LEADERSHIP AND INDUSTRIAL SUSTAINABILITY

Code: 20910

Main Scientific Area: Health, Environment and Industrial Technologies

Lecturer: Joana Maria Marques Vale

Language of Instruction: Portuguese

Regime: S1

Contact Hours: 30h Total Workload: 130h

ECTS: 6,0

Objectives

Conscious leadership combination between management tools and sustainable practices is essential to promote sustainability in the industry and meet the growing environmental and social responsibility of companies. The students should be able to:

1. develop a project/idea using sustainable materials,

2. improve the leadership and engineering design skills,

3. The design project must promote easy product maintenance and ergonomics.

Learning Outcomes

Ability to develop project proposals in groups based on industrial sustainability, practicing and developing the essential Leader Qualities and Responsibilities.

Course Contents

1. Industrial leadership

1.1. Leader essential qualities

1.2. Leader responsibilities

1.3. Real examples

2. Technical Drawing in Industry

2.1. Design Communication

2.2. Standardization

2.3. Types of Technical Drawings

2.4. CAD (Computer-Aided Design) Software

2.5. Analysis and Verification

2.6. Process Documentation

2.7. Quality control

2.8. Error and Cost Reduction

2.9. Training and Education

2.10. Permanent Documentation

3. Ergonomics and usability

3.1. Job Design

3.2. Factory Layout

3.3. Awareness

3.4. Risk assessment

3.5. Adaptation of Tools and Equipment

3.6. Feedback from Workers

3.7. Health and Safety Policies

4. Materials and manufacturing technologies

4.1. Material Selection

4.2. Manufacturing Technologies

4.3. Quality Control Technologies

4.4. Waste Management and Sustainability

4.5. Logistics and Supply Chain

4.6. Stock management

4.7. Maintenance

4.8. Standardization and Continuous Improvement

4.9. Digital Technologies (Industry 4.0)

5. Design thinking

5.1. Understanding the Internal and External Customer

5.2. Defining Complex Problems

5.3. Generation of Creative Ideas

5.4. Prototyping and Experimentation

5.5. Multidisciplinary Collaboration

5.6. Continuous Improvement

5.7. Focus on Employee Experience

5.8. Innovation and Adaptation

6. Life Cycle Assessment (LCA and circular economy)

6.1. Identification of Circular Economy Opportunities

6.2. Environmental Impact Assessment

6.3. Product Design Improvement

6.4. Dynamic Life Cycle Assessment

6.5. Waste and By-product Management

6.6. Traceability and Transparency

6.7. Policies and Regulations

6.8. Supply Chain Optimization

7. Energy management of industrial machines and installations

7.1. Energy Audits

7.2. Continuous Monitoring

7.3. Automation and Intelligent Control

7.4. Efficiency of Engines and Equipment

7.5. Cargo Management

7.6. Renewable Energy Sources

7.7. Heat Recovery

7.8. Lighting Management

7.9. Cost Monitoring 7.10. Compliance with Machinery Standards and Regulation

Recommended Bibliography

de Moura, L. A. A. (2023).Qualidade e gestão ambiental: Sustentabilidade e ISO 14001. Freitas Bastos.

Avery, G. (2005).Leadership for sustainable futures: Achieving success in a competitive world. Edward Elgar Publishing.
Avery, G. C., Bergsteiner, H. (2011).Sustainable leadership: Honeybee and locust approaches. Routledge.

Learning and Teaching Methods

The programmatic contents of this curricular unit will enable the student to acquire a set of skills in the area of Industrial Leadership and Sustainability, more specifically, in terms of the importance of Technical Design in Industry, Ergonomics and usability, Materials and manufacturing technologies, Design Thinking , Life Cycle Assessment (LCA and circular economy), Energy Management of machines and industrial installations and work in Compliance with Machinery Standards and Regulations when executing a project.

Assessment Methods

Weekly Leader Proposal (3 values):

The duration of the Leader's weekly proposal presentation is 5 minutes.
Weekly, a Leader will be elected by the group as spokesperson, who will be responsible for ensuring ways to improve processes/product and reduce costs, according to the department they will represent in the company. Students must develop a project/idea using sustainable materials and thereby develop and improve their leadership and engineering design skills. The Design must promote easy maintenance and ergonomics of an existing or new product.
The weekly proposal has a unit value of 0.5 values. In six sessions, the leaders must take turns among themselves. Contributed so that at the end of the semester the group achieves up to 3 Values (e.g. 6x 0.5 values per session).
In all classes, groups will have approximately 45min to prepare their weekly proposal and then present it. Weekly presentations are mandatory.
In the second class, they must permanently define the group, inform the teacher and hand over a list with the dates and names of the students identifying when each member will be the weekly Leader. The division must be as balanced as possible, avoiding unnecessary repetitions of Leader. It is important to be clear which Department each one will represent as Leadership.

Group Work and Final Presentation (17 points):

Group work of 3 to 5 members.
The final group work must have a limit of 30 well-founded pages and respond to the structure proposed by the teacher.
Each group's final presentation must take place in the last class and last a maximum of 15 minutes.