Preface

Short history of the University from the foundation till Miskolc

For many centuries, Hungary was one of the major participants in mining and production of precious metals in Europe. In the 18th century, five-sixth part of the gold and one-quarter of the silver mined in Europe were originating from Hungary mainly from the mines located in Transylvania and in Upper Hungary. The development of mining and metallurgy required the training of those, specializing in these and related technologies. The new knowledge demanded new specialists and – in the absence of engineering higher education – a new type of school. Since the most advanced technologies and the most skilled specialists were located in Selmecbánya (today Banská Stiavnica, Slovakia) and there were a number of mines in the neighborhood, the town was a reasonable choice as the residence of the new school to be founded. The Court Chamber and the Treasury were ordered to organize and finance the school. The decree entitled "Instruction" was issued by the Court Chamber on June 22, 1735. It prescribed the curriculum, the requirements and the number of students studying in "**Berg-Schola**" to be established in Selmecbánya under the leadership of Sámuel Mikoviny (1700-1750) who was charged to conduct the realization. Mikoviny used every effort to consolidate the school and his activity was so successful that Maria Theresa, empress of the Austro-Hungarian Monarchy, granted the institution an academic rank under the name of **Academia Montanistica** on October 22, 1762. By this act the first technical institution of higher education was established in the world. A Forestry School operating as the institution of the count of arch-chamberlain was established in 1808 and was elevated to the academic rank and joined the Academy in 1838. At that time, the new name of the school was **Berg- und Forstakademie.** The name of the institution changed again in 1904 – it became the **College of Mining and Forestry.** In the Fall of 1918, the school had to move to Sopron. The period between World War I and World War II was very confused. The school was often renamed and was joined to the Hungarian Royal József Nádor University of Engineering and Economics (1934) then it moved to Miskolc in 1949 where the **Technical University for Heavy Industry** was established with the two independent faculties, namely the Faculty of Mining Engineering and the Faculty of Metallurgical Engineering, respectively.

University programs in metallurgical and materials engineering in Miskolc

The education of mining and metallurgical engineers was relocated over four years to Miskolc; 1949 was the first academic year that was started in Miskolc. The first rector of the Technical University for Heavy Industry was prof. dr. Elemér Szádeczky-Kardoss, a department head and former dean of the Faculty of Mining, Metallurgical and Forestry Engineering in Sopron. The Faculty of Metallurgical Engineering became independent and dr. Zoltán Horváth, a professor of non-ferrous metallurgy became its first dean in 1955 for ten years. Starting from 1960, specializations in (i) iron- and non-ferrous metallurgy, (ii) casting and (iii) metal forming have been offered. From the beginning of the 1980s students could specialize in Physical Metallurgy and since 1989 in Physical Engineering as well. The education of Materials Engineering started in 1993 (in sync

with the changes taking place all over the world) with the primary aim of providing knowledge in the fields of material structures, solid-state physics, materials science and material quality assurance.

The credit system was introduced to the Hungarian higher education system in 2003. The first BSc level education in materials engineering was offered in the academic year of 2005/2006 in Miskolc. Presently this is the only BSc degree offered by the Faculty of Materials Science and Engineering. Here the aim is to provide our students knowledge in the fields of basic natural science, materials science, including structure, diagnostics and technology as well as economics for materials of metallic, ceramic, polymer and composite nature. Upon successful completion of their studies, students receive a BSc (Bachelor of Science) degree. They can either choose to start a career as an engineer or they can pursue graduate studies at the MSc (Master of Science) level. The best graduating MSc students can continue on as PhD students of the Antal Kerpely Doctoral School of Materials Science and Technology. This type of multi-step system of higher education has become a general training method all over the world and the degrees issued by the University of Miskolc internationally recognized and accepted.

This volume summarizes the most important results of the ongoing research in the **Center of Excellence on Applied Materials Science and Nanotechnology** at the Faculty of Materials Science and Engineering, University of Miskolc. The primary goal of the research activities is the extension of the knowledge available for materials exhibiting special properties. The Center of Excellence has the following five Scientific Divisions:

- Knowledge Intensive Material Production (led by András Roósz),
- Multifunctional Materials (led by Zoltán Gácsi),
- Nanotechnology (led by György Kaptay),
- Integration of Micro and Macro Functionality into Chemical Technology (led by János Lakatos) and
- Materials Informatics and Image Analysis (led by Péter Barkóczy).

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Main building of the University of Miskolc

Ceremony hall of the University of Miskolc with wall picture created by Endre Szász

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