SAFETY AND LABORATORY MANIPULATION

CU characterization:

CU name:
Safety and Laboratory Manipulation

Scientific area acronym:
BM

Duration:
Semiannual

Working hours:
78

Contact hours:
26

ECTS:
3

Observations:
Mandatory CU

Teacher in charge and respective teaching load in the CU:
Maria Luísa Vieira – 6 hours

Other teachers and respective teaching load in the CU:
Ricardo Parreira - 9,5 hours
Ana Armada - 7 hours
Dinora Lopes - 3 hours

Intended learning outcomes (knowledge, skills and competences to be developed by the students):

1. Understand the concept of Biosafety and the classification of biological agents according to the different levels of laboratories in the areas of Microbiology and Parasitology.
2. Know the rules for transporting biological samples.
3. Understand the concepts of decontamination, asepsis and sterilization.
4. Know the different types of biological safety chambers.

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Intended learning outcomes (knowledge, skills and competences to be developed by the students):

5. Know international legislation and directives in the field of laboratory safety.
6. Know the role of the laboratory in relation to animal experimentation and understand the rules to be used.
7. Solve exercises applied to the execution of laboratory techniques.
8. Understand the concept of 'Quality Control (QC)' - Standardization of laboratory procedures applied to culture media, reagents, glassware and equipment, ISO standards and CE mark; Legislation (US directives).
9. Understand the importance of internal and external QC.
10. Know the role of Reference Laboratories and Proficiency Tests.

Syllabus:

I. Theoretical classes (Lectures)

Biosafety and biological risk

Decontamination, asepsis and sterilization

Quality control (QC) in the Labor

II. Theoretical and Practical

Biosecurity and accidents in laboratory environment: responsibilities and behavior;

Animal experimentation and the laboratory - Visit to the Animal house (Bioterio) at the IHMT-NOVA. Discussion of several basic concepts related to laboratory animal science; Legislation and accreditation of facilities, people and projects. Principle of the 3R's: Reduce, Reuse and Refine

Resolution of exercises applied to laboratory practice (solution preparation and culture media; dilutions from stock solutions; reconstitution primers ...)

III. Laboratorial Practice

Laboratory Manipulation - Titration a phage lysate

Cell culture

Count of bacteria (with Petroff-Hauser chamber) / running a quick test (in house) versus the same test [commercial version-(kit)]. Comparison of results in the context of Quality Control.

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Teaching methodologies (including assessment):

Theoretical classes (T), Theoretical-Practical Classes (TP) and Laboratory Practice (PL), all these learning units are integrated with each other, so that students in the theoretical-practical and practical components can frame the knowledge learned in the theoretical classes' initials.

- Students, with at least 2/3 of attendance, take a final written test (multiple choice test) with 40 questions covering the subjects taught.
- Rating scale from 0 to 20.
- Approval with a rating equal to or greater than 10.

References for consultation / mandatory existence:

Students have access to slides (PPT) classes and materials assigned by the teachers involved in Curricular Unit, through the Moodle platform and the bibliography indicated below:

- Cooper,G., CLS., MHA. (2008). Basic Lessons in Laboratory Quality Control. QC Workbook. Published by Bio-Rad Laboratories, Inc. Quality Systems Division 60pp.
- IHMT, NOVA (2014). Manual de Segurança Biológica. 50pp.
- WHO. (2011). Laboratory Quality Management System. Handbook, 245 pp.
- Laboratory Biosafety and Biosecurity Risk Assessment Technical Guidance Document. https://www.aam.org.ar/.../Laboratory-Biosafety-Biosecurity-Guidance.pdf
- Yao, K., McKinney, B., Murphy, A., M. T. (ASCP), Rotz, P., Wafula, W., Sendagire, H., Okui S., MPH, Nkengasong, J. N. (2010). Improving Quality Management Systems of Laboratories in Developing Countries. American Journal Clinical Pathology, 134, 401-409. doi: 10.1309/AJCPNBBL53FWUIQJ.