Internships at Wels Campus
Work Placements and Internships for Incoming Exchange Students

APPLY NOW – current internship openings

Dear Partner Institution,
it has become increasingly popular among international students to join our School of Engineering for an internship / work placement within one of our current R&D projects. We are proudly presenting this compilation of currently open internship positions and are looking forward to receiving applications by your students!

Kamilla Trubicki
Head of International Office – Wels Campus

Application documents in English or German shall be sent **through the International Office at the home university** to the International Office at Wels Campus (international@fh-wels.at) **at least 4 months prior to the start date.** Only complete application documents can be considered.
Those include:

- **Student Application Form** (see https://www.fh-ooe.at/en/international/incomings/application/)
- **Transcript of Records** (= an official list from your home university which shows the grades for all the courses you have already passed. This Transcript must be in English or German!)
- **Accommodation Form** (if you want us to reserve accommodation for you)
- Current **CV**
- **Letter of Motivation**
- **Photocopy of your passport**
- **Passport-size photo** (digital version)

Remuneration for internships depends on the availability of funding in the specific projects. In addition, for all internships, there is the opportunity to apply for financial support through scholarships.
Erasmus+ Student Mobility for Traineeships (SMT): for students from European universities. Please contact your home university about the application for Erasmus+.
Upper Austria scholarship: available for students from selected partner universities. Please contact the International Office at Wels Campus for further information about the application process.

A. Automation & Simulation

1. Railway automation – Autonomous train operation and automatic decoupling of train wagons

The research group "railway automation and traffic telematics" is specialized on public transport and consists of seven active staff members. The following major projects have been realized or are currently in progress:

- Development of a GPS based train control system (TCS) for regional branch lines (low traffic density lines)
- Implementation of this train control system for real operation including the final authorization by the Austrian ministry of transport
- Design and Implementation of a lab demonstrator for connection assurance system
- Implementation of a system for dynamic passenger information for real operation
- Research for autonomous driven small train units for regional branch lines ("Trainlets" without driver)
- Development of an automated luggage storage module system with adaptable containers

Possible Tasks:
Task 1: Acoustical sensor system to detect applied brakes of train wagons
It happens from time to time at a marshalling yard that a brake of a wagon of a train is not released. This is represented by a typical and characteristic "screech" when the train set in motion. With a suitable sensor system this "screech" should be detected and therefore an applied brake is identified.

Task 2: Optical track detection system
For an autonomous train it is necessary to reliably detect objects and obstacles in order to avoid accidents. Part of this autonomous object detection is to further classify them as "in danger zone" or "outside danger zone", i.e., the train has to stop or can safely pass. This decision requires the system to know the exact course of the track ahead. Different approaches and algorithms in the field of image processing should be tested and evaluated to estimate the course of a railway track using tools like Matlab or OpenCV.

Task 3: Programming of simulation environment for autonomous train operation
The autonomous train operation shall be tested within a simulation lab. To ensure this simulation environment different programming tasks are planned. This includes real time simulation and HMI for the operation.

Profile: BSc 3rd year or higher; Proficiency in English or German

- Knowledge in sensor systems and signal processing (Task 1 acoustical sensor)
- Mechatronic knowledge in handling and robotics (Task 2 "Langmacher")
- Knowledge in Image Processing (Task 3 track detection)
- Experience with Matlab or OpenCV (C++,C#,Python) (Task 3 track detection)
- Good programming skills in Java, Ada, C#, C++ (Task 4 Simulation environment)
- Knowledge in software engineering and human-machine-interaction (Task 4 Simulation environment)

Project period: spring 2016 or later, 4-6 months

Contact: Dr. Burkhard Stadlmann • Automation Engineering

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B. Energy & Environment

1. Characterization of Dusts

Dusts from various industrial processes and from the environment as well as some other granular material have to be characterized (particle size distribution, density, bulk density, chemical composition and flowability). The composition of size fractions of these dusts has to be investigated after separation by air classification. For some granular material the dependence of the flowability on the moisture content has to be investigated.

Possible Tasks:
Task 1: Physical characterization

Task 2: Chemical characterization

Task 3: Investigation of the dependence of the flowability on the moisture content

Profile: BSc 2nd year or higher; Proficiency in English or German
- Knowledge in chemical or environmental engineering
- Practical experience in laboratory work
- The candidates should be highly self-motivated. The ability to learn and develop skills is also important.

Project period: start date flexible, 3-12 months

Contact: DDr Christof Lanzerstorfer • Process Engineering and Production

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2. Development of sensors for thermochemical heat storage

The research group ASiC is working on the development of thermochemical heat storages, which are able to store heat at ambient temperature levels. The materials used, both natural and synthetical zeolites, silica-gel and others have the ability to adsorb a liquid medium, e.g. water, in the micro and mesopores. During this adsorption process, a significant amount of energy is released. For precise operation and control of the storage, it is required to know the current state of charge. Currently, there are no sensors available.

