Social Data Science Master's program

training program

For students who start in the fall semester of 2025/2026

Social Data Science Master's programme

<u>Valid:</u> for students starting in semester 2025/2026/1
<u>General information:</u>

Supervisor: Johannes Wachs, Associate Professor
Training location: in Budapest
Working hours: full-time
Training language: english
Whether you are enrolled in dual training: no

<u>Specialisations:</u>

No specialisations

<u>Training and output requirements</u>

1. Title of the Master's programme:
a) in Hungarian: társadalmi adattudomány mesterképzési szak
b) in English: social data science master programme

2. The title of the certification:
a) in Hungarian: okleveles társadalmi adattudós
b) in English: social data scientist

3. Classification of the Master's programme:

3.1. <u>Training area:</u> information sciences

3.2. <u>The level of qualification attainable in the Master's programme:</u>
- master- (magister, master of science, abbreviation MSc-)
- according to ISCED 2011: 7
- according to the European framework: 7
- according to the Hungarian qualifications framework: 7

3.3. <u>International Standard Classification of Education field of education code (ISCED-F 2013):</u> 0588

3.4. <u>Degree orientation:</u> balanced (40-60 percent)

4. Training duration, in semesters: 2 semesters

5. The number of credits to be completed for the Master's degree: 60 credit

6. Master's degree training objectives and professional competences:

6.1. Training objectives:

The aim of the programme is to teach students how to analyse important social and economic phenomena using advanced machine learning and statistical methods on semi-structured data sources, including networks, spatial data and texts. Participants will learn how to interpret the results in the light of social science theories and how to design analyses that are of practical relevance to different stakeholders. They will be introduced to both machine learning and causal inference techniques to make predictions and analyse cause and effect relationships. Students will learn to critically interpret data science analyses, the inferences that can be drawn from them, the comparison of alternative explanations, the consideration of confounding factors and the estimation of uncertainty. The programme will also provide insights into the limitations and implications of data science approaches, including ethical and equity considerations. The interdisciplinary approach of the programme will emphasise the communication of results in written, oral and visual formats. Graduates will also be prepared to continue their studies in a doctoral programme.

6.2. Attained professional competences:

6.2.1. The graduates have

a) knowledge:
- Understand social scientific theories that explain the mechanisms behind human behaviour and social structures.
- Knowledge of statistical techniques and computational algorithms used to analyse large and semi-structured data sets.
- Understand the stages of the data life cycle: data collection, cleaning, validation and storage.
- Understand the ethical issues and legal limitations of data collection, analysis and dissemination in social research.
- Know when and how to measure cause and effect relationships. Understand the risks of uncertainty in communicating these relationships.
- Understands how to integrate the insights of individuals with different skills, and the potential for effective collaboration.
- Knows effective written, visual and oral communication strategies for communicating with different stakeholders.
- Know how to apply machine learning algorithms to make predictions and extract meaningful knowledge from them

b) skills:
- Ability to assess, collect, clean, process and store different types of data for analysis.
- Generate new ideas and evaluate new ideas using different forms of data including semi-structure data.
- Ability to program at a high level, including handling large data sets and prototype analyses.
- Clearly define the objectives of data analytics projects, manage the implementation of projects and communicate results to stakeholders.
- Ability to generate and interpret robust studies and experiments tailored to complex social issues using appropriate techniques.

- Uses social science theories to form hypotheses about observed data generated by social and economic processes.

- Ability to make informed, ethical decisions in the design, implementation and dissemination phases of social data science research.
- Apply machine learning algorithms to make predictions and extract meaningful knowledge from them.
- Ability to think through counterfactual and alternative hypotheses on causal relationships.

c)   attitudes:
- Monitors technological developments and the changing social environment.
- Appreciates that his/her work requires analytical thinking and a thorough examination of data, claims and research.
- Committed to the highest standards of ethical integrity in data management, analysis and reporting.
- He/she values the importance of adapting to new technologies, methods and changes in the data world.
- Proactive in identifying problems, developing solutions an implementing changes effectively.
- Open to working with a variety of partners
- Considers it important to take social impacts into account in work.

d)   autonomy and responsibilities:
- Make informed strategic decisions based on rigorous data analysis and interpretation.
- Complies with legal and ethical standards in the collection, use and dissemination of data.
- Autonomous in translating data-driven insights into practical recommendations.
- Takes responsibility for honest communication of results.
- Maintains a commitment to continuous professional development in rapidly evolving data science technologies and methodologies.
- Independently monitors results and resists peer pressure.

