

## 02450 Introduction to Machine Learning and Data Mining

**DTU Learn:** If you are enrolled in the course you can access material and participate in the course through the DTU learn homepage

**Lectures:** The lectures will take place Tuesdays from 13:00-15:00. Due to coronavirus the lectures will be online in the first few weeks of the semester. Information about streaming and access will be available on DTU Learn.

**Exercises:** Exercises will take place after lectures Tuesdays from 15:00-17:00.

Exercises on Microsoft Teams:

- **Team Centrum-1 (B116, auditorium 81), (R):**
  - Anne Kjerstine Desler: *s194333@student.dtu.dk*
- **Team Centrum-2 (B116, auditorium 81), (Matlab):**
  - Alvaro Carrera Cardeli: *s172254@student.dtu.dk*
- **Team Centrum-3 (B116, auditorium 81), (Matlab):**
  - Santiago Maldonado Hernández: *s212744@student.dtu.dk*
- **Team Centrum-4 (B116, auditorium 81), (Python):**
  - Hatef Abdollahi: *hatab@dtu.dk*
- **Team Centrum-5 (B116, auditorium 81), (Python):**
  - Lenka Hýlová: *lenhy@dtu.dk*
- **Team South-1 (B116, foyer south), (Python):**
  - Rune Dodensig Kjærsgaard: *rdokj@dtu.dk*
- **Team South-2 (B116, foyer south), (Python):**
  - Yevhenii Osadchuk: *yevos@dtu.dk*
- **Team South-3 (B116, foyer south), (Python):**
  - Jens Perregaard Thorsen: *s183568@student.dtu.dk*

- **Team Southwest (B116, group area southwest), (Python):**
  - Gonzalo Eduardo Mazzini: *s202683@student.dtu.dk*
- **Team West (B116, group area west), (Python):**
  - François R. J. Cornet: *frjc@dtu.dk*
- **Team Northwest (B116, group area northwest), (Python):**
  - Sai Shaurya Iyer: *s192192@student.dtu.dk*
- **Team Northeast (B116, northeast), (Python):**
  - Bjarke Arnskjær Hastrup: *bjaha@dtu.dk*
- **Team East (B116, group area east), (Python):**
  - Jonas Thusgaard Elsborg: *s183797@student.dtu.dk*
- **Team Sountheast (B116, group area southeast), (Python):**
  - Nikolai Beck Jensen: *s194639@student.dtu.dk*
- **Team Orbit-1 (B116, room 45 + 49), (Python):**
  - Hugo Henri Joseph Sénétaire: *hhjs@dtu.dk*
- **Team Orbit-2 (B116, room 45 + 49), (Python):**
  - Changzhi Ai: *changai@dtu.dk*

**Reading material, lecture slides and exercises:** The course will use lecture notes and other freely available material. Lecture notes, slides, course assignment instructions etc. is available on DTU learn.

**Online Demos:** We have developed several online demos which illustrates key concepts from the course. The topics discussed currently includes PCA, regression, classification and density estimation.

**Discussion forum:** For online help and discussion see the DTU Learn discussion forum.

**Teachers :**

**Bjørn Sand Jensen (BSJ):** *bjje@dtu.dk*

**Jes Frellsen (JF):** jefr@dtu.dk

### Lecture schedule:

No	Date	Subject	Reading	Homework
1	1 February, 2022	BSJ Introduction	<b>C1</b>	
<b>Data: Feature extraction, and visualization</b>				
2	8 February, 2022	BSJ Data, feature extraction and PCA	<b>C2, C3</b>	P3.1, P2.1, P3.2
3	15 February, 2022	BSJ Measures of similarity, summary statistics and probabilities	<b>C4, C5</b>	P4.1, P4.2, P4.3
4	22 February, 2022	BSJ Probability densities and data visualization	<b>C6, C7</b>	P6.1, P6.2, P7.1
<b>Supervised learning: Classification and regression</b>				
5	1 March, 2022	BSJ Decision trees and linear regression	<b>C8, C9</b>	P9.1, P8.1, P8.2
6	8 March, 2022	BSJ Overfitting, cross-validation and Nearest Neighbor ( <b>Project 1 due before 13:00</b> )	<b>C10, C12</b>	P10.1, P10.2, P12.1
7	15 March, 2022	BSJ Performance evaluation, Bayes, and Naive Bayes	<b>C11, C13</b>	P13.1, 13.2, P12.2
8	22 March, 2022	JF Artificial Neural Networks and Bias/Variance	<b>C14, C15</b>	P15.1, P15.2, P15.3
9	29 March, 2022	JF AUC and ensemble methods	<b>C16, C17</b>	P16.1, P16.2, P17.1
<b>Unsupervised learning: Clustering and density estimation</b>				
10	5 April, 2022	JF K-means and hierarchical clustering <i>Holiday</i>	<b>C18</b>	P18.1, P18.2, P18.3
11	19 April, 2022	BSJ Mixture models and density estimation ( <b>Project 2 due before 13:00</b> )	<b>C19, C20</b>	P20.1, P19.1, P19.2
12	26 April, 2022	JF Association mining	<b>C21</b>	P21.1, P18.2, P18.3
<b>Recap</b>				
13	3 May, 2022	BSJ Recap and discussion of the exam	<b>C1-C21</b>	

