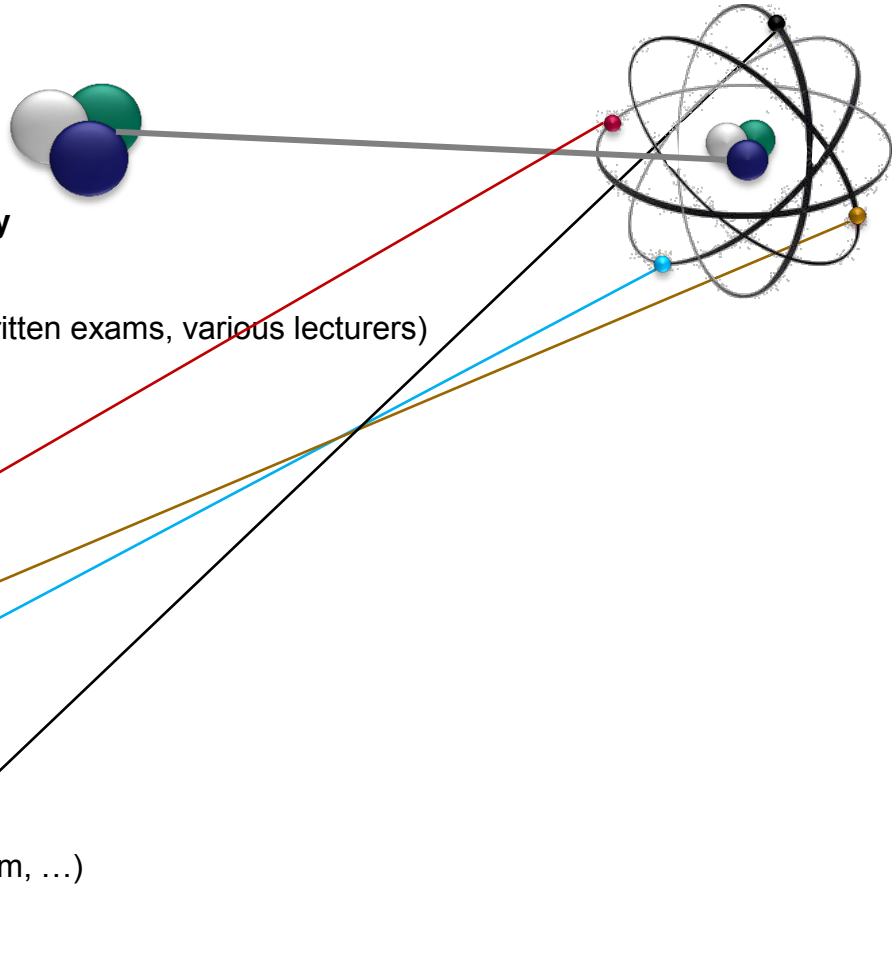

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Company visits with focus on production and SCM in the German Automotive Industry
(e.g. visits of Mercedes, BMW, Porsche, Bosch, SAP, …)

Excursions with technical focus
(e.g. trip to European Patent Office, Technic Museum, German Museum, …)

Integration into German student life and culture
(e.g. high ropes course, buddy concept, campus life, …)

High Ropes Course - Impressions

Team building – first day

Penn State students of the SMEAL College joining the business summer school in Pforzheim 2011

Region Pforzheim, Black Forest & Lake Constance - Impressions

Lake Constance

Pforzheim & Black Forest

Penn State students of the SMEAL College enjoying their field trips of the business summer school in Pforzheim

Soccer World Championship 2014 - Impressions

Stuttgart (European Championship 2012)

main auditorium Pforzheim (European Championship 2012)

26th of June 2014

Berlin (European Championship 2012)

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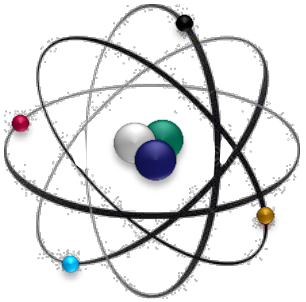
Pforzheim University

