

Course Outline

Data Science B.Sc.

valid for students who have started
their studies from winter semester
2023/2024 onwards

Faculty of Informatics and Data Science



Universität Regensburg
FAKULTÄT FÜR INFORMATIK UND DATA SCIENCE

Compulsory Modules

Module Position	Subject Area	Credits	Notes
Compulsory Module Group I: Foundations of Data Science		45	
DAT-B-DATA	Introduction to Data Science	12	
DAT-B-DATA.1	Lecture on Data Science	5	
DAT-B-DATA.2	Tutorial on Data Science Part A	5	
DAT-B-DATA.3	Tutorial on Data Science Part B	2	
DAT-B-PROB	Data Science 1 (Probability)	6	
DAT-B-PROB.1	Lecture on Probability	3	
DAT-B-PROB.2	Tutorial on Probability	3	
DAT-B-INFER	Data Science 2 (Inference)	6	
DAT-B-INFER.1	Lecture on Statistical Inference	3	
DAT-B-INFER.2	Tutorial on Statistical Inference	3	
DAT-B-ML	Machine Learning	10	
DAT-B-ML.1	Lecture on Machine Learning	5	
DAT-B-ML.2	Tutorial on Machine Learning	5	
DAT-B-MODEL	Data Science 3 (Modeling)	6	
DAT-B-MODEL.1	Lecture on Statistical Modeling	3	
DAT-B-MODEL.2	Tutorial on Statistical Modeling	3	
DAT-B-ETHICS	Being a Data Scientist	5	
DAT-B-ETHICS.1	Seminar on Being a Data Scientist	5	

Compulsory Module Group II: Foundations of Computer Science 33

DAT-B-PROG	Programming	9	
DAT-B-PROG.1	Lecture on Programming I	4	
DAT-B-PROG.2	Tutorial on Programming I	2	
DAT-B-PROG.3	Lecture on Developer Skills	1	
DAT-B-PROG.4	Tutorial on Developer Skills	2	
INF-BSc-P08	Algorithms and Data Structures	6	
INF-Bsc-P08.1	Lecture on Algorithms and Data Structures	4	
INF-Bsc-P08.2	Tutorial on Algorithms and Data Structures	2	
INF-BSc-P09	Databases I	6	
INF-BSc-P09.1	Lecture on Databases I	4	
INF-BSc-P09.2	Tutorial on Databases I	2	
DAT-B-DE	Data Engineering	6	
DAT-B-DE.1	Lecture on Data Engineering	3	
DAT-B-DE.2	Tutorial on Data Engineering	3	
DAT-B-DUD	Security and Privacy	6	
DAT-B-DUD.1	Lecture on Security and Privacy	3	
DAT-B-DUD.2	Tutorial on Security and Privacy	3	

Module Position	Subject Area	Credits	Notes
Compulsory Module Group III: Foundations of Mathematics		18	
INF-BSc-P06	Mathematics 1 FIDS - Foundations and Linear Algebra I	6	
INF-BSc-P06.1	Lecture on Foundations of Mathematics	2	
INF-BSc-P06.2	Tutorial on Foundations of Mathematics	1	
INF-BSc-P06.3	Lecture on Linear Algebra I	2	
INF-BSc-P06.4	Tutorial on Linear Algebra I	1	
INF-BSc-P14	Mathematics 2 FIDS - Linear Algebra II and Calculus I	6	
INF-BSc-P14.1	Lecture on Linear Algebra II	2	
INF-BSc-P14.2	Tutorial on Linear Algebra II	1	
INF-BSc-P14.3	Lecture on Calculus I	2	
INF-BSc-P14.4	Tutorial on Calculus I	1	
INF-BSc-P16	Mathematics 3 FIDS - Calculus II and Numerical Analysis	6	
INF-BSc-P16.1	Lecture on Calculus II	2	
INF-BSc-P16.2	Tutorial on Calculus II	1	
INF-BSc-P16.3	Lecture on Numerical Analysis	2	
INF-BSc-P16.4	Tutorial on Numerical Analysis	1	

Research Module Group 26

DAT-B-SELPACED	Self-Paced Research	12	
DAT-B-SELPACED.1	Project Seminar Scientific Project	10	
DAT-B-SELPACED.2	Seminar Scientific Project	2	
DAT-B6-THESIS	Bachelor Thesis and Scientific Writing	14	
DAT-B6-THESIS.1	Working on the Bachelor Thesis	12	
DAT-B6-THESIS.2	Lecture on Scientific Writing	1	
DAT-B6-THESIS.3	Tutorial on Scientific Writing	1	

