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**THE INTERNATIONALIZATION PROCESS  
IN THE TECHNICAL MILITARY HIGHER EDUCATION  
INSTITUTIONS**

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***Abstract:** The most important universities have as objectives the increasing of the internationalization of higher education and the development of student, teaching staff and researchers' mobility, as well as the international compatibility of bachelor's, master and PhD study programs. Although the functioning of the technical military higher education institutions is subject to further limitations imposed by the rigors of the military system, its connection to the quality requirements of the European system is a necessity as well as a reality. While for the students of civil universities Erasmus mobility represents an opportunity to increase their employability chances, for military students Erasmus mobility represents the chance to gain international experience which, along with the new skills and knowledge acquired, provide them a better adaptation to fit into a new, international and multicultural environment.*

## **1. Introduction**

Military Technical Academy “Ferdinand I”, Bucharest (MTA Bucharest) is a polytechnic higher education military institution having as mission the training of engineer officers for the Ministry of National Defense and for other beneficiaries from the national system of defense, public order and national security [1]. MTA Bucharest conducts higher education study programs organized in undergraduate, master and doctoral studies in its accredited fields and specializations: Armament, Ammunition and Missiles Engineering, Aerospace Engineering, Automotive Engineering, Military Engineering, Civil Engineering, Geomatics, Electronic Engineering, Telecommunication and Information Technology, Computers and Information Technology, System Engineering etc. Regarding international relations, MTA Bucharest conducts outgoing and incoming student mobilities in collaboration with military and civilian universities. Student mobilities target undergraduate and master exchange study programs, the development of bachelor's, master and PhD projects and theses, the development of strong collaborations and, specific for military institutions, training sessions including military activities.

## **2. Erasmus+ KA1 Higher Education Student and Staff Mobility Projects**

Military Technical Academy “Ferdinand I” Bucharest has been taking part in mobility programs such Erasmus since 1998. . Every year, MTA Bucharest sends about 70 students abroad (50 undergraduate students, 15 master students and 5 PhD students) in Erasmus mobilities (SMP or SMS) and receives about 20 foreign students. At the same time, about 30 staff mobilities are realized yearly (10 for teaching and 20 for training). About 10 foreign teachers take part in mobility exchanges in MTA Bucharest every year. In general, the MTA Erasmus student and teaching staff mobilities are conducted in military and civilian universities, and sometimes in research civilian institutions with technical concerns [3].

### **3. Erasmus+ KA2 Strategic Partnership Greener and Safer Energetic and Ballistic Systems (GSEBS)**

Greener and Safer Energetic and Ballistic Systems (GSEBS) (2014-2016) was a Strategic Partnerships for higher education program, funded by Erasmus+ programme, Key Action 2 - Cooperation for innovation and the exchange of good practices. The project was run by Military Technical Academy “Ferdinand I”(RO), University of Coimbra (PT), ENSTA Bretagne (FR) and Imperial College London (UK). The aim of the project was to provide an Intensive Study Programme (IP) for MA and PhD students coming from four prestigious HEIs across Europe. This includes a wide range of multi and interdisciplinary lectures delivered by distinguished professors and researchers from the participating HEI with renowned expertise in their field of interest. Theoretical information is experienced in practice by the students through case studies and demonstrations using the most advanced ICT modeling tools and laboratories. The course teaching activities are followed by conferences, workshops and other multiplier events which ensure a wide dissemination and debate of the topics in academia, research areas, industry and governmental organizations.

### **4. International Semester “Defence and Security Technical Systems”**

The project of an international semester on military technical education was set up by the Military Technical Academy “Ferdinand I” of Bucharest in 2018 and implemented for the first time in 2019. The teaching objective of the semester is to prepare the participants for the acquisition of professional and transversal competencies that will allow them to develop projects in the field of technical defence and security systems in international, multidisciplinary and intercultural teams. The semester consists of 3 parts: core curriculum, scientific project and military training.

