ROMANIA

Ministry of National Defence

MILITARY TECHNICAL ACADEMY

"FERDINAND I"

Education and Scientific Research

www.mta.ro

TRAINING AREA

Bologna process

- ✓BACHELOR
- ✓MASTER
- ✓Ph.D.

QUALITY ACADEMIC EDUCATION

EUA European University Association

- ✓POSTGRADUATE COURSES

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FACULTIES

“A” FACULTY Integrated Armament Systems, Military Engineering and Mechatronics	“B” FACULTY Aircraft and Military Vehicles	“C” FACULTY Informatic Systems and Cybernetic Security	“E” FACULTY Communications and Electronic Systems for Defence and Security

“D” DEPARTMENT
Foreign Languages, Military Science and Management

Co-funded by the Erasmus+ Programme of the European Union

“A” FACULTY
Integrated Armament Systems, Military Engineering and Mechatronics

“A1” DEPARTMENT
Department of Armament Systems and Mechatronics

“A2” DEPARTMENT
Department of Civil Engineering, Military Engineering and Geomatics

Centre of Excellence
in Armament Integrated Systems, Military Engineering and Mechatronics (CESIAG)








“B” FACULTY
Aircraft and military Vehicles

“B1” DEPARTMENT
Department of Military Vehicles and Transport

“B2” DEPARTMENT
Department of Integrated Aircraft Systems and Mechanics

Centre of Excellence
in Self-Propelled Systems and Technologies for Defence and Security (SATAS)





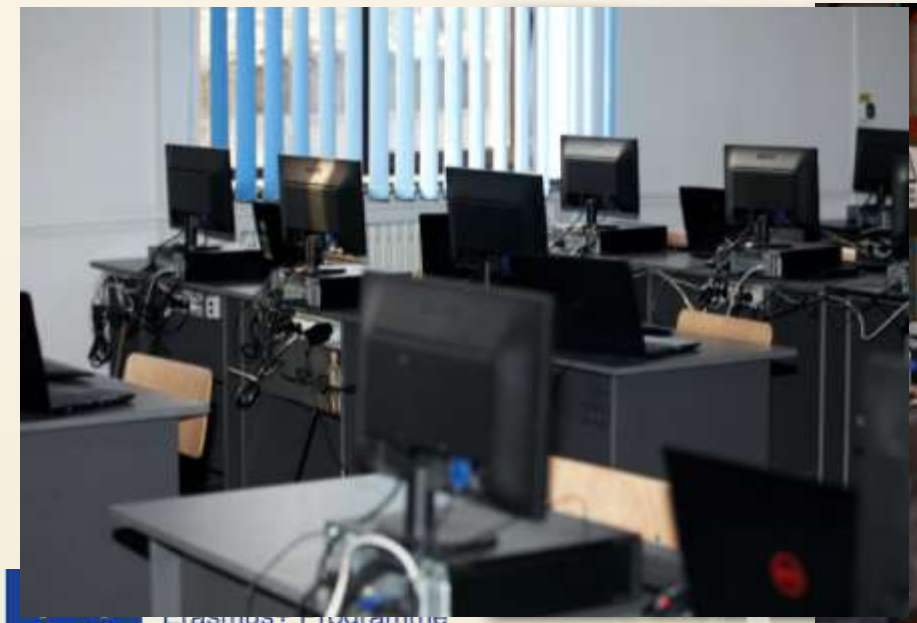



“C” FACULTY
Informatic Systems and Cybernetic Security

“C1” DEPARTMENT
Department of Computers and Cybernetic Security`

“C2” DEPARTMENT
Department of Applied Informatics

Centre of Excellence
In Cyber Security Advanced Technologies (CETASC)



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“E” FACULTY
Electronic Systems for Defence and Security

“E1” DEPARTMENT
Department of Communications and Information Technology

“E2” DEPARTMENT
Department of Military Electronic Equipment and Information Technology

Centre of Excellence in Communications and Information Technology (CECTI)
Centre of Excellence in Robotics and Autonomous Systems (CERAS)




