

### Curricular Unit Form (FUC)

Course:	<b>INDUSTRIAL ENGINEERING MANAGEMENT</b>					
Curricular Unit (UC)	<b>Total Productive Maintenance and Lean Management</b>				Mandatory	<b>X</b>
					Optional	
Scientific Area:	Engineering and industrial management					
Year: 1º	Semester: 1º	ECTS: <b>6,6</b>		Total Hours: <b>4,5</b>		
Contact Hours:	T:	TP: <b>67,5</b>	PL:	S:	OT:	TT:
Professor in charge		Academic Degree /Title		Position		
<b>António João Feliciano Abreu</b>		<b>PhD</b>		<b>Associate Professor</b>		

T- Theoretical ; TP – Theory and practice ; PL – Laboratory ; S – Seminar ; OT –Tutorial ; TT – Total of contact hours

Entry into Force	Semester: <b>Winter</b>	Academic Year: <b>2016/2017</b>
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#### Objectives of the curricular unit and competences (max. 1000 characters)

Understand the dilemmas of process and operations' management.  
 Understand the importance and challenges of Lean management for creation of value and customer satisfaction.  
 Understand the role of Total Productive Maintenance (TPM), its objectives and the advantages achieved with its Implementation.  
 Understand the role of tools / methodologies to support maintenance activities.  
 Understand the integration of production and operations in logistics systems and supply chains ('SC');

#### Syllabus (max. 1000 characters)

1- Operations Management Context  
 2 - Introduction to lean thinking- Concept of waste, tools for identifying wastes, lean principles, lean house.  
 3 - Lean Techniques and Tools - Value Stream Mapping, Kanban, spaghetti map, SMED, 5S, A3 report, SIPOC , 5W analysis, 5W2H formula, Visual management tools, TOPS / 8D methodology, takt time, standardization of processes.  
 4 - Implementation of JIT and JIDOKA - The concept of flow, pull versus push system, heijunka leveling production, Kanban system, Milk run, supermarkets, the role of process automation, kaisen approach, Error Proofing.  
 5 - Quality 6 sigma - Concepts and metrics.  
 6 - Lean Maintenance - Maintenance function , terminology and basic concepts, Total Productive Maintenance (TPM), Reliability Centered Maintenance (RCM), LCC of an asset.  
 7- Lean Supply Chain Management.

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### Demonstration of the syllabus coherence with curricular unit's objectives (max. 1000 characters)

The chapters of the syllabus correspond to the fundamental concepts referred in the objectives of the curricular unit.

### Teaching methodologies (including evaluation) (max. 1000 characters)

Whenever appropriate the teaching methodology includes lectures with oral presentation, exhibition of real case

studies, solving exercises, and use of software in the laboratory.

In order to be approved, students must:

Have a written exam grade  $\geq 9.5$

Have a project grade  $\geq 9.5$

The final grade is given by the mean of the classifications above.

### Demonstration of the teaching methodologies coherence with the curricular unit's objectives (max. 3000 characters)

The teaching methodology will be carried out through theoretical and practical classes. On the theoretical classes are discussed the principles and the concepts that will allow the student to understand the topics covered in this course.

In order to consolidate theoretical concepts, students solve exercises and discuss case studies in practical classes.

The project aims students to develop their technical knowledge, and skills in problem solving, team working, critical thinking and communication.

### Main Bibliography (max. 1000 characters)

Pinto, João Paulo. Pensamento Lean. A filosofia das organizações vencedoras. Lidel (2ª edição), 2009.

Martin, James William. Lean Six Sigma for Supply Chain Management: The 10-step Solution Process, McGraw-Hill Professional, 2006.

Coimbra, Euclides A., Total Flow Management: Achieving Excellence with Kaizen and Lean Supply Chains, Kaizen Institute; 1st edition, 2009.

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Christopher, Martin Logistics & Supply Chain Management: creating value-adding networks (3rd Ed), FT Press; 2005.

Coyle, C. John Langley, Brian Gibson, Robert A. Novack, Edward J. Bardi, Supply Chain Management: A Logistics

Perspective John J South-Western College Pub; (8th ed.), 2008.

Heizer, J. & Render, B. Operations Management. New Jersey, Pearson Prentice Hall, 2006

Stevenson, W. Operations Management (9th ed.). Boston, Irwin / McGraw-Hill, 2006