VŠB - Technical University of Ostrava

INTERNATIONAL SUMMER SCHOOL 2015

- ADVANCED METHODS OF MECHATRONICS
- FUTURE OF THE RENEWABLE AND ALTERNATE ENERGY SYSTEMS
- OSTRAVA – THE IMAGE OF THE (POST) INDUSTRIAL CITY
- SPECIFICS OF SUSTAINABLE ENERGY
- MATHEMATICAL AND PHYSICAL MODELING OF METAL FORMING PROCESSES

VŠB – Technical University of Ostrava

VŠB-TU OSTRAVA was founded in 1849 and has since grown into a modern institution of higher learning, offering the highest levels of education in technical and economic fields, based on the interconnection of science, research, education, and the creative activity that binds and enhances them. Ostrava region has long been a hub of major industry in central Europe, and study and research at VŠB-TUO is informed by historically close ties with major international companies, as well as by joint research and mobility programmes with university partners the world over. The University holds prestigious EU certificates - the ECTS and DS Labels, which certify the quality of our education. VŠB-TUO is a pleasant place to study and to start your professional career, making new friends along the way.

OSTRAVA is a metropolis within the Moravian-Silesian Region. It has the third largest population in the Czech Republic, and a very advantageous strategic position close to the borders with Poland and Slovakia. Ostrava is surrounded by the Beskydy and the Jeseniky Mountains, which offer good opportunities for free time activities. Ostrava was a region of heavy industry including the coal mining, metallurgical and chemical industries, although over the last 20 years this industrial face is changing. Today, Ostrava is an important economical, cultural, administrative and educational centre of the region.

CHOOSE YOUR SUMMER COURSE

ADVANCED METHODS OF MECHATRONICS

TERM: 6. – 10. 7. 2015
DURATION: 5 days
GRADUATION: 2 ECTS credits

The summer school of mechatronic systems offers an intensive 5 days course for all of those, who are fans of mechatronics, particularly systems for active vibration control, including basic hardware and software. Lectures will consist of theoretical fundamentals followed by practical exercises that will demonstrate methods and tools for measuring signals from mechanical and electrical systems and explain how to process them in Matlab. The laboratory experiments will be based on MEMS (Micro Electronic Mechanical Systems) and piezoactuators and the laboratory measurements will use models, such as Segway for vertical stabilization, active vibration control of cantilever beams and journal bearings with the use of the piezoactuators.


Prof. Ing. Jiří Tůma, CSc

The schedule is planned to divide each day into parts with key lectures, demonstrations in the lab and basic work in the computer room. Courses are planned from 9:00 to 16:00 with two short breaks and a lunch break.

TOPICS:

- Data acquisition and processing using Signal Analyser and Matlab (spectral analysis; filters).
- Demonstration of MEMS sensors features.
- Modelling of mechatronic systems (cantilever beams, rotor system supported by journal bearings)
- Active vibration control with the use of piezoactuators (demo test rigs)
- Excursions (the Lower Area of Vitkovice, Tatra Technical Museum).

Designed for students in the field of mechatronics, mechanical engineering and electrical engineering.

Leader of the course: Prof. Ing. Jiří Tůma, CSc., Professor in the Department of Control Systems and Instrumentation of Faculty of Mechanical Engineering at the VŠB – Technical University of Ostrava. He is involved in lectures and research in the field of automatic control, signal processing, measurement of vibration and noise, experimental dynamics and recently also with active vibration control. (jiri.tuma@vsb.cz)
Contact person: doc. Ing. Lenka Landryová, CSc. (lenka.landryova@vsb.cz)

FUTURE OF THE RENEWABLE AND ALTERNATE ENERGY SYSTEMS

TERM: 13. - 17. 7. 2015
DURATION: 5 days
GRADUATION: 2 ECTS credits

The summer course will be oriented on the use and future implementation of renewable and alternate energy sources for a sustainable future of family homes and small communities. An academic programme offers you interdisciplinary knowledge in the fields of energy sources, accumulation techniques, electromobility for independence and sustainability.The programme is based on lectures and site visits together with an workshop on a selected topic and presentations of course participants.

