

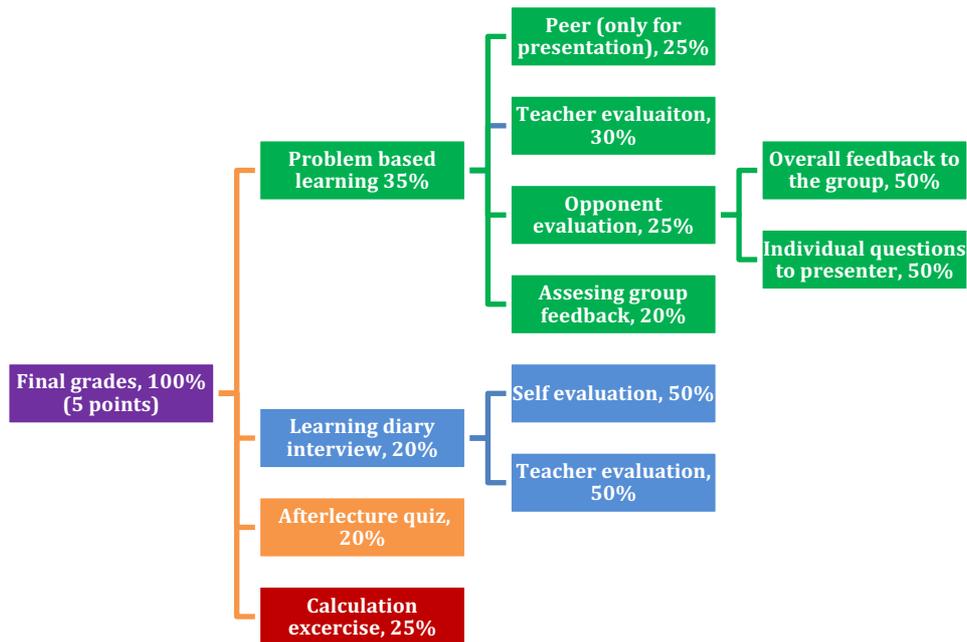
CHEM-E3140 - Bioprocess technology II

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Lecture schedule for CHEM-E3140 - Bioprocess technology II

Class No.	Week	Date/time	Location	Topic	Lecturer
1	44	Tue 01.11.21 08-10	Zoom	Bioreactor operation, scale up studies	Sandip Bankar
2	44	Thu 04.11.21 8-10	Zoom	Calculation Growth kinetics	Sandip Bankar
3	45	Tue 08.11.21 08-10	Zoom	Enzyme kinetics	Sandip Bankar
4	45	Thu 11.11.21 08-10	Zoom	Calculation Scale up OTR	Sandip Bankar
5	46	Tue 15.11.21 08-10	Zoom	St1 lecture - Enzymes in ethanol production	Siiri de Ruijter
6	46	Thu 18.11.21 08-10	Zoom	Calculation Enzymes	Sandip Bankar
7	47	Tue 22.11.21 08-10	Zoom	Mixing in bioreactors	Sandip Bankar
8	47	Thu 25.11.21 08-10	Zoom	Calculation Mixing	Sandip Bankar
9	48	Tue 30.11.21 10-12	Zoom	Kemira - Coagulation and Flocculation in Wastewater Treatment	Michael Recktenwald
10	48	Thu 02.12.21 10-12	MyCourses	Calculation assessment	Sandip Bankar
12	49	Wed 8.12.21 10-12	Zoom	Presentation and assessment	Sandip Bankar
13	49	Thu 09.12.21 8-10	Zoom	Presentation and assessment	Sandip Bankar
14	49	Fri 10.12.21 10-12		Reserve day	

