Code: QA483

Name: Estatística Aplicada à Química Analítica

Name in English: Statistics Applied to Analytical Chemistry

Name in Spanish: Estadística Aplicada a la Química Analítica

Subject type: Weekly

Approval Type: Grade and frequency

Characteristic: Regular

Frequency: 75%

Period Type / Offering period: Semi-annual / Every period

Requires Final Exam: Yes

Vectors

T	L	P	O	PE	OE	SL	WEEKS	CREDITS
2	**0**	**0**	**0**	**0**	**0**	**2**	**15**	**2**

Occurrence on curriculum: 05, 50

Pre requirement: QA282

Summary:
Errors in chemical analyses. Data treatment and statistical evaluation. Sampling. Standardization methods. Experimental design. Introduction to multivariate methods.

Program:
Accuracy and precision. Types of errors in experimental data. Systematic errors. Nature of random errors. Experimental results distribution. Statistical treatment of random errors. Sample and population. Gaussian curve properties. Standard deviation, variance, relative standard deviation and coefficient of variation. Significant figures. Confidence intervals. Statistical tools for hypothesis testing. Errors in hypothesis testing. Dixon test, Student t test, Snedecor test (F-test). Variance analysis. Obtaining a representative sample. Gross sample and laboratory sample. External standard, internal standard and standard addition methods. Homoscedasticity. Ordinary least squares method. Analytical methods figures of merit. Experimental planning. Principal component analysis. Multivariate calibration. Use of electronic spreadsheets.

Basic Bibliography

1) SKOOG, D.A.; WEST, D.M.; HOLLER, F.J.; CROUCH, S.R. **Fundamentos de Química Analítica**. tradução da 9. Ed. São Paulo: Cengage Learning, 2015. 950 p.
2) HARRIS, D.C. **Análise Química Quantitativa**. 9. Ed. Rio de Janeiro: LTC, 2017. 774 p.
3) MILLER, J.C.; MILLER, J.N. **Statistics for Analytical Chemistry**, 3. Ed. New York: Prentice Hall, 1993. 233 p.

Supplementary Bibliography

1) CHRISTIAN, G.D. **Analytical Chemistry**. 6. Ed. New York: Wiley, 2004. 828 p.
2) BRUNS, R.E.; SCARMINIO, I.S.; NETO, B.B. **Como fazer experimentos: aplicações na ciência e na indústria**, 4. Ed. Porto Alegre: Bookman, 2011. E-book.
3) SKOOG, D.A.; HOLLER, F.J.; NIEMAN, T.A. **Princípios de Análise Instrumental**. 6. Ed. Porto Alegre: Bookman, 2009. 1055 p.
4) RODRIGUES, M.I.; IEMMA, A.F. **Planejamento de Experimentos e Otimização de Processos.** 3. Ed. Campinas: Cárita Editora, 2014, 358 p.
5) DRAPER, N.; SMITH, H. **Applied Regression Analysis**. 3. Ed. New York: Wiley, 1998. 736 p.