

Module Title: Pattern Recognition and Classification
Module Code: DA0302
Maximum Number of Students: 20
Total ECTS Credits 2
Notional Learning Hours (a) Contact Time - 15 h (b) Private Study - 10 h Format of Teaching: Lectures 10 h Laboratories or Practicals 5 h Other 0 h Teaching Strategy: Formal lectures in 60/90 min timetable.
Convener: J.M. Palacios
University: University of Cádiz
Language of Tuition: English
Module Description - The Purpose or Aims: <ol style="list-style-type: none"> 1. To introduce fundamentals of pattern recognition and classification methods and its applications 2. To discuss and analyze several scientific publications regarding the state-of-the-art of this module 3. To practice with real data from analytical problems.
Learning Outcomes: At the end of the module the learner is expected to be able to: <ol style="list-style-type: none"> 1. Understand the principles of pattern recognition and classification 2. Correctly select and apply these chemometric tools to analytical problems 3. Interpret the results obtained after using these tools
Summary of Course Content: Pattern recognition and classification methods provide an approach to the interpretation of the multivariate data often encountered in analytical chemistry. Widely used methods include mapping and display, discriminant development, clustering, and modeling. These methods can be applied to a great variety of chemical problems with the aim of classification. This classification developed from spectral, chromatographic, or compositional data may be desirable for any number of purposes, including source identification, detection of odorants, presence or absence of a disease in a patient or animal from which a sample has been taken, and food quality testing, to name a few. After studying the fundamentals of these chemometric tools, some analytical problems based on real data as well as their possible interpretations will be discussed.

Transferable Skills Taught:*Information Technology:*

Application of pattern recognition and classification methods to real analytical problems

Communication:

To discuss and interpret results obtained after applying the quoted chemometric tools

Interpersonal skills:

Elaborate and show a group written assignment

Assessment Methods:

1. LO1 – Written Examination (30%)
2. LO2 – Practical Exercises (30%)
3. LO3 – Group Work Discussion (40%)

Assessment Criteria:Threshold

LO1 – to correctly define different pattern recognition and classification methods

LO2 – to appropriately apply these chemometric tools to analytical problems

LO3 – to identify the main information provided with different pattern recognition and classification methods

Good

LO1 – to distinguish adequately the principles and concepts of different pattern recognition and classification methods

LO2 – to select the appropriate pattern recognition and classification method to resolve analytical problems

LO3 – to interpret the results obtained after applying these tools

Excellent

LO1 – to be able to describe the main advantages of pattern recognition and classification methods

LO2 – to be able to design a strategy to resolve certain analytical problem by means of pattern recognition and classification

LO3 – to be able to combine all the information obtained after applying different pattern recognition and classification methods on analytical problems

Resource Implications of Proposal and Proposed Solutions:

Lecture notes will be available for students.

Recommended reading:

"Handbook of Chemometrics and Qualimetrics", D. L. Massart, B. G. M. Vandeginste, L. M. C. Buydens, S. De Jong, P. J. Lewi, J. Smeyers-Verbeke, Elsevier, The Netherlands, 1997.