

Course Introduction

What (and how) are we going to learn?

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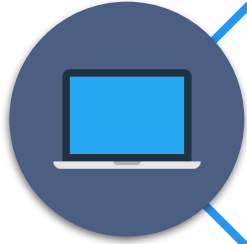
Course Objectives

Working with data
in a disciplined way

Course Objectives

- Learn how to apply the scientific method to
 - Ask the right questions
 - Obtain and clean up data
 - Explore and analyze data
 - Make the correct conclusions
- Write your own research
 - Learn how to create evidence-based, reproducible research
- Learn how to create a complete solution
 - Incorporate best practices in software design and science
- Communicate and compare results with the community

Prerequisites



Programming Basics

- Some familiarity with Python is required
- Software development experience is a plus



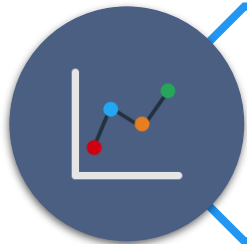
Math Concepts

- Know some algebra and statistics (and a little bit of calculus)
- Have basic logic and intuition



Intermediate English

- Understand what is written on the slides



Scientific Mindset

- Be open to (and not afraid of) challenges



Course Format Details

Curriculum, schedule, trainer,
lecture format, exam

Curriculum

- Course introduction
- Data acquisition
- Data tidying and cleaning
- Data visualization. Exploratory data analysis
- Case studies, part 1: Images and text
- Case studies, part 2: Spatial data and networks
- Modelling basics: regression models
- Best practices in software and science
- Exam preparation: end-to-end project
- DS Q&A: data science in the wild

Course Schedule

- Lessons
 - 9 lectures x 4 hours each
- Homework
 - 4 hours+ – the more, the better
 - Quiz – 0,25-0,5 hours
 - Questions to check your understanding
 - Lab – 1-6 hours
 - Problems related to real-life data science
- Extracurricular activities: 0+ hours
- Practical exam
 - 5-20+ hours

Time Allocation

- Course
 - 15 June – 10 August 2023
- Exam
 - **Group 1:** 20 August 2023, 09:00 – 18:00, GMT+3
 - **Group 2:** 27 August 2023, 09:00 – 18:00, GMT+3
- Retake exam
 - 3 September 2023, 09:00 – 18:00, GMT+3

Final Exam

- Quiz (theoretical exam)
 - 10 questions for 30 minutes
- Practical project
 - Work on your own
 - No teams allowed
 - Present your results (documentation, code, etc.) in a **limited** amount of time
 - Work on a given assignment
 - Assignment release time: at second lecture
 - Perform research
 - Scientific papers, community forums, etc.
 - Analyze the data
 - Write code
 - Communicate the results

Grading Scheme

- **Quizzes:** up to 10%
 - Due date: at the end of the course
- **Labs:** up to 10%
 - Due date: at the end of the course
- **Final exam:** up to 80%
 - Theoretical exam (quiz): 30% (24% of total grade)
 - Practical exam (project): 70% (56% of total grade)
 - Develop at your own pace
 - **Upload deadline:** Friday before the exam date; 12:00 PM
 - Project defense
 - Online: Sunday, according to schedule
- **Discord / Facebook group activity:** bonus up to 10%
- **Other bonuses:** up to 10%

Grading and Course Certificates

- All students will be graded on a scale from 2,00 to 6,00
 - The same way the standard grading in Bulgaria works
- Everyone who scores $\geq 5,00$ (total) will get a **certificate** from SoftUni
- Everyone who scores $\geq 3,00$ (on both theory and practice) can get a MoES certificate as well
 - You need to apply explicitly within a limited time



Why bother?

- Starting point for a **new career** or **continuing education** in your current field
- **Career assistance**
 - The SoftUni career center will help you find work
- Official and recognizable
 - Employers value certificates
- Proof of hard work :)
 - Shareable and verifiable
- We make sure that everyone who scores $\geq 5,00$ knows what they're doing :)

STRENGTH

+0

11

DEXTERITY

+2

14

CONSTITUTION

+2

15

INTELLIGENCE

+6

22

WISDOM

+4

18

CHARISMA

+3

16



DUNGEONS & DRAGONS®

Yordan Darakchiev

CHARACTER NAME

Trainer

CLASS

Human

RACE

Researcher

BACKGROUND

Lawful Good

ALIGNMENT

FEATURES & TRAITS

- Programmer
 - .NET / full-stack Web developer
- Machine learning engineer
 - Multiple projects, mainly image processing
- Trainer
 - Various programming courses
 - Scientific (and popular) lectures
- Scientist / Enthusiast
 - BSc & MSc in Astrophysics
 - Currently pursuing a PhD

PROFICIENCIES & LANGUAGES

- Machine learning
- Research
- Teaching
- Software engineering
- Python
- C#
- JavaScript



Learning Resources

Learn more
and share your knowledge

SoftUni Resources

- [AI module page](#)
- [Course page](#)
- [Facebook group](#)
- [Discord server](#)
- Guidelines
 - Ask and answer questions
 - I will try to answer your questions as well
 - Post what you've learned
 - Links to resources, code snippets, ideas, tips and tricks
 - Share your problems (homework or not) and help solve them
 - Create and maintain a community

Online Resources

■ Books

- ["How not to be wrong"](#) – Jordan Ellenberg
- ["Python Data Science Handbook"](#) – Jake VanderPlas
- ["Python for Data Analysis"](#) – Wes McKinney
- ... and anything else you can find

■ Websites

- [Khan Academy](#)
- Communities: [Kaggle](#), [Quora](#), [Stack Exchange](#)
- Online courses: [Coursera](#), [edX](#), [MIT OCW](#), [Stanford](#), etc.

■ YouTube

- [AsapSCIENCE](#), [Veritasium](#), [Vsauce](#), [TedEd](#), [Daniel Shiffman](#), [CrashCourse](#), [Numberphile](#), [Computerphile](#), [Vi Hart](#), [3Blue1Brown](#), [blackpenredpen](#), [Mathologer](#), and many more

The image features a white background with two blue decorative bars at the top and bottom. The top bar is a solid blue strip. The bottom bar consists of a thin dark blue line above a wider, lighter blue strip. The word "Questions?" is centered in a blue, sans-serif font.

Questions?