

Master Study Program Applied Data Science

Overview of Study Modules Offered by or in Collaboration with the Department of Medical Informatics, UMG

Abbreviations:

rec. It is recommended
sem.: to take this course in semester #
ECTS: Credit Points
CH: Contact Hours per week

WiSe,
SoSe

winter term,
summer term

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Modules	Topics covered in Medical Informatics Lectures	Lecturers	Offer	rec. sem.	ECTS	CH	Module group
M.Inf.2101: Best Practice Methods of Privacy and Ethics in Data Science	Applied ethics, ethical and legal frameworks, privacy and data protection, anonymity, data ownership, user consent, data collection, data processing, data storage, data management, data sharing, equity and diversity.	Responsible: Bickeboeller, Gold MI Lecturer: Sax	WiSe	1-3	5	2	Core curriculum, Fundamentals of Data Science (I. 1. a.)
M.Inf.2102: Advanced Statistical Learning for Data Science	Advanced statistical methods, ensemble learning (federated learning, transfer learning), model assessment (AUC, PRAUC, MCC), validation (CV, Monte Carlo), and interpretation (EFS, GNN, XAI) as well as statistical network inference.	Responsible: Hauschild, Altenbuchinger MI Lecturers: Hauschild, Beinecke	WiSe	1-3	6	4	Core curriculum, Statistical methods of Data Science (I. 1. b.)
M.Inf.2801: Research Lab Rotation	Advanced Research Training in Medical Informatics, Medical Data Science	Krefting	each semester	3-4	12	n/a	Professionalization Section, Key competencies (I. 2. c. aa.)
M.Inf.1303: Imaging and Visualization	Image Processing in Medical Care	Krefting, Grothausmann	SoSe	1-3	6	4	Professionalization Section, Elective courses Data Science – Computer Science (I. 2. a. aa.)

Modules in the Application Domain Medical Data Science (I. 2. b. IV.)

Modules	Topics	Lecturers	Offer	rec. Sem.	ECTS	CH	Module group
B.Inf.1351.A: Grundlagen der Biomedizin¹	B.Inf.1351.A.1: Grundlagen der Biomedizin I DNA, RNA, Phänotyp, Zellen, Bakterien, Viren, genetisch bedingte Krankheiten, Biobanken B.Inf.1351.A.2: Grundlagen der Biomedizin II Organe, Organsysteme, Erkrankungen, medizinische Disziplinen	Kusch, Kossen, Rieß, Nußbeck, Kraus	WiSe/SoSe	1-3	6	4	(I. 2. b. IV. 1.)
M.Inf.1304: E-Health	E-Health	Krefting, Frank, Paetsch, Berg, Weber, Kirsche, Osburg, Tschudnowsky, Bunar, Dimde, Hartge, Kluge	WiSe	1-3	6	4	(I. 2. b. IV. 2.)
M.Inf.1307: Current Topics in Medical Informatics	Clinical Decision Support Systems in Medicine	Rühlicke	WiSe	1-3	6	4	(I. 2. b. IV. 2.)
M.Inf.1308: Journal Club²	Journal Club	Krefting, Sax et al.	each semester	1-3	3	2	(I. 2. b. IV. 2.)
M.Inf.1351: Work Methods in Health Research	Collaborative Work Methods in Research	Sax	WiSe	1-3	5	3	(I. 2. b. IV. 2.)
M.Inf.356-1: Personalized Medicine	Personalized Medicine <i>Prior attendance of module B.Inf.1351.A is strongly recommended.</i>	Sax et al.	SoSe	1-3	3	2	(I. 2. b. IV. 2.)

¹ **Module B.Inf.1351.A** spans over two semesters. A.1 is offered every winter term, A.2 is offered every summer term. It is advisable – but not mandatory! – to start the module in the winter term, because the second part of the module builds on the first.

² **Journal Club** is offered continuously during as well as outside of lecture periods. Students have to attend 12 sessions during their studies and do two presentations of their own.