BIO-467

Scientific literature analysis in bioengineering

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Cursus	Sem.	Type
Life Sciences Engineering	MA1, MA3	Opt.

Language of teaching	English
Credits	5
Withdrawal	Unauthorized
Session	Winter
Semester	Fall
Exam	During the semester
Workload	150h
Weeks	14
Hours	**5 weekly**
Lecture	2 weekly
Exercises	3 weekly
Number of positions	**20**

Il n'est pas autorisé de se retirer de cette matière après le délai d'inscription.

Remark

only one registration per student to a scientific thinking course

Summary

Students are given the means to dig effectively into modern scientific literature in the multidisciplinary field of bioengineering. The method relies on granting sufficient time to become familiar with the background and hypotheses, on effective support during the analysis and on oral assessment.

Content

The scientific literature proposed includes traditional subjects as well as topics of recent interest in the bioengineering field and more specifically on (i) cell and molecular engineering, (ii) analytics and (iii) neuroprosthetics.
The course in ialso supported by the EPFL librarian team to discuss principles and tools related to scientific databases and literature search.

Keywords

literature-analysis, bioengineering, bioanalytics, immunoengineering, cellular engineering, molecular engineering, biosensors, lab-on-a-chip, neuroprosthetics, DNA nanotechnology, biomaterials

Learning Prerequisites

Required courses

none

Learning Outcomes

By the end of the course, the student must be able to:

- Analyze scientific papers in a selection of bioengineering fields
- Interpret the results reported in the scientific literature
- Compare results with claims
- Compare among different papers the respective approaches chosen to a similar aim

- Synthesize the main messages of a scientific work
- Differentiate review and original works and other paper types
- Search scientific literature effectively

Transversal skills

- Plan and carry out activities in a way which makes optimal use of available time and other resources.
- Communicate effectively, being understood, including across different languages and cultures.
- Demonstrate the capacity for critical thinking
- Make an oral presentation.
- Summarize an article or a technical report.
- Write a literature review which assesses the state of the art.

Teaching methods

(i) Supervised work on several sets of scientific papers.
For each set, students will have one first week to consult, understand, do additional lietrature search on the papers. At the end of the week the student participate in a working session with one assistant per group of students. A second week is given for the preparation of a presentation and question and answer session on the papers.

(ii) Literature search and reporting
Each student indepedently performs a literature serch on a theme of choice on which he/she will work for approx two weeks. Specific guidelines are given to report on this activity and the work is supervised by the assistants and by the teacher as well.

Expected student activities

Study several sets of papers through the semester. Carry on additional literature search for critical assessment of the papers and for deeper understanding of the field, application, scientific questions addressed by the papers. Work in groups and prepare group presentations (one per set of papers).
Participate actively to the discussion on the work perfomed by the other groups.
Perform a literature search on a topic of choice and prepare a report according to a template.

Assessment methods

Evaluation of preparation of the papers and related material.
Evaluation of group presentations
Evaluation of participation to the discussions related to the work reported by the other groups.
Evaluation of the presentation and report on individial literature search.

Supervision

Office hours	Yes
Assistants	Yes
Forum	No
Others	Office Hours on appointment

Resources

Notes/Handbook

Slides and papers will be made available on the moodle