

# Multiplier Event on the Experiencing of e-Learning Platform for Biomechatronics,

hosted by Bizzcom s.r.o. company, in  
Bucany, Slovakia  
13th September 2023

**EMERALD PROJECT - EUROPEAN NETWORK FOR 3D PRINTING OF BIOMIMETIC MECHATRONIC SYSTEMS** Working together for a green, competitive and inclusive Europe **bizzcom**

**EMERALD MULTIPLIER EVENT  
ON THE EXPERIENCING  
OF E-LEARNING  
PLATFORM FOR  
BIOMECHATRONICS**

**WHO CAN APPLY?**  
STUDENTS, PROFESSORS  
RESEARCHERS  
COMPANIES

**SCAN TO APPLY**

**WWW.PROJECT-EMERALD.EU**

**13TH SEPTEMBER 2023  
BUCANY, SLOVAKIA**

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EUROPEAN NETWORK FOR 3D PRINTING OF BIOMIMETIC MECHATRONIC SYSTEMS - EMERALD



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EMERALD: European network for 3D printing of biomimetic mechatronic systems  
EEA & Norway Grant - Contract No. 21-COP-0019

MULTIPLIER EVENT on Experiencing of e-learning platform for bio-mechatronics  
organized by BIZZCOM s.r.o. company, Slovakia  
– Event agenda- 13<sup>th</sup> of September 2023

Session 1 – EMERALD e-learning platform for bio-mechatronics	
8:30	Registration of participants to the Multiplier Event
9:00	Opening and Welcome ceremony: Branislav Rabara – Director of BIZZCOM s.r.o. company (Slovakia)
9:15	EMERALD project overall presentation – progress, actions, KPIs, perspectives / details about the event – Associate Prof. Răzvan Păcurar (Technical University of Cluj-Napoca, Romania)
9:30	EMERALD main concept of the EMERALD e-learning platform for bio-mechatronics - Associate Prof. Răzvan Păcurar (Technical University of Cluj-Napoca, Romania)
9:45	EMERALD – e-learning platform for bio-mechatronics – presenting of CAD / CAE virtual laboratory room e-learning facilities - (Associate Prof. Răzvan Păcurar – Technical University of Cluj-Napoca - Romania)
10:15	EMERALD – e-learning platform for bio-mechatronics – presenting of 3D scanning and 3D printing virtual laboratory rooms e-learning facilities - (Associate Prof. Filip Gorski – Poznan University of Technology - Poland)
10:30	EMERALD – e-learning platform for bio-mechatronics – presenting of Testing and Materials characteristics virtual laboratory room e-learning facilities - (Associate Prof. Diana Băilă – University Politehnica Bucharest - Romania)
10:45	EMERALD – e-learning platform for bio-mechatronics – presenting of Sensoring, Programming and Assembling virtual laboratory rooms e-learning facilities - (Prof. Filippo Sanfilippo – University of Agder - Norway)
11:00	EMERALD – e-learning platform for bio-mechatronics – presenting of VR / AR virtual laboratory room e-learning facilities - (Martin Zelenay – BIZZCOM - Slovakia)
11:15	Conclusions about the content and future perspectives on improving the use of the EMERALD – e-learning platform for bio-mechatronics/ realizing of bio-mechatronics systems to support people with special needs (amputated arms) (Technical University of Cluj-Napoca, Romania)
11:30	Coffee break / Press conference

AGENDA



Session 2 – Experiencing the – EMERALD e-learning platform for bio-mechatronics / VR / AR / MR experience	
12:00	Opening of the session and organizing aspects related to the EMERALD e-learning platform for bio-mechatronics experiencing / dividing in groups (Martin Zelenay – BIZZCOM (Slovakia)
12:15	Experiencing the virtual rooms of the EMERALD e-learning platform for bio-mechatronics (testing on the computer) / Experiencing of VR applications using VR googles / Experiencing AR applications using tablets /collection of feedbacks (all partners + participants to the Multiplier Event)
13:15	Conclusions about the experiencing of the EMERALD e-learning platform for bio-mechatronics and discussions related to feedbacks /aspects that are still necessary to be improved in the e-learning platform / round table discussions (Martin Zelenay – BIZZCOM (Slovakia)
13:45	Comments and discussions on the possibility of joining different projects / consortium / EU Networks - Branislav Rabara – Director of BIZZCOM s.r.o. company (Slovakia)
14:15	Closing words / ending of Multiplier Event
14:30	Lunch break

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EMERALD – e-learning platform for bio-mechatronics – presenting of Testing and Materials characteristics virtual laboratory room e-learning facilities - UPB