The summer school offers an intensive 5 days course for all of those who are fans of sustainable development, permaculture, sustainable energetics and future independence on non-renewable energy sources. Particularly photovoltaic- and geothermal- systems, hydrogen technologies and energy accumulation techniques. Lectures will consist of theoretical fundamentals followed by practical exercises that will demonstrate methods and tools for development, planning, measuring and evaluation renewable and alternate systems. The laboratory experiments will be based on equipment of Buildings control laboratory, Laboratory of photovoltaic solar systems, Fuel cells laboratory, Heat pump laboratory, ADC laboratory and Prototype laboratory.


Assoc. Prof. Bohumil Horak, Ph.D.

TOPICS:

- Renewable and alterante energy systems and energy accumulation.
- Buildings control, KNX, independent family homes on energies and water.
- Electromobility, electric cars, electronic systems, batteries.
- Hydrogen technologies, production, storage and use of hydrogen.
- Laboratory presentations (Hydrogen fuel cell laboratory, Demonstration energy independent house, New Aula geothermal heat pump system, ADC laboratory automatic parking system with electric car charging capabilities).
- Excursions (The Mining museum Landek, TRIANON energy demonstration site, Vitkovice World of technics).
- Workshop RAES2015.

Designed for students and wide public in the field of energetics, electrical and mechanical engineering, civil engineering, architecture and urban planning, safety engineering, municipal development and engineering.

Leader of the course: Assoc. Prof. Bohumil Horak, Ph.D., associate professor in the Department of Cybernetics and BMI of Faculty of Electrical Engineering and Computer Science at the VSB – Technical University of Ostrava. He is involved in lectures and research in the field of measurement and control of the renewable and alternate energy sources. (bohumil.horak@vsb.cz)

Contact person: Ing. Kristyna Friedrischkova (kristyna.friedrichkova@vsb.cz)

OSTRAVA - THE IMAGE OF THE (POST) INDUSTRIAL CITY

TERM: 13. – 17. 7. 2015

DURATION: 5 days

GRADUATION: 2 ECTS credits

The summer course will be oriented on the future of transformation and identity in the (post) industrial city of Ostrava (Czech Republic) from different perspectives of architectural history, current development and transformation to a sustainable future of the city and region. Summer school program will be focused on the restoration of the industrial area of Lower Vitkovice as a dynamically developing part of Ostrava.

TOPICS:

- Life beyond industry
- (post) industrial area of Lower Vitkovice
- Redevelopment of brownfields in the city of Ostrava

Designed for students in the fields of architecture, landscape architecture and urban planning, history of architecture and urban history, municipal development and economics.

Dipl. Ing. arch. Eva Špačková, Ph.D.

Leader of the course: Dipl. Ing. arch. Eva Špačková, PhD. teaches as an assistant professor/lecturer in the Department of Architecture at the Faculty of Civil Engineering at VŠB - Technical University in Ostrava. She is concerned with the topic of housing and public spaces in the city in all of its forms with an emphasis on regeneration of the environment and buildings built in the socialist period. (eva.spackova@vsb.cz)

Contact person: Dipl. Ing. Daniel Vaněk (daniel.vanek.st@vsb.cz)

SPECIFICS OF SUSTAINABLE ENERGY

TERM: 13. – 17. 7. 2015
DURATION: 5 days
GRADUATION: 2 ECTS credits

The International Summer School - Specifics of sustainable energy - is a 5-day intensive course intended for those who learnt about new ways of energy utilization during their studies. Classes will include lectures from of the leading experts from the energy sector as the Czech Republic and abroad. Attention will be focused on the issue of energy conversion, interdisciplinary the problems of energy, cooperation within the team. During the Summer School will the "schooler" present their own work and create their own project within Energy sector.

The schedule is planned to divide each day into parts with key lectures, demonstrations in the lab and soft skills, incl. own work presentation. Courses are planned from 9:00 to 16:00 with two short breaks and a lunch break.


Prof. Ing. Dagmar Juchelková, Ph.D.

TOPICS:

- Modelling of energy processes
- Renewable energy sources
- Utilization of various raw materials
- Efficiency of conversion processes
- Excursions

Designed for students in the fields of the suitable energy utilization, renewable and alternative energy sources, municipal waste utilization, modern construction, reduction of harmful emissions and engineering.

