# 66228 - Paper Technology

**Información del Plan Docente**

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| **Academic Year** | 2017/18 |
| **Faculty / School** | 110 - Escuela de Ingeniería y Arquitectura |
| **Degree** | 531 - Master's in Chemical Engineering |
| **ECTS** | 3.0 |
| **Year** | 1 |
| **Semester** | Half-yearly |
| **Subject Type** | Optional |
| **Module** | --- |

## 1.General information

## 1.1.Introduction

## 1.2.Recommendations to take this course

## 1.3.Context and importance of this course in the degree

## 1.4.Activities and key dates

## 2.Learning goals

## 2.1.Learning goals

## 2.2.Importance of learning goals

## 3.Aims of the course and competences

## 3.1.Aims of the course

## 3.2.Competences

## 4.Assessment (1st and 2nd call)

## 4.1.Assessment tasks (description of tasks, marking system and assessment criteria)

## 5.Methodology, learning tasks, syllabus and resources

## 5.1.Methodological overview

The methodology followed in this course is oriented towards achievement of the learning objectives. A wide range of teaching and learning tasks are implemented, such as lectures, group work, visits, assignments, autonomous work, and assessment.

Classroom materials will be available via Moodle. These include a repository of the lecture notes used in class, the course syllabus, as well as other course-specific learning materials.

# 66228 - Paper Technology

## 5.2.Learning tasks

The course includes the following learning tasks:

- Lectures (18 hours). The main concepts will be explained.
- Group work (10 hours). Group work in class under the supervision of the professor.
- Visits (2 hours). Visits to pulp and paper plants, so students can work on a real case.
- Autonomous work (25 hours).
- Guided assignment (16 hours).
- Assessment (4 hours).

## 5.3.Syllabus

The course will address the following topics:

1. The paper industry. Types and characteristics. Chemical, semi-chemical, mechanical, thermomechanical and recovered paper processes.
2. Raw materials: wood, crops, residues, recovered papers. Fiber properties.
3. Types of paper. Structure and properties of paper. Industrial papers, for writing, tissue. Properties: structural, mechanical, surface, barrier.
4. The process of pulp production. Unit operations. Digestion, Bleaching, Disintegration, Refining, Pulping. Design of production processes.
5. Paper production and quality control. Wet end and dry end operations. Testing of pulp and paper.
6. Chemicals in the paper industry. Chemicals added in the pulp and paper production.
7. Environmental aspects of the pulp and paper industry. Emission levels. Resource management. Best available techniques. Energy management.

## 5.4.Course planning and calendar

Provisional course planning

- Topic 1: The paper industry. 2 h (l)
- Topic 2: Raw Materials. 2 h (l)
- Topic 3: Types of Paper. 2 h (l)
- Topic 4: The pulp production process. 4 h (l), 3 h (gw)
- Topic 5: paper production process and quality control. 3 h (l), 3 h (gw)
- Topic 6: Chemicals in the paper industry. 3 h (l), 2 h (gw)
- Topic 7: Environmental aspects of the industry of pulp and paper. 4 h (l), 2 h (gw)

* Legend: l =lecture, gw =Group work in the classroom

## 5.5.Bibliography and recommended resources


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| **BB** | Bajpai, P. Environmentally Friendly Production of Pulp and Paper / P. Bajpai. Ed. Wiley. 2010 |
| **BB** | Smook, Gary A.. Handbook for pulp & paper technologists / Gary A. Smook . - 3rd ed. Vancouver : Angus Wilde, cop. 2002 |


**LISTADO DE URLs:**

ASPAPEL (Asociación Española de

# 66228 - Paper Technology

Fabricantes de Pasta, Papel y Cartón) - [
http://www.aspapel.es]
Documento de referencia de Mejores
Técnicas Disponibles en la industria de la
pasta y el papel Ministerio del Medio
Ambiente - [
http://www.prtr-es.es/data/images/BREF%20Pasta%20y%20Papel%20(versi%C3