**Universidad de Valladolid**

## Course Syllabus

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| **Subject** | CREATIVITY AND INNOVATION IN INDUSTRIAL DESIGN |
| **Degree** | INDUSTRIAL ENGINEERING INTERNATIONAL SEMESTER |
| | TRANSVERSAL COURSE FOR THE SEVEN BACHELOR'S DEGREES TAUGHT IN INDUSTRIAL ENGINEERING |
| **Code** | 75000 |
| **Semester** | Second semester |
| **Type** | Optional |
| **ECTS credits** | 6 |
| **Lenguage** | English |

| **Teaching staff (contact information)** | *Name* | *Location* | *email* |
|---|---|---|---|
| | Nieves Fernández Villalobos | 400 office ETSAV | nfvillalobos@arq.uva.es |
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| **Departments** | Theory of Architecture and Architectural Projects. |

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## 1. Sense of the Course

### 1.1 Contextualization

The subject is part of the International Semester. It is one of the three subjects that students can choose to study in addition to the final project.

### 1.2 Relationship with other subjects

The elective subjects that the student can choose in the international semester are:

Environment and Renewable Energy
Science, Technology and Society
**Creativity and Innovation in Industrial Design**
System Dynamics. Modelling and Simulation in Engineering
Technical Projects Development and Manufacturing Engineering
Spanish Course.- Language Centre

### 1.3 Recommended Prior Knowledge

Although it is not obligatory, it is advisable that the student knows how to use some computer drawing tools of design.

## 2. Competences

### 2.1 Generic competences

- Capacity for abstraction, analysis and synthesis.
- Ability to organize and planning time.
- Critical reasoning ability / logical analysis.
- Ability to apply knowledge to practice.
- Capacity to work in a team effectively.
- Capacity for creativity and innovation.

### 2.2 Specific competences

- Project Culture: ability to adapt creativity, methodological tools and acquired knowledge to solve problems of different nature, related to the development of the product.
- Ability to communicate in formal graphic and symbolic languages
- Transversality of knowledge
- Implementation of industrial design and development projects
- Ability to plan the development phases of a product at the conceptual level.
- Capacidad para determinar los requerimientos formales y funcionales de un producto.
- Ability to project, visualize and communicate ideas.

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### 3. Course goals

- Students will know the current trends in industrial design and the challenges of the discipline and will use them as a starting point for creation and innovation.(1)
- Students will analyze different products and will extract from them their innovation strategies. (1)
- Students will know and apply creative techniques in the development of design projects. (2)
- Students will create drawings prior to final design ideation, and discuss critically about the process, choice of alternatives and decision making in the final result.(2 Y 3)
- Students will know and apply the methods and techniques for the semiotic analysis.(3)
- Students will develop skills for creating visual messages. (3 y 4)
- Students will understand, apply and implement the basic principles of visual, graphic and compositional language. (4)
- Students will apply the main concepts of Graphic Design in different projects. (4)

### 4. Learning Units

| Unit 1: | Innovation in industrial design. Evolution of the discipline, current trends and challenges for innovation. |
|---|---|

**Workload in credits ECTS:** 1,6

#### a. Course goals

- Students will know the current trends in industrial design and the challenges of the discipline and will use them as a starting point for creation and innovation.
- Students will analyze different products and will extract from them their innovation strategies.

#### b. Contents

- Innovation in industrial design. Basic concepts and tools for innovation.
- Icons of innovation in the discipline.
- Design social utopia or reality? Trends and design challenges: emotional design, critical design, inclusive design, design for extreme situations, health design, green design, etc.

#### c. Bibliography

BASIC BIBLIOGRAPHY:
AICHER, Otl: *El mundo como proyecto.* Barcelona: Gustavo Gili, 1997.
BONSIEPE, Gui, *El diseño de la periferia*. Debates y experiencias. Barcelona: Gustavo Gili, 1985.
BRAUNGART, Michael; McDONOUGH, William: *Cradle to Cradle. De la cuna a la cuna. Rediseñando la forma en que hacemos las cosas.* Madrid: McGraw Hill, 2005 (1ª ed. 2003).
PAPANEK, Victor: *Diseñar para el mundo real: ecología humana y cambio social.* Madrid: Blume, 1977.
WOODHAM, Jonathan M.: "Design and Social Responsibility". *Twentieth Century Design.* Londres, Oxford: Oxford University Press, 1997. Págs. 221- 239.

