



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:	CEP9600
2. MODALITY:	
Master (X)	PhD (X)
3. PERIOD	
Day (X)	Night ()
4. IDENTIFICATION OF THE DISCIPLINE:	
Name:	SAMPLE PREPARATION METHODS
Code:	CEP9600
Study load:	96 hours
Credit:	06
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 Prof. Dr. Maria Goretti de Vasconcelos Silva Prof. Dr. André Henrique	
6. SUBJECT:	
The discipline of Sample Preparation Methods addresses sampling principles; conditioning and sample storage; decomposition techniques of inorganic samples for the determination of inorganic species; techniques for extracting volatile; decomposition techniques of organic samples for the determination of inorganic species; techniques for preparing organic samples for the determination of organic compounds.	
7. PROGRAM UNIT:	
1. Introduction of Sample Preparation 2. Sampling and preservation of the samples 3. Sample collect 4. Interferences control	

3. Conditioning and storage of samples
4. Decomposition techniques of inorganic samples for the determination of inorganic species
5. Decomposition techniques of organic samples for the determination of inorganic species
6. Techniques for preparing organic samples for the determination of organic compounds: extraction of organic compounds from liquid and solid matrices; Volatile Extraction: Extraction with water vapor (vapor distillation, and microwave hydrodistillation); solvent extraction; chemically active solvent extraction; supercritical extraction, headspace; solid-liquid extraction (Soxhlet method), solid phase extraction (SPE), liquid-liquid extraction (LLE), ultrasound.

8. EVALUATION:

Two tests with 50 % weight each one.
Frequency equal or superior to 75 %.

9. BIBLIOGRAPHY:

Basic

1. Krug, F. J., Rocha, F. R. P.; Métodos de preparo de amostras para análise elementar, 2ª edição, EditSBQ, São Paulo, 2016.
2. Mitra, S., Sample Preparation Techniques in Analytical Chemistry, John Wiley & Sons, New Jersey, 2003.
3. Microwave-Enhanced Chemistry: Fundamentals, Sample Preparation, and Applications (Acs Professional Reference Book) by H. M. Skip Kingston and Stephen J. Haswell (Hardcover - Aug 1, 1997)
4. Zezzi, M. A.; Trends in sample preparation, Nova Sciece Publishers, New York, 2006.

Complementary

1. Flores, E.M.M.; Microwave-Assisted Sample Preparation for Trace Element Determination. 1. ed. Amsterdam, The Netherlands: Elsevier, 2014.
2. Janusz Pawliszyn, J. (Ed), Comprehensive Sampling and Sample Preparation, Analytical Techniques for Scientists, 2012, Elsevier Inc. Academic Press, ISBN: 9780123813732, 3200 p.
3. Demeestere, K., Dewulf, J., De Witte, B., Van Langenhove, H., Sample preparation for the analysis of volatile organic compounds in air and water matrices, J. Of Chromatografy, 2007, vol. 1153, no 1-2 (313 p.) [Document: 15 p.] (220 ref.), pp. 130-144 [15 page(s) (article)].
4. Nigel J.K. Simpson (ED), Solid-Phase Extraction: Principles, Techniques, and Applications, CRC Press, 2010- 528 p.
5. Winefordner, J. D., Sample preparation in Analytical Chemistry., Jonh Wiley & Sons, 2010.

