

Course analysis

Higher Seminar in Industrial Biotechnology I-V

<u>Course name:</u> Higher Seminar in Industrial Biotechnology I-V	<u>Cycle:</u> 3
<u>Course code:</u> FCB3001, FCB3002, FCB3003, FCB3004, FCB3005	<u>ECTS credits:</u> 3,0
<u>Term:</u> VT22+HT22	<u>Study period:</u> P1-P4
<u>Course coordinator:</u> Christina Divne	<u>Examiner:</u> Christina Divne
<u>Degree of examination:</u> 100%	<u>Answer frequency:</u> 33% (3 of 9 participants answered from all courses)

1. About the course series

The course series including courses FCB3001-FCB3004 was established spring 2019 and replaced the previous course series FBB3330-FBB3360 that had been running 2014-2019. An additional course in the series, FCB3005, was established in 2021.

The seminar course series for doctoral student "Higher Seminar in Industrial Biotechnology" (course codes FCB3001, FCB3002, FCB3003, FCB3004, FCB3005 for years 1-5 respectively, 3.0 ECTS each) focuses on critical analysis of published research within the broader field of biotechnology as well as in more specialized fields of research. Whenever possible, the students also present and critically analyze each other's manuscripts, which can be at any stage of completion.

The five courses cover the full extent of the third-cycle education. The courses are examined as a single module through by 80 percent active attendance. As part of the attendance criterion, three mandatory tasks are required: presence, presentation of own manuscript or article, critical review and discussion on manuscripts/articles presented by other students.

When doctoral students work with their own manuscripts, the manuscripts can be at any stage from preliminary draft to revision stage with existing review comments. For students that have not yet authored a manuscript draft, published articles in varying fields of biotechnology (with focus on the students' research areas, i.e., bioprocess technology, metabolic engineering, enzyme engineering, and structural biology) are discussed.

Each course (3.0 ECTS) spans one year with two sessions per month, and the students can start at any time during year. Typically, each student presents at two sessions per year, but all students take part in active in-depth review and analysis.

2. Pedagogical approach

The presenting student emails the reading material (manuscript or article) to all students one week before the course session. All other students prepare a careful review and critical analysis before the course session.

During the course session, the presenter summarizes the contents of the manuscript/article in the form of an oral presentation supported by lecture slides. Discussions regarding all aspects of the manuscript/article (layout/disposition, language, data presentation, data analysis, conclusion etc.) take place during and after the presentation. All students are encouraged to ask questions, reflect and discuss.

The learning outcomes are coupled to several of the Higher Education Ordinance's examination objectives for doctoral and licentiate degree, more specifically:

- ILO1: Links to Higher Education Ordinance's degree objectives A1 and A2 for doctoral degree, and A1 for licentiate degree.
- ILO2: Links to Higher Education Ordinance's degree objectives B1, B2, B4, B5 and B6 for doctoral degree, and B1 and C3 for licentiate degree.
- ILO3: Links to Higher Education Ordinance's degree objectives B3 and B4 for doctoral degree, and to B2 for licentiate degree.
- ILO4: Links to Higher Education Ordinance's degree objectives C1, C2 for both degrees, including KTH's local sustainability goal.

3. Student throughput and group composition

As of December 2022, the seminar series enrolled a total of 9 doctoral students distributed over the five courses (but all students study together).

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<u>Number of new students enrolled 2022:</u>	<u>Number of students finishing 2022:</u>
FCB3001: 4	FCB3001: 2
FCB3002: 1	FCB3002: 0
FCB3003: 0	FCB3003: 2
FCB3004: 2	FCB3004: 1
FCB3005: 1	FCB3005: 0

4. Changes made before this course offering

After the pandemic the course is given on campus with possibility to attend by zoom in hybrid mode. This is important since some students spend their time between two universities in different countries.

5. Summary of the course evaluation

Answer frequency: 3 students answered the questionnaire which was anonymous (33%).

The questions 1-11 were scored 1-5 where 1=strongly disagree; 3= neither agree or disagree; 5=strongly agree.

Question	Scores	Average score
1. The course helped me to learn about new topics within the field of Biotechnology to get a broader perspective.	5, 5, 5	5.0
2. The course helped me to obtain specialized knowledge in me own research area.	3, 3, 5	3.7
3. I had the possibility to practice presenting research results (own and others) during the course.	5, 5, 5	5.0
4. I spent time thinking about how to present research in a pedagogical way when preparing presentations.	5, 5, 5	5.0
5. I had the possibility to practice critical analysis and evaluation.	5, 5, 4	4.7
6. I had the possibility to learn about academic writing and academic authorship, and the publishing process.	4, 5, 4	4.3
7. I had the possibility to discuss ethical issues related to scientific writing and publishing research results.	5, 5, 5	5.0
8. I had the possibility to discuss and learn about sustainability through discussions and own reflection.	2, 3, 4	3.0
9. I felt comfortable discussing in an open, inclusive and non-judgmental environment.	5, 5, 5	5.0
10. I consider the course useful for my studies and research project.	3, 5, 5	4.3
11. I consider the course useful for reaching the examination goals for my intended degree.	5, 3, 4	4.0
12. What was the best aspect of the course ?	<ul style="list-style-type: none"> ▪ I like the fact that the course provide a friendly open discussion when someone is presenting. ▪ Everyone seems to have the will to help others, and the professor try to give critical comments as much as she can ▪ Atmosphere ▪ Thematic Discussion Rounds ▪ I really like the open discussion part in the course (e.g., thematic discussions) 	
13. What can be improved in the course ?	<ul style="list-style-type: none"> ▪ More thematic discussions ▪ Since it is a seminar course, maybe including visits to different Biotechnology companies and institutions could help in knowing more of what is going on in this area of Biotechnology. It will also be an opportunity to discuss with others and make scientific connections. ▪ Currently, no 	
14. Any other comments ?	<ul style="list-style-type: none"> ▪ It is a good course! I like it! ▪ Currently, no 	

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Positive aspects:

Averages for three respondents where: + agree, 0 neither agree or disagree, - disagree

+2	1. The course helped me to learn about new topics within the field of Biotechnology to get a broader perspective. 3. I had the possibility to practice presenting research results (own and others) during the course. 4. I spent time thinking about how to present research in a pedagogical way when preparing presentations. 7. I had the possibility to discuss ethical issues related to scientific writing and publishing research results. 9. I felt comfortable discussing in an open, inclusive and non-judgmental environment.
+1.7	5. I had the possibility to practice critical analysis and evaluation.
+1.3	6. I had the possibility to learn about academic writing and academic authorship, and the publishing process. 10. I consider the course useful for my studies and research project.
+1.0	11. I consider the course useful for reaching the examination goals for my intended degree.
+0.7	2. The course helped me to obtain specialized knowledge in me own research area.
0.0	8. I had the possibility to discuss and learn about sustainability through discussions and own reflection.

Based on the averages, the course broadly fulfils the intended learning outcomes, and is appreciated by the students. However, the sustainability aspect needs to be followed up more closely. All research presented has relevant contribution to sustainable development and we need to find a meaningful way to discuss this topic.

Aspects that can be improved:

The students appreciate thematic discussions and want more of those. One way to include thematic discussions on specific topics and still make sure all students have the possibility to present once per study semester would be to have one to two thematic discussions per semester where the student presentation is shorter to accommodate the discussion theme. This should be discussed during 2023.