"D" DEPARTAMENT
Foreign Languages, Military Science and Management

Didactic Commission of
Foreign Languages and Intercultural Communication

Didactic Commission of
Tactics, Physical Education and Sport

Didactic Commission of
Euro-Atlantic Security and Management








KA2 Project EUCTSDS

European Common Technical Semester for Defence and Security

No.	Subjects				ECTS
1	**Applied Informatics**	Network of teachers	RO MTA	RO MTA	3
2	**Applied Automation for Engineering Systems**	Network of teachers	PL MUT		3
3	**Integrated Weapon Systems**	Network of teachers	RO MTA	FR FASFA	3
4	**CSDP for Technical Systems**	Network of teachers	FR FASFA		3
5a	**Computer Networks**	Network of teachers	BG NMU	BG NMU	3
6a	**Programming Languages**	Network of teachers	RO MTA		3
7a	**Signal Processing**	Network of teachers	GR HAFA		3
8a	**Microcontrollers**	Network of teachers	RO MTA		3
5b	**Propulsion Systems**	Network of teachers	GR HAFA	PL MUT	3
6b	**Dynamic of Flight**	Network of teachers	PL MUT		3
7b	**Mechanics and Material Science**	Network of teachers	GR HAFA		3
8b	**Computer-Aided-Design and Numerical Analysis**	Network of teachers	BG NMU		3
9	**Interdisciplinary Scientific Project**			GR HAFA	6
10	**Foreign Languages (Bulgarian/French/Greek/Polish/Romanian)**				2
11	**Physical Education and Sports**				2
	TOTAL				34

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KA2 Project EUCTSDS
Basic Engineering Module

LTTA – Basic Engineering + TPM
RO MTA – Bucharest (18 – 24.04.2023)

Sunday +Monday 16 + 17 April Orthodox Easter	Tuesday 18th of April Arrival of Participants	Wednesday 19th of April 1st Day of LTTA Applied Informatics & Applied Automation for Engineering Systems	Thursday 20th of April 2nd Day of LTTA Intercultural communication CERC 2023 Traditional dinner	Friday 21st of April 3rd Day of LTTA Applied Informatics & Applied Automation for Engineering Systems	Saturday 22nd of April 4sth Day of LTTA Applied Informatics & Applied Automation for Engineering Systems	Sunday 23rd of April 5sth Day of LTTA Applied Informatics & Applied Automation for Engineering Systems	Monday 24th of April 6th Day of LTTA Applied Informatics & Applied Automation for Engineering Systems

EuCTSds TPM

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European Common Technical Semester for Defence and Security
PROJECT NO 2020-1-RO01-KA203-080375

BASIC ENGINEERING

- **Applied Informatics**

✓ The students learn the basics of programming using the engineering programming languages (ie Matlab).

✓ In this context, the basics of computer architecture including memory model and data types are also taught.

✓ After successful participation, the students are able to design algorithms and programmes, applied in Mechanical and Aerospace Engineering, Electronic Engineering or Computer Science.

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European Common Technical Semester for Defence and Security

BASIC ENGINEERING

Applied Automation of Engineering Systems

Goal of the Module:

- Education, discovering and understanding practical principles of control systems and robotics.
- Learning about mathematical analysis of linear control systems, stability assessments, control quality, synthesis methods and correction of automation systems' dynamic properties.
- Learning about the mathematical description and analysis of robotics systems, structural and functional analysis.
- Discovering and understanding practical matters regarding control and robotics systems.

