



**PROJECT CONFERENCE
NOSOV MAGNITOGORSK STATE TECHNICAL
UNIVERSITY**

Magnitogorsk 20 -22 March 2017

TEMPUS MMATENG

“Modernization of two cycles (MA, BA) of competence-based curricula in material engineering according to the best experience of Bologna Process ”

<http://mmateng.eu>

This project has been funded with support from the European Commission

Agenda

Venue: 38, Lenin Ave, Magnitogorsk, Nosov Magnitogorsk State Technical University /room 231

Monday 20 March 2017		
9.00 – 9.30	Registration of the consortium meeting participants	NMSTU, room 231
9.30 – 10.00	Opening of the Tempus MMATENG project meeting and Master Classes at NMSTU. Welcome of the conference participants by First Vice -Rector, Vice -Rector for Research and Innovation of NMSTU.	Dr.-Ing. Peter Arras KU Leuven , Belgium Prof Dr. Mikhail Chukin NMSTU, Russia
10.00 – 10.30	Overview of the project outcomes & Project meeting.	Dr. Ing Peter Arras KU Leuven , Belgium
10.30 - 11.30	Master class: “Anisotropy in metals and plate forming”	Prof Dr ir. Jan Ivens KU Leuven, Belgium
13.00 – 14.00	Master class: “Stainless Steels”	Prof Jean Bernard Vogt, ENSCL, France
14.00 – 15.00	Master class: “CREO – virtual prototyping”	Dr.-Ing. Peter Arras KU Leuven, Belgium
15.00 – 15.15	Coffee break	NMSTU, room 231
15.15 – 16.15	Master class: “Material selection”	Prof Dr ir. Jan Ivens KU Leuven, Belgium
16.30 – 18.00	Campus tour in NMSTU	Prof Dr Natalia Koptseva NMSTU, Russia
Tuesday 21 March 2017		
10.15 – 11.30	Master Class “Business planning- scheduling and Estimation” & “Introduction to Business Plan - useful tools for support market analysis, scheduling and estimation”	Prof Janusz Mikula Kinga Korniejenko CUT, Poland
11.30 – 12.15	Master Class : “Improving the microstructure and mechanical properties of metallic materials by severe plastic deformation”	Prof Dr Alexander Pesin NMSTU, Russia
12.15 – 13.00	Master Class: “Think TRIZ for Creative Problem Solving”	Marina Polyakova NMSTU, Russia
14.00 – 17.00	Company visit: OJSC Magnitogorsk Iron and Steel Works http://eng.mmk.ru	Alexander Kharchenko NMSTU, Russia

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Masterclasses:

“Anisotropy in metals and plate forming”, Prof Jan Ivens (KU Leuven, Belgium)

The forming limits of metal plates are determined by the anisotropy factor r and the strain hardening coefficient n . This lecture focuses on the definition of both parameters, the experimental determination and their link to the forming limit diagrams. The effect of the material history on the forming will also be defined.

“Stainless Steels”, Prof Jean Bernard Vogt, (École Nationale Supérieure de Chimie de Lille, France)

The objective of the master class is to explain the origin of the different classes of stainless steels. The role of alloying elements on phase stability will be commented. Then, the four main classes of stainless steels will be presented. Their properties (mechanical, corrosion resistance) will be analysed. Closer attention will be paid to austenitic stainless steels as a material specially devoted to overcome corrosion resistance and to duplex steels as they appear as cheap solution.

“CREO-Virtual Prototyping”, Dr ing. Peter Arras (KU Leuven, Belgium)

Modern computer aided techniques changed the world of design towards a world in which virtual prototypes can be used to check and improve the design. These design methods aim to eliminate the use of many physical prototypes.

In a short overview we will explore the different techniques and see how they can be used in teaching engineering students .

“Material selection”, Prof Jan Ivens, (KU Leuven, Belgium).

The vast number of materials available for engineering applications is an opportunity and a challenge. It requires a methodological approach to select a material in the early stages of the design process. The lecture presents the materials selection approach, as developed by Prof. M. Ashby (Cambridge University), based on the definition and optimisation of the material index. The method will be illustrated by some examples.

“Business planning- scheduling and Estimation”, Prof Janusz Mikula (Cracow University of Technology, Poland).

