

Course guide

220233 - 220233 - Simulation and Physicochemical Technology for the Manufacturing of Biomaterials, Pulp and Paper Products

Last modified: 19/04/2023

Unit in charge: Terrassa School of Industrial, Aerospace and Audiovisual Engineering

Teaching unit: 714 - ETP - Department of Textile and Paper Engineering.

Degree: MASTER'S DEGREE IN INDUSTRIAL ENGINEERING (Syllabus 2013). (Optional subject).

Academic year: 2023

ECTS Credits: 5.0

Languages: Catalan, Spanish

LECTURER

Coordinating lecturer: MARIA BLANCA RONCERO VIVERO

Others: SILVIA GALEA MARTINEZ

DEGREE COMPETENCES TO WHICH THE SUBJECT CONTRIBUTES

Specific:

1. Ability to analyze, implement and project the main unitary operations and systems which compose manufacturing processes of fibrous materials (biomaterials, core and paper).
2. Ability to analyze and evaluate the physical, mechanical and optical properties about specific fibrous materials (biomaterials, core and paper).
3. Ability to develop new types of paper or paper products according to their specifications and specific technical applications.
4. Ability to select and evaluate various sources of vegetable fibers suitable for the manufacture of fibrous materials (biomaterials, pulp and paper) with certain technical characteristics.

TEACHING METHODOLOGY

LEARNING OBJECTIVES OF THE SUBJECT

STUDY LOAD

Type	Hours	Percentage
Hours large group	30,0	24.00
Self study	80,0	64.00
Hours small group	15,0	12.00

Total learning time: 125 h

CONTENTS

(ENG) Mòdul 1: Introducció a la simulació

Full-or-part-time: 4h

Theory classes: 1h

Self study : 3h

(ENG) Mòdul 2: Simulador de processos paperers CADSIM

Full-or-part-time: 12h

Theory classes: 4h

Self study : 8h

(ENG) Mòdul 3: Mòduls de simulació de CADSIM

Full-or-part-time: 38h

Theory classes: 10h

Laboratory classes: 4h

Self study : 24h

(ENG) Mòdul 4: Intercanvi de dades

Full-or-part-time: 29h

Theory classes: 8h

Laboratory classes: 3h

Self study : 18h

(ENG) Mòdul 5: Additius Funcionals-I

Full-or-part-time: 12h

Theory classes: 2h

Laboratory classes: 2h

Self study : 8h

(ENG) Mòdul 6: Additius Funcionals-II

Full-or-part-time: 14h

Theory classes: 3h

Laboratory classes: 2h

Self study : 9h

(ENG) Mòdul 7: Additius de control

Full-or-part-time: 16h

Theory classes: 2h

Laboratory classes: 4h

Self study : 10h

GRADING SYSTEM

Each student's overall mark will be the sum of the individual marks obtained in the following assessment events:

- Activity 1 (Evaluation of knowledge acquisition through written exam: Midterm exam): 35%.
- Activity 2 (Evaluation of laboratory activities from written reports and oral presentations): Evaluation of laboratory activities: 30%
- Activity 3 (Evaluation of knowledge acquisition through written exam: Final exam): 35%.

The unsatisfactory result in the midterm exam (Activity 1) may be redirected by a written test on the day set for the final exam (Activity 3). Students who didn't assist at the midterm exam (Activity 1) or with a grade lower than 5.0 in the midterm exam (Activity 1) can access this test. The grade obtained in the redirected test will replace the initial grade as long as it is higher.

- EV4 (Evaluation of practical case solving and assignments from written reports and oral presentations): 20%

For those students who meet the requirements and submit to the reevaluation examination, the grade of the reevaluation exam will replace the grades of all the on-site written evaluation acts (tests, midterm and final exams) and the grades obtained during the course for lab practices, works, projects and presentations will be kept.

If the final grade after reevaluation is lower than 5.0, it will replace the initial one only if it is higher. If the final grade after reevaluation is greater or equal to 5.0, the final grade of the subject will be pass 5.0.

EXAMINATION RULES.

Written practical reports are to be prepared individually by each student. Passing the subject requires completing the practical activities and delivering the corresponding reports.

BIBLIOGRAPHY

Basic:

- Aurel Systems Inc. CADSIM Plus: the dynamic electronic flowsheet processor simulator.
- Ek, M.; Gellerstedt, G.; Henriksson, G. Pulp and paper chemistry and technology, vol. 3, Paper chemistry and technology. Berlin: De Gruyter, 2009. ISBN 9783110213430.
- Cátedra de Tecnología Papelera, CIPAGRAF. Los productos químicos auxiliares en la industria papelera. Terrassa: ETSiIT, 1984.
- Cátedra de Tecnología Papelera, CIPAGRAF. El encolado del papel. Terrassa: ETSiIT, 1985. ISBN 846003903X.

Complementary:

- Smook, Gary A. Handbook for pulp & paper technologists. 3rd ed. Vancouver [etc.]: Angus Wilde, cop. 2002. ISBN 0969462859.
- Kouris, Michael (ed.). Pulp and paper manufacture, vol. 8, Coating, converting and specialty processes. 3rd ed. Montreal: Joint Textbook Committee of the Paper Industry of the United States and Canada, 1993. ISBN 091989304X.
- Thorp, Benjamin A. (ed.). Pulp and paper manufacture, vol. 7, Paper machine operations. 3rd ed. Montreal: Joint Textbook Committee of the Paper Industry of the United States and Canada, 1993. ISBN 091989304X.