ERASMUS+ INTERNSHIP, SUMMER 2015
FACULTY OF MECHANICAL ENGINEERING AND COMPUTER SCIENCE,
UNIVERSITY OF BIELSKO-BIAŁA

The Faculty of Mechanical Engineering and Computer Science offers an Erasmus+ Internship for Students in different Laboratories of our Faculty.

The Student should chose **two** of the five modulus listed below (A, B, C, D , E).

A. Mechanical Engineering – designing, modelling, analysis (1 month),
B. Robotics and Mechatronics (1 month),
C. Measuring, Analysis of materials, Manufacturing processes and Production Engineering (1 month),
D. Computational methods and Computer Science (1 month),
E. Cars and Engines (1 month).

Internship dates: From 1st June to 31st July 2015.

If you require more information about the internship availability, please contact:

Izabella Rajzer, PhD
Erasmus Coordinator at the Faculty of Mechanical Engineering and Computer Science
University of Bielsko-Biała
ul. Willowa 2, Building A/103
43-309 Bielsko-Biała
Tel. +48 (33)8279363,
e-mail: irajzer@ath.bielsko.pl
www.ath.bielsko.pl

Please find all necessary documents on the Academic Exchange Office' page:

http://www.eng.ath.bielsko.pl/index.php/erasmus-application-forms/for-traineeships

Detailed program of the training period:

A. Mechanical Engineering – designing, modelling, analysis (1 month)

- 3D modeling and designing using Inventor or Unigraphics or CATIA system,
- Finite Element Method Analysis using FEMAP or Nastran or Ansys system,
- Stamping die modeling using Dynaform or Autoform system,
- Experimental research of fatigue life of gear teeth,
- Presentation of power-closed loop test stand,

- Calculating the geometric dimensions of sample of geared wheel for the strength tests,
- Study of flange coupling using the power-closed loop test stand,
- Calculating the flange coupling parameters and experimental verification of the results,
- Measurement of the actual torque transmitted by the coupling using the sensor,
- Dynamics of robots,
- Basics of MATLAB,
- Basics of C++,
- Modeling of mechanical systems using MATLAB software,
- Dynamic analysis of multibody systems using ADAMS software,
- Fundamentals of Finite Element Method (FEM) and Rigid Finite Element Method (RFEM).

B. Robotics and Mechatronics (1 month)

- Analog electronics,
- Digital electronic,
- Introduction of communication and Wireless Sensor Network,
- Robot elements, controlling devices,
- Start up and moving of the robot,
- Robot programming,
- Operation of CNC machine tools (SINUMERIK),
- Programming of the CNC machine tools (SINUMERIK),
- Flexible programming of the CNC machine tools (SINUMERIK),
- Programming of robots (Kuka, Motoman),

C. Measuring, Analysis of materials, Manufacturing processes and Production Engineering (1 month)

- Metallographic specimen preparation,
- Analysis of a materials microstructure,
- Electrospinning as a method of materials production,
- Crystallization process of casting aluminum alloys on the base of the ATD method (thermal-derivative analysis),
- metallographic microscopic testing and dispersion hardening of cast machinery parts,
- measurements with use of coordinate measuring machine (CMM),
- programming of measurment on CMM,
- measurements with use of laser interferometer,
- Static tensile test of metal specimens,
- Static compression test of metal specimens,
- Strength tests of plastics,
- Static and dynamic tests of structures using the MTS system,
- Reynolds experiment,

- Determination of losses for flows in pipes,
- Relative liquid equilibrium,
- Turbulent free jet,
- Modelling and simulation of production processes,
- Management of Health and Safety at Work.

D. Computational methods and Computer Science (1 month)

- Operating systems,
- Web services – history,
  - SOAP type Web services,
  - REST type Web Services,
- OData web Serwices architecture,
- Querying OData WebServices – Basic techniques,
- Creating OData Web Serwice i .NET,
- Connecting to OData Web Service in client application,
- Querying OData Web Services – Advanced techniques,
- Decision support systems,
- Calculus with Maxima CAS System,
- Elements of Statistics,
- Fourier analysis,
- Variational Calculus.

E. Cars and Engines (1 month)

- Alternative fuels for CI and SI engines,
- Dual -fuel CI and SI engines,
- Numerical simulation of work cycle of combustion engines,
- Modeling and investigations of fuel injection systems for CI and SI engines,
- Modeling and investigations CR fuel systems,
- Optimization of the algorithm for CI and SI engines control,
- Investigations of dynamics of vehicle,
- Investigations of transmission systems of vehicle,
- Electric and hybrid drive,
- Thermodynamics of real gases.