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Of Biomimetic Mechatronic Systems  
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HOME PROJECT REPORTS DISSEMINATION INTELLECTUAL OUTPUTS EVENTS PARTNERS **VIRTUAL LABS** CONTACT



### EMERALD E-LEARNING VIRTUAL LABORATORY PLATFORM

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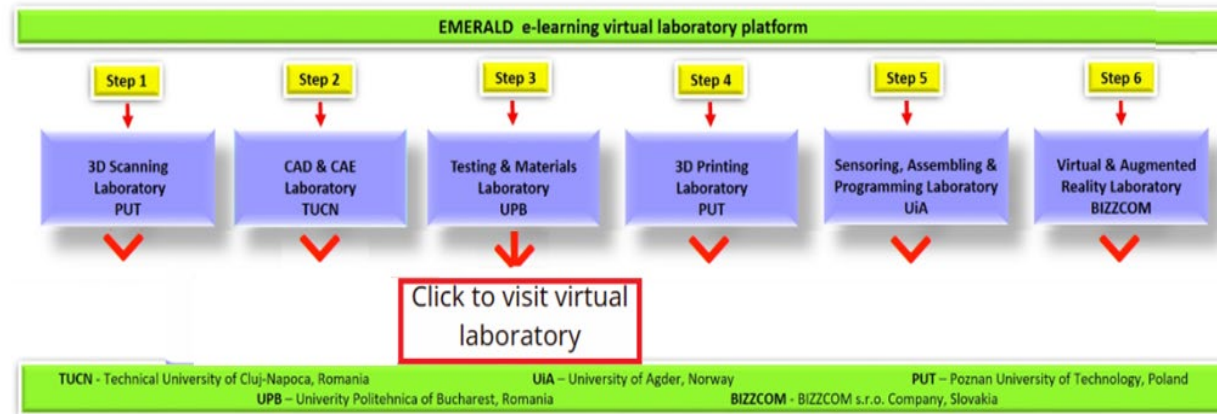


## EUROPEAN NETWORK FOR 3D PRINTING OF BIOMIMETIC MECHATRONIC SYSTEMS - EMERALD

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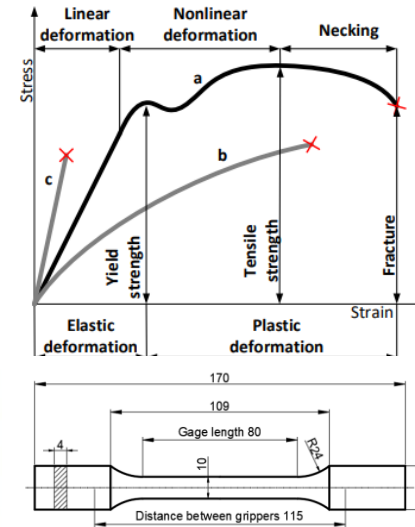
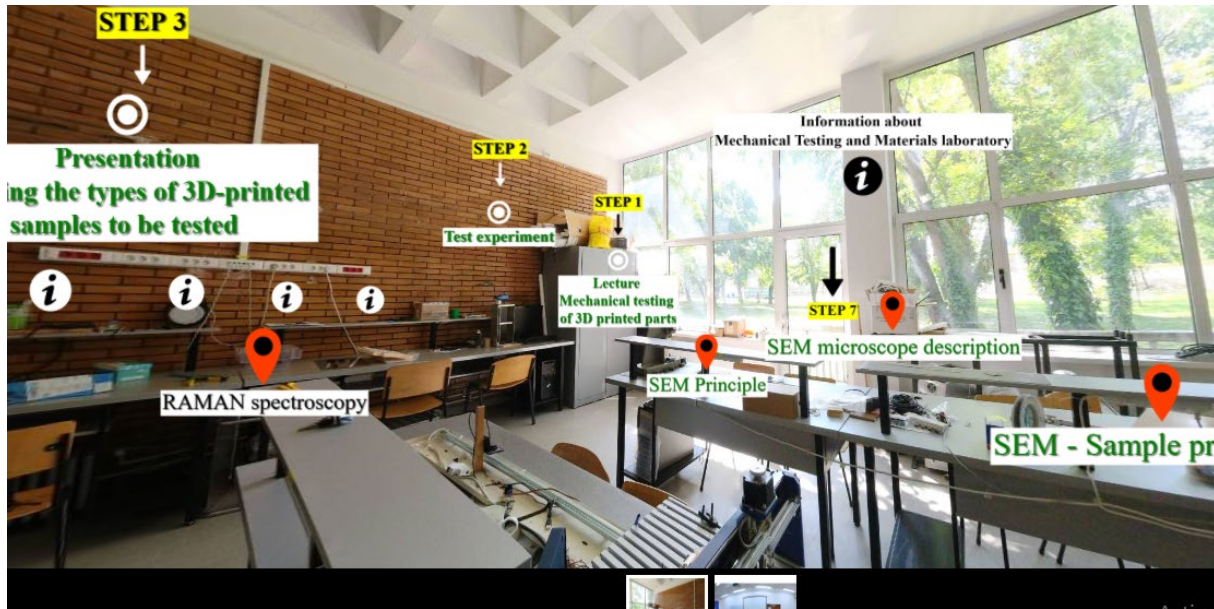
Please click on the tooltips on the diagram below to virtually visit our laboratories.

