



TUBAF

Die Ressourcenuniversität.
Seit 1765.

Welcome to Freiberg!

Information for new students of "Mathematics for Data and Resource Science"

Dean of Studies – Prof Dr Björn Sprungk

A very warm welcome to study in Freiberg

Some information:

- ❑ Mathematics for Data and Resource Sciences (Master)
- ❑ Abbreviation **MDRS**
- ❑ Enrolling international students since winter term 2023

New Structure of the Master's Programme

1st Semester	2nd Semester	3rd Semester	4th Semester
Statistical Foundations of Data Science (5 LP)	Mathematics of Machine Learning (6 LP)	Mathematical Seminar (6 LP)	
Seminar Mathematical Fundamentals (5 LP)	Geomodelling (5 LP)		
Mathematical Electives (37-51 LP)			Master Thesis (30 LP) or Master Thesis + Internship (20 + 10 LP)
Minor subject electives (4-12 LP)			
German Language (8 LP)		Free module (0-6 LP)	

- ❖ 4 semesters
- ❖ Lectures start on October 19th, 2026 (VISA-issues? Often online lectures possible!)
- ❖ 7 mandatory courses, many electives (math and minor subject)
- ❖ 2 additional certificates possible
- ❖ Reduced Master's Thesis possible (given industrial internship of 4 months)

Certificates

Specialization "Geomathematics"

Module	CP
Advanced Theory of Potential Fields	4
Applied Geomodelling	4
Applied Machine Learning for Geoscience	5
Basics in Partial Differential Equations	4
Climate Change	5
Continuum Multiphysics in the Geosciences	4
Current Topics in Numerical Analysis I	6
Current Topics in Numerical Analysis II	6
Differential Geometry	5
Finite Element Methods (FEM) for Mathematicians	9
Fourier Analysis	5
Global Analysis	5
Introduction to Scientific Programming	4
Inverse Problems	5
Inverse Problems in Geophysics	6
Mathematics of Crystallographic Texture Analysis	5
Modelling and Simulation	9
Numerical Methods for Initial Value Problems	9
Numerical Simulation Methods in Geophysics	6
Parallel Computing	6
Scientific Computing Project	6
Selected Topics in Applied Operator Theory	5
Selected Topics in Partial Differential Equations	5
Theory of Electromagnetic Methods	4
Theory of Potential Methods	4
Vector Optimization	6
Total (26 modules)	142

Specialization "Mathematical Data Science"

Module	CP
Algorithmic and Structural Graph Theory	9
Algorithmic Geometry	6
Algorithmic Topology	6
Algorithms	6
Applied Machine Learning for Geoscience	5
Applied Statistics	6
Current Topics in Stochastics	6
Data Analysis Project	4
Data-driven Forecasting under Uncertainty	6
Geometry and Topology	6
Introduction to Bayesian Data Analysis	4
Introduction to High Performance Computing and Optimization	4
Introduction to Machine Learning and Big Data	6
Mathematical Image Processing	6
Mathematics of Crystallographic Texture Analysis	5
Mathematics of Ethics	5
Methods in Machine Learning	6
Methods of Applied Algebra	6
Numerical Methods for Nonlinear Optimization and Nonlinear Systems	9
Parallel Computing	6
Random Graphs	5
Statistical Analysis of Systems	6
Stochastic Processes	6
Stochastic Programming	6
Topological Data Analysis	6
Vector Optimization	6
Wavelets	6
Total (27 modules)	158



Certificate of Specialization in Mathematical Data Science

This is to certify that

XXXX XXXX

– Date of Birth: XXXX.XXXX –

has successfully completed the required comprehensive coursework to demonstrate proficiency in the field of mathematical data science within the Master's degree program
Mathematics for Data and Resource Sciences

Freiberg, 5. Oktober 2026

Prof. Dr. Björn Sprungk
(Dean of Studies)

Sample plans for the two specializations (they are examples, they are not mandatory!)

