

Program: Chemistry (15025012071P6)

Course: ELECTROCHEMISTRY AND CORROSION

Code: PPGQU0058

Workload: 60 hours

Credits: 04

Syllabus:

Fundamentals, definitions, and concepts of electrochemistry; Faraday's laws and electrical work; Thermodynamic description of electrolytic solutions; Ionic activity and Debye-Hückel law; Electrolytic conductivity; Redox equilibrium; Electrochemical cells; Standard electrode potential; Standard hydrogen electrode; Gibbs free energy and cell potential; Nernst equation; Electrochemical kinetics; Polarization; polarization curves, and limiting current; Industrial electrochemical processes; Electroplating; Primary and secondary batteries; Fuel cells; Electrochemical corrosion; Corrosion in the chemical and petrochemical industries.

Bibliography:

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OLDHAM, K. B.; MYLAND, J. Fundamentals of Electrochemical Science, Academic Press, 1994.

IVES, H. B.; LUO, J. L.; RODDA, J. R. Passivity of Metals and Semiconductors, The Electrochemical Society Inc., 2001.

HAMANN, C. H.; HAMNET, A.; VIELSTICH, V. Electrochemistry, Wiley-VCH, New York, 1998.

BARD, A. J.; FAULKNER, L. R. Electrochemical Methods – Fundamentals and Applications, John Wiley & Sons, New York, 1980.

BRETT, C. M. A.; BRETT, A. M. O. Electrochemistry – Principles, Methods, and Applications, Oxford University Press, 1993.

FONTANA, M. G. Corrosion Engineering, 3rd Edition, McGraw-Hill Publishing Company, New York, 1986.

DENARO, A. R. Fundamentos de Eletroquímica, 1st Edition, São Paulo: Edgard Blücher, 1974.