



## Deep Learning Course Summer Semester 2021 Covid-19 & Online Teaching Guide (v1.0)

Due to the current situation, all teaching at FAU will be conducted online, including the Deep Learning lectures and exercises. The following document contains the most important information regarding how we will conduct the lecture and exercise sessions. **Read carefully!**

You can get the most up-to-date information by enabling notifications for the forum “General Questions and Announcements”<sup>1</sup> in the StudOn group of this course. Information regarding the general situation can be found at <https://www.fau.de/corona/>.

**Exercises will start on Monday, April 19.**

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### 1 First things first...

- Please make sure you are registered for this course in StudOn <sup>2</sup>
- Enable notifications for the forum 1.
- In the course, please register for the exercises by April 16, 20:00<sup>3</sup>. Otherwise, we cannot guarantee a spot in the exercises for you! We will try to accommodate your preferences regarding specific days as much as possible.
- Please make sure to have Microsoft Teams activated in IDM latest by Thursday, April 15!<sup>4</sup> Otherwise, we also cannot guarantee a spot in the exercises for you! The process in IDM takes a minute, but it takes an hour until you can use Teams. So do it right away.

<sup>1</sup>Link to the forum: <https://www.studon.fau.de/frm3729309.html>

<sup>2</sup>Link to course: <https://www.studon.fau.de/crs3729302.html>

<sup>3</sup>Link to ex. registration: <https://www.studon.fau.de/xcos3729316.html>

<sup>4</sup>Link to instructions: <https://www.anleitungen.rze.fau.de/medien/ms-teams/> [German]



- Join the DL Team in MS Teams<sup>5</sup>
- Note: This course consists of lecture, exam and exercises
- For questions regarding the organization of the course, please write Florian Thamm (florian.thamm@fau.de), Zijin Yang (michael.yang@fau.de) and Katharina Breininger (katharina.breininger@fau.de) directly.  
For all other questions, please use the forum or write to cs5-deep-tutors@lists.fau.de.

## 2 Deep Learning - Lecture

- The lecture will be prerecorded and can be watched and rewatched at any time. Note that each lecture unit consists of multiple videos of 10-25 mins.
- You can access the videos at fau.tv<sup>6</sup>. As a backup, the videos are also available at Prof. Andreas Maier's YouTube Channel<sup>7</sup>.
- Questions regarding the materials covered in the lecture can be asked by commenting below the videos on YouTube, in the StudOn forum, and during the exercises.

## 3 Deep Learning - Exercises

- The assignments consist of implementing a framework with the most important DL operators from scratch in Python 3. Later in the course, we will look at PyTorch as a popular DL framework. The first four assignments should be possible to complete on any recent system. You can find suggestions regarding IDEs and Python in section 5.
- The exercise sessions will be conducted via **Microsoft Teams**. This allows us to both present the materials, to answer questions and to provide in-person support as during normal programming exercise sessions. Additional information can be found in section 4 below.
- Again, please make sure to have MS Teams activated in IDM latest by Thursday, April 15!<sup>4</sup>
- Again, make sure that you have joined the DL Team <sup>5</sup>.
- At least for assignments 1-3, we will provide recordings that cover the slides. Please make sure to look at them to prepare for the exercise sessions and to ask questions beforehand.

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<sup>5</sup>In MS Teams, go to Teams→“Join or create team”→“Join a team with a code” and enter the code 046bkbr

<sup>6</sup>Link to the videos: <https://www.video.uni-erlangen.de/course/id/1599>

<sup>7</sup>Link to playlist: [https://www.youtube.com/playlist?list=PLpOGQvPCDQzvgpD3S0vTy7bJe2pf\\_yJFj](https://www.youtube.com/playlist?list=PLpOGQvPCDQzvgpD3S0vTy7bJe2pf_yJFj)



During exercise sessions, we will again go over the most important concepts and your questions.

- We allow groups of two people, you can use the dedicated channel in Teams to find a group partner.
- Submission of the assignments will be in-person via screen sharing with a tutor and personal presentation of your solution. Note that all members of a group have to present together. After in-person submission, please upload your solution to StudOn. Use the `dispatcher.py` file to zip your solution for upload (more information in the Description).
- Note that we will check submissions for plagiarism, also with previous semesters. We encourage you to help each other, but refrain from sharing (parts of) your solution directly.

## 4 MS Teams

- Microsoft Teams is a platform that allows for chat, video/screensharing meetings, file storage and more. All members of FAU can get access to MS Teams via the IDM portal, section “Settings and Applications”.
- You may either use Teams via web<sup>8</sup> (Note: Firefox and Safari do not support calls) or by installing the Teams App<sup>9</sup>.
- Use the Channel *General* for general questions regarding understanding of the materials
- There are different private channels for different exercise days. This is to make sure that students who are registered for a specific exercise will have priority if there are many requests. Our tutor team will make sure that you are added to the correct channel.
- Issue a request for in-person support by writing a message in your exercise day channel that includes the tag `@tutor` and the name of your group partner, if applicable, e.g.,

`‘‘@tutor @<Name-of-group-partner> and I need support with <description>’’`

We will initiate a conversation when it is your turn. Note that we will answer your requests in the order they are posted in the channel.

- Please also use the same strategy if you want to submit an exercise, e.g.