7.   The Master's programme's professional properties, the scientific fields and areas that the training is based on and their credit proportions:

7.1.   Core Social Data Science subjects: 6-15 credits

7.2.   Data Science and Informatics subjects: 12-18 credits

7.3.   Empirical Social Science subjects: 9-15 credits

7.4.   Statistics subjects: 9-15 credits

7.5.   Number of credits allocated to elective subjects: minimum 3 credits

7.6.   Number of credits allocated to the thesis or dissertation: 9 credits

8.   Internship requirements: -

9.   Specific features that distinguish the training: -

10. For studies in a foreign language, the level of foreign language proficiency to be achieved: -

11. The knowledge on which the credit is based is based on a comparison of the knowledge and competences required by the credit transfer committee of the higher education institution for the completion of the studies, and the knowledge and competences acquired previously in the following areas:

11.1.   Courses accepted as prerequisites for admission to the Master's programme, without prior credit recognition procedure and with full credit transfer:
- applied economics,
- computer economist,
- business informatics,
- physics,
- physics-engineering,
- economic data analysis,
- mathematics,
- computer science engineering,
- computer science,
- computer science operational engineering,
- electrical engineering

Bachelor's degree courses.

11.2.   The bachelor's degree courses not listed under 11.1., and the bachelor's and master's degree courses and courses under Act LXXX of 1993 on Higher Education, which are accepted as a prerequisite for admission to the master's degree programme on the basis of a comparison of the knowledge on which the credit is based (during the preliminary credit recognition procedure) by the Board of Higher Education.

11.3.   The minimum number of credits required for admission to the Master's programme is 36 credits, based on a comparison of the knowledge acquired through previous studies or written work or equivalent non-formal, informal learning or work experience, which is the basis for the award of credits, in the following areas:

- Methodology (including courses in applied methods: analysis, linear algebra, matrix algebra, probability, statistics): 12 credits (not replaceable),

- Programming skills (knowledge of any programming language, in particular Python or R): 12 credits (not replaceable)

- Knowledge of economics or social sciences (economics, sociology, political science): 12 credits (6 credits of which can be substituted)

To be admitted to the Master's programme, the applicant must have 30 credits in methodology (12 credits), programming skills (12 credits), economics or social sciences (6 credits).

The missing credits in the Master's programme must be acquired in accordance with the study and examination regulations of the higher education institution.

11. Degree thesis/ Dissertation

The aim of the dissertation is to certify the student's knowledge and expertise in a chosen topic, scientific data collection, systematization, analysis and processing related to the chosen topic, discussion of the chosen phenomenon or problem, hypothesis creation, problem solving, analysis of alternative hypotheses, analysis and in refuting the counter-arguments, in a coherent, consistent, language-oriented written explanation of his thoughts, views, positions, statements.

12. Type of Deg ree thesis
Research thesis

13. Requirements for the issue of a final certificate
The University will issue a final certificate to the student who has obtained
- the study and examination regulation prescribed in the curriculum, and
- the required credits.

14. Conditions for admission to the final examination
Joint conditions for admission to the final exam:
a)   obtaining a final certificate,
b)   submission of the dissertation by the deadline,
c)   evaluation of the dissertation with a different grade than the deadline,
d)   registration for the final exam by the deadline,
e)   the student has no overdue payment debt to the University for the given training,
f)   accounted for with assets owned by the University (borrowed books, sports equipment, etc.).

A student who has not fulfilled any of the provisions of the points a)-f) cannot be admitted to the final examination.

15. Parts of the final exam
The final exam consists of defending the oral thesis.

16. Determining the result of the final exam
The arithmetic mean of the following two grades, rounded to two decimal places:
a)   the grade given to the thesis by the reviewer (s) - determined with a five-point qualification - in case of several reviewers the average of the marks of the reviews is rounded to two decimal places, and
b)   the grade obtained for the defense of the dissertation, for the answers to the questions related to the dissertation - established with a five-level qualification.

17. Components of diploma qualification, method of calculation
The result of the diploma is the arithmetic mean of the following two digits, rounded to two decimal places:
a)   the credit-weighted average of the marks of the compulsory and compulsory elective subjects (if the student has taken more than the compulsory elective subjects, then all the subjects taken) in the amount of credits prescribed in the curriculum, and
b)   the result (grade) of the final examination.

18. Conditions for issuing a diploma
A prerequisite for the award of a diploma certifying the completion of higher education studies is the successful completion of the final examination.

