University of St.Gallen

Course and Examination Fact Sheet: Spring Semester 2025

8,276: Foundations in Data Science and Machine Learning

ECTS credits: 4

Overview examination/s

(binding regulations see below)
decentral - Presentation, Analog, Group work group grade (10%)
Examination time: Term time
decentral - Written work, Digital, Group work group grade (60%)
Examination time: Term time
decentral - Presentation, Digital, Group work group grade (20%)
Examination time: Term time
decentral - Active participation, Analog, Individual work individual grade (10%)
Examination time: Term time

Attached courses

Timetable -- Language -- Lecturer
8,276,1.00 Foundations in Data Science and Machine Learning -- English -- Guillot Malka

Course information

Course prerequisites

No prior experience is required with any of the software used in class. But you should have already used a statistical or programming software at an introductory level. Most of all, you should have a taste for coding, collaborating, and looking for answers on the internet. You need to bring your own laptop to class.

Learning objectives

Upon successfully completing this course, you will be able to:

- Perform your data analysis in a literate programming environment
- Import, scrape, and export data
- Visualize data
- Predict outomces using machine learning methods
- Extract information from text data

with Python

Course content

This course aims to teach the basics of data management and analysis needed in a business-school oriented University like HSG. It requires no prior knowledge of computer programming. Students will acquire skills in data collection, munging, modeling. The programming language is Python.

This course provides a hands-on introduction to Data Wrangling with the python programming language. You will learn the fundamental skills required to acquire, munge, transform, manipulate, and visualize data in a computing environment that fosters reproducibility. The focus of the course is mainly applied and aims at directly putting the tools to practice.

Course structure and indications of the learning and teaching design

This course will be taught as a blocked course during the break.
The preliminary course plan for the five days (D1 to D5) is as follows:

D1-1/ Introduction to python

D1-2/ Working with data: pandas

D2-1/ Making sense of data: visualization, descriptive statistics

D2-2/ Data collection: webscraping and API

D3-1/ Machine learning: framework for prediction

D3-2/ Machine learning: classifications & regressions

D4-1/ Machine learning: unsupervised

D4-2/ NLP

D5-1/ NLP

D5-2/ Kickstarting the class project and short presentation of project ideas

Course literature

Python:

- Online books:
  - Coding for Economists
  - Python for Economics and Business Research introduction to python, pandas, plotting
- Videos on basic python concepts
- Coding exercises on python and pandas.
- Holy Python

Data analysis:

- Data Analysis for Business, Economics, and Policy
- *Python pour les data-scientists et économistes* by Lino Gallina (cf. website)

Additional course information

Malka Guillot is Associate Professor of Applied Microeconomics at HEC Liège, Université de Liège, and a Research Affiliate at the Institut des politiques publiques (IPP) in Paris. She earned her PhD in Economics from the Paris School of Economics in 2018.

Her primary research interests lie in Public Finance, Labor Economics, and Political Economy, with a focus on applied microeconomic issues. Prof. Guillot also collaborates as an invited researcher at the Center for Applied Public Economics (CAPE) at UCLouvain Saint-Louis in Brussels.

https://malkaguillot.github.io/

Examination information

Examination sub part/s

1. Examination sub part (1/4)

Examination modalities

Examination type	Presentation
Responsible for organisation	decentral
Examination form	Oral examination
Examination mode	Analog
Time of examination	Term time
Examination execution	Asynchronous
Examination location	On Campus
Grading type	Group work group grade
Weighting	10%
Duration	--

Examination languages
Question language: English
Answer language: English

Remark
Project Pitch

Examination-aid rule
Free aids provision

Basically, students are free to choose aids. Any restrictions are defined by the faculty members in charge of the examination under supplementary aids.

Supplementary aids
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2. Examination sub part (2/4)

Examination modalities

Examination type	Written work
Responsible for organisation	decentral
Examination form	Written work
Examination mode	Digital
Time of examination	Term time
Examination execution	Asynchronous
Examination location	Off Campus
Grading type	Group work group grade
Weighting	60%
Duration	--

Examination languages
Question language: English
Answer language: English

Remark
Group Project

Examination-aid rule
Free aids provision

Basically, students are free to choose aids. Any restrictions are defined by the faculty members in charge of the examination under supplementary aids.

Supplementary aids
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3. Examination sub part (3/4)

Examination modalities

Examination type	Presentation
Responsible for organisation	decentral
Examination form	Oral examination
Examination mode	Digital
Time of examination	Term time
Examination execution	Asynchronous
Examination location	Off Campus
Grading type	Group work group grade
Weighting	20%
Duration	--

Examination languages

Question language: English
Answer language: English

Remark

Project Presentation & Defense

Examination-aid rule

Free aids provision

Basically, students are free to choose aids. Any restrictions are defined by the faculty members in charge of the examination under supplementary aids.

Supplementary aids

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4. Examination sub part (4/4)

Examination modalities

Examination type	Active participation
Responsible for organisation	decentral
Examination form	Oral examination
Examination mode	Analog
Time of examination	Term time
Examination execution	Synchronous
Examination location	On Campus
Grading type	Individual work individual grade
Weighting	10%
Duration	--

Examination languages

Question language: English
Answer language: English

Remark

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Examination-aid rule

Free aids provision

Basically, students are free to choose aids. Any restrictions are defined by the faculty members in charge of the examination under supplementary aids.

Supplementary aids
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Examination content

Active Participation (10%)
Posing questions and actively participating in class discussions.

Project Pitch (10%)
Pitch of project idea at the end of the course in class. Short set of slides with oral presentation.

Group Project (60%)
The assignment consists in a group project by a group of 2-3 students. Topics will be developed during the course, and the project would have to be handed in on May 15, 2025.

Defense of Group Project (20%)
Remote oral defense of the project, online, after handing in the group project (date to be determined).

Examination relevant literature

All required classroom material will be provided in class or online, available on the last day of the course (at the latest). Any recommended yet optional material will also be provided in the classroom notes.

Please note

Please note that only this fact sheet and the examination schedule published at the time of bidding are binding and takes precedence over other information, such as information on StudyNet (Canvas), on lecturers' websites and information in lectures etc.
Any references and links to third-party content within the fact sheet are only of a supplementary, informative nature and lie outside the area of responsibility of the University of St.Gallen.

Documents and materials are only relevant for central examinations if they are available by the end of the lecture period (CW21) at the latest. In the case of centrally organised mid-term examinations, the documents and materials up to CW 13 (Monday, 25 March 2025) are relevant for testing.

Binding nature of the fact sheets:

- Course information as well as examination date (organised centrally/decentrally) and form of examination: from bidding start in CW 04 (Thursday, 23 January 2025);
- Examination information (supplementary aids, examination contents, examination literature) for decentralised examinations: in CW 12 (Monday, 17 March 2025);
- Examination information (supplementary aids, examination contents, examination literature) for centrally organised mid-term examinations: in CW 14 (Monday, 31 March 2025);
- Examination information (regulations on aids, examination contents, examination literature) for centrally organised examinations: two weeks before ending with de-registration period in CW 15 (Monday, 07 April 2025).