

<b>Module Title:</b> Advanced Volumetric Analysis
<b>Module Code:</b> AM0902
<b>Maximum Number of Students:</b> 20
<b>Total ECTS Credits</b> 2
<b>Notional Learning Hours</b> (a) Contact Time: 10h (b) Private Study: 40h <b>Format of Teaching:</b> Lectures: 10h <b>Teaching Strategy:</b> Lectures
<b>Convener:</b> Jacinto Guiteras
<b>University:</b> University of Barcelona, Department of Analytical Chemistry
<b>Language of Tuition:</b> English
<b>Module Description - The Purpose or Aims:</b> 1. Calculation of theoretical titration curves 2. Use of theoretical titration curves for assessing the feasibility of a volumetric method. 3. Selection of the best possible procedure for end-point detection 4. Development of new methods
<b>Specific Learning Outcomes for this module: (contributing to general learning outcomes GLO 1 – GLO 10)</b> 1. Ability to calculate theoretical titration curves for acid-base, complex-formation and oxidation-reduction equilibria. 2. Ability to assess the influence of factors such as dilution, secondary reactions or the presence of other analytes on a titration. 3. Ability to select the best possible procedure for end-point detection in a particular case and to evaluate the accuracy of the determination. 4. Ability to develop new methods.
<b>Summary of Course Content:</b> The purpose of this module is to provide the students with a basic knowledge of how theoretical curves can be calculated and of the information that can be obtained from them. Special care will be paid to the influence that several factors may exert, the criteria to choose the best possible end-point indicator and to evaluate the minimum possible error.
<b>Transferable Skills Taught:</b> Writing reports Use of basic informatic tools (Spreadsheets or free computer programs)
<b>Assessment Methods:</b> Written report, combined with personal interview
<b>Assessment Criteria:</b> <u>Threshold</u> Ability to obtain titration curves for reactions belonging to acid-base, complex-formation or oxidation-reduction equilibria and for solutions containing a single analyte, even in the presence of secondary reactions. <u>Good</u> Ability to obtain titration curves for reactions belonging to acid-base, complex-formation or oxidation-reduction equilibria and for solutions containing several analytes, even in the presence of secondary reactions. <u>Excellent</u> Ability to propose new procedures for the volumetric determination of several analytes in a mixture.

**Resource Implications of Proposal and Proposed Solutions:**

Recommended reading:

"Quantitative Chemical Analysis", D.C. Harris, Freeman,, 6<sup>th</sup> ed., 2003

"Fundamentals of Analytical Chemistry", D.A. Skoog, D.M. West, F.J. Holler, S.R. Crouch, Thomson, 8<sup>th</sup> ed, 2004

**Pre-Requisites:**

No pre-requisites are required. However, basic knowledge of ionic equilibria would be useful.