Subject Code	Subject Name	Type	Number of hours per week		Credits	Evaluation	Fall or Spring Semester	2025/2026 Academic year		Credit	Course leader	Teachers	Institute	Requirement		Equivalent subject		PSO
			Lecture	Seminar				1 Fall semester	2 Spring semester					Code	Name	Code	Name	
Core courses								**27**	**12**	**39**								
Social Data Science courses								**6**	**3**	**9**								
ADIN147NAMB	Critical Inquiry	C	3	1	6	pg	Fall	6		6	László Lőrincz	László Lőrincz, Attila Varga	Institute of Data Analytics and Information Systems					No
ADIN148NAMB	Responsible Data Science	C	1	1	3	pg	Spring		3	3	Orsolya Vásárhelyi	Orsolya Vásárhelyi	Institute of Data Analytics and Information Systems					No
Data Science and Informatics courses								**6**	**0**	**6**								
ADIN149NAMB	Applying and Interpreting Machine Learning	C	2	2	6	ex	Fall	6		6	Johannes Wachs	Johannes Wachs	Institute of Data Analytics and Information Systems					No
Empirical Social Science courses								**9**	**3**	**12**								
ADIN150NAMB	Applied Network Science	C	2	2	6	pg	Fall	6		6	László Lőrincz	László Lőrincz, Johannes Wachs	Institute of Data Analytics and Information Systems					Yes
ADIN151NAMB	Economic Complexity	C	1	1	3	pg	Fall	3		3	Balázs Lengyel	Balázs Lengyel	Institute of Data Analytics and Information Systems					Yes
ADIN152NAMB	Computational Social Dynamics and Organizations	C	2	0	3	pg	Spring		3	3	Rebeka Zsuzsanna O. Szabó	Rebeka Zsuzsanna O. Szabó	Institute of Data Analytics and Information Systems					No
Statistics courses								**6**	**6**	**12**								
ADIN153NAMB	Computational Statistics	C	2	2	6	ex	Fall	6		6	László Kovács	László Kovács	Institute of Data Analytics and Information Systems					Yes
KOZG118NAMB	Causal Inference	C	2	2	6	ex	Spring		6	6	Dániel Horn	László Czaller	Institute of Economics	ADIN153NAMB	Computational Statistics			Yes
Thesis (Core)								**3**	**6**	**9**								
ADIN154NAMB	Thesis Consultation I	C	2	0	3	pg	Fall	3		3	Johannes Wachs	Johannes Wachs	Institute of Data Analytics and Information Systems					No
ADIN155NAMB	Thesis Consultation II	C	2	2	6	pg	Spring		6	6	László Lőrincz	-	Institute of Data Analytics and Information Systems	ADIN154NAMB	Thesis Consultation 1			No
Core elective courses* (6 credit)								**0**	**6**	**6**								
ADIN156NAMB	Using Geography and Text in Data Science	CE	2	2	6	pg	Spring		6	6	Sándor Juhász	Virág Ilyes, Sándor Juhász	Institute of Data Analytics and Information Systems					No
TARS161NAMB	Survey Analytics and Big Data	CE	1	3	6	pg	Spring		6	6	Bence Ságvári	Bence Sagvari	Institute of Social and Political Sciences					No
Elective courses* (6 credit)								**0**	**6**	**6**								
	Elective courses	E					Fall, Spring											
TS00001NMMB	Sports/Physical Education	E	0	2	2	pg	Fall				Csaba Vladár		Centre for Physical Educations and Sports					
IOK0001NABB	Hungarian Language SHI I.*	E/C	0	4	3	pg	Fall	3			Judit Magyar		Centre of Foreign Language Education and Research					
IOK0004NABB	Hungarian Language SHI II.*	E/C	0	4	3	ex	Spring		3		Judit Magyar		Centre of Foreign Language Education and Research					
Total credits (semester)								**30**	**30**	**60**								

Remarks

Type: C=compulsory courses, CE=core elective courses, E=elective (optional) courses, CR=criterium courses

Methods of assessment: ex=exam (exam at the end of the semester, but other forms of assessment are possible during the semester), pg=grade based on the practical assignments given during the course of the semester, s=signature

A subject that can be completed in a preferential study order (PSO) on the basis of Section 92 of the Study and Examination Regulation (SER)

Physical education
Students wishing to take part in sport can take one semester without paying a fee and the following semesters the students can only take physical education with the payment of a specified fee.

Foreign language

During their studies, students can learn a language in the form of paid subjects within the framework of elective subjects.

Curriculum

It is recommended to include the subjects in the schedule according to the sample curriculum. The student may deviate from this, taking into account:
1. the pre-study order,
2. semester of announcing subjects
3. Completion of an average of 30 credits per semester
4. In addition to the compulsory subjects, students may take elective subjects from the offer of elective subjects (see Neptun) as well as foreign languages.
5. A minimum of 2/3 of the required amount of credit must be completed at Corvinus University.

* From master elective subjects, including physical education announced at the Corvinus University of Budapest, 6 credits in total. Hungarian Language is a compulsory subject for the students participating in the Stipendium Hungaricum scholarship program in the first two semesters.

The detailed rules related to the admission of the subjects and the completion of the subjects are included in the Study and Examination Regulations!

Please note that curriculum changes are possible!