



PROGRAMS AND BIBLIOGRAPHY

Subject	
Code	Name
QA483	Statistics applied to analytical chemistry

Vector
OF:S-5 T:002 P:000 L:000 O:000 D:000 HS:002 SL:002 C:002 AV:N EX:S FM:75%

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.

Bibliography
1. Miller, J.C.; Miller, J. N. Statistics for Analytical Chemistry, Ellis Horwood, New York, Prentice Hall, 1993. 2. Skoog, D.A.; West, D.M.; Holler F.J.; Crouch, S.R., Fundamentos de Química Analítica, Translation from the 9 th North american edition, CENGAGE Learning, São Paulo, 2015. 3. Harris, D.C. Análise Química Quantitativa, 8 th Edition, LTC, Rio de Janeiro, 2012. 4. Christian, G.D. Analytical Chemistry, 6 th edition, Wiley, New York, 2004.

Evaluation criteria
For grading policy, see: Regimento Geral de Graduação, Seção I – Normas Gerais, Capítulo V – Da Avaliação do Aluno na Disciplina. Students are required to attend 75 % of the lectures. For further details, see: Regimento Geral de Graduação, capítulo VI, seção X, artigo 72.