BIO-508

Ethics for life sciences engineers

Tormey Roland

Cursus	Sem.	Type
Life Sciences Engineering	MA2, MA4	Opt.
Neuro-X	MA2, MA4	Opt.

Language of teaching	English
Credits	4
Session	Summer
Semester	Spring
Exam	During the semester
Workload	120h
Weeks	14
Hours	**4 weekly**
Courses	2 weekly
Exercises	2 weekly
Number of positions	

Summary

The decisions that life science engineers make can have profound impacts on other people, on society, and on the environment. It is important, therefore, to be aware of the potential effects of decisions, and to have a set of ethical principles and analytical tools to make good ethical decisions.

Content

Ethical decision making: rational choice, emotional insight, intuitive ethics
Normative ethical theories: Consequentialism, Deontology, Virtue, Care Ethics, Confucianism, Ubuntu
Ethical decision making tools: codes of ethics; research ethics review committees; life-cycle analysis; participatory design; value sensitive design; risk and user impact analysis; multi-criteria analysis; perspectival analysis.
Case studies & Contexts of application: informed consent with vulnerable populations; privacy and AI with biological information; use of animals in research; life cycle of organic material used in life science engineering; gender biases in life sciences research

Keywords

Engineering Ethics, Science and technology studies, Ethic of care, Gender data gap, Responsibility and Agency

Learning Prerequisites

Required courses

None

Recommended courses

None

Important concepts to start the course

The course assumes that you are aware of the techniques and applications for life science engineering covered in the Bachelor's Degree. The ethical context of some of the these techniques and applications will then be explored in this course.

Learning Outcomes

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

- Identify ethical issues which emerge in the context of life science engineering
- Analyze different positions / conceptions / interpretations of these ethical issues

- Apply a care ethics analytical approach within an engineering design cycle
- Identify structures or systems appropriate to support ethical action
- Decide on an ethical course of action

Transversal skills

- Respect relevant legal guidelines and ethical codes for the profession.
- Take account of the social and human dimensions of the engineering profession.
- Take responsibility for health and safety of self and others in a working context.
- Demonstrate the capacity for critical thinking

Teaching methods

The course will be taught with two methods:
(i) there will be some lectures to provide you with relevant content on ethics concepts, on ethical issues in life science engineering, and on ethical practices of life science engineers (lectures are generally interactive with mini expercises and 'clicker questions' a part of the lecture format).
(i) there will be a series of case studies which will be worked on both individually and in groups. The case studies will both raise awareness of ethical issues in life science engineering and will provide an opportunity to apply engineering ethical practices to analyse cases and identify ethical solutions.

Expected student activities

Since part of an ethical analysis involves trying to see things from different peoples' perspectives, you will be expected to work in groups in the class, to discuss with each other and to 'role play' different perspectives during case study analysis. Otherwise, attending class, participating in in-class activities and doing some reading will also be helpful to you.

Assessment methods

Students will submit two ethical analyses of life science engineering case studies.
There will be feedback provided on the first submission to allow students to improve their analysis for the second submission.

Supervision

Office hours	No
Assistant.e.s	Yes
Forum	Yes
Others	I'll be available at the beginning and end of class and I am otherwise accessible either by email or through the moodle forum.

Resources

Bibliography

Ibo Van de Poel and Lambèr Royakkers (2023). *Ethics, technology, and engineering: An introduction*. John Wiley & Sons
Lewis Vaughan (2019) *Bioethics: Principles, Issues, and Cases 4th Edition*. Oxford: Oxford University Press.
Giovanni Frigo, Christine Milchram. & Rafaela Hillerbrand (2023) Designing for Care. *Science and Engineering Ethics* 29, 16. https://doi.org/10.1007/s11948-023-00434-4

Ressources en bibliothèque

- Find the references at the Library
- ARTICLE: Frigo, G., Milchram, C. & Hillerbrand, R. Designing for Care. Sci Eng Ethics 29, 16 (2023).

Moodle Link

- https://go.epfl.ch/BIO-508