



Industrial Engineering and
Management of European
Higher Education

WP5 Revising a new educational pathway of IE&M

Partner: UPM + ARRUTI Approach 2



This project has received funding
from the European Union's Erasmus+
programme under grant agreement
N. 2018-2279/001-001

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IE3: UPM IE&M proposal

After de analysis of the IE3 partner proposals and the key aspects from the BoK:

- ***Both academic research and educational offer refer to managerial and technical aspects of I4.0***
- ***Importance of manufacturing technologies is stressed together with importance of data processing technologies.***
- ***Companies develop educational offer based on their needs and with respect to resources available.***

Therefore, because of the last point, it is necessary to understand the different ambitions in offer that every single University can pursue, different Master configurations could be possible.

In line with the reflective analysis carried out by LIU to clarify the borders of the academic domain IE&M, we are proposing a configuration based on blocks of modules, but not forcing to a particular configuration inside the boundaries already identified.

Another key aspect is to link the industrial needs from the very beginning, by collecting real needs (cases) and using them as application cases for practical exercises during the modules (now seen as knowledge and solution providers for the case).

We are proposing a 6ECTS block enabling students to work on these assignments and having presentations of the findings to the managers of the specific sector (Health, Perishable SC, Durable SC, etc.) for the alternatives and/or laboratory solutions implementation.



