Code: 1523 **Cereal Technology**
Degree: 2nd cycle – Food Science and Engineering
Stream: Food Processing
Curricular Year: 2nd **Semester Course: 1st**
Credits: 6 ECTS **Optional**
Language: Portuguese/English
Responsible: Isabel Maria Nunes de Sousa
Other lecturer(s): -
Web Site: http://www.isa.utl.pt/home/node/3854

1. Contact hours:
Lecture/Practicals 70 **Others** 14 **Total** 84

2. Objectives:

Know the main raw materials; processing operations and Industries as well as control methodologies and product development.

3. Programme:

Importance of the Cereal Industries. The cereal in the history of humankind; Economics and nutrition; Comparative study on cereal grains: external morphology, microscopic structure, chemical composition. Preparation of the grains: transport, reception, storage and cleaning.
Dry milling: historic evolution, types and objectives. Grain cleaning and conditioning; milling and classification.
Moist milling. Starch production. The importance and uses of starch. Processing flow for starch production from corn and potato. Wheat flour components and functionality: proteins and gluten, starch granules and gelatinisation. Other polysaccharides. Lipids and mineral elements. Quality control of wheat flours.
Bread making, flow diagram and equipments; physics and chemistry of dough.
Biscuits production: flow diagram and equipment.
Pasta production: flow diagram and equipment.
Rice blanching, drying and milling. Pre-cooked or vaporised rice.
Brewing technology: raw materials, production of malt: flow diagram and biochemistry.
Extrusion-cooking in cereals: breakfast cereals and snacks, microstructure and macromolecule dynamics.
Bio-ethanol production.
Bioplastics

4. Bibliography:

Main Bibliography

Farral, A.W. (1976) Cereal grain processing p. 285-294
Matz, S.A.(1970) Cereal technology 395 p. AVI Publishing Company Connecticut.
Godon, B. (Coord.) / Willm, C. (Coord.) (1991) Les industries de première transformation des céréales 694p
Hoseney, R.C (1986). Principles of cereal science and technology AACC
Hough,J.S.(1971) Malting and Brewing Science. Chapman and Hall.London
Kokini, J.L. (ed.) / Ho, C.T. (ed.) / Karwe, M.V. (ed.) (1992). Food extrusion science and technology
Pomeranz, Y. (ed.) (1988). Wheat chemistry and technology AACC St. Paul, MI (US).

5. Assessment:

A - Report on the laboratory techniques for grains and flour (10% of the final mark)
B - Oral presentation of a subject under the scope of the course (30% of the final mark).
C - Final exam (individual) (60% of the final mark)

6. Estimated Workload:	168	Hours
7. Last Update:	19/7/2010	