

**INTERNATIONAL CONFERENCE ON FUTURE OF  
WOOD SCIENCE & TECHNOLOGY EDUCATION 2021  
(FWSTE2021)**

**THURSDAY, 27<sup>TH</sup> May 2021**



**DEVELOPMENT OF AN INDUSTRY 4.0  
MASTER'S PROGRAM FOR THE WOOD  
AND FURNITURE INDUSTRY IN MALAYSIA**

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*Paper presented at International Webinar on the Future of Wood Science & Technology Education 2021 (FWSTE2021) on 27 May 2021.*

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## *Outline of the Presentation*

- 1.0 Background**
- 2.0 International Consortium**
- 3.0 Project Objectives**
- 4.0 Project Implementation**
- 5.0 Curriculum Design/Structure**
- 6.0 Challenges**
- 7.0 Conclusions**

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THURSDAY, 27<sup>TH</sup> May 2021

Jointly organized by:



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



*Partners:*



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*Improving Malaysian higher education knowledge towards  
wood and furniture Industry 4.0  
"Making 4.0"*

Project No. 598783-EPP-1-2018-ES-EPPKA2-CBHE-JP  
Duration: Nov 2018 – Nov 2021 (3 years).

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UPCT	Technical University of Cartagena	Spain ( <b>LEADER</b> )
CETEM	Technological Centre of Furniture and Wood	Spain
WULS	Warsaw University of Life Sciences	Poland
KIT	Karlsruhe Institute of Technology	Germany
<b>UPM</b>	<b>Universiti Putra Malaysia</b>	<b>Malaysia</b>
UKM	Universiti Kebangsaan Malaysia	Malaysia
USM	Universiti Sains Malaysia	Malaysia
UiTM	Universiti Teknologi MARA	Malaysia
MTIB	Malaysian Timber Industry Board	Malaysia

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**This internationally funded project has the aim to develop a master's degree (M.Sc.) curriculum on Industry 4.0 for the furniture and wood industry in Malaysia.**

**The curriculum being developed is the first of its kind in the country, will lead to strengthened collaboration between European and Malaysian universities.**

**It is in line with the Malaysian Education Blueprint (2015-2025) and the National Industry 4.0 Policy to ensure adequate supply of skilled human capital and skilled workers.**

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**The total grant amount approved for the project is EUR 947,450.**

**The sum allocated to UPM is EUR 111,681 (RM 510,000).**

**Key Area: Capacity building in the field of Higher Education (Erasmus+ KA2-CBHE).**

**It is the 1<sup>st</sup> such project on “Educational Capacity Building” under the Erasmus program for Malaysia in the Wood Industry.**

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## OBJECTIVES OF THE PROJECT

- 1. MAKING 4.0 aims to develop an innovative Master Degree to modernize the current training offer in wood and furniture technology processes and design around Industry 4.0.**
- 2. MAKING 4.0 aims to improve the sustainability of the Industry in Malaysia, while at the same time strengthening the collaboration and development between EU and Malaysian universities.**



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## WORK PACKAGES

WP-1 (Preparation)	Analysis and comparison of the current HE training offer in the wood and furniture industry in Malaysia	UPM
WP-2 (Development)	Training path, learning content structure and methodological aspects	KIT
WP-3 (Development)	Develop the training materials and trainers' manuals	WULS
WP-4 (Development)	Pilot test analysis and Master course validation and accreditation by MQA	UKM

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## WORK PACKAGES

WP-5 (Quality Assurance)	Quality control and risk monitoring throughout the project	CETEM
WP-6 (Dissemination and Exploitation)	Disseminating information about the project and its promotion. It also highlights the sustainability of the project.	WULS & USM
WP-7 (Management)	Financial and technical management of the project.	UPCT (as the main project leader)

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## Impacts – Short Term

- 1. Development of collaborative networks between partner universities and staff.**
- 2. Consortium meetings in partner universities allows benchmarking of best practices and lessons to be emulated.**
- 3. A comparison of HE offerings in the EU and Malaysia in the field of Industry 4.0.**

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## Impacts – Long Term

1. Create an innovative pathway to train future workers in Industry 4.0 for the wood and furniture sector in Malaysia.
2. Promoting cooperation activities between all stakeholders to shape the final outcomes.
3. Create conducive environment for intensive collaborative efforts between partner universities.
4. Boost the 4<sup>th</sup> Industry Revolution in the wood and furniture industry in Malaysia.

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## MASTER OF ADVANCES TECHNOLOGIES AND INNOVATION FOR WOOD-BASED INDUSTRY



### Program Educational Objective

Provide students with theoretical and applied knowledge of new technologies in Industry 4.0 and the latest trends in materials and processes in the wood sector.

