

Lean Management and Aeronautical Maintenance

Code: 42874
ECTS Credits: 6

Degree	Type	Year	Semester
4313785 Aeronautical Management	OB	0	2

The proposed teaching and assessment methodology that appear in the guide may be subject to changes as a result of the restrictions to face-to-face class attendance imposed by the health authorities.

Contact

Name: Jose Manuel Perez de la Cruz
Email: JoseManuel.Perez@uab.cat

Use of Languages

Principal working language: spanish (spa)

External teachers

Dr. August Casanovas
Javier Sánchez-Gallego

Prerequisites

None

Objectives and Contextualisation

In a first thematic block, the objective is to generate in the students an integral reflection on the perception of work in the traditional models of the aeronautical sector, in order to develop in each of them an active reflection towards an essential sense of business subsistence through the innovation of their processes; This is what lean management pursues. In a second thematic block, the main concepts and techniques of aircraft maintenance are introduced, mainly oriented to maintenance management. The organization of a maintenance center and all associated regulations will be studied.

Competences

- Analyse the influence of the main management procedures and techniques in aeronautical maintenance on the management of airlines.
- Apply the principles and techniques of lean management to innovation and improvement in the performance of aeronautical industry processes.
- Recognise the human, economic, legal and ethical dimension in professional practice.
- Solve complex problems by adopting a rigorous, efficient approach.
- Solve problems in new or little-known situations within broader (or multidisciplinary) contexts related to the field of study.
- Use acquired knowledge as a basis for originality in the application of ideas, often in a research context.
- Work collaboratively in multidisciplinary teams.

Learning Outcomes

1. Recognise the human, economic, legal and ethical dimension in professional practice.
2. Recognise the influence lean management can have on innovation and performance improvement in aeronautical industry processes, through case studies.
3. Solve complex problems by adopting a rigorous, efficient approach.
4. Solve problems in new or little-known situations within broader (or multidisciplinary) contexts related to the field of study.
5. Understand how the management of aircraft maintenance can affect airline operations.
6. Understand how the regulations on air navigation can restrict the performance of an aircraft.
7. Understand the basic techniques of lean manufacturing and how they can help to achieve efficient production systems.
8. Understand the five basic principles of lean (the five Ss) and how they can help to improve management efficiency.
9. Understand the lean philosophy on the basis of concepts, principles and techniques studied previously.
10. Understand the main procedures and techniques for evaluating and predicting the condition, with the aim of identifying and eliminating damage and faults in the functional systems of an aircraft.
11. Understand the main processes in the management of aircraft maintenance.
12. Understand the seven wasteful practices that are typical of inefficient management.
13. Use acquired knowledge as a basis for originality in the application of ideas, often in a research context.
14. Work collaboratively in multidisciplinary teams.

Content

M8-B1: Lean Management in the aeronautical sector

1. Process Typology: Fragmented, Invisible, No focus on the internal customer.
2. Waste and expenses: Control and bad decisions, Rework.
3. Focus on homework and specialty.
4. Pyramidal Management and Hierarchy Levels.
5. Lean philosophy.
6. Lean supply chain management. Study of cases.
7. Lean manufacturing in aviation. Concepts, techniques and case studies.

M8-B2: Aeronautical Maintenance

1. Definition of aircraft maintenance: Objectives, Maintenance Programs and Requirements.
2. EASA and FAA regulations for the maintenance of aircraft and licenses.
3. The Organization of a Maintenance Center: Departments and Structure.
4. Different types of maintenance: Line, Base.
5. Maintenance centers, CAMO, POA and DOA organizations.
6. Quality Assurance in aircraft maintenance.
7. Maintenance costs and power by the hour programs. Maintenance cost evaluation. Calculation of direct and indirect costs. Calculation of fixed and variable costs.

Methodology

The general methodological approach of the subject is based on the principle of multivariety of strategies, which is intended to facilitate the active participation and construction of the learning process by the student under the principle of "learning by doing".

Annotation: Within the schedule set by the centre or degree programme, 15 minutes of one class will be reserved for students to evaluate their lecturers and their courses or modules through questionnaires.