COMPLEMENTARY BIBLIOGRAPHY:

A.A.V.V. (ANTONELLI, Paola (ed.)): *Safe. Design Takes on Risk.* Nueva York: The Museum of Modern Art, 2005.

A.A.V.V. (HURTADO, Rosario y FEO, Roberto): *Diseños para Todos.* Madrid: Optima!, 2008

A.A.V.V. (SMITH, Cynthia E.), *Design for the other 90%.* Nueva York: Smithsonian, Cooper-Hewitt, National Design Museum, 2007.

BARBEZO, Silvia; COZZO, Brunella: *Ecodesign.* Ullmann. Köningswinter, 2009.

BROWER, Cara; MALLORY, Rachel; OHLMAN, Zachary: *Diseño eco-experimental.* Barcelona: Gustavo Gili, 2007. (1ª ed. Experimental Eco-Design. Rotovision, 2005.)

FIELL, Charlotte & Peter (eds.): *Designing the 21st Century.* Colonia: Taschen, 2003.

HERWIG, Oliver: *Universal Design. Solutions for a barrier-free living.* Basel: Birkhäuser, 2008.

NORMAN, D.A.: *La psicología de los objetos cotidianos*. Ed. Nerea, Madrid, 1990.

NORMAN, Donald A.: *Por qué nos gustan o no los objetos cotidianos.* Barcelona: Paidos, 2005.

NORMAN, Donald A*. El diseño de los objetos del futuro. La interacción entre el hombre y la máquina.* Paidós, Barcelona, 2010.

PIBERNAT, Oriol (comis.) *La utilidad del diseño*. Madrid: Círculo de Bellas Artes, 2008.

PUYUELO CAZORLA, Marina; MERINO SANJUAN, Mª Dolores (comis.): *Reptes de Disseny/Retos del Diseño/ Design Challenges*. Valencia: Universitat Politècnica de València, 2009.

UPHAUS, Nicolas (ed.): *Ecological Design*. Italia: teNeues, 2008.

VIÑOLAS MARLET, Joaquim: *Diseño Ecológico. Hacia un diseño y una producción en armonía con la naturaleza*. Barcelona: Blume, 2005.

### d. Timing

| ECTS CREDITS | EXPECTED DEVELOPMENT PERIOD |
|---|---|
| 1,6 | 8 FIRST WEEKS |

**Unit 2:** **The creative process. Creativity techniques.**

**Workload in credits ECTS:** 1,6

### a. Course goals

- Students will know and apply creative techniques in the development of design projects.
- Students will create drawings prior to final design ideation, and discuss critically about the process, choice of alternatives and decision making in the final result.

### b. Contents

- Introduction to industrial design. The design process. Phases.
- Creativity. The process of creativity.
- Creativity techniques: association of ideas, brainstorming, sleepwriting, automatic writing, esperpento, forced relationships, Synectics, etc.

#### c. Bibliography

BASIC BIBLIOGRAPHY:

GÓMEZ-SENENT, E. *Las fases del proyecto y su metodología.* Valencia: ETSII, 1992.

MUNARI, Bruno. *Cómo nacen los objetos. Apuntes para una metodología proyectual.* Barcelona: Gustavo Gili, 1983.

RICARD, André. *La aventura creativa.* Barcelona: Ariel, 2000.

COMPLEMENTARY BIBLIOGRAPHY:

ACHA, Juan: *Introducción a la creatividad artística.* Méjico: Trillas, 2008.

ALONSO MONREAL, Carlos: *Qué es la creatividad.* Madrid: Biblioteca Nueva, D.L., 2000.