- Create budgets
- Methods of time management
- Schedules-Gantt chart
- Case studies and workshop.

“Introduction to Business Plan - useful tools for support market analysis, scheduling and estimation”, Kinga Korniejenko (Cracow University of Technology, Poland)

- Business planning
- Market analysis (Elements of market analysis, Methods of market research, SWOT analysis, Porter’s 5 Forces, PEST analysis)
- Scheduling and estimation (Create budgets, Methods of time management, Schedules - Gantt chart)

“Improving the microstructure and mechanical properties of metallic materials by severe plastic deformation/masterclass “, Prof Dr . Alexander Pesin (Nosov Magnitogorsk State Technical University, Russia)

Asymmetric sheet rolling process is one of the methods of severe plastic deformation (SPD) which can be used to improve the microstructure and mechanical properties of metallic materials. The mechanism of SPD during asymmetric rolling comes from synergistic combination of compressive strain and very significant shear strain. Physical simulation of stress-strain state and microstructure evolution, which are similar to that occurring during asymmetric sheet rolling process, is very important.

“Think TRIZ for Creative Problem Solving“, Marina Polyakova (Nosov Magnitogorsk State Technical University, Russia)

TRIZ is the Russian acronym for The Theory of Inventive Problem Solving. TRIZ is a comprehensive and sophisticated theoretical system that comprises of all kinds of methods and algorithms used in technical problems or innovative design. Implementing the TRIZ methodology you can save you much time and effort in your search for ideal solutions. The TRIZ methodology includes algorithms resolving conflicts between product parameters leading to breakthrough solutions.

Campus tour in NMSTU:

Nanosteel research group (Gleeble 3500, Metallographic inverted microscope Meiji-200 Techno (Japan) , Scanning electron microscope JSM-6490LV (Japan) , Tensile-testing machine IP-100 with software (Russia), System of microanalysis INCA Energy 450 x-MAX 50 Premium, HKL Premium EBSD System Nordlys II 2 S (Great Britain), Floor-mounted universal testing double-column machine Shimadzu AG-300 kNIC (Japan) , Application for image analysis Thixomet PRO (Russia) , Optical emission spectrometer MCAI (EU).

R&D Center “Microtopography”

Interference microscope Contour GTK1 (USA), profilometer MarSurfXR20 with XT20, (Germany), equipment package for measurement of the properties of materials UMT-1 (USA)

Company visit: OJSC “Magnitogorsk Iron and Steel Works“

OJSC “Magnitogorsk Iron and Steel Works“ is one of the world's largest steel producers and a leading Russian metals company. The company's operations in Russia include a large steel producing complex encompassing the entire production chain, from preparation of iron ore to downstream processing of rolled steel. Company' turns out a broad range of steel products with a predominant share of high-value-added products.

Meeting participants list

No.	Organization	Surname	First name
1.	KU Leuven (BE)	Arras	Peter
2.	KU Leuven (BE)	Ivens	Jan
3.	Cracow University of Technology (PL)	Korniejenko	Kinga
4.	Cracow University of Technology (PL)	Mikula	Janusz
5.	École Nationale Supérieure de Chimie de Lille (FR)	Vogt	Jean-Bernard
6.	Don State Technical University (RU)	Novikova	Anastasia
7.	Far Eastern Federal University (RU)	Mansurov	Yulbarskhon
8.	Kazan National Research Technical University named after A. N. Tupolev (RU)	Ilinkova	Tatiana
9.	Nosov Magnitogorsk State Technical University (RU)	Koptseva	Natalia
10.	Nosov Magnitogorsk State Technical University (RU)	Korchunov	Alexey
11.	Nosov Magnitogorsk State Technical University (RU)	Polyakova	Marina
12.	Nosov Magnitogorsk State Technical University (RU)	Pesin	Alexander
13.	Nosov Magnitogorsk State Technical University (RU)	Potapova	Marina
14.	Nosov Magnitogorsk State Technical University (RU)	Konstantinov	Dmitrii
15.	Nosov Magnitogorsk State Technical University (RU)	Kharchenko	Alexander
16.	BelMag Joint Stock Company (RU)	Mikhailovskii	Igor