For a better understanding of the EMERALD e-learning virtual laboratory platform, which includes 3D scanning, CAD, CAE, testing and material characterization, 3D printing, sensorizing, assembly, programming, AR & VR, it is advisable to access the virtual laboratories by following the steps that are outlined in the diagram given below. By following the steps in the indicated order, this will lead to a more comprehensive understanding of the logical process involved in conceiving and developing of new biomimetic mechatronic systems to be realized utilizing 3D printing technologies.



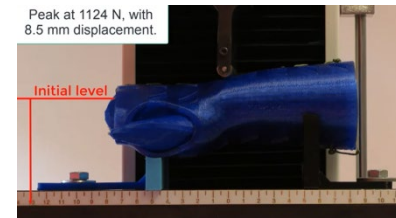
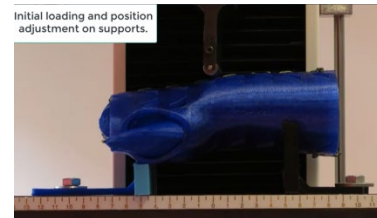
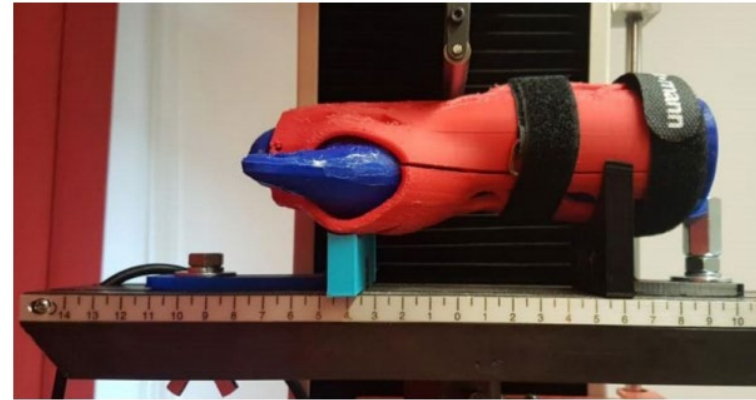
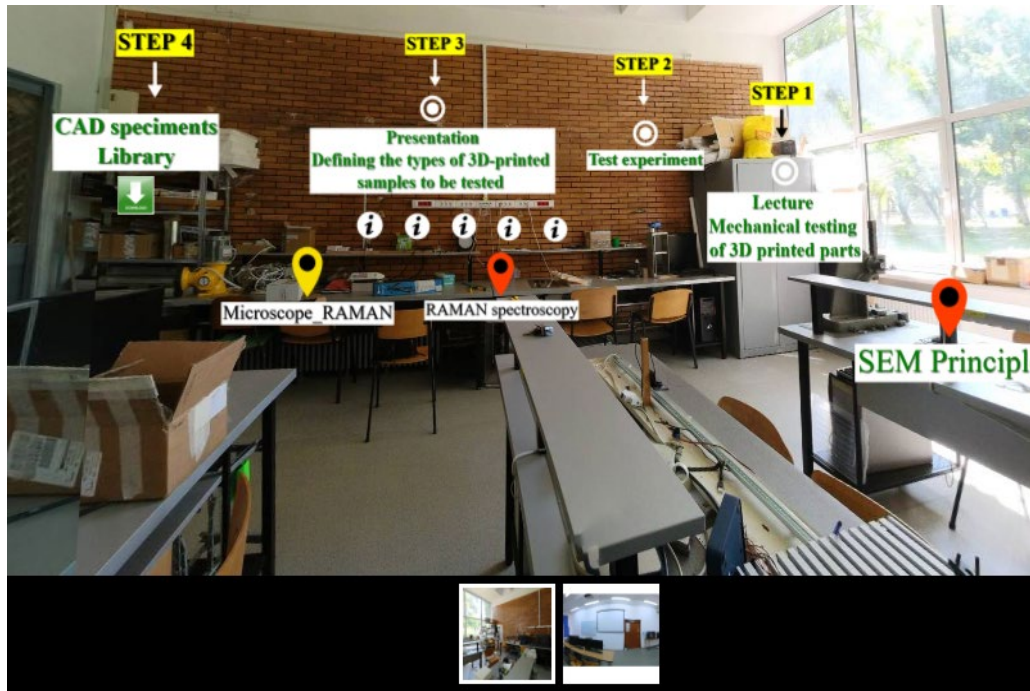
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# EMERALD VIRTUAL E-LEARNING PLATFORM - UPB UNIVERSITY LABORATORIES