The core curriculum addresses all the students enrolled in the international semester. This part contains common subjects useful for all the engineering braches (Project Management, Methods and Tools of Modeling and Simulation of Technical Systems, Sensors, Acquisition and Data Processing Systems, Intercultural and Professional Communication etc). The military training part comprises subjects related to the military science such as Armament Systems, Electronic Warfare, Cyber Security Elements, Sport and Physical Training, etc. This part addresses all the military students enrolled in the international semester.

The scientific project is the most important part of the international semester. In this part a project is developed by a multi-national and multi-disciplinary team of 3 to 6 students. At the beginning of the semester, the available projects are presented after which the students are given the opportunity to choose their preferences for the project they want to participate in. The main objective of the project is to train students from different countries and different engineering branches to work together in intercultural and multi-disciplinary groups. The students work together to complete an integrated engineering project, focusing on the development of personal competences, especially the ability to work and communicate within cross-cultural groups in combining several disciplines like mechanical, electrical engineering, information technology, aerospace engineering, armament engineering etc. Every week they have a plenary meeting during which the teams present the progress of their work and receive assistance and guidance. At the end of the semester there should be a written final report from each team. In the final presentation all the team-members are expected to participate on equal terms.

In the first spring international semester organized in the Military Technical Academy “Ferdinand I” were enrolled 15 students from Military University of Technology, Warsaw, Poland (5 cadets), “Vasil Levski” Military National University, Bulgaria (1 cadet) and Military Technical Academy “Ferdinand I” of Bucharest, Romania (3 cadets) and 6 civilian students from IUT “Paul Sabatier” Toulouse, France. They were divided in 3 teams: weapon systems, aerospace engineering and military engineering.

## 5. Conclusions

Although the majority of bachelor's, master or PhD projects could be developed in MTA Bucharest, it appears that by taking part in international mobilities, students will improve considerably their knowledge and professional skills by having the chance to observe, during their international mobility, a new approach to the professional project content. International mobility is a first test for students to see whether the knowledge and skills gained while studying in MTA Bucharest are effective or not.

At the same time students will have the chance to learn the design, structure and mode of operation of new or similar equipment, which is a challenge. This is an advantage for students who carry out activities abroad. Basically, by means of Erasmus mobility, students will have a very large number of specialized technical equipment and laboratories in which to develop their projects, improving their knowledge and skills gained in MTA Bucharest. Another aspect that should not be overlooked is the fact that during mobilities, students accumulate knowledge and skills complementary to those ensured by the educational program of MTA Bucharest, which leads to an increase of their professional level.

The experience MTA Bucharest gained from the implementation of Erasmus mobility projects and of GSEBS Erasmus+ KA2 project was used to organize a pilot international semester for technical field. Other military academies such as Military University of Technology Warsaw, Poland, "Vasil Levski" Military National University, Bulgaria, Italian Air Force Academy, Pozzuoli, Italy, Portuguese Air Force Academy, Lisbon, Portugal and Hellenic Air Force Academy, Athens, Greece are interested in a long-term collaboration with MTA Bucharest in order to develop the international semester in the technical field in the frame of Erasmus+ KA2 Strategic Partnership project and create a new LoD in the frame of Military Erasmus Initiative [2]. The organizing of the international semester for technical field will increase student and staff teaching exchanges between technical military higher education institutions.

## References

- [1] **Jane Knight**, *Internationalization: Key Concepts and Elements*, University of Toronto, Canada, 2004;
- [2] **Harald Gell, Sylvain Paile-Calvo, Symeon Zambas**, *European Education and Training for Young Officers. European Initiative for the Exchange of Young Officers, Inspired by Erasmus*, 2<sup>nd</sup> Edition, Austria, 2018;
- [3] **Moldoveanu Cristian-Emil, Edu Ioana Raluca, Rotariu Traian, Andruseac Gabriela**, *The Impact of Erasmus Mobility on Military Technical Higher Education*, Proceedings of the 9<sup>th</sup> International Technology, Education and Development Conference, INTED 2015, pp. 4233-4238, ISSN 2340-1079, ISBN: 978-84-606-5763-7, Madrid, Spain, 2-4 March 2015.