“Geomathematics”

Module	1st sem. L/E/S/P	2nd sem. L/E/S/P	3rd sem. L/E/S/P	4th sem. L/E/S/P	CP
Compulsory modules					
Seminar Mathematical Fundamentals for Data and Resource Science	0/0/3/0				5
German A1/ 1st Semester ¹	0/4/0/0				4
Statistical Foundations of Data Science	2/1/0/0				5
Geomodelling – Geostatistics for Natural Resource Modelling		2/2/0/0			5
German A1/ 2nd Semester ¹		0/4/0/0			4
Mathematics of Machine Learning		3/1/0/0			6
Seminar Mathematics for Data and Resource Sciences			0/0/2/0		6
Master Thesis (Mathematics for Data and Resource Sciences)			x	x	30
Compulsory elective modules					
Modules totalling 55 credit points are to be chosen from the elective catalogues Mathematical Elective Modules, Minor Subjects and Free Elective Module. Of these, modules totalling at least 37 credit points must be chosen from the catalogue Mathematical Elective Modules and modules totalling at least 4 credit points from the catalogue Minor Subjects. In addition, at most 6 credit points may be covered by free elective modules.					
Compulsory elective modules: Mathematical Elective Modules					
Basics in Partial Differential Equations	2/1/0/0				4
Introduction to Scientific Programming	2/2/0/0				4
Modeling and Simulation (even years only)					
Numerical Methods for Initial Value Problems (odd years only)	4/2/0/0				9
Selected Topics in Partial Differential Equations		2/1/0/0			5
Introduction to Bayesian Data Analysis		1/1/0/0			4
Inverse Problems			2/1/0/0		5
Scientific Computing Project			0/0/3/0		6
Compulsory elective modules: Minor Subjects					
Inverse Problems in Geophysics		2/2/0/0			6
Climate Change			2/2/0/0		5
Applied Machine Learning for Geoscience				2/1/0/0	5
Theory of Electromagnetic Methods				2/1/0/0	4
Credit points per semester	31	31	31	29	122

“Mathematical Data Science”

Module	1st sem. L/E/S/P	2nd sem. L/E/S/P	3rd sem. L/E/S/P	4th sem. L/E/S/P	CP
Compulsory modules					
Seminar Mathematical Fundamentals for Data and Resource Science	0/0/3/0				5
German A1/ 1st Semester ¹	0/4/0/0				4
Statistical Foundations of Data Science	2/1/0/0				5
Geomodelling – Geostatistics for Natural Resource Modelling		2/2/0/0			5
German A1/ 2nd Semester ¹		0/4/0/0			4
Mathematics of Machine Learning		3/1/0/0			6
Seminar Mathematics for Data and Resource Sciences			0/0/2/0		6
Master Thesis (Mathematics for Data and Resource Sciences)			x	x	30
Compulsory elective modules					
Modules totalling 55 credit points are to be chosen from the elective catalogues Mathematical Elective Modules, Minor Subjects and Free Elective Module. Of these, modules totalling at least 37 credit points must be chosen from the catalogue Mathematical Elective Modules and modules totalling at least 4 credit points from the catalogue Minor Subjects. In addition, at most 6 credit points may be covered by free elective modules.					
Compulsory elective modules: Mathematical Elective Modules					
Mathematics of Crystallographic Texture Analysis	2/1/0/0				5
Introduction to High Performance Computing and Optimization	2/1/0/0				4
Methods in Machine Learning	3/1/0/0				6
Algorithms		2/2/0/0			6
Introduction to Bayesian Data Analysis		1/1/0/0			4
Applied Statistics			2/2/0/0		6
Data Analysis Project			0/0/1/0 + 1 SWS project Work		4
Mathematical Image Processing (in odd years)				3/1/0/0	
Data-driven Forecasting under Uncertainty (in even years)				2/2/0/0	6
Compulsory elective modules: Minor Subjects					
Introduction to Machine Learning and Big Data		2/2/0/0			6
Applied Geomodelling			1/2/0/0		4
Applied Machine Learning for Geoscience				2/1/0/0	5
Credit points per semester	29	31	30	31	121

Important documents / informations

- ❖ Examination and Study regulations, Modules and Descriptions

<https://tu-freiberg.de/en/master-mathematics-data-and-resource-sciences>

- ❖ General information

<https://tu-freiberg.de/en/study/study>

<https://tu-freiberg.de/en/fakultaet1/study>

- ❖ Semester dates such as re-registration, exam dates and registration, ...

<https://tu-freiberg.de/en/study/study/study-organization/semester-dates>

- ❖ Timetables

<https://evlvz.hrz.tu-freiberg.de/~vover>

Timetables and schedule for the 1st Semester

Stundenplan Wintersemester 2026 / 2027 (19.10.2026 - 12.02.2027)

Mathematics for Data and Resource Sciences (Master)
1. Semester



Alle Angaben ohne Gewähr!