Compulsory Elective Modules

Module Position	Subject Area	Credits	Notes
Compulsory Elective Module Group I: Connectors		30	
Five out of the following 15 modules must be successfully completed.			
DAT-B-CON-ALGBIO	Connector Algorithms in Computational Biology	6	
DAT-B-CON-ALGBIO.1	Lecture on Algorithms in Computational Biology	3	
DAT-B-CON-ALGBIO.2	Tutorial on Algorithms in Computational Biology	3	
DAT-B-CON-BIOMED	Connector Biomedical Imaging	6	
DAT-B-CON-BIOMED.1	Lecture on Biomedical Imaging	3	
DAT-B-CON-BIOMED.2	Tutorial on Biomedical Imaging	3	
WI-Bsc-IBIS-M01a	Connector Digital Business I: Business Models and Processes	6	
DAT-B-CON-BUSINESS1.1	Lecture on Digital Business I: Business Models and Processes	3	
DAT-B-CON-BUSINESS1.2	Tutorial on Digital Business I: Business Models and Processes	3	
WI-Bsc-IBIS-M02a	Connector Digital Business II: Networks and Digital Markets	6	
DAT-B-CON-BUSINESS2.1	Lecture on Digital Business II: Networks and Digital Markets	3	
DAT-B-CON-BUSINESS2.2	Tutorial on Digital Business II: Networks and Digital Markets	3	
DAT-B-CON-GENOM	Connector Genomics and Bioinformatics	6	
DAT-B-CON-GENOM.1	Lecture on Genomics and Bioinformatics	3	
DAT-B-CON-GENOM.2	Tutorial on Genomics and Bioinformatics	3	
DAT-B-CON-IMMUNO	Connector Computational Immunology	6	
DAT-B-CON-IMMUNO.1	Lecture on Computational Immunology	3	
DAT-B-CON-IMMUNO.2	Tutorial on Computational Immunology	3	
DAT-B-CON-NLE1	Connector Natural Language Engineering 1	6	
DAT-B-CON-NLE1.1	Lecture on Natural Language Engineering 1	4	
DAT-B-CON-NLE1.2	Tutorial on Natural Language Engineering 1	2	
DAT-B-CON-NLE2	Connector Natural Language Engineering 2	6	
DAT-B-CON-NLE2.1	Lecture on Natural Language Engineering 2	4	
DAT-B-CON-NLE2.2	Tutorial on Natural Language Engineering 2	2	
DAT-B-CON-ONCO	Connector Computational Oncology	6	
DAT-B-CON-ONCO.1	Lecture on Computational Oncology	3	
DAT-B-CON-ONCO.2	Tutorial on Computational Oncology	3	
DAT-B-CON-PROCESS	Connector Process Science	6	
DAT-B-CON-PROCESS.1	Lecture on Process Science	3	
DAT-B-CON-PROCESS.2	Tutorial on Process Science	3	
DAT-B-CON-QUANT	Connector Quantum Mechanics and Information Processing	6	
DAT-B-CON-QUANT.1	Lecture on Quantum Mechanics and Information Processing	3	
DAT-B-CON-QUANT.2	Tutorial on Quantum Mechanics and Information Processing	3	
DAT-B-CON-SECURE	Connector IT Security	6	
DAT-B-CON-SECURE.1	Lecture on IT Security	3	
DAT-B-CON-SECURE.2	Tutorial on IT Security	3	

Module Position	Subject Area	Credits	Notes
DAT-B-CON-SEQ	Connector Genome Sequencing	6	
DAT-B-CON-SEQ.1	Lecture on Genome Sequencing	3	
DAT-B-CON-SEQ.2	Tutorial on Genome Sequencing	3	
DAT-B-CON-TRIALS	Connector Clinical Trials	6	
DAT-B-CON-TRIALS.1	Lecture on Clinical Trials	3	
DAT-B-CON-TRIALS.2	Tutorial on Clinical Trials	3	
DAT-B-CON-UNIV	Connector Data Science	6	
DAT-B-CON-UNIV.1	Lecture Connector Data Science	3	
DAT-B-CON-UNIV.2	Tutorial Connector Data Science	3	

Compulsory Elective Module Group II: Methods

12

Two of the following modules must be successfully completed.

DAT-B-ELM-TIME	Time Series	6	
DAT-B-ELM-TIME.1	Lecture on Time Series	3	
DAT-B-ELM-TIME.2	Tutorial on Time Series	3	
WI-BSc-IBIS-M06	Explainable AI	6	
WI-BSc-IBIS-M06.1	Lecture on Explainable AI	3	
WI-BSc-IBIS-M06.2	Tutorial on Explainable AI	3	
INF-BSc-P07	Programming II	6	
INF-BSc-P07.1	Lecture on Programming II	4	
INF-BSc-P07.2	Tutorial on Programming II	2	
INF-BSc-P17	Digital Image Processing I	6	
INF-BSc-P17.1	Lecture on Digital Image Processing I	4	
INF-BSc-P17.2	Tutorial on Digital Image Processing I	2	
INF-BSc-P11	Software Engineering	6	
INF-BSc-P11.1	Lecture on Software Engineering	4	
INF-BSc-P11.2	Tutorial on Software Engineering	2	
INF-BSc-P12	Operating Systems	6	
INF-BSc-P12.1	Lecture on Operating Systems	4	
INF-BSc-P12.2	Tutorial on Operating Systems	2	
INF-BSc-P03	Human-Computer Interaction	6	
INF-BSc-P03.1	Lecture on Human-Computer Interaction	4	
INF-BSc-P03.2	Tutorial on Human-Computer Interaction	2	
INF-BSc-P13	Foundations of IT Security	6	
INF-BSc-P13.1	Lecture on Foundations of IT Security	4	
INF-BSc-P13.2	Tutorial on Foundations of IT Security	2	
INF-BSc-WP02	Introduction to Cryptography	6	
INF-BSc-WP02.1	Lecture on Introduction to Cryptography	4	
INF-BSc-WP02.2	Tutorial on Introduction to Cryptography	2	

Publisher:

Faculty of Informatics and Data Science
www.go.ur.de/fids-faculty

Student Advisory Service „Data Science at UR“
E-mail: studienberatung.ds@ur.de

This course outline has been prepared with the utmost care.
However, no guarantee is provided for the accuracy of the information.