Time Schedule

2008: May 31 – July 12
2009: May 17 – June 28
2010: May 16 – June 27
2011: May 15 – June 26
2012: May 13 – June 24
2013: May 12 – June 23

time tested
summer school schedule
of
Penn State (Smeal College)
and
Pforzheim University
(Business School)



2014: May 17 – June 28
(EMIG - Summer School)

United States Semester

Summer School

Pforzheim University Summer Semester Lectures 2014 end on July 4

Our fingerprint

personal program
instead of
mass processing

personal development
instead of
pure formal education

integration
instead of
separation

Pforzheim University, School of Engineering – Brief Introduction

HOCHSCHULE PFORZHEIM UNIVERSITY

- 29 BA Programs
- 13 MA Programs
- 6,000 Students
- 1,200 Freshmen
- 200 Professorships
- 300 Employees
- 200 – 300 Associate Professors

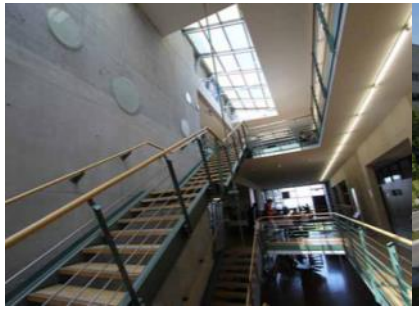
School of Design established 1877

School of Engineering established 1992

9 Bachelor's programs
3 Master's programs
2,100 students

Business School established 1963

Pforzheim University, School of Engineering – Impressions



Housing – Impressions







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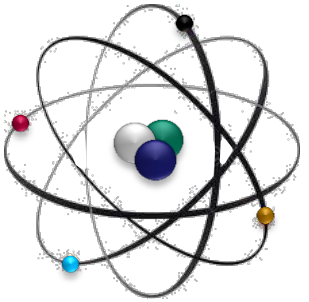


Basic Conditions Overview

Number of Credits (according to Penn State University)
- 9 (in 3 courses with 30-45 contact hours per course)

Time Schedule
- 17th of May to 28th of June 2014 (6 weeks)

Scope of Performance
- free room and board
- 4 day trip to Berlin
- 2 day trip to Munich
- several trips and entrances to companies, cities, museums, and other excursion destinations
- official student status at Pforzheim University (with student ID and all rights & duties of a German student)
- free public transit in Pforzheim and Pforzheim region
- 24/7 phone number

Language
- English (all lectures are hold and all activities, guided tours, etc. are in English)

Minimum/Maximum Number of Participants
- Min. 15 / Max. 25

Costs
- all for 5,900 US-$ (+ travel costs to and from Germany + pocket money)

EMIG – Summer School
Pforzheim University

Interest aroused?

Then contact us!

Our team in Pforzheim

Matthias Weyer,
Prof. Dr.-Ing. Dipl. Wirtsch.-Ing.

Program Director
E-Mail: matthias.weyer@hs-pforzheim.de
Phone: +49(0)7231-28-6504

Karoline Klett
Dipl. Medienwissenschaftlerin

Program Coordinator
E-Mail: karoline.klett@hs-pforzheim.de
Phone: +49(0)7231-28-6476

We are looking forward to welcoming you!

Hochschule Pforzheim University - Engineering School

Questions?

Backup

Program Details

Course A (3 Credits)

Production Management & Supply Chain Management

(with focus on the German Automotive Industry)

Lecturer:	Dean Prof. Dr.-Ing. Matthias Weyer
Contact hours:	45
Assessment:	Written exam
Methodology:	Interactive lectures with exercises, laboratory, and related field trips

Outline:

I Production Management in the German Automotive Industry

1. Insight Production Management ⇨ from production strategy to operative KPIs
2. Process – and Layout Design ⇨ from an optimal layout to a cycle time calculation
3. Production Planning and Control ⇨ from aggregate planning to MTM
4. Production System Simulation ⇨ from a traditional production to a JIT-production

II Supply Chain Management of the German Automotive Industry

1. Insight material management ⇨ from trade-offs to RFID
2. Insight supply chain management ⇨ from bullwhip effect to a strategic fit

III Management & Leadership Skills

1. Insight Management of a Production Plant ⇨ from managers to leaders
2. Management Skills ⇨ from management of instabilities to objective agreement

Program Details

Course A (3 Credits)

Production Management & Supply Chain Management

(with focus on the German Automotive Industry)

Lecturer:	Dean Prof. Dr.-Ing. Matthias Weyer
Contact hours:	45
Assessment:	Written exam
Methodology:	Interactive lectures with exercises, laboratory and related field trips

Objectives:

The automotive industry is the leading sector for production and logistics processes and innovations. In these the German Automotive industry is one of the leading industries worldwide.

