

# Master of Science program in Social Data Science (AY2024/25)

## 2-year SDS MS program course list

### Year 1

Year 1 Requirements					
<i>Modules</i>	<i>Required ECTS</i>	<i>Courses</i>	<i>Term</i>	<i>Type M/ME/FE#</i>	<i>ECTS</i>
Bootcamp	0 ECTS	Conceptions of Social Dynamics	Pre-term	ME	0
	<i>Depending on prior qualifications</i>	Introduction to Computer Science	Pre-term	ME	0
		Pre-session in Mathematics	Pre-term	ME	0
Fundamental Methods of Data Science	16 ECTS	Applied Statistics	Fall	M	4
		Data Analysis in Python	Fall	M	4
		Social Data Mining	Winter	M	4
		Course from the mandatory elective course list of the module	Fall/ Winter	ME	4
Specialization	12 ECTS	Debates and Contradictions in Social Data Science	Winter	M	4
		Social Networks 1	Fall	M	4
		Course from the list of specialization tracks	Fall/ Winter	ME	4
Advanced Methods and Concepts	12 ECTS	Topics of Social Data Science	Fall	M	4
		Digital Data Collection Methods: Opportunities and Risks	Winter	M	4
		Data Visualization	Winter	M	4
Academic writing	4 ECTS	Academic Writing for MS in Social Data Science	Winter	M	4
Optional courses	4 ECTS	Free elective MS level course from any programs at CEU PU	Fall/ Winter	FE	4
Project 1	12 ECTS	Research internship	Spring	M	12
	Fall Term Credit Total: 24 ECTS Winter Term Credit Total: 24 ECTS Spring Term Credit Total: 12 ECTS Year 1 Credit Total: 60 ECTS				

#M – Mandatory, ME – Mandatory Elective, FE – Free Elective

## Year 2

Year 2 Requirements					
<i>Modules</i>	<i>Required ECTS</i>	<i>Courses</i>	<i>Term</i>	<i>Type M/ME/FE<sup>#</sup></i>	<i>ECTS</i>
Fundamental Methods of Data Science	4 ECTS	Course from the mandatory elective course list of the module	Winter	ME	4
Specialization	8 ECTS	Course from the list of specialization tracks	Fall/ Winter	ME	4
		Course from the list of specialization tracks	Fall/ Winter	ME	4
Advanced Methods and Concepts	16 ECTS	Network Science	Fall	M	4
		Ethics of Big Data	Fall	M	4
		Course from the mandatory elective course list of the module	Fall/ Winter	ME	4
		Course from the mandatory elective course list of the module	Fall/ Winter	ME	4
Optional Courses	8 ECTS	Free elective MS level course from any programs at CEU PU	Fall/ Winter	FE	4
		Free elective MS level course from any program at CEU PU	Fall/ Winter	FE	4
Seminar	8 ECTS	Research seminar course	Fall	M	4
		Thesis seminar course	Winter	M	4
Project 2	16 ECTS	Capstone project 1	Winter	M	4
		Capstone project 2	Spring	M	12
Fall Term Credit Total: 24 ECTS Winter Term Credit Total: 24 ECTS Spring Term Credit Total: 12 ECTS Year 2 Credit Total: 60 ECTS					

<sup>#</sup>M – Mandatory, ME – Mandatory Elective, FE – Free Elective

## Modules

### Fundamental Methods of Data Science Module (12 ECTS M and 8 ECTS ME)

Course code	Course Name	ECTS	Yr	Term	Type	Host dept.	Instructor
DNDS6005	Social Data Mining	4	1	Winter	M	DNDS	Márton Karsai
DNDS6288	Data Analysis in Python	4	1	Fall	M	DNDS	Márton Pósfai
UGST4086	Applied Statistics	4	1	Fall	M	DNDS	Elisa Omodei
UGST4088	Machine Learning 1	4	1	Fall	ME	DNDS	Petra Kralj Novak
UGST4181	Mathematics for Advanced Methods and Concepts	4	1/2	Winter	ME	DNDS	Imre Fekete
UGST4184	Machine Learning 2	4	2	Winter	ME	DNDS	Petra Kralj Novak
CDCR6031	Bayesian Data Analysis I	4	1/2	Winter	ME	Cog Sci	József Fiser
ECBS5146	Data Engineering 1: SQL and Different Shapes of Data	4	1/2	Fall	ME	ECBS	László Salló

