



MEC-E5001 - Mechatronic Machine Design, Lecture, 9.1.2024-13.2.2024

This course space end date is set to 13.02.2024 **Search Courses: MEC-E5001**

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/ Department of Mechanical Engineering / MEC-E5001 - Mechatronic Machine Design, Lecture, 9.1.2024-13.2.2024

Course Grades Course feedback

Course Home

Welcome to Mechatronic Machine Design course!

Preliminary exam is open (as of 30.11.2023). The DL is on the 2nd week of the course.

The course includes preliminary exam, lectures, weekly exercises, laboratory exercises and a project work. The course has no final exam. The final grade consists of the combined points from the lecture quizzes, exercises, labs and project work. It is good if you have completed *Mechatronics Basics* before enrolling on this *Mechatronic Machine Design* course. Passing *Mechatronic Machine Design* is not required before enrolling in *Vehicle Mechatronics: Control* and *Vehicle Mechatronics: Powertrain* courses, but Mechatronic Machine Design course is likely to help in further studies.

The exercises can be found on A+ platform: <https://plus.cs.aalto.fi/mec-e5001/2024spring/>

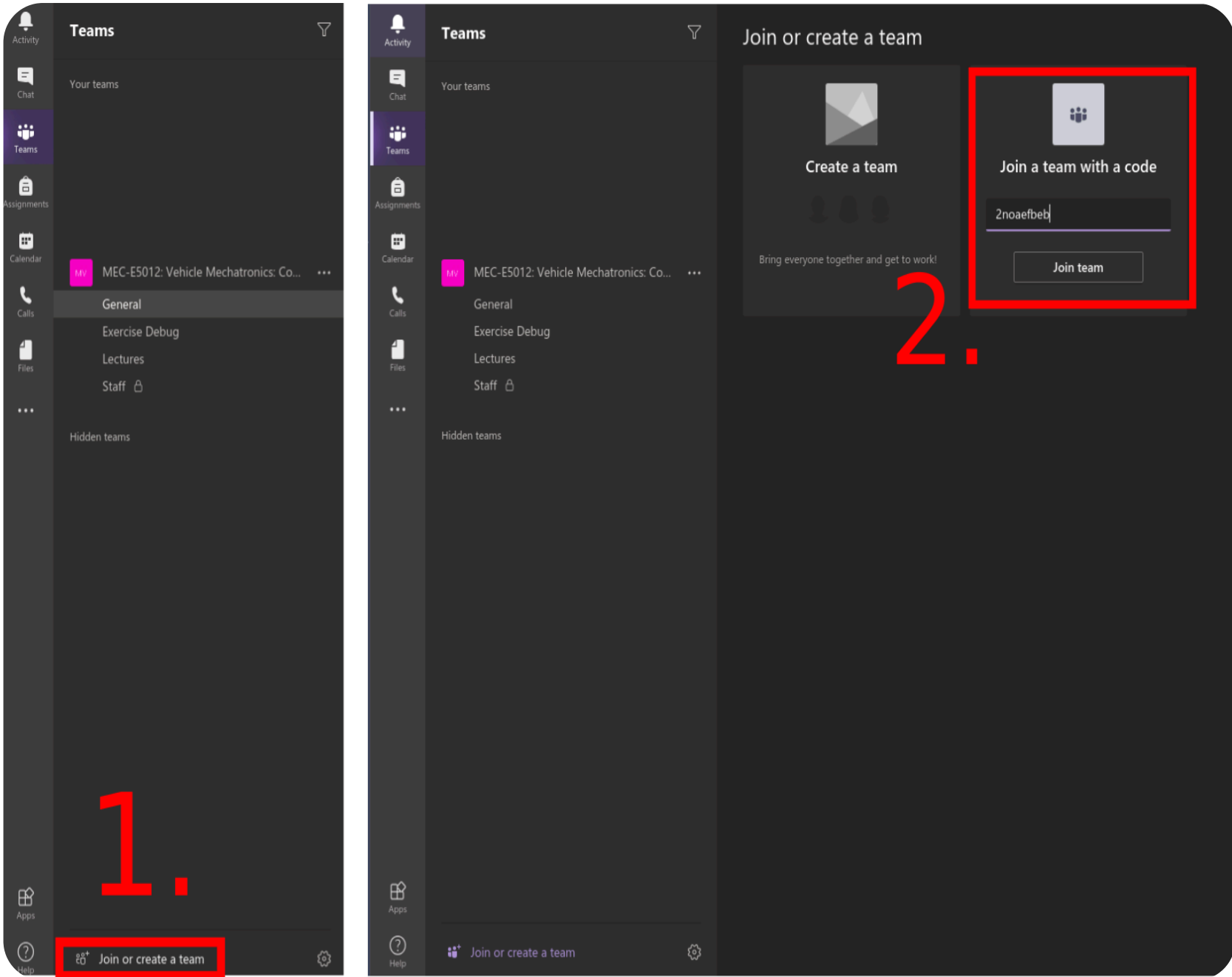
Announcements

Questions and communication

If you have any questions or comments, please **use Teams channels** to do so. Use the group chats (=channels) rather than sending direct messages, as it creates a better sense of community and your concern is most likely answered faster and everyone gets the same info.



The Microsoft teams key for the course is: **1yo20ze**
Use the code as depicted in the picture below to join the team.



Weekly activities

Monday Independent work	Tuesday Deadline for last week's exercise, 9:00 Lecture in K1/216, 9:15-11:00 Lecture quiz	Wednesday Exercise help in K1/148, 9:15-11:00	Thursday Independent work	Friday Independent work
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Course content and schedule

Wk	Lecture	Exercise	Other
1	Introduction to the course Background of mechatronics Mechatronic design process	Learning / re-cap of Matlab	
2	Dynamic systems Frequency and time domain analysis	Laplace transform, Transfer function, Impulse and step responses, Basics of dynamic models	Preliminary exam deadline Release of project work
3	Electronics and control	Operational amplifier circuits, AD & DA conversion, Bode diagram	
4	Common control topologies PID controller Control applications	Common control topologies, PID controller, Control applications	Project work startup submission deadline Sun 5th February