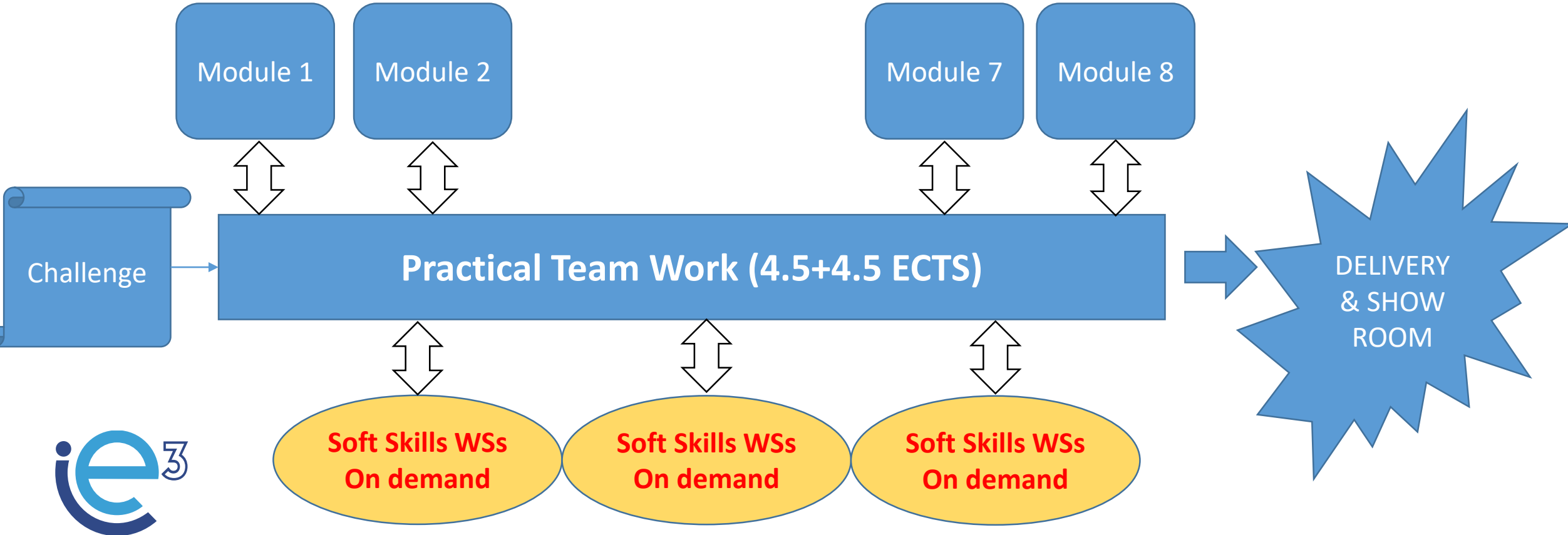
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MODULE	KEYS	SEMESTER	ECTS	CHARACTERISTICS
Advanced Project Management	<ul style="list-style-type: none"> * Managing Projects, Programs & Portfolios. * PM2, Agile, R&D. * Project WorkPlans, Scope, Quality, Risk, Tracking, Stakeholders. * Integration of I4.0 in the management. 	1	6	<ul style="list-style-type: none"> * Flipped classroom. * Discussion and score based on participation. * Practical usage in the practical module.
Innovation in operations management: value chain management in a global context	<ul style="list-style-type: none"> * Innovation in operations. * Smart I4.0 * Quantitative methods and Simulation * Value creation and Lean concepts 	1	6	<ul style="list-style-type: none"> * Service processes * Process Modelling * Quantitative Simulation * Smart production and Smart Maintenance
Supply Chain Optimization and Simulation	<ul style="list-style-type: none"> * Main Concepts * Discrete event simulation * Network simulation * Robust and resilience 	1	6	<ul style="list-style-type: none"> * Theoretical concepts * Simulation tools * Experimental designs with different goals * Critical thinking and discussion of the state of the art
Information Systems in IE&M	<ul style="list-style-type: none"> * Data from processes. * Local and cloud workflows. * Data storage and process flow. * Machine learning. 	1	6	<ul style="list-style-type: none"> * Business Intelligence tools. SQL * PLCs and wearables. Digital controllers * Beacons and BLE
Innovation and Strategic management in a global environment. Technology and Corporate Social Responsibility	<ul style="list-style-type: none"> * Organizational Business Models * Transformation of the OBM by the Technology * CSR and Values. Transparency driven by Technology * Case studies 	2	6	<ul style="list-style-type: none"> * Cases * Individual & group assignments. * Practical usage in the practical module as proposal for organization of operations. * Introduction to Research. Methodologies.
Business in an interconnected world	<ul style="list-style-type: none"> * Entrepreneurship and intraentrepreneurship. Technology as opportunity * Strategic analysis of corporative decisions. Impact of I4.0 * Sources and Tools for corporate funding * Real Options and Project finance 	2	6	<ul style="list-style-type: none"> * Cases * Individual & group assignments. * Practical usage in the practical module as proposal for organization of operations.
Big Analytics	<ul style="list-style-type: none"> * Big Data in cloud. Deep Learning modelling * Distributed processing and microservices. Elasticity * IT security * IT ethics and compliance 	2	6	<ul style="list-style-type: none"> * Hadoop and Spark * ISO 2700x, ISO 35030, ISO18045 and ISP 24760 * ISO 26000
Advanced Lean Management with Quality management as centric element	<ul style="list-style-type: none"> * Lean operation and Lean management * I4.0 integration in Value streams * Quality management in I4.0 * Value creation from the data-flows. Modelling and Improvements 	2	6	<ul style="list-style-type: none"> * Integrated vision of Quality management and Production & Services processes * Big Analytics and Quality monitoring and Prediction * Lean artifacts and I4.0

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MODULE	CONCEPT	ECTS
IPC	INTERNATIONAL PROJECT CONTEXTS	3
IMT	INDUSTRIAL MARKETING AND TECHNOLOGY	3
ICY	INTERNSHIP IN COMPANY with Supervision	12
IOT	IOT APPLICATIONS AND MANAGEMENT	3
OTC	OT CYBERSECURITY	3
QCL	MACHINE LEARNING FOR QC	3
NLP	NLP AND ARTIFICIAL INTELLIGENCE	3
MKF	MARKET FORECAST	3
ITM	ICT MANAGEMENT	3
NSA	NUMERICAL SIMULATIONS. AGENTS	3
ARM	AUGMENTED REALITY IN MANUFACTURING	3
ARQ	AUGMENTED REALITY FOR QUALITY	3



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Main strengths:

- More practical perspective. Focused in 'doing' instead of R/W.
- Enable 1Y at home + half a year/Y abroad.
- Practical Engagement enables to create social impact outside of the University.
- Design for blended learning and virtual teamworking.



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Opportunities:

- To open courses to foreign students under the agreement of the academic authorities.
- To analyze integrated degrees based on modular / semester oriented visits or remote assistance.
- To open individual courses to in-Company blended education (<http://masterimpa.d10.dinasever.com/>).

