UNIVERSIDADE LUSÍADA
LISBOA

Course Unit Program
Applied Technologies

Academic Year 2026/2027

## 1. Organic Unit

Faculty of Architecture and Arts

## 2. Course

DESIGN

## 3. Cycle

1st

## 4. Course Unit

Applied Technologies (L5014)

## 5. Scientific Area

## 6. Curricular Year

2nd

## 7. Type of Curricular Unit / Semester

2nd Semester



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## 8. Class type and workload (work time)

| | |
|---|---|
| Theoretical classes: | |
| Practical classes: | |
| Theoretical-Practical Classes | 30,00 |
| Tutorial Guidance: | |

## 9. ECTS Credits

3,00

## 10. Scientific Area Coordinator

## 11. Regent

Prof. Doutor RUI HUMBERTO DE MATOS DIAS

## 12. Assistants

## 13. Teaching Language

Portuguese

## 14. General Objectives

Understand raw materials and synthetic materials: elemental chemistry and properties.
Understand processes of transforming materials into products: artisanal (crafts) and industrial.
Understand the life cycle of materials and products.

## 15. Specific Objectives

Knowing how to frame the design project in light of considering materials and transforming processes, artisanal (crafts) and industrial.
Knowing how to correctly define materials and transforming processes in project development: develop sensibilities at a technical and expressive level, as well as at the level of sustainability, particularly in terms of environmental sustainability.
Knowing how to deal with technical constraints.

## 16. Skills to be acquired

Knowing how to design taking into account the correct application of materials and production techniques.
Workshop skills development, applying machines and tools available: testing materials, prototyping, small series of products execution.

## 17. Teaching Methodology



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Theoretical approaches supported by selected bibliography.
Participated presentations.
Case studies: materials, processes, techniques, products.
Practical approaches using available machines and tools.
Participated demonstrations: testing materials.
Workshop exercise monitoring.
Study tours to production units.

## 18. Course Unit Program

Metal technology:
Notion of metal and metal alloy / classification of metallic materials;
Elementary chemistry and properties;
Transforming processes: machining, forming, joining and finishing processes;
Metal technology and product design;
Environmental sustainability issues.

Polymer technology:
Notion of polymer and plastic;
Classification of polymers: natural and synthetic; synthetic (conventional): thermoplastics, thermosets and elastomers; biopolymers; composites;
Elementary chemistry and properties;
Transformation processes: continuous methods (extrusion, calendering and pultrusion) and discontinuous methods (injection, compression, transfer, blowing, rotation, thermoforming and pouring moulding);
Injection moulding technology;
Polymer technology and product design;
Environmental sustainability issues.

The program items listed above will be complemented by a practical exercise with workshop execution, bringing together the two technological components (metals and polymers) or just one (optional for students).
Other applied technologies (wood, ceramics, glass) are covered in the "Processos de Fabrico" (Manufacturing Processes) course in the 3rd year of the degree.

## 19. Assessment Methods

Two written tests.
Workshop exercise.
Student participation and commitment, attendance, punctuality and meeting deadlines.

## 20. Didactic Resources

Multimedia presentations.
Visualization of materials and products, and physical testing.
Machines and tools available in the design workshop.
Internet.
Selected bibliography.



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## 21. Sustainability Objectives

Although the aim of teaching this course and of the degree is to fulfill goal 4 of SDG defined by the UN.- quality education - the foundational basis of the UL-Lisbon Design courses is the belief that Design is a tool for the sustainable promotion of society in its ethical, social and ecological aspects. Therefore, one of the global objectives of Design teaching at ULL is to alert students to the importance of their future as designers so that it fulfils all the 17 SDG defined by the UN.

## 22. Keywords

Applied technologies
Metals
Polymers
Product design
Sustainability



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## 23. Main Bibliography

Author(s): HARPER, Charles, ed.
Title: Handbook of Plastics Technologies: The Complete Guide to Properties and Performance
Edition: 2ª Year: 2010
Local: New York
Publisher: McGraw-Hill
ISBN Code:

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Author(s): THOMPSON, Rob
Title: Manufacturing Processes for Design Professionals
Edition: reimpressão Year: 2017
Local: London
Publisher: Thames & Hudson
ISBN Code:

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Author(s): WALSH, Ronald A.; CORMIER, Denis
Title: McGraw-Hill Machining and Metalworking Handbook
Edition: 3ª Year: 2006
Local: New York
Publisher: McGraw-Hill
ISBN Code:

## 24. Complementary Bibliography

Author(s): ALESINA, Inna; LUPTON, Ellen
Title: Exploring Materials: Creative Design for Everyday Objects
Edition: Year: 2010
Local: New York
Publisher: Princeton Architectural Press
ISBN Code:

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Author(s): LEFTERI, Chris
Title: Making It: Manufacturing Techniques for Product Design
Edition: 2ª Year: 2012
Local: London
Publisher: Laurence King



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