Tasks: Based on a prototype of a sensor device, further develop the sensor principle. Design studies to evaluate the cross correlation between the actual sensor signal and disturbance signals. Development of compensation algorithms to eliminate disturbances. Perform measurements and data analysis.

Profile: BSc 3rd year or higher; Proficiency in English or German. Knowledge of Matlab and Simulink required. Knowledge in sensor systems and signal processing.

Project period: start date flexible, 3-12 months

Contact: ASiC, Dr. Harald Kirchsteiger

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3. Development of sensors for phase change materials

The research group ASiC is working on the development of heat storages, based on phase change materials PCM. The energy content of a PCM store is mainly determined by the aggregate condition (solid, liquid) of the storage material. For precise operation and control of the storage, it is required to know the current state of charge. Currently, there are no sensors available on the market, which are able to measure the state of aggregation for this kind of application.

Tasks: Based on several prototypes of different sensor principles, further develop the sensor technologies. Design studies to evaluate the cross correlation between the actual sensor signal and disturbance signals. Development of compensation algorithms to eliminate disturbances. Perform measurements and data analysis.

Profile: BSc 3rd year or higher; Proficiency in English or German. Knowledge of Matlab and Simulink required. Knowledge in sensor systems and signal processing.

Project period: start date flexible, 3-12 months

Contact: ASiC, Dr. Gerald Steinmaurer

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C. Food Technology & Nutrition

1. Protein Interaction Lab

The MICRO-prot group at the University of Applied Sciences Upper Austria in Wels, Austria searches for a number of students to become part of a team in the area of Molecular Biology/Biophysics/Chemistry under the guidance of the main researcher. Further information: http://www.protein-interaction-lab.at

Tasks: The main task will be the molecular, chemical and analytical characterization of the effects of secondary plant metabolites (phytamins) on biological systems. Methods include HPLC, IC, ELISA, sophisticated fluorescence microscopy (TIRF) and molecular biology tools. The position will require that the student uses different tools including a novel biophysical assay (Mircopatterning-technique) to investigate the protein interactions and the effects of secondary plant metabolites on them.

Profile: Applicants should have a great interest in (fluorescent) microscopy. Knowledge in human cell culture handling and basic molecular biology tools (PCR, gel-electrophoresis, etc.) are required.
The candidate should be highly self motivated and an independent thinker. The ability to work as part of a team and good interpersonal skills coupled with an ambition to learn and develop skills is also important.

Project period: October 2015 or later, 6-8 months

Contact: Dr. Julian Weghuber • Food Technology and Nutrition

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2. FFoQSI Lab

The Austrian Competence centre for Feed and Food Quality, Safety and Innovation (FFoQSI) with one location at the University of Applied Sciences Upper Austria in Wels, searches for a number of students to become part of a team in the area of feed and food analysis, characterization and development under the guidance of the main researcher. Further information: http://www.ffoqsi.at

Tasks: The main task will be the identification and characterization of feed and food raw materials and their usage in (functional) food products. These should be superior in terms of safety, quality and innovation degree. The projects are conducted in close collaboration with partners from the industry.

Profile: Applicants should have a great interest in basic chemical analysis tools such as HPLC and GC-MS and other related methods. A solid background in the basics of food technology is required.
The candidate should be highly self-motivated and an independent thinker. The ability to work as part of a team and good interpersonal skills coupled with an ambition to learn and develop skills is also important.

Project period: October 2017 or later, 6-8 months

Contact: Prof.(FH) Dr. Julian Weghuber • Food Technology and Nutrition

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3. Biosciences Lab

The Biosciences research group at the University of Applied Sciences Upper Austria in Wels, Austria, welcomes students to become part of an international and multidisciplinary team (Molecular Biology/Biology/Biochemistry/Chemistry) under the guidance of researchers. Work is performed on diverse

biotechnological projects associated to the production of value added products and bioethanol by microorganisms, as well as the discovery of extremophile microorganisms with the ability to produce industry relevant products. Further information: https://www.fh-ooe.at/campus-wels/biosciences/

Task: The main tasks during the internship will be the optimization of microorganisms (genetic engineering and fermentation) to produce value added products, as well as the analysis of novel compounds produced by defined microorganisms. Methods include molecular biology (PCR, electrophoresis, CRISPR-cas9, cloning, heterologous gene expression), analytical approaches (HPLC/GC), cellular biology (fluorescence microscopy, immunoblot) and biotechnology.