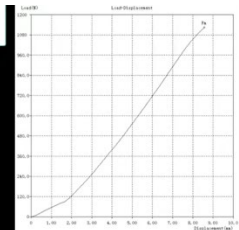


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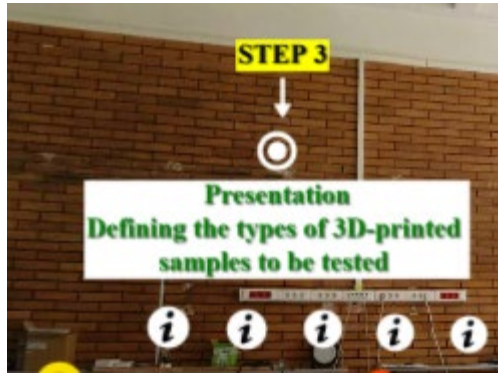
Almost purely elastic deformations.



Steps of the real bending testing experiment presented and explained in the video

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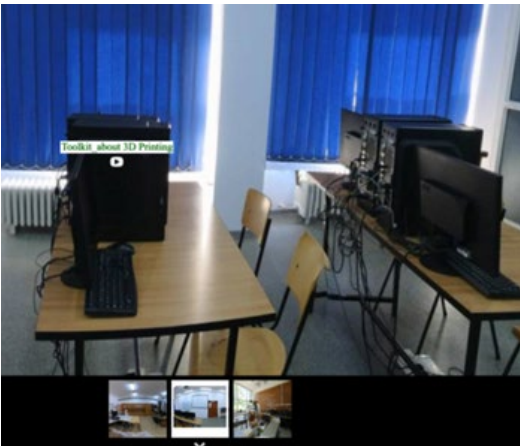
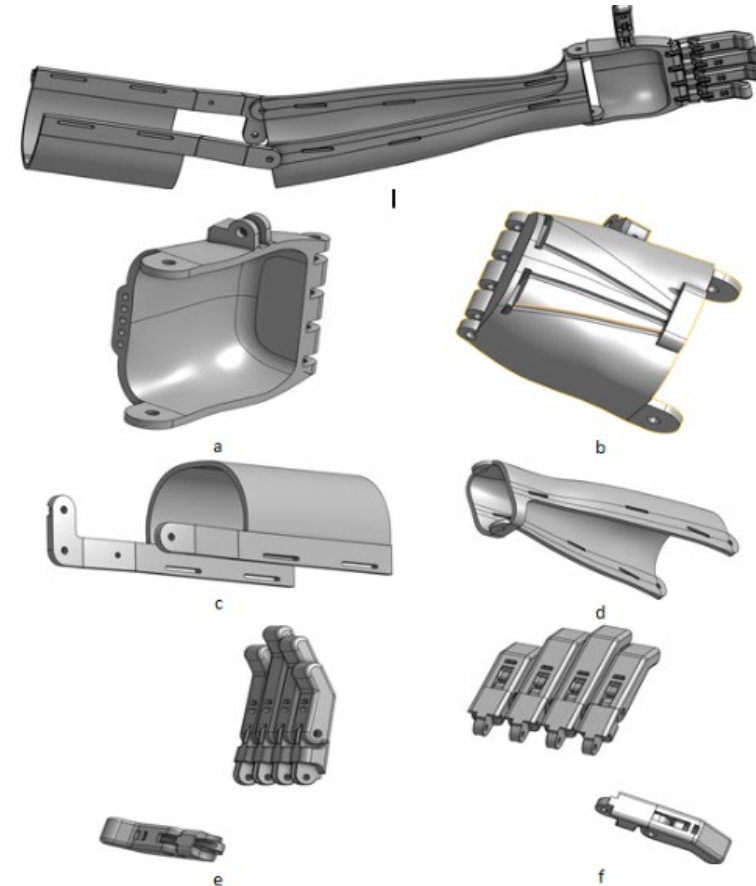
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**Defining the types of 3D-printed samples to be tested**  
- Lecture -