Main Topics:

1. Mathematical Models of Automation Systems. (Lec.: 2h; Exer.: 4h)
2. Design the Controller and Synthesis of the Automation Control Systems. (Lec.: 2h; Exer.: 4h)
3. Modelling, Control Design and Experiment of 2 DOF/3 DOF Helicopter. (Exer.: 2h, Lab:4)
4. Modelling, Control Design and Experiment of Inverted Pendulum/ Rotary Double Inverted Pendulum. (Exer.: 2h, Lab:4)
5. Introduction to manipulators and robot systems (construction and control). (Lec.: 2h, Lab.:4)
6. Environments for offline programming of robots. (Lec.: 2h; Lab.: 4h)
7. Selected online robot control systems. (Lec.: 2h; Lab.: 4h)

Competences:

- Students will learn about the construction of automation and robotic systems, modelling, simulation, programming languages, and work principles in the subject.
- Classes provide knowledge in the field of modelling robotic stations and programming robots.

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European Common Technical Semester for Defence and Security

BASIC ENGINEERING

Applied Automation of Engineering Systems

1. **Mathematical Models of Automation Systems.** *(Lec.: 2h; Exer.: 4h),*
   Creating of linear models of control systems as transfer-function model, frequency model, state-space model, time and frequency characteristics, characteristics of fundamental dynamic elements, block diagrams. The goal of the classes is to model, design and simulation of some control system in Matlab software.
2. **Design the Controller and Synthesis of the Automation Control Systems.** *(Lec.: 2h; Exer.: 4h)*
   The types, characteristics and parameters of the classical controllers. Ziegler-Nichols controller design method. Root locus design method. The goal of the classes is to model, design, and simulate some control system in Matlab software.

3. **Modelling, Control Design and Experiment of 2 DOF/3 DOF Helicopter** ***(Exer.: 2h, Lab:4)****,*
   The objective of this classes is to model, design and test the helicopter model mounted on a fixed base with two propellers driven by DC motors. The front propeller controls the elevation of the helicopter nose about the pitch axis, and the back propeller controls the side-to-side motions of the helicopter about the yaw axis. The pitch and yaw angles are measured using high-resolution encoders. The pitch encoder and motor signals are transmitted via a slipring.

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BASIC ENGINEERING

Applied Automation of Engineering Systems

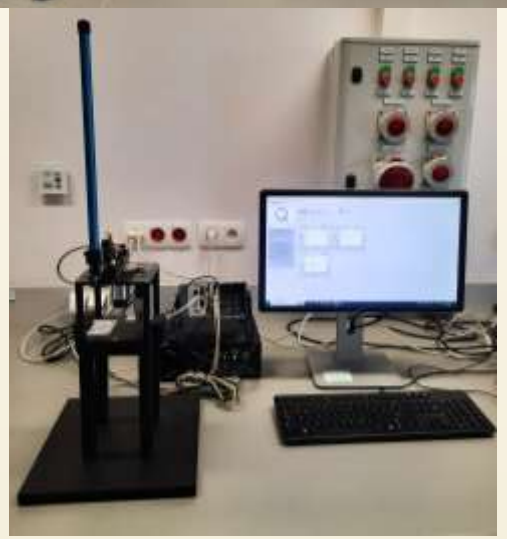
4. **Modelling, Control Design and Experiment of Inverted Pendulum/ Rotary Double Inverted Pendulum (Exer.: 2h, Lab.:4)**

   The objective of this classes is to design and implement a state-feedback control system that will balance the pendulum in the upright, vertical position / will balance a rotary double inverted pendulum and positions the rotary arm to a commanded angular position.

5. **Introduction to manipulators and robot systems (construction and control).**

   (Lec.: 2h, Lab.:4),

   Presentation of the construction of selected types of manipulators, controllers and control panels. Configuration of the robot system. Presentation of the robot control methodology.



