

8045 – MSc in Bioinformatics for Health Sciences

30994 – SCA. Science in Action

Syllabus Information

Academic Course: 2018/19

Academic Center: 804 - Official Postgraduate Programme in Biomedicine

Study: 8045 – Bioinformatics in Health Sciences - MSc

Subject: 30994 – SCA. Science in Action

Credits: 5.0

Course: 2nd

Teaching languages: English

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Teaching Period: 1st or 3rd term

Presentation

This course aims to develop the student's thinking about issues related to values in science, scientific integrity and the responsible conduct of research. The course takes the PRBB Code of Good Scientific Practice (CGSP) as a starting point and aims to contribute to a reflective process that will mature during the student's professional life as a scientist. All students should be familiar with the contents of the CGSP prior to starting this course.

The objectives of the course are to stimulate students to think critically about different aspects of good scientific practice and to enhance understanding of the realities of scientific practice in today's environment of scarce resources, high competitiveness and low regulation.

Associated skills

General competences:

1. To acquire knowledge of the PRBB Code of Good Scientific Practice.
2. To be aware of the uncertainties, conflicts, tensions and contradictions that underlie the practice of scientific research today.

Specific competences:

1. To develop and refine skills in critical reading, reflection and discussion of ethical issues and conflicts that scientists may confront during their professional life.
2. To develop and refine skills in thinking logically about sometimes difficult and uncomfortable problems and situations.

In particular the following competencies will be developed:

a) Instrumental competences:

- Skills in critical reading, analysis and synthesis of ethical arguments.
- Reading and oral communication in English.
- Problem solving skills through discussion with peers.

b) Interpersonal competences:

- Capacity to discuss and negotiate a position with peers and to reach a consensus decision.
- Capacity to clearly express own opinion both in small groups and with whole class.
- Awareness of other perspectives and ability to modify own opinion based on careful consideration of these other viewpoints.

c) Systemic competences

- Self-directed study and reflection on complex ethical issues with no clear answers.
- Ability to assimilate information from different sources to develop and clarify own view point.
- Capacity to understand uncertainty and the need for decision making in uncertain and unpredictable circumstances.

Contents

1) Scientific integrity

- Be aware of the importance of values in the conduct of science.
- Be aware of the behaviors that may threaten the integrity of science.
- Know the contents of the Universal Ethical Code for Scientists and other international guidelines.
- Be familiar with the PRBB Code of Good Scientific Practice.
- Understand the best ways to prevent problems of integrity.

2) Building and performing a research project

a) Record Keeping

- Be aware of the importance of systematic data collection and management in all scientific studies.
- Discuss about the challenges and the best ways to collect and store data collected in scientific studies.
- Be aware of the mechanisms and procedures for the adequate protection of data and samples and the special case of human samples and data derived from them.

b) Data ownership

- Understand the concept of ownership with respect to data and samples obtained in a scientific study.

- Know the rules regarding ownership of data and samples obtained during one's own research when one is moving from one center to another.

c) Sharing data and collaboration

- Be aware of the need to plan for future sharing of data, samples and other scientific results.

3) Animal experimentation

- Be familiar with the debate on the moral status and rights of animals.
- Be able to justify the use of animals in a research project.
- Understand the necessary procedures for the use of animals in a research project.
- Understand the "3 Rs" policy, for Reduction, Replacement and Refinement of the use of animals in research.

4) Human research

- Be familiar with the issues surrounding the obtaining of informed consent from human participants in research.
- Be familiar with the major national and international policy guidance in this area e.g. the Declaration of Helsinki, Belmont report etc.
- Be aware of the tensions between different philosophical positions with respect to autonomy, liberty and duty in the use of humans in research.

5) Conflicts of interest

- Understand the concept of conflict of interest and be able to distinguish different types.
- Know about specific conflicts of interest and their potential consequences.
- Be aware of the main conflicts of interest that may arise in academic-industry relationships.
- Be able to identify the main conflicts of interest that may occur in a clinical study financed by the pharmaceutical industry.
- Know about strategies for managing conflicts of interest both for self and others.