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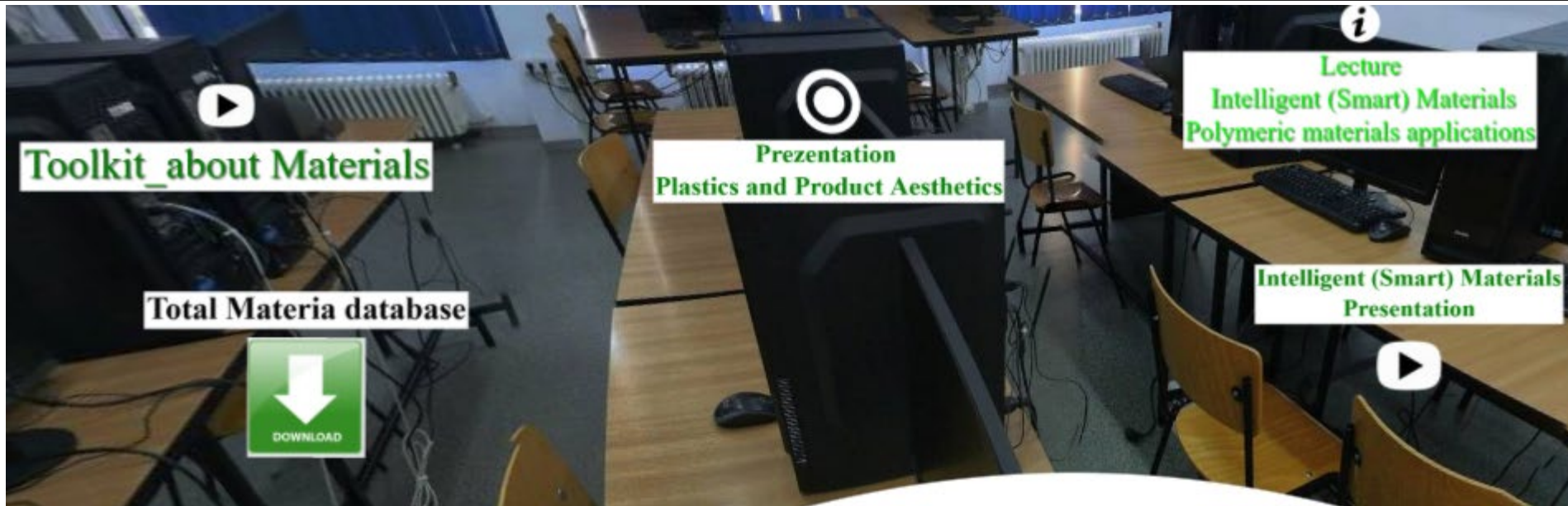
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EUROPEAN NETWORK FOR 3D PRINTING OF BIOMIMETIC MECHATRONIC SYSTEMS  
**MODULE**

**\* Some aspects regarding the prescribed precision and manufacturing precision of implants, prostheses and orthoses \***

Project Title	European network for 3D printing of biomimetic mechatronic systems 21-COP-0019
Output	IO1 - EMERALD e-book for developing of biomimetic mechatronic systems
Module	Some aspects regarding the prescribed precision and manufacturing precision of implants, prostheses and orthoses

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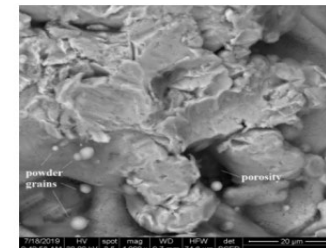
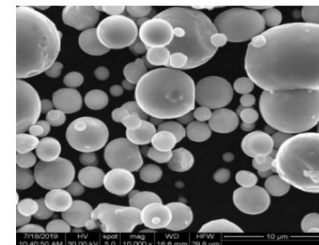
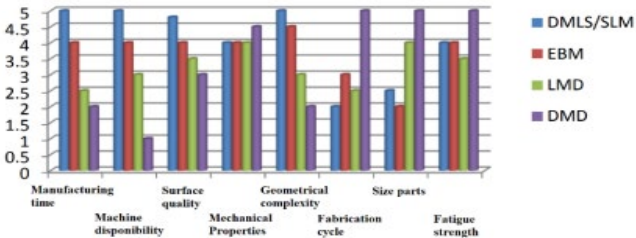


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**MODULE 8**  
Intelligent (Smart) Materials

