

List of Contents

- [Prerequisites](#)
 - [Software](#)
 - [Topics](#)
 - [Course Activities](#)
 - [Resources](#)
 - [Assignments](#)
 - [Getting Help](#)
 - [Course Policies](#)
- ////////////////////////////////////

Prerequisites

You are expected to be fluent in programming (Python), statistics knowledge at the level of Stat 110 or above, data science (or machine learning) at the level of AC209A and AC209B (CSCI E-109A and CSCI E-109B).

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Software

We will be using a variety of software primarily Python 3, Pytorch, Tensorflow, Docker, etc. More details in class.

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Topics

The course is organized in three modules each one 4 weeks long.

1. **Deploy data science** (integration + scalability)
 - 1a. Virtual Environments, Virtual Boxes, and Containers
 - 1b. Kubernetes
 - 1c. Dask
2. **Transfer learning and distillation**

- 2a. Intro to Transfer Learning: Basic Transfer Learning and SOTA Models
- 2b. Transfer Learning across Tasks
- 2c. Distillation and Compression

3. Visualization as investigative tool

- 3a. Introduction and Overview of Viz for Deep Models
- 3b. Convolutional Neural Networks for Image Data
- 3c. Recurrent Neural Networks for Text Data

Course Activities

Each module is structured in three types of activities and they are: **Lectures**, **Reading Discussion**, and **Practicum**. Each activity requires the students to complete different assignments in the form of exercise/homework, quizzes, reading assignment, and presentation (see Assignments below). During the first 3 weeks of each module, students will attend Lecture on Tuesday and Reading Discussion on Thursday. The fourth week of each module will be Practicum on Tuesday and Thursday. **Attendance is mandatory**.

1. **Reading List** consists in papers, blogs and other reading material that will be released no later than the beginning of each week. This will be the base for all the activities during the week See Readings Guidelines here [link to guidelines](#).
2. **Lectures** are held on **Tuesdays** from **4:30-5:45** pm in Cruft 309. During this activity we will discuss and summarize the basic concepts of the material covered during the week.
3. **Reading Discussions** are held on **Thursdays** from **4:30-5:45** pm in in Cruft 309. During this activity, two groups will present to the rest of the class one or two papers from the Reading List and lead the discussion. See Paper Presentation Guidelines here [link to guidelines](#).
4. **Practicum** are activities in the form of a project based on the material covered in the module. The students will work in groups and be expected to deliver a complete assignment in 10 days. There will be three practicum.

Resources

A brief list of the resources can be found below:

[Resource Name](#)

Assignments

The **final grade** will be calculated using the following weights for each assignment:

Exercises

There are 9 homework to complete. They will be released at the end of each regular week Lecture and due the next one. The homework are graded on a scale 1 to 5, where 5 is the highest grade.

Quizzes

There will be a quiz at the beginning of each Reading Discussion based on what was discussed during lecture. The question will cover some of the material from Reading List and students will access them using Ed Platform on Canvas (select Ed from tab on course main page). Students will have a limited amount of time to complete the quiz. 40% of the quizzes will be dropped before calculating your final grade.

Presentations

At every Reading Discussion, two groups will present the reading material assigned at the beginning of the week. Please see these on the presentations.

Practicums

There will be a final group project due during Exams period encompassing all the material learned in class.

Projects

There will be a final group project due during Exams period encompassing all the material learned in class.

Assignment	Final Grade Weight
Quizzes	9%
Exercises	9%
Presentations	15%
Practicums	45%
Projects	20%
Participation	2%
Total	100%

Getting Help

For questions about exercise, course content, package installation, and after you have tried to troubleshoot yourselves, the process to get help is:

1. Go to **Office Hours**, this is the best way to get help.
 2. Post the question in **Ed Forum** and hopefully your peers will answer.
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Course Policies

Collaboration Policy

We encourage you to talk and discuss the assignments with your fellow students. Discussion is encouraged. Presentation during Reading Discussion, Practicum and Projects are group activities.

Communication from Staff to Students

Class announcements will be through **Ed Forum**.

Academic Honesty

Ethical behavior is an important trait of a Data Scientist, from ethically handling data to attribution of code and work of others. Thus, in AC295 we give a strong emphasis to Academic Honesty. As a student your best guidelines are to be reasonable and fair. We encourage teamwork for problem sets, but you should not split the homework and you should work on all the problems together.

Accommodations for students with disabilities

Students needing academic adjustments or accommodations because of a documented disability must present their Faculty Letter from the [Accessible Education Office](#)(AEO) and speak with Pavlos by the end of the third week of the term: Friday, February 14. Failure to do so may result in us being unable to respond in a timely manner. All discussions will remain confidential.
