SCIENTIFIC COMMUNICATION PROJECT

Identification

Studies: Bioengineering Degree

Year: Second year

Term: Third term

Number of European Credit Transfer System (ECTS): In total, the course consists of 3 credits. Attendance to the course is compulsory, with special attention to seminars and practical sessions. The course is divided into the following types of sessions: i) 16 hours of theoretical sessions; ii) 11 hours of seminars; and iii) 12 hours of practical sessions (in each one of two groups).

Professorship
Esther Barreiro (CEXS, Catalan/Spanish), Simone Tassani (DTIC, English) and Oscar Camara (DTIC, English), Universitat Pompeu Fabra, Barcelona.

General objectives
This course is intended to learn how to identify the best scientific sources; to accurately search the most relevant literature for a given topic, especially of peer-reviewed articles published in high-class scientific journals; to distinguish the different types of documents currently in use to communicate scientific results; and to understand the processes involved in scientific publishing. A special focus will be on ethics in performing research and reporting scientific results.
Additionally, the student will learn how to read, summarize and critically review a research paper and how to communicate these findings to peers.

1. Theoretical subjects (large group)

Each subject will be taught as a master class. All students will attend these sessions together.

Subject # 1: Literature review. Students will learn how to identify the best scientific sources and how to carry out the best and most reliable search of the scientific literature. Esther Barreiro, 1 hour. Campus del Mar.

Subject # 2: Scientific journals. Students will learn what scientific journals are, their organization and structure, their goals and achievements and how their quality can be assessed. They will also learn how authors make their decisions about where, when, and how the research results should be submitted and to which kind of journal. Esther Barreiro, 1 hour. Campus del Mar.

Subject # 3: Article types & introduction to peer-review. Students will learn the different types of articles that journals usually publish and the objectives of those types of articles published in peer-reviewed journals. Esther Barreiro, 1 hour. Campus del Mar.
Subject # 4: Peer-review process. Students will learn the reasons and the procedures of the peer-review process. Examples of peer-reviewed manuscripts will also be provided. Esther Barreiro, 1 hour. Campus del Mar.

Subject # 5: Scientific text types. Students will learn the different types of scientific texts that scientists have to write on continuous basis: abstracts, manuscripts, and grant applications. Esther Barreiro, 1 hour. Campus del Mar.

Subject # 6: Style of articles published in peer-reviewed journals. Students will learn how to write the different types of articles and their particular style in peer-reviewed journals. Esther Barreiro, 1 hour. Campus del Mar.

Subject # 7: Scientific meetings and conferences. The students will be taught about the different types of scientific meetings. They will also learn how to prepare results and data collections to be submitted to scientific meetings. Besides, they will also be taught about the different types of sessions and how to prepare and present in each type of session. Oscar Camara, 2 hours. Campus de Poblenou.

Subject # 8: Writing. The basic principles of effective writing will be exposed. Additionally strategies to organize the writing process will be given. Examples of bad writing as well as automatic generation of scientific papers will be shown and discussed. Oscar Camara, 3 hours. Campus de Poblenou.

Subject # 9: Ethics in science. Students will be taught about the ethics in the laboratory environment, analysis of the results, data interpretation and potential manipulation, scientific fraud, plagiarism, duplication of data, and “salami” science. Students will also learn the international guidelines and ethical procedures currently in use and applied when working with different types of biological samples: in vivo (human and animal samples) and in vitro (cells) studies. Simone Tassani, 2 hours. Campus del Mar.

Subject # 10: Oral communication. Examples of good presentations and simple guidelines for the conceptualization, preparation, and presentation of talks will be given. Storytelling rules. Oscar Camara, 3 hours. Campus de Poblenou.

2. Seminars and Practical sessions

⇒ During the seminars and practical sessions, the students will learn how to critically read, review and present a research article. Therefore, there are three types of seminars/practical sessions: refereeing, writing and oral communication exercises.

⇒ In the refereeing exercises, the students will have to prepare a slide presentation about the main traits and findings published in the article. They will have to give a 10-minute talk using a presentation as support. A maximum of 10-15 slides will be allowed during the presentation. All students in each group will have to present individually. The other students attending the presentation will have to ask questions about the contents of the presentation to the speakers. Furthermore, students will have to hand in a written assignment (graded for the evaluation), which will consist of the written review. In this review, students will critically judge the quality of the scientific contents, rationale to
conduct the study, experimental design, ethical considerations, main findings, and
discussion of the findings in contrast to the published literature on the topic in question. A
maximum of 1,000 words will be accepted for the review, which will be double-spaced and
12 Arial or Times Roman font size will be used. The assignment will be handed to each
professor, at the latest, three (3) days before the initial date of the practical session period. Additionally, this review has to be presented to the other students and the teacher
during a second 10-minute ppt slide presentation. In this presentation, they will discuss
their own article review. The contents of the second presentation will be basically the
summary of the comments raised in their article review: general comments, specific
comments, strengths, and weaknesses of the article.

⇒ In the writing exercises, the students firstly need to indicate a scientific topic of interest.
Then, some exercises will be prepared to complete parts (e.g. title, abstract, conclusions)
of a given scientific paper. Finding the original complete paper should be easy for the
students. Nevertheless, they are encouraged to write their own version of these parts
since there will be no tolerance on plagiarism, which will be checked using the official
software of the Universitat Pompeu Fabra. A different type of exercise will involve the
partial translation (e.g., introduction, state-of-the-art, methods, results) from Spanish to
English of a scientific paper. All these writing exercises will be completed with auto-
evaluation forms, which will be discussed in a group session with all students.