6) The politics and practice of publication

a) Publication practices

- Know about good practice in the communication of scientific results.
- Understand the peculiarities of communicating scientific results in different communication media.

b) Plagiarism

- Understand what's considered plagiarism and learn good practices to avoid it.

c) Peer review

- Be familiar with the peer review process.
- Identify the conflicts of interest that may arise for a reviewer of a grant application or an article submitted for publication.
- Recognize the strengths and weaknesses of peer review and be able to propose alternatives or ways in which the peer review process may be improved.

d) Authorship

- Know how to identify the conditions for authorship and be able to argue convincingly regarding the position of an author in a list of credits.
- Understand who should appear in the acknowledgements.

7) Responsibility to society

- Be aware that the public should benefit from and be aware of the research results.
- Understand the influence and consequences that researchers opinions can have in the society and learn the rules for a responsible advocacy.

Teaching Methods

Approach and general organization of the subject

The subject consists on an online material and class seminars. The aim of the online materials is to promote student autonomy by providing the essential information relevant to the course topics in a format that can be studied flexibly in the student's own time. Completion of the self-study component is essential to develop an understanding of the different tensions that operate in today's scientific enterprise and students are expected to devote sufficient time to the careful study of these materials in preparation for the seminars.

Class seminars aim to give students the opportunity for an in-depth reflection and discussion of controversial and sometimes difficult issues with their colleagues and the tutors. Students are expected to actively engage in discussion and problem solving individually and in groups.

Format:

- i) Online material for self-study. Students should work on the material related to the chosen seminar's topics before the attendance to the seminars.
- ii) Attendance at 4 class seminars. Two seminar topics are compulsory: Seminar 1, Scientific Integrity and Seminar 6, Politics and Practice of Publication. Two further seminars can be selected from a choice of four.
- iii) Online test based on online materials.

Training activities

Online: Theoretical concepts will be introduced through online materials including case-studies and scenarios, video dramas, readings, discussions on the forum, as well as regular feedback to the student through questionnaires and quizzes.

Face-to face seminars: They will be based on the analysis and discussion of problems. Problems will be prepared as case studies or from published articles and will be given to the students together with the relevant material, at the

beginning of the course or in the seminars as appropriate. Teaching methodologies will include short presentations, group work and role plays.

Program of activities

The subject consists on self-study online materials that provide the essential information regarding the course topics, and class seminars that will offer the opportunity of discussing with colleagues and trainers about controversial and difficult issues. To ensure a fruitful and interesting discussion during the seminars it is necessary that students have worked on the online materials before attending to the seminars.

Estimated time spent on the subject:

- In the classroom: Work in the classroom includes the face-to-face seminars held twice weekly over a period of 3 weeks (total of 6 hours) and the completion of the compulsory online course (self-study and final test, total of 41 hours).

- Outside the classroom: Activities outside the classroom include preparation of seminars as well as participation in online forums, further reading and other activities such as visualization of interactive videos, documentaries, etc. (total 78 hours).

Evaluation

Assessment system

The compulsory attendance to four face-to-face seminars and the completion of the online course will be assessed. There will be a final 'case study' test based on the contents of the online course.

Grading system

Students will be graded according to the following criteria:

-80% of the grade will come from the results of the final 'case study' test and the quizzes of each module.

-20% of the grade will come from an assessment of their active participation in the course via the online forum.

Bibliography and information resources

[The Immortal life of Henrietta Lacks by Rebecca Skloot](#)

[Practical ethics by Peter Singer](#)

[Real science : what it is, and what it means by John Ziman](#)

[Scientific integrity : text and cases in responsible conduct of research by Francis L. Macrina](#)

[Selling sickness : how the world's biggest pharmaceutical companies are turning us all into patients by Ray Moynihan and Alan Cassels](#)