

<b>Module Title:</b> Extraction methods for solid foods
<b>Module Code:</b> AM0207
<b>Maximum Number of Students:</b> 20
<b>Total ECTS Credits</b> 2
<b>Notional Learning Hours</b> (a) Contact Time - 10 h (b) Private Study - 10 h  <b>Format of Teaching:</b> Lectures 10 h Laboratories or Practicals 0 h Other 0 h  <b>Teaching Strategy:</b> Formal lectures in 60/90 min timetable.
<b>Convener:</b> M. Palma
<b>University:</b> University of Cádiz
<b>Language of Tuition:</b> English
<b>Module Description - The Purpose or Aims:</b>  <ol style="list-style-type: none"> <li>To introduce fundamentals of the following analytical techniques: ultrasound assisted extraction (UAE), microwave assisted extraction (MAE) and pressurized fluid extraction (PFE)</li> <li>To introduce the special problems working on the extraction of compounds from solid samples, specifically solid foods</li> <li>To show the problems related with the stability of samples under different extraction conditions</li> </ol>
<b>Learning Outcomes:</b>  At the end of the module the learner is expected to be able to: <ol style="list-style-type: none"> <li>Correctly describe the principles of the extraction techniques for solid foods</li> <li>Select the most adequate extraction technique on the basis on the kind of compounds they are trying to extract</li> <li>Correctly develop and optimize an extraction method</li> </ol>
<b>Summary of Course Content:</b>  The fundamentals and limitations of ultrasound assisted extraction, microwave assisted extraction and pressurized fluid extraction are going to be introduced. Moreover, the applicability of these extraction techniques to field of food analysis is going to be also introduced. Several applications are going to be presented in order to make the students able to choose the best extraction technique on the basis of the composition of the food sample.
<b>Transferable Skills Taught:</b>  <i>Communication:</i> Ability to write a laboratory report  <i>Information Technology:</i> Optimization of extraction methods

**Assessment Methods:**

1. LO1 – Written Examination (20%)
2. LO2 – Written Examination (50%)
3. LO3 – Group Work Discussion (30%)

**Assessment Criteria:**Threshold

- LO1 – to correctly describe the components of a given extraction system (UAE, MAE and PFE) system  
LO2 – to be able to identify if what extraction technique(s) can be applied for some compounds  
LO3 – to identify the most important extraction variables for each extraction technique

Good

- LO1 – to identify what kind of samples can be extracted in each extraction system  
LO2 – to be able to determine what compound cannot be extracted by some extraction techniques  
LO3 – to be able to determine the influence of different extraction variables on the recovery

Excellent

- LO1 – to be able to determine the operational conditions for each extraction techniques  
LO2 – to be able to choose the most adequate extraction technique depending on the compound to be extracted  
LO3 – to develop an extraction method

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

Lecture notes will be available for students.

Recommended reading:

- "Analytical Chemistry", R. Kellner, J.M. Mermet, M. Otto, H.M. Widmer, Wiley-VCH Verlag, Weinheim, Germany, 1998.  
"Supercritical Fluid Extraction" L. Taylor. Wiley, New York, 1996  
"Handbook on Analytical Separations" R.M. Smith Ed. Vol. 3. "Environmental Analysis" W. Kleibohmer. Elsevier, 2004.