EI
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Course Guide
Academic year 2023/24

Creation Labs 2 Materials
Cristina Subías Soto

Curse Code:	106070
Credits:	3 ECTS
Year:	3
Semester:	First Semester
Type:	Compulsory
Subject:	XXXXX
Date:	6/2/2024 11:52

This Course is taught in: Catalan
Tutorials may be carried out in: Catalan, Spanish, English

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Course Guide Index

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Course Description

Brief description

The development of man into a self-aware, rational being was marked by a continuous struggle to master and gain control of the materials available around him.

Materials are part of our lived environment. We shape them. We work with them. We use them. What are their properties? What process takes us from matter to material?

We live in an era in which the new properties of existing materials as well as the plenitude of new materials open up a wide range of possibilities for design and product development. There are more opportunities than ever to create a project or product that will stand out from the rest and have a high added value in the market.

But it's not only the functionality and effectiveness of a product or project that will determine its "success". There are many intangible aspects that will also play a role, including its emotional properties, which are a consequence of its technical and sensory properties—today, materials can interact with their users, become autonomous, or even grow and die.

Designers' work is no longer simply about finding other uses for each newly developed material. Instead, they must attempt to create and/or synthesise the most suitable materials to meet the modern needs arising in the design world.

Course objectives

Study the historical development of materials and innovations in this process, going from traditional materials to ultra-materials, and look at how materials innovation can change the world through design.

Know the specific standards linked to the mechanical, chemical or thermal properties of each material. These standards will guide designers when choosing between one material and another during the development of a design project.

Understand the physical and chemical principles that govern these standards and how they will be applied to natural, plant or animal structures. In this way, innovating with new materials or reinventing by using existing materials has to be a decision linked to the design itself, and not a consequence of a fashion or trend.

Experiment with materials as the main and first tool of the design process.

Provide students with the ability to understand materials not as a consequence of the project development process but as an instrument to be incorporated in the first stage of that process, either as a method of exploring ideas or as the very premise on which the project is based.

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Recommendations

This course is recommended for any design students who have an interest in materials and are curious to explore their possibilities.

The multidisciplinary nature of the course means that it is open to all; however, it is ideally suited to students doing the Product or Spaces specialisation.

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Contents

- Matter from a physical and conceptual standpoint
- The fundamentals of matter: essential properties and use properties.
- Materials as a source of inspiration: techniques for brainstorming ideas through materials.
- Overview of materials and solutions to new requirements:
  - Biomimicry
  - Nanotechnology
  - Sustainability

- Intelligent or adaptive materials (smart materials).

- Other materials.

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Methodology

Teaching methodology

- Theoretical classes and viewing current examples to illustrate teachings.
- Application of idea brainstorming processes through the choice of materials as the first stage of design.
- Exploration of research methods that can be useful for understanding new materials.
- Development of self-analysis methods to evaluate the results obtained.
- Individual and/or group work focused on the use and/or creation of new materials.
- Presenting completed work.
- Viewing documentaries on the latest research on materials.
- Class trip to Materfad, a materials centre.
- Classroom visit by a researcher from ICMAB (Barcelona Institute of Materials Science).
- Class trip to a technological research centre.

Activities

- Class trips/visits: to material centres, to a technology centre, a researcher joining us in the classroom as a guest lecturer.
- Class attendance.
- Participation in corrections and other activities (documentary screenings, etc.)
- Research work, analysis, design, development and application of new materials in a given context.

The first three points will make up 30% of the total grade, in line with what is indicated in the Assessment Criteria section.

The last point will make up 70% of the total grade, in line with what is indicated in the Assessment Criteria section.

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Assessment

Assessment system

The aim of the continuous assessment approach is for students to be able to track their academic performance throughout the course, in order to allow them to improve it.

From the second enrolment onwards (i.e. if you have enrolled in the course before), the assessment of the subject may consist, at the discretion of the professor(s), of a final exam, which will allow the professor(s) to evaluate if the learning outcomes listed in the course guide have been achieved. In this case, the grade achieved in the exam will also be the overall grade awarded for the course.

The final course grade will be based on a continuous assessment of students' work. The professor will monitor each student's development and progress individually. The assessment criteria are related to the acquisition of the skills corresponding to this subject, described in detail in this course guide.

The skills acquired during this course will be assessed through the presentation of one or more practical assignments (these assignments may be combined into a single work/final project).

In order to pass this course, students must get a pass grade for all the exams and/or practical exercises/assignments, and have attended all the training visits/trips, and have attended all supervised activities listed in this course guide, which are considered essential for this course.

Class attendance and participation in class trips are mandatory. Students who have an unjustified absence from more than 20% of classes or trips will be considered "Not present" for grading purposes.

Assignments, projects or work will not be accepted if submitted outside of the established deadlines or if they do not meet the submission requirements.

General Assessment Regulations

// In order to pass a course, students must obtain a minimum grade of 5.0.

// Once a student has passed a course, he or she cannot be subject to a new assessment or be re-graded on that course.

// Any student who has not submitted all assignments required to be handed in or has attended less than 80% of the classes without having justified these absences will be considered "Not Assessed" (NA). In the case of justified absence, students must contact their professor(s) once they return to class to determine how they will make up for the classes they have missed.

// In the event that a student commits any irregularity that could lead to a significant variation in an exam or assignment grade, this exam or

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assignment will be graded 0, regardless of any disciplinary proceedings that may be initiated. In the event of various such irregularities for exams or assignments pertaining to the same course, the final grade for this course will be 0.

Appeal process

Students may appeal a grade by making a formal request to this effect to the faculty. Any revisions of grades will be carried out according to the academic calendar.

Students can request for a project or exam to be reassessed at any time.