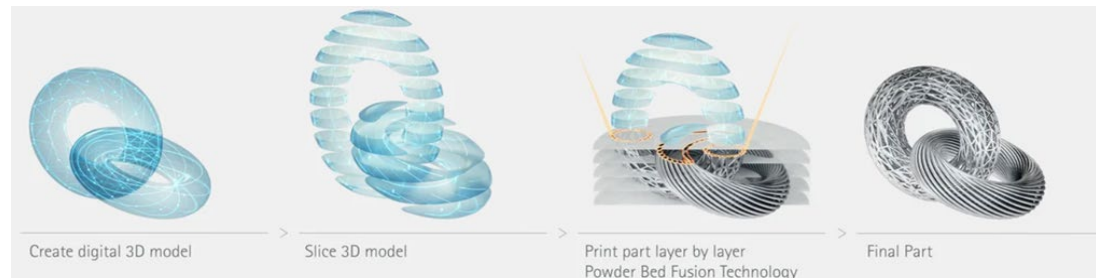
Project Title	European network for 3D printing of biomimetic mechatronic systems 21-COP-0019
Output	IO1 - EMERALD e-book for developing of biomimetic mechatronic systems
Module	Module 8 Intelligent (Smart) Materials



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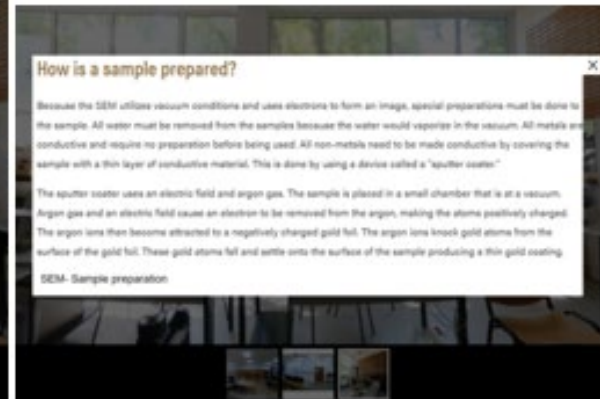
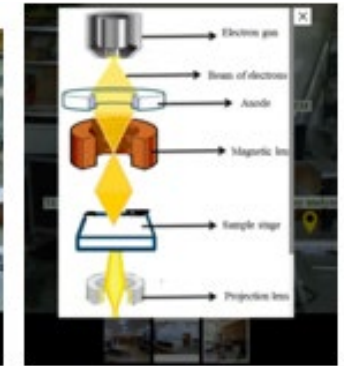
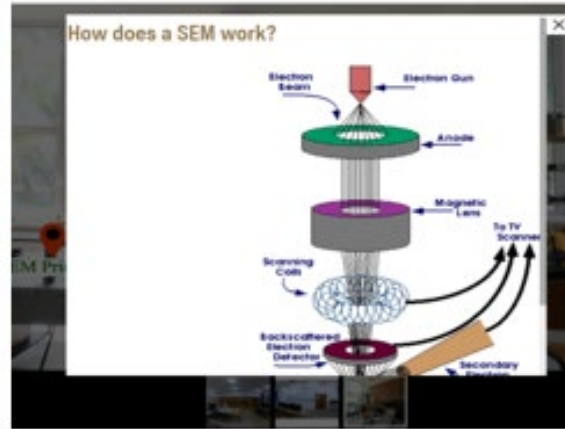
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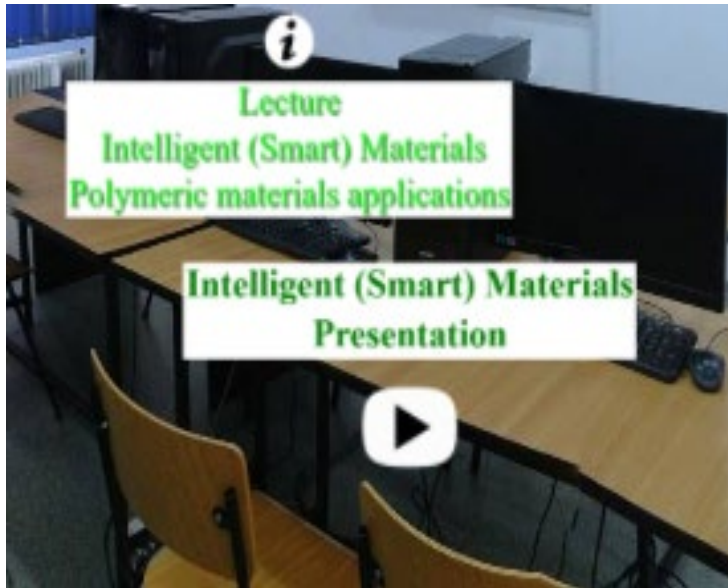
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Examples of information that can be found in the Testing and Materials laboratory



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### MODULE 8.1 Intelligent (Smart) Materials

<b>Project Title</b>	European network for 3D printing of biomimetic mechatronic systems 21-COP-0019
<b>Output</b>	IO1 - EMERALD e-book for developing of biomimetic mechatronic systems
<b>Module</b>	Module 8.1 Intelligent (Smart) Materials_ Polymeric materials