BASSAT, Luis: *La Creatividad.* Barcelona: Conecta, 2014.

GÓMEZ-SENENT, E. *Las fases del proyecto y su metodología.* Valencia: ETSII, 1992.

RICARTE BESCÓS, José María: Procesos y técnicas publicitarias: ideas básicas. Bellaterra: Universitat Autònoma de Barcelona, 2000.

VALDERRAMA, Beatriz: *Creatividad Inteligente: guía para convertir ideas en innovación*. Madrid: Pearson, 2012.

#### d. Timing

| ECTS CREDITS | EXPECTED DEVELOPMENT PERIOD |
|:---:|:---|
| 1,6 | 8 FIRST WEEKS |

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**Unit 3:** **Visual Thinking. Process and development.**

**Workload in credits ECTS:** 1,4

#### a. Course goals

- Students will create drawings prior to final design ideation, and discuss critically about the process, choice of alternatives and decision making in the final result.
- Students will know and apply the methods and techniques for the semiotic analysis.
- Students will develop skills for creating visual messages.

#### b. Contents

- Introduction to visual thinking and process: See, watch, imagine, show.
- Problem solving. Group Graphics and procedures.
- Storyboarding and Idea Mapping. Visual Planning and Digital Capture.

#### c. Bibliography

BASIC BIBLIOGRAPHY:

ARNHEIM, Rudolph. *El pensamiento visual.* Buenos Aires: Eudeba, 1971.

BUZAN, Tony: *Cómo crear mapas mentales.* Barcelona: Urano, 2013.

CROSS, Nigel: *Design Thinking.* Gran Bretaña: Bloomsbury, 2011.

ROAM, Dan: *Tu mundo en una servilleta*. Barcelona: Gestión 2000, 2010.

SIBBET, David: *Visual Meetings: How Graphics, Sticky Notes and Idea Mapping Can Transform Group Productivity.* Hoboken, NJ: Wilely, 2010.


COMPLEMENTARY BIBLIOGRAPHY:

AUMONT, J.: *La imagen*. Barcelona: Paidós, 1992.

BARTHES, R.: *La aventura semiológica*. Barcelona: Paidós, 1993.

ROAM, Dan*: La Clave es la servilleta*: Resolver problemas y vender ideas mediante dibujos. Barcelona: Gestión 2000, 2013.

VOGEL, Craig; CAGAN, Jonathan; BOATWRIGHT, Peter: *The design of things to come: How ordinary people create extraordinary products*. New Jersey: Wharton school publishing, Pearson education, 2005.

### d. Timing

| ECTS CREDITS | EXPECTED DEVELOPMENT PERIOD |
|---|---|
| 1,4 | 7 LAST WEEKS |

**Unit 4:** **Graphic creation processes. Visual communication.**

**Workload in credits ECTS:** 1,4

### a. Course goals

- Students will develop skills for creating visual messages.
- Students will understand, apply and implement the basic principles of visual, graphic and compositional language.
- Students will apply the main concepts of Graphic Design in different projects.

### b. Contents

- Visual Representation and graphic design concepts.
- Methodology graphic project: planning, visual communication strategies and phases of a graphic project.
- Corporate Visual Identity: identity, identification levels and methodology.

### c. Bibliography

BASIC BIBLIOGRAPHY:

ARNHEIM, Rudolph. *Arte y percepción visual: psicología del ojo creador*, Alianza, 1979.

CHAVES, N: *La imagen corporativa: Teoría y metodología de la identificación institucional*. Gustavo Gili, Barcelona (3ª Ed., 1994).

DONDIS, D.A.: *La sintaxis de la imagen. Introducción al alfabeto visua*l. Gustavo Gili, Barcelona, 1997.

SWANN, A: Bases del Diseño Gráfico. Gustavo Gili, Barcelona, 1990.

COMPLEMENTARY BIBLIOGRAPHY:

ADAMS, S. y MORIOKA, N: Logo Design Workbook: A Hands-On Guide to Creating Logos. Rockport Publishers, Inc. 2004.

