

Module Title: Preparation and use of reference materials. Proficiency testing schemes.
Module Code: QM0306
Maximum Number of Students: 20
Total ECTS Credits: 2
Notional Learning Hours (a) Contact time: 10 h (b) Private study: 40 h Format of Teaching: Lectures and seminars: 10 h Laboratory practices: 0 h Others: 0 h Teaching Strategy: Formal lectures and practical seminars in the classroom in 60/90 min timetable.
Convener: Angels Sahuquillo
University: Department of Analytical Chemistry. University of Barcelona.
Language of Tuition: English
Module Description - The Purpose or Aims: <ol style="list-style-type: none"> To show the role of certified reference materials in the traceability of analytical measurements. To introduce the types of reference materials (certified reference materials (CRMs) and quality control materials (QCMs) and their use in analytical laboratories. To introduce the preparation steps involved in the production of reference materials. To introduce different types of intercomparison exercises and their aims. To introduce the statistical concepts allowing the correct evaluation of the participation of an analytical laboratory in a proficiency test (PT).
Specific Learning Outcomes for this module: (contributing to general learning outcomes GLO 1 – GLO 10) General Learning Outcomes: GLO 8, GLO 9 At the end of the module the learner is expected to be able to: <ol style="list-style-type: none"> identify the steps involved in the preparation of a RMs and in the organization of a PT. correctly find and select a RM suitable for a particular use in an analytical laboratory critically analyse and evaluate the technical competence of an analytical laboratory from the information of its participation in a PT.
Summary of Course Content: The module aims to show to the students the different types of reference materials available and to introduce its proper use in an analytical laboratory, both in the validation step of an analytical method and in different steps of the laboratory quality control system (internal and external quality control). The preparation steps involved in production of RMs will be introduced, as well as all the analytical work required for homogeneity and stability tests. Different types of intercomparison exercises will be introduced and the different steps involved in the organization of a PT scheme will be described. The minimum statistical tools for the evaluation of the technical competence of a laboratory participating in a PT will be introduced.
Transferable Skills Taught: <i>Communication:</i> Identification and writing of the minimum information to be contained in a report of a CRM <i>Information Technology:</i> Find information about reference materials providers. Find information about proficiency testing providers.
Assessment Methods: LO2 and LO3: Resolution of exercises proposed in seminars (50 %) LO1, LO2, LO3: Written examination (50 %)

Assessment Criteria:Threshold

LO1: to know the steps involved in the preparation of RMs and organization of a PTs

LO2: to distinguish the proper use of a RM

LO3: to know the statistical tools used in the different steps of a PT

Good

LO1: to know and to describe the steps involved in the preparation of RMs and organization of a PTs

LO2: to use properly a RM, as well as the sources of information of providers of RMs

LO3: to understand the technical report of a PT including the statistical tools involved in all the steps

Excellent

LO1: to design the general preparation steps for the production of RMs, as well as for the organization of a PTs

LO2: to select a RM to fulfill the necessities of an analytical laboratory of a given field

LO3: to take decisions about the technical competence of a laboratory from the information of its participation in a PT and to propose actions for the improvement of the competence.

Resource Implications of Proposal and Proposed Solutions:

Lectures notes will be available to the students together with documentation for practical seminars on the use of reference materials and the evaluation of the participation of an analytical laboratory in PTs.

Some technical papers published in scientific journals on RMs and PTs will be provided.

Other Bibliography for consultancy:

- *Proficiency Testing in Analytical Chemistry*. R.E. Lawn, M. Thompson, R. F. Walker. Royal Society of Chemistry. LGC (Teddington), 1997. ISBN: 0-85404-432-9.

- *Practical statistics for the analytical scientist. A bench guide*. T. Farrant. Royal Society of Chemistry. LGC (Teddington), 1997. ISBN: 0-85404-442-6.

Pre-requisites

No pre-requisites are required