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### Intelligent (Smart) Materials

Professor Catalin Zaharia, Head of Department  
University Politehnica of Bucharest, Department of Bioresources and Polymer Science  
Advanced Polymer Materials Group, Scientific Director  
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EMERALD International Summer School on 3D Printing in Bio-Mechatronics – 12-23 September 2022

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### 3D-printed prosthetics

<https://www.rapidmade.com/3d-printing-in-the-medical-industry>

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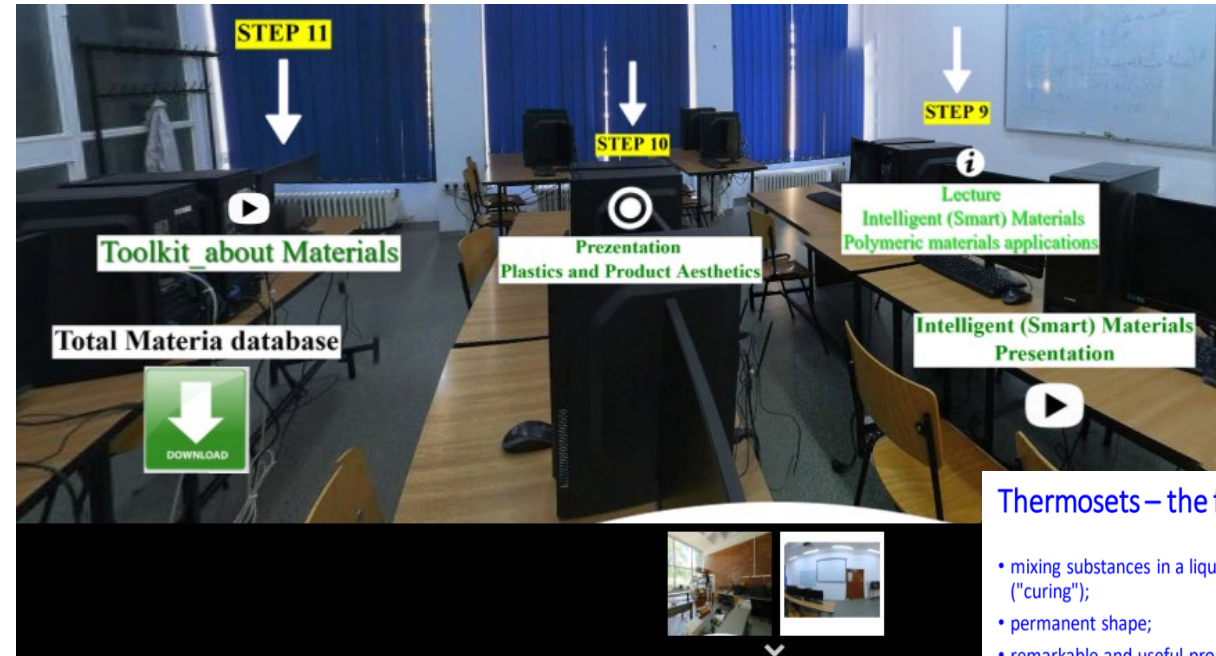
## European Network For 3D Printing Of Biomimetic Mechatronic Systems

### Ultra performance 3D bioprinter at University Politehnica of Bucharest

- ✓ Natural and synthetic 3D structures
- ✓ Cells incorporation
- ✓ Bioconstructs that stimulate the architecture and properties of biological tissues

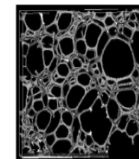


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### Thermosets – the first synthetic plastics

- mixing substances in a liquid state, resulting an irreversible hardening ("curing");
- permanent shape;
- remarkable and useful properties:
  - good strength;
  - electrical and thermal insulation;
  - relative good heat resistance;
  - total opacity.



Polyurethane structure

08.2023

Plastics and Product Aesthetics

6

### Thermoplastic materials

- invented in the first half of 20<sup>th</sup> century and perfected after WWII.
- Most used thermoplasts are:
  - Polyethylene (PE);
  - Polypropylene (PP);
  - Polyvinyl chloride (PVC);
  - Polystyrene (PS);
  - Polycarbonate (PC);
  - Acrylonitrile butadiene styrene (ABS)



