

## COURSE SYLLABUS

### 1. Identification

Code and title: QUP 032 – Chromatographic Methods of Analysis

Professor: Tânia Mara Pizzolato and Claudia Alcaraz Zini

Level: Master and Doctorate

Credit hours: 3

Revised: June\_2020

### 2. Summary

Classification of Chromatographic Systems. Definitions. Qualitative and Quantitative Analysis. Equipments. Recent Advances in Gas and Liquid Chromatography. Coupled Techniques: CG/MS, LC/MS. applications.

### 3. Objective

The objective of the course is to train professionals for the application and development of chromatographic techniques in their various modalities.

### 4. Contents

- Gas chromatography: definitions and concepts. Equipment. Chromatographic columns: packed and capillary. Detectors. Injectors. Qualitative and quantitative analysis. Coupled techniques: GC/MS.
- Liquid chromatography: definitions and concepts. Stationary phases and their separation mechanisms. Property of solvents and mobile phase. Ion chromatography. Instrumentation: HPLC, UPLC, detectors. Gel permeation chromatography: principles and functioning. Ion chromatography.
- Chromatography in supercritical fluid: definitions and concepts. Instrumentation. Properties of mobile and stationary phases. Applications.
- Low pressure chromatographic methods. Sequential injection chromatography: definitions and concepts. Instrumentation. In-line sample preparation systems: principles and functioning. Applications.
- Electromigration techniques in capillaries. Capillary electrophoresis and capillary electrochromatography: definitions and concepts. Instrumentation. Quantitative analysis. Applications.

### 5. Assessment

List of exercises, presentation and discussion of scientific articles, theoretical tests and/or directed works. The student, who obtains a final grade of A, B or C, awarded as per the list below, will be considered approved:

A: grade equal to or above 9.0

B: grade equal to or above 7.5 and below 9.0

C: grade equal to or above 5.0 and below 7.5

D: grade below 5

FF: lack of frequency

## 6. Methodology

Lectures, exercises lists, seminars and examinations.

## 7. Bibliography

1. M. L. Lee, F. T. Yaro and K. D. Bartle, Open Tubular Gas Chromatography: theory and practice. New York: Wiley and Sons, 1984. 445 pp.
2. W. G. Jennings, Gas Chromatography with Glass Capillary Columns. Amsterdam: Academic Press, 1980. 2nd ed. 320 pp.
3. R. R. Freeman, High Resolution Gas Chromatography. Palo Alto: Hewlett Packard, 1981. 2nd ed. 197 pp.
4. R. L. Grob, Modern Practice of Gas Chromatography. New York: Wiley and Sons, 2004. 4th ed. 1064 pp.
5. L. R. Snyder; J. J. Kirkland; J.W. Dolan, Introduction to Modern Liquid Chromatography. New York: Wiley and Sons, 2009. 3rd ed. 960 pp.
6. J. Weiss, Handbook of Ion Chromatography. New York: Wiley and Sons, 2016. DOI:10.1002/9783527651610.
7. Artigos atualizados da área, disponibilizados para os alunos.