ARNHEIM, Rudolph. El pensamiento visual. Buenos Aires: Eudeba, 1971.

BARTHES, R.: La aventura semiológica. Barcelona, Paidós, 1993.

FLOCH, J.M.: Semiótica, marketing y comunicación; bajo los signos, las estrategias. Paidós Comunicación, Barcelona, 1993.

KANIZSA, G.: Gramática de la visión percepción y pensamiento. Barcelona, Paidós, 1998.

MUNARI, B: Diseño y Comunicación Visual, contribución a una metodología didáctica. Gustavo Gili, Barcelona, 1996.

LEBORG, C: Visual Grammar. Princeton Architectural Press, New York, 2006.

LUPTON, E: Graphic Design Thinking. Princeton Architectural Press, Maryland Institute College of Art, New York, 2008.

LUPTON, E. y PHILLIPS J.C: Graphic Design The New Basics. Princeton Architectural Press, New York, 2008.

SEBEOK, T.A: Signo, una introducción a la semiótica. Paidós Comunicación, Barcelona, 1996.

POULLIN, R: The Language of Graphic Design: An Illustrated Handbook for Understanding Fundamental Design Principles. Rockport Publishers, 2011.

WHEELER, A: Designing Brand Identity. An essential guide for the entire branding team. John Wiley & Sons, Inc., Hoboken, New Jersey, 2009 (3th edition)

ZELANSKY, P. y FISCHER, M.P. Color. Blume, Madrid, 2001.

### d. Timing

| ECTS CREDITS | EXPECTED DEVELOPMENT PERIOD |
|---|---|
| 1,4 | 7 LAST WEEKS |

## 5. Teaching and Learning Methods

The course consists of 4 modules or learning units; each one is divided into theoretic lessons, workshop/ practices, public corrections or checking and concerted tutoring classes.

The lectures will use primarily expository method for transmitting the fundamental knowledge of the subject. Active student participation will be encouraged.

In the tutoring classes a personal relationship between teacher and students will be established. They are usually developed in groups, previously arranged, in order to check the proper development of the work, prior to final delivery.

The practical classes/workshop will support for understanding and deepening of the concepts provided in lectures. The exercises will be done individually or in small groups, depending on the activity to develop and the number of students enrolled. Some of the works will be done in the classroom and others in non-attendance hours. All the works of each learning unit will be presented to the teacher and other students and handed to the teacher on the dates indicated in the schedule presented below.

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### 6. Dedication of the student to the subject

| PRESENTIAL ACTIVITIES | HOURS | NON PRESENTIAL ACTIVITIES | HOURS |
|---|---|---|---|
| Learning Unit 1: theorical, exercises and project | 16 | Learning Unit 1: exercises and project | 24 |
| Learning Unit 2: theorical, exercises and project | 16 | Learning Unit 2: exercises and project | 24 |
| Learning Unit 3 : theorical and exercises | 14 | Learning Unit 3 : exercises | 21 |
| Learning Unit 4: theorical, exercises and project | 14 | Learning Unit 4: exercises and project | 21 |
| **Total presential** | **60** | **Total non presential** | **90** |

### 7. Activities evaluated and grading system

- The evaluation of students in **ordinary call** will be held according to the following parameters:
    - Attendance, Participation, Activities and Works made in Learning Unit 1: 25%
    - Attendance, Participation, Activities and Works made in Unit 2: 25%
    - Attendance,  Participation, Activities and Works made in Unit 3: 25%
    - Attendance, Participation, Activities and Works made in Unit 4: 25%

To pass the course is essential to approve each of the parts separately.

- The evaluation of students in **extraordinary call** will be held according to the following parameters:
    - Activities and Works made in Learning Unit 1: 25%
    - Activities and Works made in Learning Unit 2: 25%
    - Activities and Works made in Learning Unit 3: 25%
    - Activities and Works made in Learning Unit 4: 25%

To pass the course is essential to approve each of the parts separately.

### 8. Additional Considerations