



FEDERAL UNIVERSITY OF CEARÁ
Provost Office of Research and Graduate Studies

COURSE PROGRAM

1. IDENTIFICATION OF THE COURSE:	
1.1 Course	Graduate Program in Chemistry
1.2 Code:	CEP9500
2. MODALITY:	
Master (X)	PhD (X)
3. PERIOD	
Day (X)	Night ()
4. IDENTIFICATION OF THE DISCIPLINE:	
Name:	OPTICAL METHODS OF TRACE ELEMENT ANALYSIS
Code:	CEP9500
Study load:	64 hours
Credit:	04
Optional:	Yes (X) No ()
Mandatory:	Yes () No (X)
Specific Area:	Analytical Chemistry
5. RESPONSIBLE PROFESSOR:	
Prof. Dr. Gisele Simone Lopes Prof. Dr. Wladiana Oliveira Matos	
6. SUBJECT:	
Flame atomic absorption spectrophotometry (FAAS). Electrothermal atomic absorption spectrophotometry (ETAAS). Hydride generation atomic absorption spectrophotometry (HGAAS) and cold vapor atomic absorption spectrophotometry (CVAAS). Inductively coupled plasma optical emission spectrophotometry (ICP OES). Inductively coupled plasma mass spectrometry (ICP MS). Methods of sample introduction in the spectrometers.	
7. PROGRAM UNIT:	
1. Introduction. 2. Atomic absorption spectrophotometry 2.1. Flame Atomization 2.2. Electrothermal Atomization 2.3. Special Techniques: cold vapor and hydride generation	

- 2.4. Practical applications
- 3. Emission spectrophotometry
 - 3.1. Optical emission in induced plasma
 - 3.2. Plasma coupled to mass spectrometry
 - 3.3. Practical applications
- 4. Sample Introduction

8. EVALUATION:

Discussion and presentations of scientific articles.
Frequency equal or superior to 75 %.

9. BIBLIOGRAPHY:

Basic

1. A. G. Howard e P. J. Statham. "Inorganic Trace Analysis – Philosophy and Practice". Chichester, John Wiley and Sons, 1993.
2. J. D. Ingle, S. R. Crouch. "Spectrochemical Analysis", Prentice Hall, New Jersey, 1988.
3. L. H. J. Lajunen and P. Perämäki. Spectrochemical Analysis by Atomic Absorption and Emission, 2nd Edition, Royal Society of Chemistry: Cambridge, UK, 2004.
4. D. A. Skoog, F. J. Holler, T. A. Nieman. "Principles of Instrumental Analysis", 6th edition, Thomson, 2007.

Complementary:

5. J. L. Todoli, J. M. Mermet. "Liquid Sample Introduction in ICP Spectrometry: A Practical Guide", 1st edition, Elsevier Science, 2011.
 6. G. Schlemmer, B. Radziuk "Analytical Graphite Furnace Atomic Absorption Spectrometry: A Laboratory Guide", 1st edition, Birkhäuser, 2012.
- A. Sanz-Mendel, R. Pereiro. "Atomic Absorption Spectrometry: An Introduction", 2nd edition, Momentum Press, 2014.