**C<sub>x</sub>** refers to Chapter **x** of the course notes. **P<sub>x.y</sub>** refers to problem number **y** in chapter **x** of the course notes. The first listed problem will be that weeks discussion question at the exercises.

### FAQ:

- **I got a question about a report/lecture topic. Can I send you an email/visit your office?**

Questions about course content/reports are best asked on the discussion forum so all students have access to the same information.

- **Will you sign a participation report for my exchange stay/dorm application?**

Yes, but please fill out everything you can beforehand, including your participation. I will edit it and I am often unsure what it needs to say.

- **I have a question relating to the course regarding a personal matter. Who should I contact?**

Please send an e-mail or phone the teachers listed above.

- **It is one week into the semester course but I would like to join it! Can you add me?**

I can (and will!) add you to the group so you can see the material, but to join the course (and be at the exam) you have to enroll. You can do this through your DTU study planner. If the study planner does not work, you have to contact the study administration by email. My default position is to approve all new students. Always check your exam registration when they are published.

- **Can I get my reports transferred from a previous semester?**

Yes. Old reports are automatically transferred by default. See description for project 1. Please do not upload old reports anew unless you have changed the content

- **How do I know I get credit for my reports?**

If you are missing a report, I will send you an email to your s123456@student.dtu.dk shortly after the exam. No email, no problem.

- **What is my grade in the report?**

Reports are not graded but evaluated. By the DTU rules we cannot give you a numerical score. However, the feedback from TA's should provide a good indication.

- **When do I get feedback on the reports?**

Under normal circumstances, feedback should be available about 3 weeks after you handed in project 1, and 2 weeks after you handed in project 2.

- **I still haven't gotten report feedback?**

If feedback is delayed more than a day or two please send the listed teachers an email.

- **Is my report "passed"/"approved"?**

Reports are not "passed/not passed". Even a very poor report is better than not handing in.

- **The report handin is tomorrow and I don't have a group/my other team members are not responding to emails. Can I get an extension?**

No. Some students complete their projects on their own; if you don't have a group, or things are going south with your group, you have to fix it within the deadline.

- **How do I find a group?**

Please use the discussion forum to find team members.

- **Can I do the projects alone?**

Only after explicit permission from me due to resource constraints.

- **I think I will hand in my report an hour or two after the deadline. What could go wrong?**

We are reasonable if you are handing in late due to extraordinary circumstances, but otherwise we take the deadline serious. It would not be fair to all those students who meet the deadline if we accepted late handins without consequences.

- **Can I bring a computer to the exam?**

You must bring a computer to the exam since the exam use electronic hand-ins. You can also bring ipads, etc. The only limitation is you cannot communicate with others during the exam.

- **When and where is the exam?**

The examination time-table can be found at <https://www.dtu.dk/english/education/examination-timetable> and to find 02450 you need the schema block which can be found here: <https://kurser.dtu.dk/course/02450>

- **I have another question about the exam**

Please look at the official FAQ about exams: <https://www.inside.dtu.dk/da/undervisning/regler/regler-for-eksamen/faq-om-skriftlig-eksaminer>

- **When is the resit exam?**

In the spring semester there is a resit exam in August. For the fall semester the next exam is in the following spring semester.

- **I cannot log onto DTU Learn/inside or a specific functionality on the sites appear to be broken**

If you encounter IT problems and it appears clear something is wrong with a page or your account please submit a ticket to the (usually very responsive) IT support: <https://itservice.ait.dtu.dk>

- **Can I be a TA?**

Yes, after the course has completed, I will make a call for teaching assistants. Pay is more than 200DKK per hour and there is preparation time!