

LEARNING MODULE DESCRIPTION

GENERAL INFORMATION

1. Module title: **Anti-doping aspect in Chemistry**
2. Module code: **ADAC**
3. Term: **2nd**
4. Duration: **15 hours**
5. ECTS: **2**
6. Module lecturer: **prof. Daniel Jardines Garcia.**
7. E-mail: djg_cu@yahoo.es
8. Language: **English**

DETAILED INFORMATION

Basic understand of analytical and organic chemistry is required.

The lecture is addressed to students who want to gain or extend their knowledge about Anti-doping. The lecture will begin with the origin of doping and its evolution to the necessity of creation of an organization to fight it. After that, it follows a basic pharmacology information of substances correlated with doping and its detection.

At the end of the course students will:

- be able to describe the main antidoping compounds;
- understand general mechanisms of antidoping chemistry and antidoping international rules;
- know selected applications of antidopings;
- be exposed to a research/application topic by participation in a course project.

READING LIST

1. J. Clayden, N. Greeves, S. Warren, P. Wothers: *Organic Chemistry*. Oxford University Press, 2005.
2. Brunton, L. L. (Editor) Goodman & Gilman's *The Pharmacological basis of Therapeutics*. McGraw-Hill Medical, New York, 2011.
3. Seamus P. J. Higson: *Analytical Chemistry*. Oxford University Press, 2004.
4. C. Georgakopoulos, , M. Alsayrafi. *Future Medicine*. 2015.
5. M. Thevis. *Mass Spectrometry in Sports Drug Testing*. John Wiley & Sons, Inc. 2010.
6. D. Thieme, , P. Hemmersbach, (Eds.). *Doping in Sports*. Springer-Verlag Berlin Heidelberg. 2010.
7. Articles in journals indicated by the lecturer.

SYLLABUS:

Lecture

Issue 1: **History and evolution of doping**

- Normative evolution

Issue 2: **International and Antidoping rules**

- Ethical code
- Technical Documents

Issue 3: **Pharmacology of doping substance 1**

- Small molecules

Issue 4: **Pharmacology of doping substance 2**

- Bio-molecules

Issue 5: **A practical introduction to commonly employed analytical techniques**

- Bio-analytical methods
- Critical choice of technique

Student workload (ECTS credits)

| Activity types | Mean number of hours* spent on each activity type |
|--|---|
| Contact hours with the teacher as specified in the programme | 15 |
| Independent study (1) | 15 |
| Independent study (2) | 15 |
| Total hours | 45 |
| Total ECTS credits for the module | 2 |

* Class hours – 1 hour means 45 minutes

(1) Independent study – examples of activity types: preparation for classes, data analysis,

(2) library-based work, PowerPoint presentation of the chosen topic related to the lecture .