

## SCIENTIFIC COMMUNICATION PROJECT

### Identification

**Studies:** Bioengineering Degree

**Year:** Second year

**Term:** Second term

**Number of European Credit Transfer System (ECTS):** In total, the course will consist of 3 credits (32 hours). 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) 12 hours of theoretical sessions, ii) 8 hours of seminars and iii) 12 hours of practical sessions.

### Professorship

Esther Barreiro (CEXS) and Miguel Ángel González Ballester (DTIC), 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. Thursday, April 10<sup>th</sup> 2014, 14:00h- 15:00h. Room 61.302-304. 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. Thursday, April 10<sup>th</sup> 2014, 14:00h- 15:00h. Room 61.302-304. 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. Thursday, April 10<sup>th</sup> 2014, 14:00h- 15:00h. Room 61.302-304. Campus del Mar.

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**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. Friday, April 11<sup>th</sup> 2014, 08:40h- 9:30h. Room 61.S02. 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. Friday, April 11<sup>th</sup> 2014, 09:30h- 10:30h. Room 61.S02. 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. Thursday, April 24<sup>th</sup> 2014, 08:40h- 09:30h. Room 61.302-304. Campus del Mar.

**Subject # 7: Ethics in science I.** 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. Esther Barreiro, 1 hour. Thursday, April 24<sup>th</sup> 2014, 09:30h- 10:30h. Room 61.302-304. Campus del Mar.

**Subject # 8: Ethics in science II.** 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. Esther Barreiro, 1 hour. Friday, April 25<sup>th</sup> 2014, 08:40h- 09:30h. Room 61.302-304. Campus del Mar.

**Subject # 9: 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. Miguel Ángel González Ballester, 4 hours. Monday, April 28<sup>th</sup> 2014, 11:10h-13:00h room 52.421, and Tuesday, May 6<sup>th</sup> 2014, 14:40h-16:30h room 52.329. 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, which will be available days in advance, published in a scientific Journal. The article will have been written in English. 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 ppt 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.

## 2.1. Seminars (large group)

All students will attend these sessions together.

**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. Friday, April 11<sup>th</sup> 2014, 14:00h- 16:00h. Room 61.S02. 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. Friday, April 11<sup>th</sup> 2014, 16:00h- 18:00h. Room 61.S02. Campus del Mar.

**Seminar # 3: Preparing and presenting a paper.** In this sessions, the professor will illustrate how to make a summary and presentation of the example paper.

Esther Barreiro, 2 hours. Thursday, May 8<sup>th</sup> 2014, 11:10h- 13:00h. Room 61.S02. 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. Thursday, May 8<sup>th</sup> 2014, 16:00h- 18:00h. Room 61.S02. Campus del Mar.

## 2.2. Practical sessions (in small groups)

They will always be organized in 2 groups of about 15 students each (group # 1 & group # 2). Therefore, only about 15 students will participate in each seminar.

**Practical session # 1: 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 (Group # 1) and Miguel Ángel González Ballester (Group # 2), 2 hours each session & group.

Esther Barreiro, 2 hours. Friday May 2<sup>nd</sup> 2014, 08:40h -10:30h. Room 61.302-304. Campus del Mar.

Miguel A. González, 2 hours. Tuesday May 6<sup>th</sup> 2014, 16:40h -18:30h room 52.329. Campus de Poblenu.

**Practical sessions # 2-6: 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 feed-back 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. Feedback about the performance of the students during the course of the presentations will also be provided by the professors in this session.

Esther Barreiro (Group # 1) and M.A. González(Group # 2), 10 h in total for each group.

Esther Barreiro, 2 hours. Friday May 9<sup>th</sup> 2014, 08:40h -10:30h. Room 61.S02. Campus del Mar.

Esther Barreiro, 5 hours. Thursday May 15<sup>th</sup> 2014, 8:40h -13:30h. Room 61.232. Campus del Mar.

Esther Barreiro, 3 hours. Thursday May 15<sup>th</sup> 2014, 15:00h -18:00h. Room 61.S02. Campus del Mar.

Miguel A. González, 4 hours. Monday May 12<sup>th</sup> 2014, 10:40h -14:30h room 52.423. Campus de Poblenou.

Miguel A. González, 2 hours. Monday May 12<sup>th</sup> 2014, 17:40h -19:30h room 52.117. Campus de Poblenou.

Miguel A. González, 4 hours. Tuesday May 13<sup>th</sup> 2014, 10:40h -14:30h room 52.323. Campus de Poblenou.

### 3. Evaluations

Evaluations of the students' performance will be made on the basis of a total score of 10 points.

- 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%

The course will only be passed if the following objectives are achieved:

- Scores must be equal or higher than 50%
- Attendance to all sessions: master classes, seminars, and practical sessions

### 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 the seminars 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.

Benos *et al.* *Adv Physiol Educ* 2003; 27: 47-52.

Benos *et al.* *Adv Physiol Educ* 2005; 29: 59-74.

Benos *et al.* *Adv Physiol Educ* 2007; 31: 145-152.

Provenzale *et al.* *Journal of Nuclear Medicine Technology* 2006; 34: 2.

Cicutto. *Chest* 2008; 133: 579-581.

Additional references will also be provided during the course.