⇒ In the oral communication exercises, the students will individually present scientific
works in different formats: teaser (1-2 minutes presentation); medium (5 minutes); and
long (10 minutes) presentations. Within the possibilities, some of the presentations will be
recorded, for a subsequent self-evaluation of the presentation.

2.1. Seminars (large group)

All students will attend these sessions together.

Refereeing exercises

Seminar # 1: Introduction to the activities and example paper. Students will be given
precise instructions as to the specific activities to work on. Additionally, a paper will be
presented, which will serve as an example on how to prepare the seminar and review.
Esther Barreiro, 2 hours. Campus del Mar.

Seminar # 2: Seeking the best articles for the presentations. In this session, the
professor will illustrate how to search using the computer and several web databases the
best articles (originals, reviews, letters, etc.) that will help them understand the contents of
the example paper (original article to peer-review).
Esther Barreiro, 2 hours. Campus del Mar.

Seminar # 3: Preparing and presenting a paper. In these sessions, the professor will
illustrate how to make a summary and presentation of the example paper.
Esther Barreiro, 2 hours. Campus del Mar.

Seminar # 4: Reviewing a paper. In this session, the teacher will illustrate how to do a
proper review of the example paper and summarize this in the review form. Weaknesses
and strengths of the sample article will be analyzed together with the group.
Esther Barreiro, 2 hours. Campus del Mar.
Writing exercises


2.2. Practical sessions (in small groups)

They will always be organized in 2 groups of about 18 students each.

Refereeing exercises

Practical session # 1-2: Feedback on the individual assignments. In order to fully understand the contents of the article to work on, students will have to ask as many questions as necessary to each professor. Esther Barreiro, 2 hours per group. Campus del Mar.

Practical sessions # 3-4: Presentations and review discussions. In these sessions, students will have to explain individually the article presentation: a 10-minute talk followed by 10-minute discussion during which the presenter will have to answer the questions posed by the other students and/or the professors. Additionally, each student will present the review of the paper in a 10-minute presentation. After this, students will be given feedback from the professors about the different comments raised in the reviews written by the students. The professors will clarify potential misunderstandings in the interpretation of the study results published in the article or any other doubts. The professors will also provide feedback about the performance of the students during the course of the presentations in this session. Esther Barreiro, 4 hours per group. Campus del Mar.

Oral communication exercises


Practical session # 6: Medium presentation (5 minutes) Announcement: week 4. Presentation: week 8. Oscar Camara, 1h45 per group. Campus de Poblenou.

Practical session # 7: Long presentation (10 minutes) Announcement: week 4. Presentation: week 10. Oscar Camara, 3h30 per group (2 sessions of 1h45 per group). Campus de Poblenou.
3. Evaluations

Evaluations of the students' performance will be made on the basis of a total score of 10 points, 50% of them related to the refereeing exercises and the remaining half to the writing and oral communication exercises. The course will only be passed if the two halves are individually over 5 (out of 10) points. The final mark will be computed as the addition of the two parts. Attendance to lectures is highly recommended and compulsory for seminar and practical sessions where deliverables/results need to be shown.

Refereeing exercises (50% of final mark)
- Presentation on the assigned article (non-recoverable): 30%
- Presentation on the assigned article review (non-recoverable): 30%
- Handling of questions (non-recoverable): 10%
- Written review of the paper (non-recoverable): 20%
- Interaction and active participation during all sessions (non-recoverable): 10%

Writing exercises (25% of final mark)
- Completing parts of a scientific paper (non-recoverable): 50%
- Translation of scientific paper from Spanish to English (non-recoverable): 50%

Oral communication exercises (25% of final mark)
- Teaser (non-recoverable): 30%
- Medium presentation (non-recoverable): 30%
- Long presentation (non-recoverable): 40%

No tolerance on plagiarism

In the theory sessions, the professors will explain in detail what plagiarism is and how one can avoid plagiarism. Students that have doubts on this aspect will be encouraged to consult with the professors. The professors will scan all written deliveries for plagiarism using the official software of the Universitat Pompeu Fabra. In case this software detects plagiarism the professors will carefully verify the case. If they judge that the student indeed plagiarized, this automatically leads to complete suspension of the student. Students that commit plagiarism will not pass the course and cannot participate in the July exams. The same applies to students that submit work under their own name, which was prepared by somebody else. Also these students will be suspended from the main course and the July exams. The case will be presented to the Committee Board of the Polytechnic School and the Universitat Pompeu Fabra for the opening of an Academic File, which will be reviewed to decide the applied penalty (e.g. expulsion from UPF for 6 months).
4. Requirements

- The paper presentation, review and written review will be in English, especially the text in the ppt slides and word documents. However, students will be able to present (oral) in either Spanish or Catalan if preferred.
- Attendance to all sessions, especially to the seminars and practical sessions, is compulsory. Any kind of leave will have to be duly justified and documented.
- Students will not be able to change groups at their own discretion. Changes will only be approved by the Secretariat on one-by-one student basis. This will mean that one student from group # 1 can switch to group # 2 provided that a student in the latter group moves to the former group and the Secretariat accepts the reasons for such a change.

5. References

Berquist et al. AJR 2008; 191: 1291-1292.


Additional references will also be provided during the course.