### Advanced Methods and Concepts Module (20 ECTS M and 8 ECTS ME)

Course code	Course Name	ECTS	Yr	Term	Type	Host dept.	Instructor
DNDS6002	Data Visualization	4	1	Winter	M	DNDS	Tiago Peixoto
DNDS6007	Digital Data Collection Methods: Opportunities and Risks	4	1	Winter	M	DNDS	Márton Karsai
DNDS6014	Topics of Social Data Science	4	1	Fall	M	DNDS	Gerardo Iñiguez
TBA	Ethics of Big Data	4	2	Fall	M	TBA	TBA
UGST4143	Network Science	4	2	Fall	M	DNDS	Tiago Peixoto
DNDS6008	Agent-Based Models	4	2	Winter	ME	DNDS	János Kertész
DNDS6022	Dynamical Systems on Networks	4	2	Winter	ME	DNDS	Federico Battiston
ECBS5147	Data Engineering 2: Cloud Computing	4	1/2	Fall	ME	ECBS	Zoltán Csaba Tóth
ECBS6071	Introduction to Data Analysis in R	4	1/2	Winter	ME	ECBS	Marc Kaufmann
TBA	Social Dynamics	4	2	Winter	ME	DNDS	Federico Battiston

Specialization Module (8 ECTS M and 12 ECTS ME)

*Specialization module mandatory courses:*

Course code	Course Name	ECTS	Yr	Term	Type	Host dept.	Instructor
DNDS6012	Social Networks 1	4	1	Fall	M	DNDS	Elisa Omodei
UWC5029	Debates and Contradictions in Social Data Science	4	1	Winter	M	UWC	Márton Karsai

*Specialization in Economics mandatory elective course list:*

Course code	Course Name	ECTS	Yr	Term	Type	Host dept.	Instructor
ECBS5019	Econometrics 1	8	1/2	Fall	ME	ECBS	Róbert Pál Lieli & Ádám Reiff
ECBS5035	Microeconomics for Economic Policy	8	1/2	Fall	ME	ECBS	Mats Köster & Paul Voss
ECBS5061	Econometrics 2	8	1/2	Winter	ME	ECBS	Sergei Lychagin & Arieda Muco
ECBS5138	Data Analysis 1: Exploration - Economic Policy track	4	1/2	Fall	ME	ECBS	Gábor Békés
ECBS5145	Data Analysis 2: Finding Patterns with Regressions - Economic Policy Track	4	1/2	Fall	ME	ECBS	Tímea Laura Molnár
ECBS5181	Financial Econometrics	4	1/2	Winter	ME	ECBS	TBA
ECBS5215	Fintech in Depth	4	1/2	Winter	ME	ECBS	Tomy Lee
ECBS5246	Theory and Practice of Economic Forecasting	4	1/2	Winter	ME	ECBS	Klaus Weyerstrass
ECBS5349	Entrepreneurship and Innovation	4	1/2	Winter	ME	ECBS	Andrea Kozma
ECBS5401	Finance	4	1/2	Spring	ME	ECBS	Christian Schopper
ECBS6065	Psychology and Economics	8	1/2	Winter	ME	ECBS	Marc Kaufmann
ECBS6067	Prediction with Machine Learning for Economists	4	1/2	Fall	ME	ECBS	Gábor István Békés
ECBS6253	Machine Learning for Natural Language Processing 1	4	1/2	Spring	ME	ECBS	Arieda Muco
DNDS6023	Social Networks 2	4	1/2	Winter	ME	DNDS	Balázs Vedres
DNDS6032	Data Science for the Development Goals	4	1/2	Winter	ME	DNDS	Elisa Omodei

*Specialization in Environment Science mandatory elective course list:*

Course code	Course Name	ECTS	Yr	Term	Type	Host dept.	Instructor
ENVS5132	Introduction to Geospatial Analysis	6	1/2	Winter	ME	DESP	Viktor Lagutov
ENVS5190	Humans and the Biosphere	2	1/2	Fall	ME	DESP	Ruben Mnatsakanian
ENVS5191	The Non-human Biosphere	2	1/2	Fall	ME	DESP	Ruben Mnatsakanian
DNDS6032	Data Science for the Development Goals	4	1/2	Winter	ME	DNDS	Elisa Omodei
UWC5010	Introduction to Geospatial Data Visualization I	2	1/2	Fall	ME	UWC	Viktor Lagutov
UWC5020	Introduction to Geospatial Data Visualization II	2	1/2	Fall	ME	UWC	Viktor Lagutov
DNDS6023	Social Networks 2	4	1/2	Winter	ME	DNDS	Balázs Vedres