Assessment methods and percent contribution in final grades



Problem based learning

- 1) Students will be given some real-life bioprocess problems to find out suitable solutions
- 2) Students are free to refer any literature and method/techniques to offer a solution. This means that you have complete free hand in this task
- 3) Thorough 'literature review' of assigned topic is required to deal with a problem
- 4) Please try to focus on commercial viability of a process with economics and life cycle assessment into consideration
- 5) Please provide 'process flow diagram' and other necessary charts/calculations wherever necessary
- 6) Make suitable assumptions wherever needed and mention them clearly
- 7) Please compile and compare your 'outcome' with other published reports with proper discussion and justification
- 8) Present an overview of your solutions to your colleagues and to the opponent group in presence of teacher
- 9) Please prepare a concise report (1000-3000 words, excluding references)
- 10) Every working group will be assigned to an **opponent group** who will evaluate your work progress throughout the course and also act as an 'opponent' during final presentation. Just like thesis defence! Opponent group is like a student supervisor for your group
- 11) Please arrange at least two meetings as per your convenience with your opponent group to discuss the work progress and brainstorm about the topic
 - a) First meeting should be arranged immediately after the topic is assigned to discuss the work-direction and -distribution in a group
 - b) Second meeting can be arranged when group is almost ready with a solution, as per your convenience, but no later than 03.12.2021
 - c) It's working group's responsibility to arrange a meeting with opponent group and to find a suitable time for all members
 - d) ***Both working group and opponent group are evaluating each other!*** Hence, it is highly recommended to be present in all occasions unless the absence is unanimously agreed by a group with a valid reason
 - e) Opponent group will evaluate working group during presentation and their point contributes 1/4th in final problem-based learning evaluation
 - f) Opponent group should submit a statement about working group with their 'point evaluation' to the Teacher on/before 15.12.2021
 - g) Working group can also submit a statement about opponent group's involvement and contribution in this project on/before 15.12.2021
- 12) **Please follow the structure for report as-**
 - a. Abstract – 100-150 words
 - b. Background
 - c. Theory/mechanism/classification/types/calculations etc. This is the main text of a report
 - d. Importance/discussion from bioprocess technology point of view
 - e. Conclusion – 100-150 words (Please don't repeat the 'main text' here. Try to write in your own words, about what have you learned from this assignment)

- f. References - You can follow reference style of any scientific journal, provided it is consistent throughout the text. Please cite relevant references both in text as well as in reference list. Please note that references are excluded from report word count.
- g. ***Please also mention individual's contribution in a separate paragraph (not counted in total word count)***

Opponent group evaluating working group -

- b) Please make sure that all members of a working group are equally participating in a task
- c) ***During meetings*** – Please see if working group is progressing in right direction and they are doing sufficient literature work
- d) ***During presentation*** – *Every opponent group member should ask at least one question to the working group.* You can also ask a preliminary draft about task beforehand from working group in order to study the topic neatly
- e) You can ***evaluate the comprehension of individual*** member as well as ***working group*** as-a-whole based on ***general criteria*** mentioned in next page. Please make sure to give 50% points to the 'group as-a-whole' and 50% points to the 'individual' member from working group (considering answer to specific question and overall contribution in the group). *You can distribute the questions to be asked among your opponent group members, so that every member from working group is confronted with at least one question.*
- f) Propose your group's final 'point suggestions' (out of 10) for individual member from working group to the teacher. *Please note that your assessment points are confidential and can be sent directly to Sandip via email (sandip.bankar@aalto.fi). Your individual names and comments will not be revealed to anyone.*

Working group evaluating opponent group -

- a) Working group can prepare a ***feedback statement*** about opponent group to describe their ***involvement*** in finding a solution to your problem
- b) You can assess their ***willingness to participate*** in meetings and ***scientific contribution*** to the subject
- c) Evaluate if the '***questions asked***' during presentation are ***relevant and adding value*** to your topic
- d) Propose your group's 'point suggestions' (out of 10) to the whole opponent group or for individual member from opponent group, whichever is convenient. *Please note that your assessment points are confidential and can be sent directly to Sandip via email (sandip.bankar@aalto.fi). Your individual names and comments will not be revealed to anyone*

