# MASTER`S PROGRAM DATA ANALYSIS AND ARTIFICIAL INTELLIGENCE

## YEAR 1

### Semester 1

Empirical Methods

Machinw Learning

Big Data Technologies and Analytics

Software Design with Python

Research Methodology

### Semester 2

Advanced Statistics

Advanced Machine Learning

Advanced Information Retrieval

High-dimensional Data Analysis

Systematic Literature Review

## YEAR 2

### Semester 3

Optimization

Managing Software Development

### Semester 4

Final Thesis

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**Machine learning** is the base of the Data Science specialization. The course includes simple ML algorithms, ensembles and an introduction to neural networks. It's balanced between the theoretical foundation of the algorithms and practice

**Advanced Machine Learning** gives deeper knowledge in the area. It covers autoencoders, generative models, recurrent neural networks and LSTM, graphical models, bayesian machine learning and other topics. You will learn practical aspects of training neural networks.

**High-Dimensional Data Analysis** gives you a much deeper understanding of clustering algorithms, distribution estimation, and strategies of preprocessing data.

**Big Data Technologies and Analytics** cover distributed file systems, MapReduce, Spark, NoSQL databases and distributed machine learning.

**In Empirical methods**, you will recall statistics, construct experiments and apply it in the domain of Software Engineering.

Mathematical courses **Advanced Statistics and Optimization** are fundamental in Machine learning.

The course **Managing Software Development** is about the predictable process of developing software that is needed by the customer. In ML projects correct assumptions about conditions in which the system will be used are crucial. You will also learn how to organize the teamwork, those skills will be useful when you will achieve the team lead level.

During the study, you will select **Technical electives**. There is a wide range of courses, from specializations inside ML, - DS application in applying DS in specific domains like finances, or you can get an additional specialization beyond ML.

**In Humanitarian electives**, you will develop your soft skills like communication or public speaking, learn to pass and conduct interviews, understand what is important in launching your startup and cover a lot of other interesting nontechnical aspects.

**In Thesis**, you will practice all your acquired knowledge, introduce new approaches in ML. Many students publish papers in the top conferences during the work on their thesis.