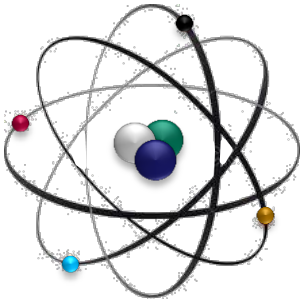
After joining the course, students will have an **idea about the mindset**, the **problems**, and the **tasks of production and logistics management** in the automotive industry, and **discover trade-offs** like those between product design, custom orientation, logistics, and production.

With that experience their **habitual concentration on pure engineering**, **design**, or **development contents** will **be enlarged**, so that dependencies and effects of their engineering work on other functions can be internalized.

Students discuss specific tasks and problems concerning production and supply chain management and **learn how to use well-chosen methods** to break concerning tasks and to prevent concerning problems. Students will gain a **deeper understanding** about **management tasks and skills** in a technical environment, consider how the dilemmas and polylemma have to be balanced, and speculate about an optimization of production systems. Included in the overall program are **visits** to production plants such as **Mercedes-Benz**, **Audi**, **Porsche**, and **BMW** as well as to institutions as the **European Patent Office**, or technology-oriented museums as the German Museum in Munich.

With that students are able to deal with problems and tasks and have the ability and knowledge to act with self-assurance in production and supply chain environments.

Program Details



Course B (3 Credits)

Lecture Series Engineering in Manufacturing

(with focus on the German Automotive Industry)

Laser Materials Processing in Automotive Production

Objectives

Laser Materials Processing plays a significant and further increasing role in advanced automotive production. This can be explained through its various advantageous properties, such as high processing speeds or low heat inputs to the work pieces. Educational objective is a **basic understanding of laser technology and laser materials processes** and thus the capability to plan and to technologically accompany its applications in production.
Focus will be on: **Welding** and **cutting** for B-I-W. Welding, cladding, hardening for powertrain parts. Materials processes for the car interior.
The lecture includes the possibility of supplementary **practical demonstrations** in the **lab** for the participants.

Prof. Dr.-Ing. Roland Wahl

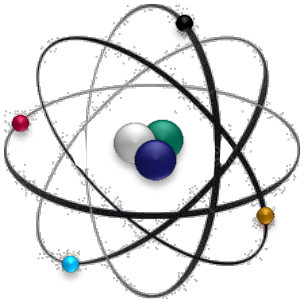
Robotics in the Automotive Industry

Objectives

The purpose of this course is to give an introduction to the **basics of modeling, programming and controlling of robot systems**. The course is presented in a format of **lectures** with integrated practical **lab** sessions. A small **autonomous robot will be programmed as group exercise** during the lecture sessions, illustrating the algorithmic principles which are presented. Keywords: Autonomous Robots, Microcontrollers, Embedded Systems, Algorithms, Finite State Machines, C, Multitasking, Sensors, Actuators.

Prof. Dr. rer.nat. Peer Johannsen

Program Details



Course B (3 Credits)

Lecture Series Engineering in Manufacturing

(with focus on the German Automotive Industry)

Innovation Management in the Automotive Industry

Objectives

The course is intended for students interested in **innovation management**. After introducing the concept of innovation and the significance of technological, market and organizational changes in economics and management, key issues of German strategies for innovation are shown. During the course it will be demonstrated how managing innovation is a major driver of competitiveness in industrialized and developing countries in a global context. The analysis of **new concepts** like open or reverse innovation is part of the lecture. Different **management techniques** and **strategies including case studies** from the automobile industry will be discussed to show how value can be created by innovation.

