

“IMPROVING MALAYSIAN HIGHER EDUCATION KNOWLEDGE TOWARDS WOOD AND FURNITURE INDUSTRY 4.0 – MAKING 4.0”

Prof. Dr. Jegatheswaran Ratnasingam
Project Leader,
Faculty of Forestry and Environment,
Universiti Putra Malaysia.



Presentation in conjunction with **ERASMUS Day** at
Universiti Putra Malaysia
15 October 2020





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


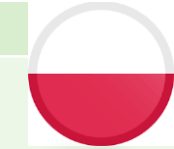





Partners:




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

Partners

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




About the Project

- 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.
- 




About the Project

- The total grant amount approved for the project is EUR 947,450.
 - The sum allocated to UPM is EUR 111,681.
 - Key Area: Capacity building in the field of Higher Education (Erasmus+ KA2-CBHE).
- 



Objectives

- 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.
- 

Roles of Partners


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

Roles of Partners

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)





Function of Lead at Beneficiary

- 1. Ensure adequate communication with coordinator and other beneficiaries.
 - 2. Support the coordinator to fulfill all tasks as per Grant Agreement.
 - 3. Submit all relevant data, financial statements and other documents, on time to coordinator.
 - 4. Provide the coordinator with other information and documents to support the project.
 - 5. Notify the coordinator promptly of any event that may substantially delay the implementation of actions.
 - 6. Inform the coordinator of any change that may affect the beneficiary in one way or another, in the smooth implementation of the project.
- 




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.
- 



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 4th Industry Revolution in the wood and furniture industry in Malaysia.
- 

Achievements

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



wood, furniture manufacturing processes and design

Wood and material processing

- Basics of material science
- New materials
- Eco-sustainability of materials
- Future trends

Automation and mechanization

- Basic of technology
- Mechanical processing of wood and wood-based materials
- Gluing technology
- Finishing technology
- Knowledge about existing types of production planning with the demand forecast

Eco-design

- Why it is important to design interactive products that are usable?
- What is eco-design, its different stages, what it provides to a company?



KETs of Industry 4.0

Technological
surveillance
and
competitive
intelligence

Cloud
Computing (CC)

Internet of
Things (IoT)

ICT/
Networking

Augmented
Reality (AR)

Additive
manufacturing

Simulation

Robotics

Lean
manufacturing

Low cost
automation

System
management

Modules of the Master and ECTS credits

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

Percentage of ECTS by Master components

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

MASTER OF ADVANCE TECHNOLOGIES AND INNOVATION FOR WOOD-BASED INDUSTRY

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


	MASTER'S STRUCTURE		
MODULE 2	Intelligent and Sustainable design. Elective subjects. Choose two		4
	Eco and sustainable design	2	E
	Product design and digitalization	2	E
	Circular Economy in the wood and furniture sector	2	E
MODULE 3	Wood and New Materials. Compulsory subjects.		6
	Wood science	2	C
	Material for furniture manufacturing	2	C
	Material Processing	2	C
MODULE 4	Innovation management. Elective subjects. Choose two		4
	Innovation management systems	2	E
	Technological surveillance and competitive intelligence	2	E
	Management Systems. Lean Manufacturing.	2	E
Internship & Dissertation	Internship		5
	Internship/ Practicum	5	C
	Master Thesis		5
	Master Thesis	5	C

Challenges

- 1. The Covid-19 pandemic has been a huge challenge as 2 consortium meetings had to be cancelled and reverted to on-line mode.
- 2. Implementation of action plans, related to purchase of equipment, was severely delayed.
- 3. Opportunities to disseminate and promote the project was also limited.
- 4. The delays in action plans, had also affected the reporting dateline to the EU. Hopefully an extension is approved.
- Stakeholder and consortium partners networking sessions were also reduced.




Risks

- 1. The execution of the action plan cannot be fulfilled, leading the repercussions from the EU, in terms of financing.
 - 2. Due to lack of promotion and engagement with stakeholders, uptake of the M.Sc. program may be limited from the industry players.
 - 3. The project completion date may need to be extended.
- 



INCENTIVES TO JOIN THE MASTER PROGRAM AT LOCAL PARTNER UNIVERSITIES

- Potential students will most likely be funded by companies or their employers.
 - A limited number of scholarship and financial grants will be made available available for students from the participating universities.
 - A KA-107 grant follow-up application has been submitted, and if approved, will support staff and students mobility.
- 



THANK YOU!