Thermoplastic pellets

08.2023

Plastics and Product Aesthetics

11



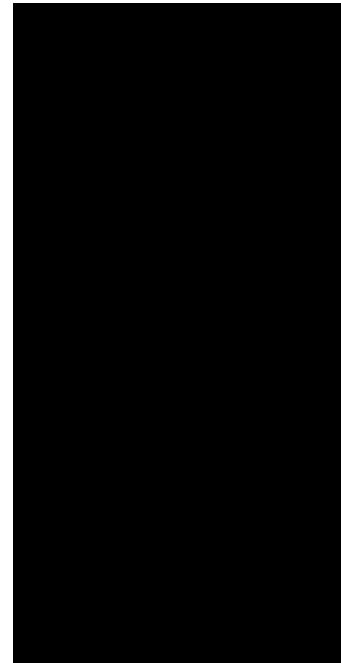
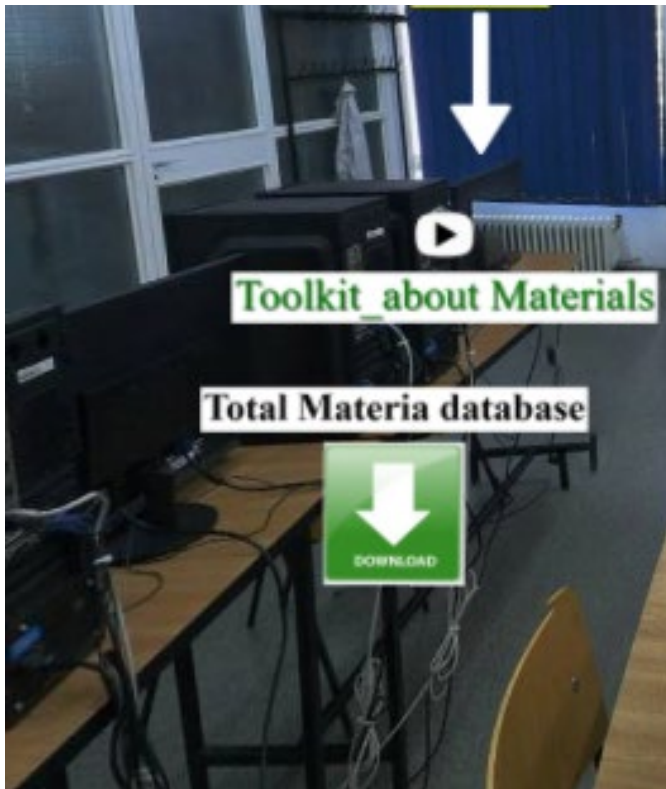
## Plastics and product aesthetics

**Andrei DUMITRESCU**  
Professor, PhD.

Manufacturing Engineering Department,  
National University of Science and Technology POLITEHNICA of Bucharest

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Materials toolkit

EMERALD

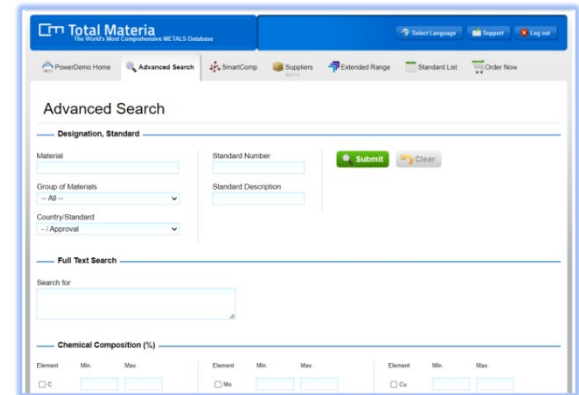
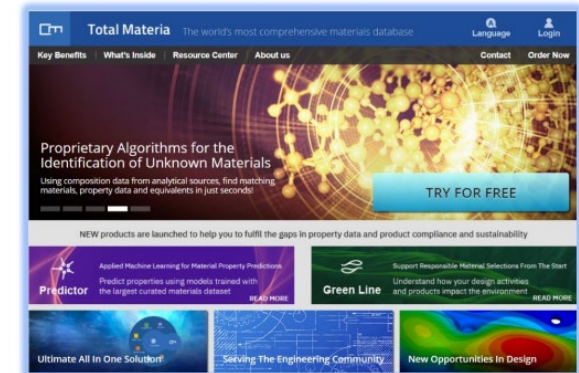
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E-toolkit – New materials used for the developed biomimetic mechatronic systems

Project Title	European network for 3D printing of biomimetic mechatronic systems 21-COP-0019
Output	102 - EMERALD e-toolkit manual for digital learning in producing biomimetic manufacturing method
Module	Database used for the smart (intelligent) materials properties
Date of Delivery	January 2023
Authors	Diana BĂILĂ, PCB
Version	FINAL VARIANT, *27.01.2023*



[drive.google.com/file/d/1WxRRw...](https://drive.google.com/file/d/1WxRRw...) →



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