Prof. Dr.-Ing. Guy Fournier

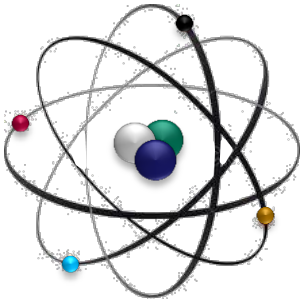
Sustainable Mobility in the Automotive Sector

Objectives

Situation analysis and motivation for sustainable mobility; reduction of running resistances; efficient conventional drives; alternative fuels; electric and hybrid drives; fuel cell drive; comparison of efficiency, energy/power density and CO2-emission; electro mobility for two-wheelers (Ebikes); system aspect of electro mobility; scenarios and forecasts for introduction of electric drives. The Learning target: Understand the need for **sustainable mobility**. Know and understand **different technical approaches** to reach that goal. Know about the **Pros/Cons** and **Benefits/Limits** of **different drive technologies**.

Prof. Jürgen Wrede

Program Details



Course B (3 Credits)

Lecture Series Engineering in Manufacturing

(with focus on the German Automotive Industry)

Intercultural Engineering

Objectives

Internationalization is omnipresent in all realms of automotive production, logistics, sales and marketing. Supply chains span across the whole world, and almost all stakeholders involved have international working contacts on a daily basis. Apart from the technical aspects of organizing and managing production in international subsidiaries, supplier networks, logistics and sales and marketing contacts, interactions between people from diverse cultural backgrounds influence the success of global business.

This lecture gives an **introduction to Intercultural Engineering** in order to **gain an understanding** of the **complexity** of **intercultural cooperation** in the automotive industry and presents **approaches** and **tools** to **deal with the intercultural challenges** successfully.

Prof. Dr. Katharina Kilian Yasin

Marketing for Engineers in the Automotive Supply Industry

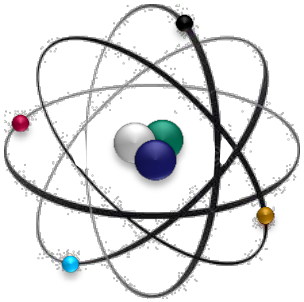
Objectives

Supplying automotive OEMs or even big 1st tier requires a good understanding of the different roles along the supply chain. **Marketing and sales activities** differ significantly from any other industry or market.

This lecture gives in **introduction** into this issue **with a special focus on the impact for engineers working** in these kinds of customer-supplier-relationships.

Prof. Dr.-Ing. Henning Hinderer

Program Details



Course B (3 Credits)

Lecture Series Engineering in Manufacturing

(with focus on the German Automotive Industry)

Economic thinking and acting in industrial companies: How managers do business!"

Objectives

This course provides an extensive introduction into the way of **thinking** and **acting** of **managers in industrial companies** with a focus on the automotive branch.

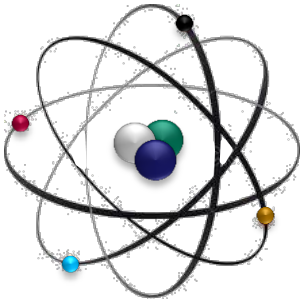
Managers have to ensure efficiency and profitability in their company by taking the right decisions. E. g. the production capacity has to be defined by the estimation of the sales volume based on an analysis of the initial market situation. Then, financing and profitability of the companies' activities have to be ensured.

For making the right decisions a lot of **managers' instruments like** market **research analysis**, **cash flow statement**, **unit costing** and **profit** and lost statement are used. Key ratios help to become aware about the business situation.

By preparing a **case study** in an interactive way/ By participating in a **business simulation** the student will learn the **basic application** of all these **tools** and will be able to do business in an industrial company like a real manager.

