Lecture schedule, CHEM-E1130 2020-2021

1	Jan 11, 14:15-16:00	Prof. Puurunen	CHEM-E1130 Course introduction; Introduction to catalysis
2	Jan 13, 14:15-16:00	Prof. Puurunen	Industrial catalysis: history and examples of significant processes
3	Jan 18, 14:15-16:00	Prof. Puurunen	Catalyst Characterization 1: Chemisorption and physisorption methods
4	Jan 20, 14:15-16:00	Prof. Puurunen	Preparation of heterogeneous catalysts
	Jan 21, 12:00-14:00	-	(pre-agreed time slot for group work, if needed - no location attached)
5	Jan 25, 14:15-16:00	Prof. Puurunen	Deactivation of heterogeneous catalysts
6	Jan 27, 14:15-16:00	Dr. Marja Tiitta	Catalysis in crude and renewable refining
	Jan 28, 12:00-14:00	-	(pre-agreed time slot for group work, if needed - no location attached)
	Jan 29, 12:15-14:00	M.Sc. Yim & Verkama	Assistant hour, adsorption exercise
7	Feb 1, 14:15-16:00	Prof. Puurunen	Catalyst characterization 2: Composition, phase, etc
8	Feb 3, 14:15-16:00	Prof. Puurunen	Homogeneous catalysis
	Feb 4, 12:00-14:00	-	(pre-agreed time slot for group work, if needed - no location attached)
9	Feb 8, 14:15-16:00	Dr. Arandia	Catalyst characterization 3: Temperature-programmed methods
10	Feb 10, 14:15-16:00	Prof. Puurunen	Case: Catalyst preparation by Atomic Layer Deposition
	Feb 11, 12:00-14:00	-	(pre-agreed time slot for group work, if needed - no location attached)
11	Feb 15, 14:15-16:00	Prof. Puurunen	Catalysis applications: future research directions, + Methanol economy videos
12	Feb 17, 14:15-16:00	Prof. Puurunen	CHEM-E1130 Wrap-up (+ Methanol economy videos)

[Updated, 13.1.2021]

Deadlines, CHEM-E1130 Catalysis 2020-2021

Date	Students	Description
11.1.2021 at 14:00	DL	Pre-questionnaire before 1st lecture (worth 2 points; if you miss this, you can earn the points later)
12.1.2021 at 23:59	DL	Enrolling to the course ends
13.1.2021	DL	Methanol economy DL 1 Group preference (item opens 12.1. at 10:00)
13.1.2021		Adsorption exercise shared
18.1.2021 14:00		Methanol economy group info shared (latest)
24.1.2021	DL	Methanol economy DL2: Group formation & division of tasks (Task 1, group submission)
31.1.2021	DL x 2	Methanol economy DL 3: First full report version (Task 2, group submission) and submission to Workshop (Task 3, individual submission)
2.2.2021 23:55	DL	Adsorption exercise returning DL
7.2.2021	DL	Methanol economy DL 4: Peer review of reports (Task 3, individual submission)
9.2.2021 23:55		Cut-off date adsorption exercise returning (one point per day removed for late returning)
12.2.2021		Adsorption exercise evaluations feedback
14.2.2021	DL x 2	Methanol economy DL 5: Final report (Task 4) and Video presentation link (Task 5)
21.2.2021	DL	Methanol economy DL 6: Individual reflection report
23.2.2021		1st exam (course exam)
15.4.2021		2nd exam (after period IV)
(to be determined)		3rd exam? (after period V?)

Intended learning outcomes

After the course the students are able to:

1. give the definition of catalysis and describe concepts related to heterogeneous and homogeneous catalysts
2. explain steps and methods in catalyst preparation
3. describe and apply selected catalyst characterization methods
4. explain why and how catalysts deactivate and how catalyst deactivation can be postponed or prevented
5. give examples of where catalysts are applied
6. recognize challenges potentially solvable by catalytic reactions

2021 Planned time allocation for students

Learning activity	Time allocation	Max points
Lectures + time to think	12 x 2 h = 24 h +12 x 2 h = 24 h	-
MyCourses Quizzes (max 2 points each Quiz) + pre-questionnaire (2 points)	12 x 1 h = 12 h + 2 h	20
Adsorption exercise	2 + 10 h = 12 h	12
Methanol economy group work + + Individual reflection report	26 h + 2 h	21
Studying for exam	27 h	-
Exam	4 h	45
Course feedback	2 h	2
Total	135 h	100

Relation with UN's sustainable development goals?

→ **#13, Climate Action**

Advances Sustainable Development Goals: ◉ Yes ○ No

Choose Sustainable Development Goals:

Catalysis course 2020-2021, development items

- **MyCo implementation**: keep and further improve the already high level. (In 2021, on-line open book exams.)
- **MyCo Quizzes**: Keep the good level. Further improve clarity of wording and MyCo technicalities
- **Adsorption exercise**: Keep the good level. Further improve the clarity and contents of the instructions; plan Zoom-based help session.
- **Group works**: New type of group work item this year (methanol economy co-creation)
- **Continuous feedback**: Keep the “I like, I wish” questions in quizzes. Also keep the student-friendly Continuous instant anonymous feedback option (improve the teacher-friendliness of the implementation -- invisible to students).