

Microbiomics (I002614)

Wegens Covid19 kan mogelijk afgeweken worden van de onderwijs- en evaluatievormen. Dergelijke afwijkingen zullen via Ufora worden gecommuniceerd.

Cursusomvang *(nominale waarden; effectieve waarden kunnen verschillen per opleiding)*
Studiepunten 4.0 **Studietijd 120 u** **Contacturen** **40.0 u**

Aanbodsessies en werkvormen in academiejaar 2021-2022

A (semester 1)	Engels	Gent	microteaching	20.0 u
			groepswerk	13.75 u
			hoorcollege	6.25 u

Lesgevers in academiejaar 2021-2022

Rajkovic, Andreja	LA23	Verantwoordelijk lesgever
Boon, Nico	LA25	Medelesgever

Aangeboden in onderstaande opleidingen in 2021-2022

	stptn	aanbodsessie
Master of Science in Bioscience Engineering: Cell and Gene Biotechnology	4	A
Master of Science in de bio-ingenieurswetenschappen: milieutechnologie	4	A
Uitwisselingsprogramma bio-ingenieurswetenschappen: cel- en genbiotechnologie (niveau master-na-bachelor)	4	A
Uitwisselingsprogramma bio-ingenieurswetenschappen: milieutechnologie (niveau master-na-bachelor)	4	A

Onderwijstalen

Engels

Trefwoorden

juxtaposition, SWOT, molecular techniques, detection, monitoring, (sub)typing, quantitative approach, controls, sample preparation, interpretation

Situering

The lectures will relate to how molecular approaches can contribute to increase insights and solve issues related to specific case studies in bioscience engineering. This will cover a wide variety of applications (environmental bioengineering and plant biotechnology, food safety and (human) health) and matrices (e.g. soils, plants, water, food, the gastrointestinal tract, etc.). At the end of the course, the student will be knowledgeable to judge benefits and drawbacks of a diverse range of molecular techniques in a given context. The student should be able to select and argue the most appropriate techniques "fit for purpose" with a correct interpretation of results in the framework of a set research question

Inhoud

The course will introduce the concept of juxtaposition: by means of a number of case studies (research problems) the lecturer(s) will place two (or more) methodological approaches, molecular tools or alternative methods that might be used, parallel to another for problem solving. The purpose of **juxtaposing** two directly or indirectly related molecular (or other alternative) approaches to each other, is to highlight the contrast between the two and to compare them. Also, the concept of a SWOT analysis for support in 'fit for purpose' decision making of a particular approach for a defined research problem, will be introduced.

Juxtaposition of molecular (or other alternative) approaches will relate to topics such as:

1. Fingerprinting of microbial communities
2. (over)interpretation of untargeted analysis versus targeted analysis
3. The (non)sense of relative versus absolute quantification
4. The usefulness of sequencing vs. culturomics
5. The relationship (or not) between phylogeny & activity

6. Augmentative biological control (bio-augmentation, probiotics, biological control agents in primary production)
7. Definition of pathogenicity of human pathogens
8. One-health: (Sub)typing & source attribution
9. Online monitoring of water quality

Active learning will be stimulated during the lectures by involving the students in the discussion of various molecular approaches. The case studies discussed in the lectures will elaborate molecular approaches for one particular defined application in the area of bio-science engineering.

Besides, student groups will have to critically analyze a research paper of a similar research problem in another application area (other matrix). They will need to discuss the 'fitness' of the molecular approach taken and report on this to their peers (students & lecturers), both by means of 1) microteaching and 2) a written assignment.

The course notes will mainly serve as a reference book providing information on the principle and pitfalls of the molecular approaches introduced during the case studies. The lectures will be supported by online material on the electronic learning environment such as videos, articles and hand-outs of the presentations summarizing the key messages of the lessons learnt from the case studies.

Begincompetenties

basic level of molecular biology, microbiology and biochemistry is required.

Eindcompetenties

- 1 To discuss [the strengths, weaknesses, opportunities and threats \(SWOT analysis\) of the molecular approaches currently available for defined case studies.](#)
- 2 To select the appropriate molecular approach [and argument the methodology, including the use of appropriate controls in place, in applied biological sciences](#)
- 3 Interpret the [results generated taking into account the specific context.](#)
- 4 Critical reflection and communication on various sources of information.

Creditcontractvoorwaarde

Toelating tot dit opleidingsonderdeel via creditcontract is mogelijk mits gunstige beoordeling van de competenties

Examencontractvoorwaarde

Dit opleidingsonderdeel kan niet via examencontract gevolgd worden

Didactische werkvormen

Groepswerk, microteaching, project, online hoorcollege, online werkcollege: geleide oefeningen

Toelichtingen bij de didactische werkvormen

During the lectures, the several case studies are critically discussed in close interaction with the students to get familiar with the concept of juxtaposition.

During the group work, the students themselves analyze a research paper of a similar research problem in another application area (other matrix) and they discuss the 'fitness' of the molecular approach taken in order to prepare the report on this to their peers (students & lecturers).

During the microteaching, they will present the outcomes of their group work and discuss this with their peers.

Leermateriaal

Syllabus is available through UFORA UFORA will contain lots of supporting information for this course.

Referenties

Vakinhoudelijke studiebegeleiding

Coaching is available before or after lectures and on fixed moments for the task assignment (group work). The lecturers and assistants can also be contacted by mail.

Evaluatiemomenten

periodegebonden en niet-periodegebonden evaluatie

Evaluatievormen bij periodegebonden evaluatie in de eerste examenperiode

Mondeling examen

Evaluatievormen bij periodegebonden evaluatie in de tweede examenperiode

Mondeling examen

Evaluatievormen bij niet-periodegebonden evaluatie

Mondeling examen, participatie, werkstuk, peer-evaluatie

Tweede examenkans in geval van niet-periodegebonden evaluatie

Examen in de tweede examenperiode is niet mogelijk

Toelichtingen bij de evaluatievormen

The course content of the lectures and microteachings is evaluated by means of an oral examination

The group work task is evaluated by means of the presentation and discussion (microteaching), the assignment and peer-evaluation of the group members. Participation of the students during all the microteachings is also mandatory and is taken into account for the evaluation.

Eindscoreberekening

The examination accounts for 50% of the evaluation, while the group work accounts for 50% of the evaluation. Students who eschew period aligned and/or non-period aligned evaluations for this course unit may be failed by the examiner.