Engineering – the German Way

3 week intensive term at the Department of Engineering and Management at Munich University of Applied Sciences

The Department of Engineering and Management at Munich University stands for best practice in applied teaching, both in engineering and in business administration. Our students are able to bridge the gap between customers and suppliers, marketing and R&D, and manufacturing and controlling. We not only promote international education by offering a wide range of courses taught in English, but we also have considerable experience in organizing academic part-programs. For the past six years our department has been running a 6-week summer school for students at the Grenoble School of Management and for the last 10 years we have been running two different 3-week programs in the UK for our Bachelor’s and Master’s students. Over 400 Bachelor’s students and 250 Master’s students have taken part in these programs so far.

We have now decided to offer an intensive course for students of Engineering from US universities. The intensive course focuses on the German approach to engineering from various perspectives and has been designed to combine classwork with real practical experience. All technical modules within the course include a factory tour to give students a direct insight into the industry.

In addition to four demanding engineering modules, there are two more modules that address the differences between everyday business life in the German and US economies: module 1 examines the nature of cooperation between trade unions and employers, and module 2 explores the impact of technology law and harmonization on engineering in Europe. Both of these issues can be difficult to understand from an outside perspective, but the course gives US students the opportunity to deepen their understanding by gaining information first-hand.

Despite the legal and socio-economic aspects of the course, the program has a clear focus on issues in engineering. We aim to offer US students an insight into engineering “the German Way” and in doing so encourage them either to stay permanently or to come back and study with us as an exchange student.

Modules:

1. R&D Management
2. Introduction to Production and Manufacturing Systems
3. Digital Factory Layout and Factory Simulation
4. Ergonomics – Aspects in Manufacturing and Product Design
5. Professional skills 1: The Impact of Technology Law and Technical Harmonization on Engineering in Europe
6. Professional skills 2: Industrial work force dynamics in Germany
All of the lectures are taught by a professor in our department. There are 10 hours of classes for each technical module and an additional factory tour (i.e. 50 hours of classes in total). Students will get to know the BMW World, Museum and Factory in Munich very well. All of the lectures and factory tours are conducted in English. Students are provided with course materials and grades are based on a written examination at the end of each module and contributions in class.

**R&D Management**
This course provides students with an overview of the development process for complex products such as automobiles and machines. Topics include a general introduction to the requirements of and success factors in successful product development, as well as the tools used to manage and control the product development process. The goals input and expectations of other stakeholders inside and outside the company are also addressed. The course will help students understand the product development process and teach them the fundamental concepts behind and techniques used in product development. By the end of the course students will understand the key questions in product development and general solutions to them.

**Introduction to Production and Manufacturing Systems**
This course provides students with an overview of production systems, with an emphasis on operations and collaboration with (international) suppliers. Topics include an introduction to manufacturing technologies and their effect on quality, costs, and make-or-buy decisions, as well as international aspects such as the shipping and marketing of manufactured goods around the world. Techno-logistic tools to supply customer-specific products with short lead times are also presented and discussed. By the end of the course students will understand what the quality and costs of manufacturing technologies mean and they will be familiar with the fundamental concepts behind and techniques used in international production. This will help them to produce and deliver customized products with short lead times.

**Digital Factory Layout and Factory Simulation**
This course provides students with an overview of digital factory planning (processes and layout) and factory simulation, as well as the methods and principles of lean production. Students experience using a simulation tool for digital factory planning and are also asked to run their own production shop, learning how to improve productivity through lean methods and principles. The integrated course promotes systematic analysis, simulation, and first-hand practice of processes and structures in a factory environment. Students will gain an understanding of the concepts behind the digital factory, the methods and tools used to plan and test a product, and the related production processes from the early design phase to operative control of the factory. They will use discrete event simulation tools for plant, line and/or process simulation and will learn effective methods for implementing lean work systems in production.
Ergonomics – Aspects in Manufacturing and Product Design
This course begins by giving students an overview of the basics of ergonomics with respect to legal and social demands and by detailing the core competences of an ergonomist: anthropo-technics, occupational physiology, human capabilities and environmental interactions. These will be used to generate basic application principles for designing products, tools, workplaces and human-machine interactions. Special attention will be paid to seating and set design, climate and clothing, the handling of weights, noise and noise prevention, and the design of the workplace with regard to workflow. By the end of the course students will understand the interaction between humans and work, as well as the fundamental concepts behind and techniques used in analyzing work situations with regard to the main stress factors. They will be able to evaluate strategies for well-designed, i.e. healthy and stress-reduced, workplaces and machine or product interactions and to highlight the social, economical and human demands on ergonomic work.

Professional Skills 1: The Impact of Technology Law and Technical Harmonization on Engineering in Europe
This option provides students with an overview of the impact of laws concerning machinery and other technical products. The effects of technical harmonization on engineering will be highlighted and discussed, and the responsibilities of managers and other executives when placing products on the European market will also be considered.

Professional skill 2: Industrial work-force dynamics in Germany
This option provides students with an overview of cooperation and co-determination in German industry. Students will learn about the specific organizational structure of labor unions and employers’ associations in Germany. They will learn how negotiations on wages and working conditions proceed and how to start and settle a legal strike.

Additional Information: Accommodation, social events and other services
The intensive course will take place 01.05.2015 – 24.05.2015 (arrival/departure) (tbc.) and participants will be accommodated in Hotel Meininger. Our department has a long-established and trusting relationship with two hostels in Munich that host groups of international students visiting our department several times a year.


We offer a guided transfer service from Munich Airport Franz Josef Strauss to the hotel in Munich city center when students arrive. We welcome – and also say farewell – to our US guests with a dinner in a typical Bavarian restaurant or “Biergarten”.

The first day will be spent on a team-building exercise at the high rope park in Lengries. Lengries is a one-hour drive south of Munich and is considered the home of German alpine skiing stars. The high rope park is the department’s preferred partner for team-building events with international students.

As Munich is famous all over the world for its famous beer, a brewery tour at Löwenbräu or Augustiner is a must for US students in Munich and includes as well a “zünftige Brotzeit” (proper Bavarian snack).
In order to get to know Munich and not to have to bother with public transportation fees, students will be provided with a 3-week ticket (2 zones) that covers all the subway, bus and tram networks in Munich they need.
Internet access (wireless) at the university and the hostel is free of charge.

Students will be provided with more details in a student handbook which will be sent to students 4 weeks before arrival.

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