Prof. Harald Schnell

Program Details



Course C (3 Credits)
German as a Foreign Language

Lecturer:	different lecturers from our Institute of Foreign Languages
Contact hours:	30
Assessment:	Written and oral exam (internationally recognized exam)
Methodology:	Interactive lectures, role-plays, simulation games

Course levels:
Placement test and allocation to beginner's (level A1) or advanced (levels A2, B1, B2, C1) German course according to CEFR (Common European Framework of Reference for Languages).
A1: At level A1 you can communicate in a very simple way about needs of a concrete type (e.g. introductions, food and drink, shopping, say where you live.) You can use a few very basic grammatical constructions.
A2: At level A2 you can communicate in a simple way in typical everyday situations. In a familiar context you can hold short conversations. You can use simple grammatical structures correctly.
B1: At B1 level you can communicate in a simple and connected way in everyday situations. You can describe experiences, hopes and ambitions and give reasons for opinions. On the whole you can use the most important grammatical structures correctly. You are familiar with topics like dealing with the public authorities, work, shopping, health, children, media and where you live.
B2: At level B2 you can express yourself clearly and explicitly and also successfully discuss and negotiate. You have a large command of the vocabulary needed for your field of specialization and for most general topics. Your usage of grammar is sound.
C1: At C1 level you can express yourself spontaneously and fluently. You are familiar with idiomatic phrases and can vary your style of language as appropriate. You can use the language with a high degree of grammatical accuracy.
C2: You can understand with ease virtually everything heard or read. In speaking, you can express yourself spontaneously, very fluently and precisely. You can summarize information from different spoken and written sources, reconstructing arguments and accounts in a coherent presentation. You make only rarely mistakes.

EMIG – Summer School
Pforzheim University

Lecturers

Matthias Weyer, Prof. Dr.-Ing. Dipl. Wirtsch.-Ing.

Dean School of Engineering;
Member of the University Board; Senator of Pforzheim University
Program Director EMIG
Professor for Operations Management and Supply Chain Management

Consultant for Strategic Management, Organization and Process Development, Production Control and Production Systems, Logistics and Supply Chain Management

Working for Mercedes-Benz for 20 years in different Management and Senior Management Positions

Jürgen Wrede, Prof. Dipl.-Ing.

Vice Dean School of Engineering; Head of Mechanical Engineering Department
Senator of Pforzheim University
Professor for Mechatronics in Automotive Systems

Consultant for Product Development, Especially for Automotive Systems and Vehicle Dynamics

Working for Bosch for 12 years in Product Development and Management Positions

Lecturers

Guy Fournier, Prof. Dr. Dipl. Wirtsch.-Ing

Director International Programs School of Engineering
Vice Director Institute for Industrial Ecology
Professor for Sustainable Product Development and Supply Chain Management

Consultant and researcher for sustainable mobility and strategic management for 7 years

International experience for 10 years as manager and senior consultant in a management consulting firm

Harald Schnell, Prof. Dipl.-Kfm.

Director of the study program “Business Administration & Engineering / Global Process Management”
Responsible for the international study exchange between France and Germany
Professor for Financial Control, Performance Measurement Systems and Business Simulation

Consultant for Modern Cost Accounting, Performance Measurement Systems, Financial Control of Research & Development as well as Production processes

Working for Robert Bosch Group for 15 years in different management and senior management positions

Lecturers

Roland Wahl, Prof. Dr.-Ing.

Professor for Manufacturing Technologies and Laser Materials Processing

Consultant for
- different kinds of Advanced Manufacturing Technologies, especially Joining Technologies,
- Laser Materials Processing in Manufacturing, especially Welding, Hardening, Cladding and Cutting,
- Industrial Robot employments in High-Accuracy Applications.

Working for Mercedes-Benz and Volkswagen for several years as Research Engineer for Manufacturing Technologies

Peer Johannsen, Prof. Dr. rer. nat.

Professor for Computer Science and Software Engineering

Dean of studies of the Bachelor of Mechatronics degree program
Head of the Computer Science and Robotics Lab

Scientific research in the fields of information technology, formal hardware verification, algorithms and data structures, software development, robotics

EMIG – Summer School
Pforzheim University

Lecturers

Katharina Kilian-Yasin, Prof. Dr.

Professor for International Business for Engineers - International Business and Intercultural Engineering focusing on managing cultural complexity and diversity
in technical working contexts

Henning Hinderer, Prof. Dr.-Ing.

Professor for Business Administration and Technical Sales

Consultant for technical sales and international sourcing strategies an processes

14 years of working and consulting experience in the automotive industry