`‘‘@tutor @<Name-of-group-partner> and I want to submit Ex. <Ex.#>’’`

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<sup>8</sup>Teams Web App: <https://teams.microsoft.com/>

<sup>9</sup><https://teams.microsoft.com/downloads>



- We prioritize the requests to provide fair support during the exercise. In the following the prioritizations are shown from highest (1) to lowest (6). Within one category we resolve the oldest request first (so do not repost to make us aware of your request, this moves to the end of the queue). “Exercise day channel” describes here the day channel that is currently active, e.g. on Mondays the “Monday 12 - 14” is the exercise day channel. **During submission week** (Submissions are prioritized higher)

1. Submissions in the *exercise* day channel for the current exercise
2. Questions in the *exercise* day channel about the current exercise
3. Submissions in the *general* channel for the current exercise
4. Questions in the *general* channel about the current exercise
5. Questions in the *exercise* day channel about the next exercise
6. Questions in the *general* channel about the next exercise

**Outside of submission week** (Exercise day channels are prioritized higher)

1. Submissions in the *exercise* day channel for the current exercise
  2. Questions in the *exercise* day channel about the current exercise
  3. Questions in the *exercise* day channel about the next exercise
  4. Submissions in the *general* channel for the current exercise
  5. Questions in the *general* channel about the current exercise
  6. Questions in the *general* channel about the next exercise
- During the exercise sessions, we will present the most important concepts via a call in *General*. You can join this call to listen to the presentation. **When joining the call, please make sure to have your microphone muted and your video off!** If you have questions, please post them in *General*.
  - For support and getting started, please visit <https://support.office.com/teams>

## 5 Software

### 5.1 Python and Numpy

Python is an interpreted, high-level, general-purpose programming language. Additional packages complement the functionality of “core” Python. For example, the NumPy package adds support for large multi-dimensional matrices and high level mathematical operations. If you have not worked with Python and NumPy before, please make sure to have a look at beginners guides<sup>10</sup>.

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<sup>10</sup>For example: <https://docs.python.org/3/tutorial/> and <https://docs.scipy.org/doc/numpy/user/quickstart.html>.



**Note: The following is only relevant if you work on your own machines. In the CIP pools, there is already a python distribution installed!**

We recommend to use the python distribution from **Anaconda/Miniconda** which includes functionality for package management and virtual environments, but feel free to use any distribution of your choice.

## 5.2 Anaconda

- “Anaconda® is a package manager, an environment manager, a Python/R data science distribution, and a collection of over 7,500+ open-source packages”  
quoted from <https://docs.anaconda.com/anaconda/>
- Information on how to install for Linux/Max/Windows at <https://docs.anaconda.com/anaconda/install/>
- Version with fewer preinstalled packages: Miniconda  
<https://docs.conda.io/en/latest/miniconda.html>
- Anaconda/Miniconda support virtual environments that include a specific set of packages. We have prepared the file `dlenvironment.yml` that allows you to create a new virtual environment with all packages necessary for assignments 0-3. You can create the environment by using the command (after installation of Anaconda/Miniconda)

```
conda env create -f <path-to-yml-file>
```

in a terminal. It creates an environment named DLEx. You can activate/use this environment by typing

```
conda activate DLEx
```

For more information on virtual environments, please have a look at <https://docs.conda.io/projects/conda/en/latest/user-guide/tasks/manage-environments.html>

## 5.3 IDE

While you can work on the exercises in a simple text editor, integrated development environments (IDEs) can help to simplify programming and debugging significantly. We recommend to use **PyCharm**<sup>11</sup> for this exercise. One alternative we want to mention is **Visual Studio Code**<sup>12</sup>. Both IDEs offer plugins that allow for remote pair programming which may be convenient for working in a group of two. **Happy Coding!**

<sup>11</sup>Link to PyCharm: <https://www.jetbrains.com/pycharm/>

<sup>12</sup>Link to VS Code: <https://code.visualstudio.com/>



### 5.3.1 PyCharm

- In the CIP pools, you can load PyCharm by typing

```
module load pycharm-community
```

in a terminal. You can then start it by typing

```
pycharm
```

- To install it on your own machine, please refer to <https://www.jetbrains.com/pycharm/>
- The community edition is free for everyone. Additionally, JetBrains offers free access to the professional version for students. Please refer to <https://www.jetbrains.com/community/education/#students> for more information.
- The “Code with me” plugin allows **remote pair programming** with integrated voice/video calls  
<https://www.jetbrains.com/code-with-me/>
- To make sure you use the right python interpreter for your project, make sure to set it accordingly in PyCharm. If you use Anaconda/Miniconda, please refer to <https://docs.anaconda.com/anaconda/user-guide/tasks/pycharm/> and select the **already existing** virtual environment DLEx.
- In the professional version, you can configure a remote python interpreter to run your code on a remote machine (e. g. in the CIP pool) via SSH
- For information on how to debug with PyCharm, please refer to <https://www.jetbrains.com/help/pycharm/part-1-debugging-python-code.html>
- **Happy Coding!**

### 5.3.2 Visual Studio Code

- In the CIP pools, you can load Visual Studio Code by typing

```
module load vscode
```

in a terminal. You can then start it by typing `vscode`

- To install it on your own machine, please refer to <https://code.visualstudio.com/>



- The “Live Share” plugin allows **remote pair programming**  
<https://visualstudio.microsoft.com/de/services/live-share/>
- The “Remote - SSH” plugin allows you to work on a remote machine (e. g. the CIP pool) via SSH.

## 6 Miscellaneous

- If you have issues attending online classes, e.g., because of your internet connection, please contact [tf-stib@fau.de](mailto:tf-stib@fau.de) as soon as possible.
- You may use the machines in the CIP pool of the computer science department remotely via SSH, or you may use a graphical login like xpra (<https://remote.cip.cs.fau.de/>). Additionally, the CIP admins are working towards an HTML-based xpra client that will allow you to access CIP machines remotely. For more information, please refer to <https://wwwcip.informatik.uni-erlangen.de/>
- **Stay healthy :)**