Addendum A
to the
2020 1+1 Dual Degree Graduate Program Agreement
between Western Michigan University and Instituto Superior Técnico

Double Degree
Master in Industrial Engineering and Management (IST)/Master of Science in Industrial Engineering (WMU)
(to start in academic year 2021/2022)

Program proposal – October 19th, 2020

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Note: In this document 1 WMU credit is considered equivalent to 2 ECTS (European Credit Transfer and Accumulation System).

1 – Application and entrance admission criteria

At WMU:

- Applications
  Can be found online and a complete application will be forwarded to and reviewed by the Academic Adviser on a rolling basis.

- Admission Requirements
  1. Possess a baccalaureate degree in engineering or a related discipline. Students without an engineering degree but with appropriate background in mathematics and science will be required to take IEE 5010: Survey of Industrial Engineering Topics.
  2. Meet Graduate College admission requirements.
  3. Possess a grade point average of 3.0 or better.
  4. Submit GRE scores for the General Test.

At IST:

- Application requirements
  Students should hold or be enrolled in a BSc degree/1st cycle degree in Industrial Engineering and Management, or other BSc degree/1st cycle degree which fulfills the admission requirements to the Master degree/2nd cycle in Industrial Engineering and Management at IST (MEGI). The student's overall grade should be greater than or equal to 14 out of 20. A list with the ranking of the students that meet the requirements will be published following the order of the possible admission.

- Admission requirements
  The students are subject to an eliminatory interview, by IST and WMU representatives. The double degree is only formalized if the students are accepted in MEGI and approved in the interview. The candidates must demonstrate an excellent command of spoken and written English.

2 – Nominations and applications
For students from WMU to IST the nomination and complete application documents must be sent to IST by April 15th of the previous academic year.

For students from IST to WMU the nomination and complete application documents must be sent to WMU by March 15th of the previous academic year.

3 – Academic year start
   At WMU: Early September
   At IST: September – October

4 – Curricular plan
   There are three curricular options:
   (1) 1st year at IST (Operations and Logistics profile) and 2nd year at WMU, for IST students;
   (2) 1st year at IST (Financial Engineering profile) and 2nd year at WMU, for IST students;
   (3) 1st year at WMU and 2nd year at IST, for WMU students.
   The detailed curricular options are presented in the following tables.

(1) 1st year at IST (Operations and Logistics profile) and 2nd year at WMU

			1st Semester							2nd Semester		
		1st Quarter			2nd Quarter			3rd Quarter			4th Quarter		
		Course	ECTS	WMU Cred	Course	ECTS	WMU Cred	Course	ECTS	WMU Cred	Course	ECTS	WMU Cred
1st year @ IST *Operations and Logistics profile*	Supply Chain Management	6	3	Decision Support Models	6	3	Corporate Strategy	6	3	Logistics and Distribution (UCE 2)	6	3
	Intermediate Operations Research	6	3	Systems Simulation Models	6	3	Operations Planning and Control (UCE 1)	6	3	Optional	6	3
	Econometrics				6	3	Project Management				6	3
2nd year @ WMU	**Course**					**ECTS**	**WMU Cred**				**ECTS**	**WMU Cred**
	IEE 6040 - Facilities Planning and Design					6	3	Master's Dissertation				30	6+
	IEE 6080 - Reliability Engineering					6	3						
	Optional					6	3						
	Optional					6	3						
	Optional					6	3						

Optional courses @ IST
Multivariate Statistical Methods for Engineering and Management
Industrial Organization
Engineering Economics
Technology Based Entrepreneurship
Seminars on Innovation and Sustainable Development

Optional courses @ WMU
EM 5050 - Continuous Improvement in Operations
EM 5070 - Computer Integrated Manufacturing
EM 5080 - Advanced Quality Management
EM 5120 - Management of Service Operations
IEE 5420 - Human Factor Engineering
IEE 6570 - Studies in Industrial Engineering
IEE 6990 - Practical training

(2) 1st year at IST (Financial Engineering profile) and 2nd year at WMU

	1st Semester						2nd Semester					
	1st Quarter			2nd Quarter			3rd Quarter			4th Quarter		
	Course	ECTS	WMU Cred	Course	ECTS	WMU Cred	Course	ECTS	WMU Cred	Course	ECTS	WMU Cred
1st year @ IST *Financial Engineering profile*	Supply Chain Management	6	3	Decision Support Models	6	3	Corporate Strategy	6	3	Risk Evaluation and Management (UCE 2)	6	3
	Intermediate Operations Research	6	3	Systems Simulation Models	6	3	Quantitative Finance (UCE 1)	6	3	Optional	6	3
	Econometrics				6	3	Project Management				6	3
	Course				ECTS	WMU Cred					ECTS	WMU Cred
2nd year @ WMU	IEE 6060 - Capital Budgeting and Cost Analysis				6	3	Master's Dissertation				30	6+
	IEE 5170 - Applied Data Mining for Engineers				6	3						
	Optional				6	3						
	Optional				6	3						
	Optional				6	3						

Optional courses @ IST
Multivariate Statistical Methods for Engineering and Management
Industrial Organization
Engineering Economics
Technology Based Entrepreneurship
Seminars on Innovation and Sustainable Development

Optional courses @ WMU
EM 5050 - Continuous Improvement in Operations
EM 5070 - Computer Integrated Manufacturing
EM 5080 - Advanced Quality Management
EM 5120 - Management of Service Operations
IEE 5420 - Human Factor Engineering
IEE 6570 - Studies in Industrial Engineering
IEE 6990 - Practical training

(3) 1ˢᵗ year at WMU and 2ⁿᵈ year at IST

		1ˢᵗ Semester			2ⁿᵈ Semester		
		1ˢᵗ Quarter		2ⁿᵈ Quarter			
1ˢᵗ year @ WMU (Accelerated WMU BSE/MSE)		**Course**	**ECTS**	**WMU Cred**	**Course**	**ECTS**	**WMU Cred**
		IEE 3010 Product and Service Design	6	3	IEE 3420 Ergonomics and Design	6	3
		IEE 3110 Introduction to Operations Research	6	3	IEE 4160 Operations Control in Industry	8	4
		IEE 3100 Engineering Economy	6	3	IEE 4010 Facilities Planning and Logistics	6	3
		EM 6120 Production and Operations Management	6	3	IEE 6060 Capital Budgeting and Cost Analysis	6	3
		IEE 5170 Applied Data Mining for Engineers	6	3	IEE 6420 Ergonomics and Occupational Biomechanics	6	3

	Course	**ECTS**	**WMU Cred**	**Course**	**ECTS**	**WMU Cred**		**ECTS**	**WMU Cred**
2ⁿᵈ year @ IST	Supply Chain Management	6	3	Decision Support Models	6	3	Master's Dissertation	30	6+
	Intermediate Operations Research	6	3	Systems Simulation Models	6	3			
	Econometrics			6	3			

5 – Dissertation

    The master's dissertation will be supervised by IST and WMU, and evaluated by both parties after an oral defence.

6 – Academic and administrative representatives

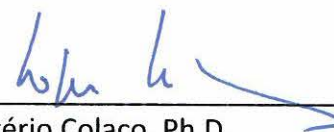| Academic responsible for the program at WMU Professor Azim Houshyar e-mail: houshyar@wmich.edu	Academic responsible for the program at IST Professor João Lourenço joao.lourenco@tecnico.ulisboa.pt
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December 10th, 2020

**Instituto Superior Técnico, University
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December 10th, 2020