Profile: Applicants should have an education in molecular biology / chemistry / biochemistry / biology or related subjects. The candidates will be part of an international team of researchers and should be able to work both individually and collaboratively within the Biosciences research network. Previous hands-on laboratory experience is an advantage and knowledge of German or English is required. Applicants should be highly self-motivated and ambitious to learn and develop their scientific skills.

Benefits include the opportunity to work on challenging research projects within an international team and obtain theoretical and practical experiences in the field of biotechnology and discovery of novel industry-relevant products. Additionally, become part of University students' community and improve interpersonal skills.

Project period: start date flexible, 3-12 months

Contact: Dr. Alexander Jäger • Bio- and Environmental Technology

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4. Projects in Instrumental Analysis Biotechnology or Biochemistry or Environmental Chemistry

In a number of projects following tasks are available for incoming students:
- Analytical method development and validation (mainly HPLC)
- Isolation of single compounds/compound groups from plant material and structural elucidation
- Testing of plant based extracts in chemical test assays (i.e. anti-oxidant behaviour)
- Testing of plant based extracts in biochemical in-vitro assays (i.e. lipase inhibition, acetylcholinesterase inhibition, amyloid beta aggregation inhibition)
- For selected compounds testing of absorption into CaCo-2 cells (cell culture system)

Profile: BSc 2nd year or higher; Proficiency in English or German

Project period: start date flexible, 2-3 months

Contact: Dr. Thomas Eidenberger • Bio- and Environmental Technology

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D. Materials & Production Engineering

1. Thermoforming of fiber reinforced composite parts with a thermoplastic polymer matrix system

Task: Glass and carbon fiber reinforced composite parts with a thermoplastic polymer matrix system gain rapidly more and more importance in automotive and aviation industry. At the beginning of this process the heating step of the reinforced polymer sheet has a crucial influence on cycle time and part quality. In a first step, the heating step has to be analysed and further developed in this project by means of a model experiment. Different heating methods such as contact heating, infrared heating and electric heating have to be evaluated. In the second step, an upscaling of the optimised heating conditions to a laboratory thermoforming process has to be done.
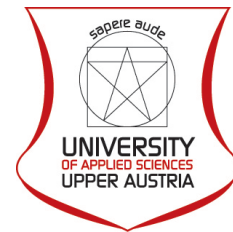
Profile: basic knowledge in polymers and polymer processing; BSc 3rd year or higher; Proficiency in English or German

Project period: 4 months

Contact: Dr. Gernot Zitzenbacher • Materials and Process Engineering, Polymer Processing Department

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2. Tribiological behaviour of polymers against hard coatings in polymer processing

Tasks: Study on friction forces and wear of different polymers on hard coatings (DLC, Ti-based hard coatings) at different conditions (sliding velocity, temperature, loads)

Profile: Basic knowledge in polymers and material science, BSc 2nd year or higher; Proficiency in English or German

Project period: 4 months

Contact: Dr. Daniel Heim • Materials and Process Engineering

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3. Deposition of diamond like coatings by plasma assisted chemical vapour deposition

Tasks: Study on the influence of the deposition parameters and the film properties; characterisation of the resulting films

Profile: Knowledge in materials science, BSc 3rd year or higher; Proficiency in English or German

Project period: 4 months

Contact: Dr. Daniel Heim • Materials and Process Engineering

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4. Biocide plastic surfaces by plasma deposition

Tasks: The objective is to generate biocidal surfaces on polymers by plasma deposition or plasma treatment

Profile: Knowledge in materials science or plasma physics, BSc 3rd year or higher; Proficiency in English or German

Project period: 4 months

Contact: Dr. Daniel Heim • Materials and Process Engineering

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5. Modelling and Simulation of Mechatronic Systems

In mechatronic systems basically electro magnetical-, thermal-, mechanical- or fluid- effects and their interactions occur. For the efficient optimal design of those systems it's essential to take into account those effects. This leads to a reduced number of prototypes and shortens the time to market.
The efficient design of mechatronic systems increasingly requires numerical simulations, because conventional design methods, based on analytical models or empirical measurements, are time consuming or insufficiently accurate. Furthermore, these virtual experiments reveal physical insights on the investigated component and their effects on the system.

Tasks: In this Internship one should extend and improve existing simulations and do some parameter-study of an existing mechatronic system. Furthermore, a cross-check of simulation results with measurements should be done.

Profile: BSc 2nd year or higher; Proficiency in English or German
- Knowledge in electrical and thermal engineering (master-level is preferred)
- Numerical Simulation: Finite-Element (ANSYS and/or COMSOL) and MATLAB/Simulink or Modelica/Dymola
- Measurement technology (electromagnetic and thermal)

Project period: 4 months

Contact: Dr. Mario Jungwirth • Mechatronics & Business