

## 66217 - The Research Process in Chemical Engineering

### Información del Plan Docente

<b>Academic Year</b>	2016/17
<b>Academic center</b>	110 - Escuela de Ingeniería y Arquitectura
<b>Degree</b>	531 - Master's in Chemical Engineering
<b>ECTS</b>	4.5
<b>Course</b>	1
<b>Period</b>	Second semester
<b>Subject Type</b>	Compulsory
<b>Module</b>	---

### **1.Basic info**

#### **1.1.Recommendations to take this course**

#### **1.2.Activities and key dates for the course**

### **2.Initiation**

#### **2.1.Learning outcomes that define the subject**

#### **2.2.Introduction**

### **3.Context and competences**

#### **3.1.Goals**

#### **3.2.Context and meaning of the subject in the degree**

#### **3.3.Competences**

#### **3.4.Importance of learning outcomes**

### **4.Evaluation**

### **5.Activities and resources**

#### **5.1.General methodological presentation**

The learning process that is designed for this subject is based on the following: Lectures, problem solving (cases), and regular deliveries of personal work, in order to increase the student participation. In the lectures the fundamentals of each topic will be presented. Model cases will be presented and analyzed for a better comprehension.

The problems and the personal work, under tuition, are an effective complement and way to allow and verify the comprehension of each concept. Problems will be developed in the computer room, where, the students may to follow the explanation on-line for a better analysis and understanding of experimental design cases and data analysis.

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### 5.2.Learning activities

The program offered to the students is planned to achieve the expected results and includes the following activities:

- Lectures (15 h) where theory of the different issues that have been proposed will be taught.
- Practical classes at the computers room (30 h). In these classes, practical cases will be solved by students supervised by the professor. Problems or cases will be related to the theoretical part explained in lectures.
- Personal work and tuition (15 h). 2-3 activities will be suggested and developed under tuition.
- Individual study (46.5 h). It is strongly recommended, to the students, to perform the study continuously throughout the semester. This includes tutorial hours.

### 5.3.Program

Section 1. Scientific information searching.

- Lesson 1. The research process.
- Lesson 2. Scientific information sources.

Section 2. Research funding.

- Lesson 3. Funding sources.
- Lesson 4. National funding.
- Lesson 5. International funding. Horizon 2020.

Section 3. Design and analysis of experiments.

- Lesson 6. Fundamental elements of statistic.
- Lesson 7. The 2 k factorial design.
- Lesson 8. Statistic process control.

Section 4. Research results publishing and transfer.

- Lesson 9. Scientific papers, books writing.
- Lesson 10. Oral presentations.
- Lesson 11. Patents.

Section 5. Additional aspects.

- Lesson 12. Research career.

### 5.4.Planning and scheduling

Schedule sessions and presentation of personal work, Lectures and solving problems classes are held according to schedule established by the EINA Faculty. Every teacher also will inform the students about individual tutorial schedule.

**5.5. Bibliography and recommended resources**

- BB** Day, Robert A.. Cómo escribir y publicar trabajos científicos / Robert A. Day y Barbara Gastel . - 4ª ed. en español Washington, D.C. : Organización Panamericana de la Salud, 2008
- BB** Gutiérrez Pulido, Humberto. Análisis y diseño de experimentos / Humberto Gutiérrez Pulido, Román de la Vara Salazar . - 3ª ed. México [etc.] : McGraw-Hill, cop. 2012
- BB** Katz, Michael Jay. From research to manuscript : a guide to scientific writing / by Michael Jay Katz Milton Keynes [United kingdom] : Springer, cop. 2009
- BB** MacClave, James T.. Statistics / James T. MacClave, Terry Sincich . - 9th ed. Upper Saddle River, NJ. : Prentice Hall, cop. 2003
- BB** Montgomery, Douglas C.. Control estadístico de la calidad / Douglas C. Montgomery. - 3a ed. México : Limusa, [2007]
- BC** Laszlo, Pierre.. Communicating Science [Recurso electrónico] : A Practical Guide / by Pierre Laszlo. Berlin, Heidelberg : Springer-Verlag Berlin Heidelberg, 2006.
- BC** Lazic, Zivorad R.. Design of experiments in chemical engineering : a practical guide / Zivorad R. Lazic . - 1st ed., 1st repr. Weinheim : Wiley-VCH, 2007

**LISTADO DE URLs:**

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Ministerio de Economía y Competitividad. Secretaría de Estado de Investigación, desarrollo e Innovación. - [<http://www.idi.mineco.gob.es>]