*Specialization in Political Science and Policy mandatory elective course list:*

Course code	Course Name	ECTS	Yr	Term	Type	Host dept.	Instructor
DOPP5078	Impact Evaluation: Policy Applications with R	4	1/2	Fall	ME	DPP	Anand Murugesan
DOPP5360	Applied Regression Analysis for Public Policy	4	1/2	Fall	ME	DPP	Ljubica Nedelkoska
DOPP5383	Advanced Impact Evaluation	4	1/2	Winter	ME	DPP	Anand Murugesan
DOPP5384	Big Data for Public Policy	4	1/2	Winter	ME	DPP	Mihály Fazekas
DOPP5664	Microeconomics, Behavior and Public Policy	4	1/2	Fall	ME	DPP	Anand Murugesan
DOPP5665	Macroeconomics and Public Policy	4	1/2	Winter	ME	DPP	Martin Kahanec
DSPS6570	Domestic Politics in the Global Economy	4	1/2	Winter	ME	DSPS	Michael Dorsch
ECBS5138	Data Analysis 1: Exploration - Economic Policy track	4	1/2	Fall	ME	ECBS	Róbert Pál Lieli
ECBS5145	Data Analysis 2: Finding Patterns with Regressions - Economic Policy Track	4	1/2	Fall	ME	ECBS	Tímea Laura Molnár
POLS5194	Social Media and Democracy	4	1/2	Fall	ME	DPS	Mariyana Angelova
POLS5814	Introduction to Public Opinion, Political Communications, Political Behavior	4	1/2	Fall	ME	DPS	Gábor Simonovits
DNDS6023	Social Networks 2	4	1/2	Winter	ME	DNDS	Balázs Vedres

DNDS6032	Data Science for the Development Goals	4	1/2	Winter	ME	DNDS	Elisa Omodei

*Specialization in Applied Social Data Science mandatory elective course list:*

Course code	Course Name	ECTS	Yr	Term	Type	Host dept.	Instructor
DNDS6023	Social Networks 2	4	1/2	Winter	ME	DNDS	Balázs Vedres
DNDS6032	Data Science for the Development Goals	4	1/2	Winter	ME	DNDS	Elisa Omodei
DOPP5384	Big Data for Public Policy	4	1/2	Winter	ME	DPP	Mihály Fazekas
ECBS5138	Data Analysis 1: Exploration - Economic Policy track	4	1/2	Fall	ME	ECBS	Róbert Pál Lieli
ECBS5145	Data Analysis 2: Finding Patterns with Regressions - Economic Policy Track	4	1/2	Fall	ME	ECBS	Tímea Laura Molnár
ECBS5215	Fintech in Depth	4	1/2	Winter	ME	ECBS	Soomin Lee
ECBS5349	Entrepreneurship and Innovation	4	1/2	Winter	ME	ECBS	Andrea Kozma
ECBS6253	Machine Learning for Natural Language Processing 1	4	1/2	Spring	ME	ECBS	Arieda Muco
ENVS5132	Introduction to Geospatial Analysis	6	1/2	Winter	ME	DESP	Viktor Lagutov
UWC5010	Introduction to Geospatial Data Visualization I	2	1/2	Fall	ME	UWC	Viktor Lagutov
UWC5020	Introduction to Geospatial Data Visualization II	2	1/2	Fall	ME	UWC	Viktor Lagutov

*Bootcamp module (0 ECTS ME)*

Course code	Course Name	ECTS	Yr	Term	Type	Host dept.	Instructor
DNDS5010	Conceptions of Social Dynamics	0	1	Pre-term	ME	DNDS	Balázs Vedres
DNDS5012	Introduction to Computer Science	0	1	Pre-term	ME	DNDS	Márton Karsai
ECBS5002	Mathematical methods	0	1	Pre-term	ME	ECBS	Eszter Bencsné Bokányi & Ferenc Bencs

Academic Writing Module (4 ECTS M)

Course code	Course Name	ECTS	Yr	Term	Type	Host dept.	Instructor
CAW5044	Academic Writing for MS in Social Data Science	4	1	Winter	M	CAW	Ágnes Diós-Tóth

Seminar Module (8 ECTS ME)

Course code	Course Name	ECTS	Yr	Term	Type	Host dept.	Instructor
TBA	Research Seminar	4	2	Fall	M	DNDS	Federico Battiston
TBA	Thesis Seminar	4	2	Winter	M	DNDS	TBA

Project Module (28 ECTS M)

Course code	Course Name	ECTS	Yr	Term	Type	Host dept.	Advisor
DNDS5021	Research Internship	12	1	Spring	M	TBC	TBC
TBA	Capstone project 1	4	2	Winter	M	TBC	TBA
TBA	Capstone project 2	12	2	Spring	M	TBC	TBA

Free Elective Module (12 ECTS FE)

The Free Elective (FE) courses shall be taken during the Winter Term of the first year and during the Fall and Winter Terms of the second year. Students shall attain at minimum a total of 12 ECTS within the two years of studies. To complete this module, elective courses at Master level from any academic programs at CEU can be taken. Students may make use of the obtained from ME courses taken beyond the minimum requirement to fulfill the FE requirement.

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-- We reserve the rights for future changes of the listed courses. --