

Code: 1646 Chemical Analysis of Foods

Degree: 1st cycle – Food Science and Engineering

Curricular Year: 2nd

Semester Course: 2nd

Credits: 6 ECTS

Compulsory

Language: Portuguese/English

Responsible: Raúl Filipe Xisto Bruno de Sousa

Other lecturer(s): Miguel Pedro de Freitas Barbosa Mourato

Web Site: <http://www.isa.utl.pt/home/node/4039>

1. Contact hours:

Lectures 28 Practicals/Laboratory 42 Others 14 Total 84

2. Objectives:

To alert, motivate and sensitize students to the importance of Chemical Analysis (CA) as a determining factor in assessing the quality and nutritional value of food products. It is also intended to highlight the key role played by CA in control of food production in the processing units.

3. Programme:

INTRODUCTION TO THE CHEMICAL ANALYSIS OF FOODS

EVALUATION OF ANALYTICAL DATA

CHEMICAL EQUILIBRIUM

Introduction

Acid-base equilibria

Precipitation equilibria

Complexometric equilibria

Oxidation-reduction equilibria

VOLUMETRIC ANALYSIS

Fundamentals

Acid-base titrations

Precipitation titrations

Complexometric titrations

Reduction-oxidation titrations

INSTRUMENTAL ANALYSIS

Electromagnetic radiation

Molecular absorption spectroscopy in the visible, UV and IR

Flame emission spectroscopy

Atomic absorption spectroscopy

SEPARATION TECHNIQUES

Chromatographic separations

Column

TLC

Paper

Gas chromatography

High-performance liquid chromatography (HPLC)

Electrophoresis

FUNCTIONALITY IN THE LABORATORY

Installation of a laboratory for chemical analysis

Modern systems analysis

Equipment acquisition

Lab economy

PRACTICE PROGRAM

VOLUMETRIC ANALYSIS

The chemical analysis laboratory.

Sampling and sample preparation for analysis.

Applications of volumetric analysis for food products.

INSTRUMENTAL ANALYSIS

I - For the various equipment used there are examples of practical application to enable a first contact and the consequent initiation with the most modern techniques of instrumental analysis.

II - SEPARATION TECHNIQUES

Applications in food analysis

4. Bibliography:

Main Bibliography

Vogel, Arthur Israel. 2008. Análise Química Quantitativa LTC, ed. Rio de Janeiro
Mendham, J.; Thomas, M. J. K.; Barnes, J. D.; Denney, R. C. (2002) Vogel - Análise Química Quantitativa. Livros Téc. e Cient. Editora. (6ª edição)
Skoog, D., West, D., Holler, F. J; (1996) Fundamentals of Analytical Chemistry, Saunders College Publishing 7th edit.
Holler, F.J.; Nieman, T.; Skoog, D. (2002) Princípios de Análise Instrumental. 5th ed. Bookman Ed.

Other Bibliography

Pomeranz, Y.; Meloan, C.E. 1994. Food analysis: Theory and practice. 3ed. Westport: AVI
A.O.A.C. – Off. Meth. of Analysis of the Assoc. of Offic. Anal. Chem., Ed. William Harwitz, Washington.
Byrne, E., 1979. Chem. Anal. of Agricultural Materials, An Foras Taluntais.,
Joslyn, M. A., 1950. Meth. in Food Analysis, Acad- Press.
Netto, I., 1959 Análise de Géneros Alimentícios – Mét. Físico-químicos, Ed. Grafitécnica,
Triebold, H. O., Aunand, L. W., 1963 Food Composition and Analysis, Van Nostrand Co.

5. Assessment:

The final classification is based on the group reports with positive evaluation and the classification of a final written test (PFE), which will have access to students who have attended at least 75% of practical classes. Shall be approved only students who have positive final grade - > 9.5, (out of 20), or achieve at least 8, (out of 20), will be submitted to an oral test with positive information.

$PEF + NF = 0.7 \cdot 0.3$ (average of group reports)

6. Estimated Workload:

168	Hours
-----	-------

7. Last Update:

12/7/2010