Leader of the course: Prof. Ing. Dagmar Juchelková, Ph.D., Professor in the Department of Power Engineering of Faculty of Mechanical Engineering at the VŠB - Technical University of Ostrava. She is involved in lectures and reasearch in the field of modul pyrolyze unit for the utilization of waste and bio waste, waste and alternative fuels, utilisation of biomass, grass utilization for energetical purpose, improvement of energy efficiency and co-combustion. (dagmar.juchelkova@vsb.cz)

Contact person: Ing. Veronika Sassmanová, Ph.D. (veronika.sassmanova@vsb.cz)

MATHEMATICAL AND PHYSICAL MODELING OF METAL FORMING PROCESSES

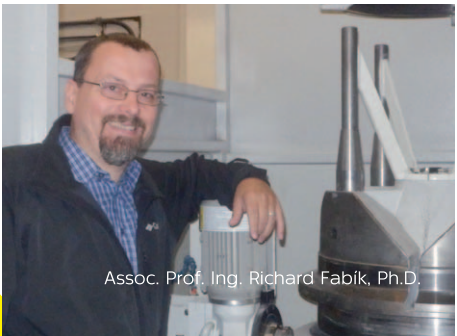
TERM: 13. – 17. 7. 2015

DURATION: 5 days

GRADUATION: 2 ECTS credits

The International Summer School of Mathematical and Physical Modeling of Forming Processes is a 5-day intensive course intended for those who learnt about hot and cold bulk forming processes (rolling, forging and wire drawing) during their studies. Through attractive interconnected laboratory tasks, it presents the key steps of preparing, carrying out and evaluating physical and mathematical simulations of bulk forming. While the physical modelling of hot rolling of steel will be conducted in a laboratory rolling mills, the participants will also learn about other equipment used in modelling of forming processes (e.g. the Gleeble plastometer). They will also be able to explore mathematical modelling using the FORGE 3D software.

The schedule is planned to divide each day into parts with key lectures, demonstrations in the lab and basic work in the computer room.



Assoc. Prof. Ing. Richard Fabík, Ph.D.

Courses are planned from 9:00 to 16:00 with two short breaks and a lunch break.

TOPICS:

- Modelling of forming processes: summary of the fields of application
- Finite element method: a problem-oriented engineering approach, involving:
  - Selection of mesh density,
  - Definition of initial and boundary conditions,
  - Selection of output formats,
  - Verification of results, and others.
- Physical modelling in the forging and rolling laboratory
- Mathematical modelling in the FORGE 3D program
- Field trip (the Lower Area of Vitkovice, rolling mill (ArcelorMittal or Trinec Steelworks).

Designed for students in the fields of metallurgy, materials science and mechanical engineering.

Leader of the course: Assoc. Prof. Ing. Richard Fabík, Ph.D. Associate professor in the Department of Materials Forming of Faculty of Metallurgy and Materials Engineering at the VŠB – Technical University of Ostrava. He is involved in lectures and research in the field of hot and cold rolling, wire drawing and heat treatment of steels, the study of structure-forming processes, mathematical modeling of forming processes and heat treatment processes. (richard.fabik@vsb.cz)

Contact person: Assoc. Prof. Ing. Richard Fabík, Ph.D. (richard.fabik@vsb.cz)

CERTIFICATE OF COMPLETION will be given to students who complete the programme in its entirety. Academic performance is assessed according to exams, assignment, attendance and lessons participation.

ELIGIBILITY: Students enrolled at any university are eligible to apply for the International Summer School. Applicants must be proficient in English. The language of instruction is English.

APPLICATION DOCUMENTS:

- Application Form with photo attached (pasted)
- Curriculum Vitae
- Certificate of Enrolment at your home higher education institution
- Transcript of Records from your home higher education institution
- Copy of the regular passport within period of validity

Application documents and more information are available at: www.vsb.cz/iss

APPLICATION DEADLINE: 31. 3. 2015

INTERNATIONAL SUMMER SCHOOL
FEE: 450 EUR/COURSE

THIS FEE INCLUDES:

- Registration and Tuition fee
- Accommodation and Breakfast
- Lecture materials
- Company visits and excursions

ACCOMMODATION in university dormitory is provided to International Summer School participants. Every room is equipped with LAN connection. You can eat in the student's cafeteria and cooking is also permitted in the dormitory. Information about dormitory is available at: http://accommodation.vsb.cz

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