Re-assessment process

General Regulations
It is not possible to appeal a grade in the case of internships external to EINA, final degree projects, and assignments/activities that, due to their eminently practical nature, do not allow it.

To participate in the grade review, students must have previously completed and been graded on other assignments whose total weight is equivalent to a minimum of two thirds of the total grade for the course or module.

To be eligible for re-assessment, students must have attended more than 80% of the classes/class trips and have completed all their assignments.

The re-assessment process may consist of a correction/extension of previous work or a final exam that will assess students' acquisition of the skills and competencies imparted during this course.

The maximum grade that can be obtained in the re-assessment is a 6, and this grade will replace the previous grades.

Assessment Criteria

70% of the final grade will correspond to the assignment(s), research work, analysis, design and development and application of a new material in a specific context (the exercises/assignments may be merged into a single work). The completeness, development and presentation of the documents that need to be handed in will also be assessed.

30% of the grade will correspond to the professor's monitoring of the student's progress over time, as well as the student's participation in tutorials, workshops and work sessions. Part of this percentage will correspond to classroom/class trip attendance.

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Biography and Resources

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Dalcacio Reis. (2010). "Product design in the sustainable era". Taschen. Paris.

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Arquitectura y diseño.

Etienne Guyon - Alice Pedregosa - Beatrice Salviat. "Matiére De quoiest fait le monde?" Editeur: Belin (23 mars 2010 Collection: Bibliothèque scientifique)

Frank Kaltenbach (ed). (2007). "Materiales translúcidos, vidrio, plástico, metal.” Ed. Gustavo Gili. Barcelona.

George M. Beylerian - Andrew Dent. "Ultramateriales. Formas en que la innovación en los materiales cambia el mundo". Ed. Blume.

Guillermo Aguilar Sahagún. "El hombre y los materiales". Ed. FCE Fondo de cultura económica México.

Guillermo Aguilar Sahagún, Salvador Cruz Jiménez, Jorge Flores Valdés. "Una ojeada a la materia". Ed. FCE Fondo de cultura económica México.

Janine M. Benyus. "Biomímesis. Cómo la ciencia innova inspirándose en la naturaleza". Ed. Tusquets.

Javier Peña Andrés. (2009). "Selección de materiales en el proceso de diseño". Ediciones CPG.

Klaus-Michael Koch. (2004). "Membrane Structures. Innovative building with films and fabric". Ed Prestel. Munich.

Linda Nussbaumer. (2011). "Inclusive Design: A Universal Need”. Fairchild Pubns. Wilmington.

"Mater in progress. Nuevos materiales, nueva industria". Barcelona

Materio “Material World 3. Innovative materials for architecture and design" Ed. Frame Publishers

Peter Zumthor. (2006) "Atmósferas" Ed. Gustavo Gili. Barcelona.

Rafael Serra (1993). "Les energies a l'arquitectura". Edicions UPC. Barcelona.

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Roberto Verganti. (2009). "Design-Driven Innovation: Changing the Rules of Competition by Radically Innovating What Things Mean". Harvard Business School Press. Boston.

S. Kalpakjian, S.R. Schmid. (2008). "Manufactura, ingeniería y tecnologia". Ed. Pearson Educación, México.

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http://es.materfad.com/materiales
http://www.inventables.com
http://www.materialslibrary.org.uk
http://www.materia.nl
http://www.materio.com
https://mtrl.com/en/

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Competencies and Learning Outcomes

Documents related to the student's learning development capacity in the subject. We can differentiate between three types of competencies: basic, specific and transversal. Basic competencies are defined based on the official Degree Plan. The specific and transversal competencies depend on the subject.

You must select on Sharepoint the competencies and learning outcomes of the class.

Specific Competences Competency

CE3 Synthesise knowledge and skills including as pertaining to artistic expression, graphic representation techniques, as well as productive materials and technologies that allow for the planning and development of design projects.

Learning Outcomes

CE.3.1 Relate formal and expressive design solutions to materials, their characteristics, behaviours, transformation processes and the treatment of finishes to come up with design project proposals.

CE3.5 Use the language of materials, their meanings and their expressive properties.

Competency

CE7 Demonstrate an understanding of materials and their qualities, as well as if manufacturing processes and costs. Be familiar with the materials and transformation processes that are most commonly in each professional design field.

CE7.3 Describe the characteristics, behaviours, benefits and applications of each material.

CE7.4 Be aware of the industrial systems for the transformation of materials in order to propose design projects.

CE7.5 Define the construction technologies and facilities necessary to make interior design projects viable.

CE7.6 Be aware of industrial construction technologies and treatment of common materials in product design.

CE7.7 Use the resources provided by the graphic arts for the development of design projects.

CE7.9 Choose the materials and transformation processes that adapt to the functional and expressive needs of each design.

CE17 Present and justify, orally and in writing, the results and work processes of the design objects created.

CE17.2 Prepare a written report on the project and defend it orally.

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CE20 Demonstrate the ability to effectively apply elementary physical principles and basic mathematical tools in the conceptualisation and creation of design projects.

CE20.2 Verify, during the design process, and demonstrate in the design presentation, how elementary physical principles apply to and act on the designed objects and spaces.

Transversal Competencies

CT9 Problem-solving and decision-making capacity.

CT10 Concern for quality, both in the concepts created and arguments presented, as well as in the formal solution and in the details of the finalised design project

CT11 Ability to adapt to the national and international job market and, in particular, to the technological, social and economic changes that are taking place in the modern world.

CT13 Make design choices that are based on a respect for the environment and that follow sustainability criteria.

CT12 Ability to integrate and synthesise knowledge acquired in different contexts and situations, with flexibility and creativity.

CT17 Demonstrate an awareness of innovative trends, new languages and cultural proposals.

CT20 Demonstrate a predisposition towards the rigour and experimentation inherent to the scientific method.

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