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European Common Technical Semester for Defence and Security

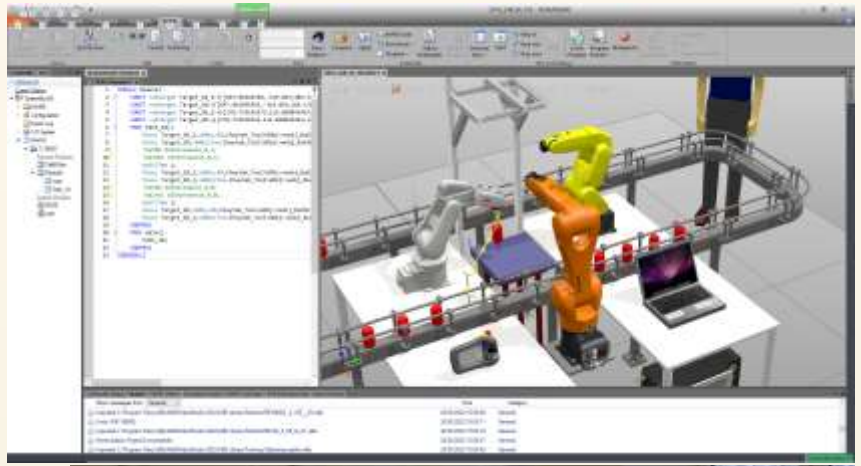
BASIC ENGINEERING

Applied Automation of Engineering Systems

5. **Introduction to manipulators and robot systems (construction and control).** *(Lec.: 2h, Lab.:4),*
   Presentation of the construction of selected types of manipulators, controllers and control panels. Configuration of the robot system. Presentation of the robot control methodology.

6. **Environments for offline programming of robots.** *(Lec.: 2h; Lab.: 4h)*
   Overview of selected environments for offline programming of robots. Acquainting with the methodology of offline robot programming. Configuration of the robot system in offline mode. Programming the manipulator movement for a selected task in a virtual environment. Conducting a simulation and analysis of the implemented process.

7. **Selected online robot control systems.** *(Lec.: 2h; Lab.: 4h)*
   Overview of selected online robot control systems. Acquainting with the methodology of online robot programming. Configuration of the robot system in online mode. Programming the manipulator movement for a selected task in a real environment. Running a real robot and analysing the process being carried out.



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KA2 Project EUCTSDS
Basic Engineering Module

Applied Informatics
Applied Automation for Engineering Systems

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European Common Technical Semester for Defence and Security
PROJECT NO 2020-1-RO01-KA203-080375

KA2 Project EUCTSDS

European Common Technical Semester for Defence and Security

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11	**Physical Education and Sports**				**2**
	TOTAL				**34**

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European Common Technical Semester for Defence and Security

SUPPLEMENTARY SUBJECTS
INTERCULTURAL COMMUNICATION

- Foundations of intercultural communication
- Characteristics of host country language
- Host country cultural landmarks
- Culture, communication, context and power
- Identity, stereotypes, prejudices and labels
- Verbal and nonverbal codes

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European Common Technical Semester for Defence and Security

SUPPLEMENTARY SUBJECTS

INTERCULTURAL COMMUNICATION

https://www.istockphoto.com/ro/ilustra%C8%9Bii/intercultural-communication

- The role of intercultural communication is to make it easier for us to **relate** to people who belong to different cultures, who speak a different language and have a different nationality and different identity references, in order to **better understand our own culture and specificity**, and ultimately ourselves.

- The **study of intercultural communication** begins like a *journey into another culture*, and ends up becoming a foray into one's own culture and identity.
- Meeting with **the Other, the alterity**, gives you the opportunity to get to *know yourself better*, by **comparison**.
- Faced with new and **diverse contexts and situations**, you can only **respond appropriately** if you *have fully understood and discovered who you really are*, not who you think you are or who you would like to be.

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SUPPLEMENTARY SUBJECTS
INTERCULTURAL COMMUNICATION

- There are also **barriers to effective intercultural communication**, such as: **stereotypes, prejudice, discrimination, labelling**, etc., which occur *in diverse and complex historical, social and political contexts*.