Guidelines for presentation-

- a) Explain the problem to the audience and rational behind the solution
- b) Try to avoid the detailed calculations from your report, but emphasize more on the approach that you used to find a solution
- c) Explain the solution and overall conclusion of your task

- d) You can also talk about your overall learning form this task
- e) Presentation time – 10 min
- f) Discussion time – 10 min

Presentation dates –

Presentations on 8.12.21 (group 1,2,3,4)

Presentation on 9.12.21 (group 5,6,7,8)

Grading – This task contributes 35 % of final grades. Groups will be assessed by peer (25% for presentation only), teacher (30%), opponent group (25%) and assigning working group feedback (20%). We will use 'Presemo' for peer evaluation.

Evaluation criteria

Evaluation criteria- for presentation –

1. Advanced and relevant content (0-5)
2. Answers to questions raised (0-5)
3. Artistic and clear presentation (0-5)
4. Challenges and future perspective explanation (0-5)

Evaluation criteria- for report –

- 1 Orderly presentation (as mentioned in point 12)
- 2 Advanced solution to a mentioned problem
- 3 Use of flow chart/tables/figures/graphics to represent the operation
- 4 Citation of relevant references (in text as well as in list)
- 5 Relevant conclusion
- 6 Timely submission (One person from each group can submit a report on behalf of all other members)

Deadline for report submission – 15.12.21 (16:00 Finnish local time)

Learning diary and self-assessment

Please submit minimum three bullet points (maximum 150 words) in MyCourses about learning diary experience before the meeting with Sandip Bankar

Learning diary meeting – You can choose any two teaching sessions to write a learning diary (either digital or paper) and book a meeting with Sandip Bankar (https://doodle.com/poll/z4hzcw542mv67pvg?utm_source=poll&utm_medium=link). **Please send outlook calendar invitation to Sandip for selected meeting date and time.** Students will write a 'learning diary' during the course that may include notes about significant learning experiences, events of the day, open questions and assessment of own actions. Students can either write the diary during- or after the contact session. Students can also highlight the points that are unclear to them along with topics that they comprehended nicely.

Prof. Bankar will have a short (approx. 15-20 minute) **face-to-face meeting** with every student in his office (**D416a, Kemistintie 1**) and ask couple of questions related to learning diary for assessment (**before 24.11.21**). *Please don't wait until last date to arrange a meeting!*

Grading - This task contributes 20 % of final grades. Student will assess their own performance and grade themselves (50%). Teacher will grade remaining 50%.

Deadline - 24.11.21

Self-assessment criteria (can be used for self-assessment) -

- 1-2: I didn't learn anything, and I am thinking to drop this course out
- 3-4: I don't learn anything, but I can memorize to pass in this course
- 5-6: I learned few topics and I am interested to read further references
- 7-8: I learned many topics and can address the bioprocess issues with some expert help
- 9-10: I comprehended all topics from this course and confident to solve the bioprocess industry challenges with some extra efforts

Quiz (after every teaching session)

This task contributes 20 % of final grades. An online quiz is organized for all lecture sessions (excluding calculation exercise). 3-5 question will be asked based on teaching session and student need to respond in MyCourses with answers within specified days after the quiz is open. Questions are either multiple choice or subjective or essay type based on content.

The quiz will always open in Mycourses half-an-hour after the lecture is over and will close by Friday's of same week (16:00), unless mentioned separately.

If you don't respond to quiz within specified time, then you will lose respective evaluation points.

Bioprocess calculation examination on 02.12.21

This assessment contributes 25 % of final grades.

Students are asked to solve bioprocess calculation problems with logical solution.

Structure - Solve any two problems out of three based on earlier calculation classes.

Evaluation criteria - Student's approach to solve the problem will be evaluated. You can choose any technique to address the problem, by providing logical justification.

Note – I am not very keen about final correct answer. Rather I would be happy to see your logical argument to the problem.