Activities

Title	Hours	ECTS	Learning Outcomes
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Type: Directed			
Presentation of works	5	0.2	4, 14
Seminars	15	0.6	4, 1, 2, 13
Theory classes	20	0.8	8, 10, 11, 12, 9, 5, 6, 7, 1, 2
Type: Supervised			
Development of group works	50	2	3, 4, 1, 2, 13, 14
Tutorials	8	0.32	3, 1
Type: Autonomous			
Individual problem solving	20	0.8	3, 4, 1, 2
Personal study	32	1.28	8, 10, 11, 12, 9, 5, 6, 7, 13

Assessment

For any of the evaluation elements to be considered in the calculation formula of the final mark of the module (according to their weights), their individual qualification must be greater than or equal to 4.

All activities based on written reports must be submitted within the due dates indicated by the teacher. If a report-based activity is suspended, the student may resubmit his report in accordance with the corrections / indications provided by the teacher.

If a written exam is suspended, the student will have the opportunity to repeat it.

The dates of recovery of exams, as well as the dates of re-delivery of work reports will be communicated by the teacher at the beginning of the course.

The student may apply for recovery provided that he has submitted to a set of activities that represent at least two thirds of the total grade for the subject.

The elements evaluated in the recovery phase will obtain the qualification of: Pass (5) or Not pass.

There is no differentiated evaluation method for repetitive students.

To have the right to be evaluated in this module, the class attendance percentages indicated below must be accredited:

- In the face-to-face modality: 75%
- In the virtual modality: 50%

The weights of each evaluation activity are given in the following table.

Assessment Activities

Title	Weighting	Hours	ECTS	Learning Outcomes
Development in groups of a course work (report)	50 %	0	0	3, 4, 1, 2, 13, 14
Individual problem solving	30 %	0	0	3, 8, 10, 11, 12, 9, 5, 6, 7, 4, 1

Bibliography

M8-B1: Lean management in the aeronautical sector

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- HAYES, Robert H. , WHEELWRIGHT, Steven C. I CLARCK, Kim B. (1988). *DYNAMIC MANUFACTURING*. Creating The Learning Organization. The Free Press. New York. U.S.A. ISBN 0-02-914211-3
- TERSINE, Richard J. (1988). *PRINCIPLES OF INVENTORY AND MATERIALS MANAGEMENT*. Ed. Elsevier Science Publishing, Co, Inc. U.S.A., 1988 ISBN 0-444-01162-5
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- NAKAJIMA, Seiichi (1993). *TPM. MANTENIMIENTO PRODUCTIVO TOTAL*. Tecnologías de Gerencia y Producción, S.A., Madrid, 1993. ISBN 84-87022-10-3
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- CASANOVAS, August; CUATRECASAS Lluís. *LOGISTICA INTEGRAL. LEAN SUPPLY CHAIN MANAGEMENT*. Profit Editorial, 2011 ISBN 978-84-15330-51-6
- CASANOVAS, August. *ESTRATEGIA AVANZADA DE COMPRAS Y APROVISIONAMIENTO. LEAN BUYING Y OUTSOURCING*. Profit Editorial, 2011 ISBN 978-84-92956-53-1
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- J.P. Womack; D.T. Jones; D. Roos. *La máquina que cambió el mundo*. Editorial: Mc Graw Hill.
- Alberto Galgano. *Las tres revoluciones: caza del desperdicio; doblar la productividad con la "LEAN Production"*. Editorial: Díaz de Santos.
- Tapping, Don. *Gestión del flujo de valor: 8 pasos para implantar métodos de producción 'lean'*. Editorial: TGP Hoshin.

M8-B2: Electrical Maintenance

- Harry A. Kinnison and Tariq Siddique (2012) *Aviation Maintenance Management*. McGraw Hill
- EASA Standard 145.
- Dale Crane (2008) *Aviation Maintenance Technician*. Ed. Aviation Supplies & Academics, Inc .; 3rd edition.
- *Aviation Maintenance Technician Handbook-Airframe and Powerplant (FAA Handbooks)*. Ed. Aviation Supplies & Academics, Inc. (2012).
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- *Aircraft Technology Engineering & Maintenance, Magazine*. Ed. Ubm Aviation Publications.
- Thomas Wild (2008) *Aviation Maintenance Technician General Test Guide*. Ed. Avotek Information Resources.

Software

No specific software is required, only the general means and tools applicable to the follow-up of the master.