### Credits

40 Malaysian credits  
1 academic year

### Students

Students with previous knowledge on wood science, design, furniture production, and those that want to improve their skills on advances technologies

#### Module 1

Processes and production of furniture



#### Module 2

Intelligent and sustainable design



#### Module 3

Wood and new materials



#### Module 4

Innovation management



#### Internship

To apply the acquired knowledge in a real working environment



#### Master Thesis

To demonstrate mastery of KETs knowledge, and apply them in the wood and furniture industry



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## CURRICULUM DESIGN & IMPLEMENTATION

<b>Modules of the Master</b>	<b>ECTS</b>
<b>Processes and Production of Furniture</b>	<b>16</b>
<b>Intelligent and Sustainable design</b>	<b>4</b>
<b>Wood and New Materials</b>	<b>6</b>
<b>Innovation Management</b>	<b>4</b>
<b>Practicum/ Internship</b>	<b>5</b>
<b>Master Thesis</b>	<b>5</b>
<b>Total Malaysian Credits</b>	<b>40</b>

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<b>Course Classification</b>	<b>Credit Value ECTS</b>	<b>Percentage %</b>
<b>Compulsory</b>	<b>28</b>	<b>70</b>
<b>Elective (Optional Subjects)</b>	<b>12</b>	<b>30</b>
<b>Total Credit Value</b>	<b>40</b>	<b>100</b>

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<b>MASTER'S STRUCTURE</b>				
	<b>COURSES</b>	<b>ECTS</b>	<b>TYPE</b>	<b>Total ECTS</b>
<b>MODULE 1</b>	<b>Processes and Production of Furniture. Elective subjects. Choose two</b>			<b>16</b>
	<b>Digital Transformation in the Industry 4.0</b>	<b>2</b>	<b>C</b>	
	<b>Production processes in the furniture sector</b>	<b>2</b>	<b>C</b>	
	<b>Automation and mechanization, low-cost Automation</b>	<b>2</b>	<b>C</b>	
	<b>Additive manufacturing</b>	<b>2</b>	<b>C</b>	
	<b>Internet of Things (IoT) applied to wood-based industry</b>	<b>2</b>	<b>C</b>	
	<b>Wireless technologies for logistics and manufacturing</b>	<b>2</b>	<b>C</b>	
	<b>Network communications in the industry</b>	<b>2</b>	<b>E</b>	
	<b>Robotics applied to the wood-based industry</b>	<b>2</b>	<b>E</b>	
	<b>Augmented reality</b>	<b>2</b>	<b>E</b>	
	<b>Simulation and 3D scanning</b>	<b>2</b>	<b>E</b>	
	<b>Cloud Computing and Big Data applied to wood-based industry</b>	<b>2</b>	<b>E</b>	



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	<b>MASTER'S STRUCTURE</b>			
<b>MODULE 2</b>	<b>Intelligent and Sustainable design. Elective subjects. Choose two</b>			<b>4</b>
	Eco and sustainable design	2	E	
	Product design and digitalization	2	E	
	Circular Economy in the wood and furniture sector	2	E	
<b>MODULE 3</b>	<b>Wood and New Materials. Compulsory subjects.</b>			<b>6</b>
	Wood science	2	C	
	Material for furniture manufacturing	2	C	
	Material Processing	2	C	

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	<b>MASTER'S STRUCTURE</b>		
<b>MODULE 4</b>	<b>Innovation management. Elective subjects. Choose two</b>		<b>4</b>
	<b>Innovation management systems</b>	<b>2</b>	<b>E</b>
	<b>Technological surveillance and competitive intelligence</b>	<b>2</b>	<b>E</b>
	<b>Management Systems. Lean Manufacturing.</b>	<b>2</b>	<b>E</b>
<b>Internship &amp; Dissertation</b>	<b>Internship</b>		<b>5</b>
	<b>Internship/ Practicum</b>	<b>5</b>	<b>C</b>
	<b>Master Thesis</b>		<b>5</b>
	<b>Master Thesis</b>	<b>5</b>	<b>C</b>

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The wood industry in Malaysia and ASEAN, in general face the following **challenges**:

1. Predominated by SMEs
2. Investment starved
3. Lack of data and ICT application
4. Low-waged sectors
5. Family-owned management
6. Growth driven by incremental inputs, rather than

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Therefore, the adoption and acceptance of this proposed Master's degree in Industry 4.0 will require concerted efforts to **entice, encourage, support and incentive** the industry players to move along towards greater automation, technology, and ICT applications which will **facilitate the greater awareness and need for highly skilled workers, with higher educations to fully utilize the technologies installed in the factories.**

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## *CONCLUSIONS*

Developing a new curriculum for a Master's degree in Industry 4.0 is the easy part.

The difficult part is to sell the program to the various stakeholders and ensure that sufficient enrollment into the program.

Despite the wood industry being perceived as an industry with the 3D stigma, with strong support from several industry trade associations and the relevant agencies, we are hopeful that this program will begin on a success note beginning fall 2022.

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**Thank you**  
**Terima kasih**  
**Danke**  
**Gracias**  
**Dziękuję Ci**