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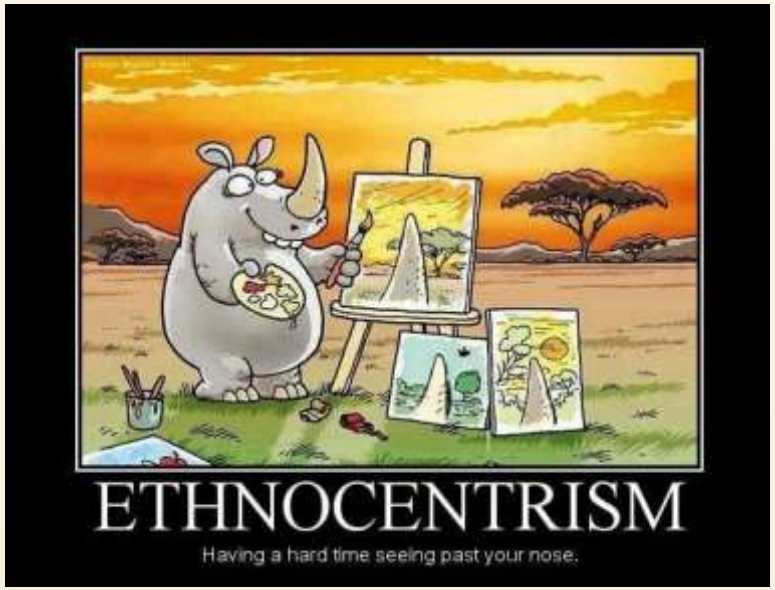

https://mobile.twitter.com/hashtag/etnocentrism?src=hash

- Another impediment is **ethnocentrism**, or the tendency to consider our own culture superior to other cultures.

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SUPPLEMENTARY SUBJECTS
INTERCULTURAL COMMUNICATION

- When we talk about intercultural communication, we implicitly refer to **culture** as a central concept in defining and describing our interactions.

- **Culture** has various definitions, including that it *describes a particular combination of perceptions that influence communication.*

- Therefore, **patterns of behaviour and attitudes** that are common to groups of people define culture.

Romanian Athenaeum

Village Museum

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SUPPLEMENTARY SUBJECTS
INTERCULTURAL COMMUNICATION

- **Cultural values**:

- are a set of deeply held beliefs that *a group shares and identifies with*;
- are patterns, systems of symbols and rules *handed down from generation to generation*;
- are *socially and historically determined*;
- *reflect a common idea and perception of how things should be*.

- **Culture** is a network of symbols with contextual meaning.

- **Keywords** :

- culture and civilization;
- common language;
- values, principles;
- social norms;
- education;
- family structures;
- history;
- religion;
- beliefs;
- traditions, customs;
- myths and folklore.

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SUPPLEMENTARY SUBJECTS
INTERCULTURAL COMMUNICATION

- *Intercultural communication* operates massively with **similarities and differences between cultures.**

- *Keyword*: ***IDENTITY***

- *personal,*
- *family,*
- *religious,*
- *spiritual identity,*
- *identity related to age,*
- *race,*
- *sex,*
- *gender,*
- *sexual orientation,*
- *belonging to a majority or minority*, etc.

- Other **factors shaping intercultural communication** are:

- *language spoken;*
- *context* (social, political, historical, emotional, psychological);
- *discourse* in context;
- *poles of power* based on social hierarchies that privilege certain groups and categories based on:

  - *stable factors* (age, ethnicity, race, sex, sexual orientation, gender, physical abilities);

  - *variable factors* (education, culture, geographical area, marital status, socio-economic status).

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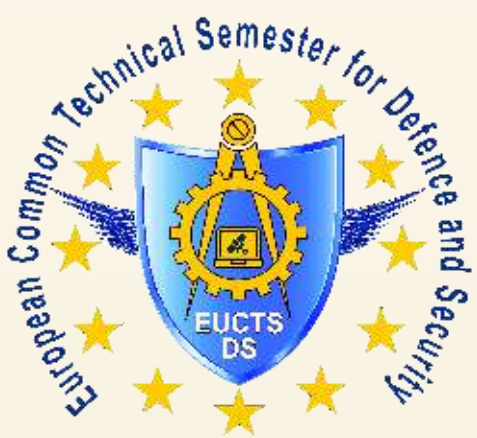

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