Code: QA383

Name: Eletroanalítica

Name in English: Electroanalytical Chemistry

Name in Spanish: Electroanalítica

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:
Introduction to electronalytical chemistry. Potentiometry. Electrogravimetry, Coulometry. Voltammetry. Amperometry.

Program:
Galvanic and electrolytic cells. Potentials in electrochemical cells and electrodes. Liquid junction potential. Activity and the influence on electrode potential. Thermodynamics of cells potentials. Nernst equation. Standard electrode potential. Electrical double layer. Currents in electrochemical cells. Ohmic potential drop. Polarization and sources of polarization. Faradaic and capacitive current. Mass transport phenomena. Reference electrodes. Metallic and membranes indicators electrodes. Selective coefficient. Instruments for potential measurement. Direct potentiometry. Operational pH definition. Potentiometric titration. Coulometry. Electrolysis at constant current. Electrolysis at Constant potential. Direct methods and coulometric titrations. Coulometric instrumentation. Potentiostat. Voltammetry. Excitation signals in voltammetry. Charge transfer kinetics. Voltammetric instrumentation. Cyclic voltammetry. Stripping methods. Amperometry. Amperometric sensors. Amperometric titrations. Biosensors.

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) SKOOG, D.A.; HOLLER, F.J.; NIEMAN, T.A. **Princípios de Análise Instrumental**. 6. Ed. Porto Alegre: Bookman, 2009. 1055 p.

Supplementary Bibliography

1) BARD, A.J.; FAULKNER, L.R. **Electrochemical methods: fundamentals and applications**. 2. Ed. New York: Wiley, 2001. 833 p.
2) BRETT, A.M.O.; BRETT, C.M.A., **Electroquímica, Princípios, Métodos e Aplicações**. Coimbra: Oxford University Press, 1996. 471 p.
3) KISSINGER, P.T.; HEINEMAN, W.R. **Laboratory Techniques in Electroanalytical Chemistry**. 2. Ed. New York: Marcel Dekker Inc., 1996. 751 p.
4) SAWYER, D.T.; HEINEMAN, W.R.; BEEBE, J.M. **Chemistry Experiments for Instrumental Analysis**. New York: Willey, 1984. 427 p.
5) CHRISTIAN, G.D. **Analytical Chemistry**. 6. Ed. New York: Wiley, 2004. 828 p.