5	Preparing for project work	Mechatronic system simulation	
6	Project work wrap up /gala Summary of the course, Students' reflections: what we learnt, Mutual feedback	No exercises	-
7		No exercises	Project work deadline Sun 26th February Course completed 2% points for official course feedback

Grading
More detailed version of the grading, workload estimations etc. can be found in webodi. To pass the course, 50% of the points is required from all the categories listed below.
- Preliminary exam: pass/fail
- Grade from lecture quiz: weight 20 %, scale 1...5, 50 % of the points required to pass: Weekly feedback is included in this category.
- Grade from exercises including lab exercises: weight 50 %, scale 1...5, 50 % of the points required to pass
- Grade from project work: weight 30 %, scale 1...5, 50 % of the points required to pass

Provided that the preliminary exam and the minimum requirements above have been passed, the grading of the course will be the following:
- 50 % of the total points: grade 1,
- 60 %: grade 2
- 70 %: grade 3
- 83 %: grade 4, and
- 93 %: grade 5.

Disclaimer: These limits are set in stone and there are no extra assignments to increase your points after submitting your course assignments (such as quizzes, exercises, project work). Furthermore, do not trust the total points shown to you by MyCourses, as it is displaying often the wrong number until the end of the course and after teacher's have double-checked all submissions.

Deadlines

The preliminary exam will be a multiple choice exam during the 2nd week of the course.
The lecture quiz deadlines are during the same day with the corresponding lecture. Everyone has the right to answer lecture quiz. Answering the lecture quiz is likely to be easier if you have attended the lectures.
The exercises will be due before the next lecture.
The project work will be due by the end of the sixth week.

Course staff and appointments

Responsible teacher: Prof. Kari Tammii
Teacher: prof. Jenni Pippuri
Assistants: Postdoctoral researcher Riku Ala-Laurinaho, doctoral researchers Joel Mattila and Pejman Habibiroudkenar.
The course staff can be met after lectures. Please, fix the appointment beforehand.

Recommended Mechatronics courses

If you want to know what courses you should be taking before or after this course, check out this list of recommended courses for mechatronics engineers.

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