Last update: 23-04-2019

220231 - Fibrous Materials for Lignocellulosic Products Manufacturing

Coordinating unit: 205 - ESEIAAT - Terrassa School of Industrial, Aerospace and Audiovisual Engineering
Teaching unit: 714 - ETP - Department of Textile and Paper Engineering
Academic year: 2019
Degree: MASTER'S DEGREE IN INDUSTRIAL ENGINEERING (Syllabus 2013). (Teaching unit Optional)
ECTS credits: 5 Teaching languages: Catalan

Teaching staff

Coordinator: CRISTINA VALLS VIDAL

Others: TERESA VIDAL LLUCIA - 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

The subject comprises theoretical lectures and practical laboratory work. At the laboratory, the students, in guided small groups, will become acquainted with fibre analysis and the specific experimental methods used to characterize raw materials and pulp.
- Participative lectures on theoretical and practical contents.
- Practical seminar where the teachers, with students' help, are to solve exercises and problems related to the theoretical contents of the subject.
- Practical sessions where the teachers, with students' help, are to solve practical cases related to the theoretical contents of the subject.
- Guided laboratory work or workshop tasks.
- Self work on the subject assignments.

Learning objectives of the subject

Study load

Total learning time: 125h	Hours large group:	30h	24.00%
	Hours small group:	15h	12.00%
	Self study:	80h	64.00%

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Content

(ENG) Mòdul 1: Introducció. Fonts de fibres vegetals	Learning time: 22h Theory classes: 8h 30m Laboratory classes: 2h Self study : 11h 30m
(ENG) Mòdul 2: Estructura de la fusta. La fibra vegetal	Learning time: 5h Theory classes: 2h Self study : 3h
(ENG) Mòdul 3: Característiques morfològiques i identificació de les pastes de coníferes i frondoses	Learning time: 12h Theory classes: 2h Laboratory classes: 2h Self study : 8h
(ENG) Mòdul 4: Característiques morfològiques i identificació de les pastes procedents de materials no fusters	Learning time: 14h Theory classes: 2h 30m Laboratory classes: 3h Self study : 8h 30m
(ENG) Mòdul 5: Composició química i estructura de la fibra cel·lulòsica	Learning time: 45h Theory classes: 9h Laboratory classes: 6h Self study : 30h
(ENG) Mòdul 6: Blanqueig de pastes	Learning time: 27h Theory classes: 6h Laboratory classes: 2h Self study : 19h

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Qualification system

Each student's overall mark will be the sum of the individual marks obtained in the following assessment events:
- Activity 1 (EV2: Evaluation of practical activities from written reports and oral presentations): 40%.
- Activity 2 (EV1: Evaluation of knowledge acquisition through written exams): 60% (30% first exam, 30% second exam)
The unsatisfactory result in the midterm exam may be redirected by a written test on the day set for the final exam. Students who didn't assist at the midterm exam or with a grade lower than 5.0 in the midterm exam can access this test. The grade obtained in the redirected test will replace the initial grade as long as it is higher.

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.

Regulations for carrying out activities

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

Bibliography

Basic:

García Hortal, J.A. Fibras papeleras. Barcelona: Edicions UPC, 2007. ISBN 9788483019160.

Colom Pastor, J.F. Estudio de la madera para la fabricación de pastas. Terrassa: ETSiiT, 1983.

Complementary:

Sjöström, Eero. Wood chemistry: fundamentals and applications. San Diego [etc.]: Academic Press, 1981. ISBN 012647480X.

Rydholm, Sven A. Pulping processes. New York: Interscience Publishers, 1965.

Casey, James P. Pulpa y papel: química y tecnología química, vol. 1. México: Limusa, 1990. ISBN 9681820614.

Dence, C.W.; Reeve, D.W. (eds.). Pulp bleaching: principles and practice. Atlanta (Georgia): Tappi Press, 1996. ISBN 0898520630.