Code: - COURSE NAME Food Rheology and Structure
Degree: Food Engineering Curricular Year: 3rd
Annual Course [ ] Semester Course: 1st [X] 2nd [ ] Trimester Course: 1st [ ] 2nd [ ] 3rd [ ]
Credits: ECTS 6 Level: 1st cycle Compulsory [x] Optional [ ]
Language: Portuguese
Prerequisites:
Lecturer(s): Isabel Sousa
Web Site:

1. Contact hours:

Lectures	Practicals	Lecture/Practicals	Laboratory	Others	Total
28			42	14	84

2. Objectives:

To understand the importance and contribution of the Rheological and Physical Properties of Food to Food Science and Engineering. To know the specific nomenclature and analytical methods. To use this knowledge in solving flow of complex fluid foods and product development problems, namely on the creation and evaluation of food structure.

3. Programme:

Main physical properties of food. Practical determinations on the lab and implications to food quality control, product development, and industrial plant design. Rheology (definition) relevance to Food Science and Engineering. General concepts related to fundamental Rheology, rheological models, constitutive equations, main parameters, experimental tests: fundamental and empirical measurements. Phase transitions in Food: glassy state, crystallization, gelatinization and gelification, fluidization. Implications on texture/consistency characteristics of food and shelf life. Food Structure its creation and evaluation: manipulation of biopolymers to control food structure. Monitoring structure building up/breakdown. Texture/consistency from the quality/perception point of view. Sensory evaluation and instrumental measurements. Case studies: Food emulsions; Food gels; Biscuits and cookies; Cheese structure and Texture; Edible active biofilms. Based on the PhD's work developed at the lab. Practical applications of the flow situations in Industry Calculations of pumping needs, tube diameters, etc. Based on the Bernoulli equation for non-Newtonian fluids. Lab Project : working in the lab to solve specific situations to apply the acquired knowledge.

4. Bibliography:

Main Bibliography

A. G. Castro, J.A. Covas e A. C. Diogo (2001). Reologia e suas Aplicações Industriais. Instituto Piaget
Sousa, I. (2001) Reologia dos Produtos Alimentares in "Reologia e suas Aplicações Industriais"
Howard A. Barnes (2000). A Handbook of Elementary Rheology.
Howard A. Barnes (2002). Viscosity
Barnes, H.A., Hutton, J.F., and Walters, K. (1989). An Introduction to Rheology. Elsevier Science
Roos, Y. H. (1997) Phase Transition in Foods.

5. Assessment:

A simple project in the field of the sensory analysis (30% of the mark) and a written exam (70% of the final mark).

6. Estimated Workload: 140 Hours

7. Last Update: 16 April 2010