Montag	Dienstag	Mittwoch	Donnerstag	Freitag	Ohne Angaben
08:00-09:30 Wöchentlich M08-1107 Vorlesung Current Topics in Numerical Analysis I/1 0103-N02	08:00-09:30 Wöchentlich M08-1107 Vorlesung Theory of Potential Methods V Bittner, Ralph-Uwe	08:00-09:30 Übungswoche M08-1107 Übung Algebraic and Structural Graph Theory I/1 Carnarius, Johannes	08:00-09:30 Wöchentlich M08-1107 Vorlesung Differential Geometry Helscher, Ralf	08:00-09:30 Wöchentlich M08-1107 Übung Formalization of Mathematics with Lean 4/1 0103-N02	
08:00-09:30 Wöchentlich M08-1108 Vorlesung Formalization of Mathematics with Lean 4/2 0103-N01	08:00-09:30 Wöchentlich M08-1108 Vorlesung Modeling and Simulation V/2 Aland, Sebastian	08:00-09:30 Wöchentlich M08-1108 Übung Deutsch f. Anal. B2/1. Sem. Gr. 1 Polanski, Karja	08:00-09:30 Wöchentlich M08-1108 Übung Deutsch f. Anal. B2/1. Sem. Gr. 1 Polanski, Karja	08:00-09:30 Wöchentlich M08-1108 Übung Deutsch f. Anal. A2/1. Sem. Gr. 2 Tawcan, Timur	
09:45-11:15 Wöchentlich M08-1110 Vorlesung Modeling and Simulation V/1 Aland, Sebastian	09:45-11:15 Übungswoche M08-1110 Übung Mathematics of Machine Learning U Gu, Hanyue	09:45-11:15 Wöchentlich M08-1110 Übung Deutsch f. Anal. A2/1. Sem. Gr. 2 Tawcan, Timur	09:45-11:15 Wöchentlich M08-1110 Vorlesung Numerical Simulation Methods in Complexity V Gärden, Thomas	09:45-11:15 Wöchentlich M08-1110 Übung Modeling and Simulation U Aland, Sebastian	
09:45-11:15 Wöchentlich M08-1109 Übung Deutsch f. Anal. A1/1. Sem. Gr. 9 Garda, Susanne	09:45-11:15 Übungswoche M08-1109 Seminar Current Topics in Numerical Analysis I/5 0103-N02	09:45-11:15 Wöchentlich M08-1109 Übung Numerical Simulation Methods in Complexity U Gärden, Thomas			
09:45-11:15 Wöchentlich M08-1111 Vorlesung Stochastic Processes V/1 Starkloff, Hans-Jörg					
11:30-13:00 Wöchentlich M08-1111 Vorlesung Ranks in Partial Differential Equations V Porkka, Marianne	11:30-13:00 Wöchentlich M08-1111 Übung Deutsch f. Anal. B2/1. Sem. Gr. 1 Polanski, Karja	11:30-13:00 Übungswoche M08-1111 Übung Theory of Potential Methods V/2 Bittner, Ralph-Uwe	11:30-13:00 Übungswoche M08-1111 Vorlesung Stochastische Prozesse V/2 Starkloff, Hans-Jörg	11:30-13:00 Wöchentlich M08-1111 Übung Applied Geostatistics U Gr.1 Minnel, Peter	
11:30-13:00 Wöchentlich M08-1111 Vorlesung Algebraic and Structural Graph Theory I/1 Carnarius, Johannes		11:30-13:00 Übungswoche M08-1111 Übung Advanced Theory of Potential Fields U Gerhardt, Christian	11:30-13:00 Übungswoche M08-1111 Übung Stochastische Prozesse U Starkloff, Hans-Jörg		

Um die Richtigkeit nicht benötigter Räume für Veranstaltungen wird entsprechend Semesterräume vom 28.06.2022 und 22.11.2022, veröffentlicht per
Bündelschreiben des Rektors R.0/2022 und R.11/2022 am 02.09.2022 und 08.12.2022, über die E-Mail-Adresse raumplanung@tuwz-freiberg.de geteilt.

Find timetables and schedule (in German) at
<https://evlvz.hrz.tu-freiberg.de/~vover/>

- Title of a lecture is not necessarily the title of the corresponding modul!
- V/Ü/S/T/P means number of Lectures/Exercises/Seminars/Tutorials/Practical courses
- Room XXX-ABCD (e.g., SQP-1301) means:
 - “XXX” is a bilding short-cut, see here
 - “A” refers to floor level
 - “BCD” is some individual room number

Remarks

- ❖ The first lecture starts on **Monday, October 19th, 2026**.
- ❖ Note that possibly the first exercise starts before the first lecture.
- ❖ The beginning of a lecture can be shifted by a few minutes. Contact your lecturer!
- ❖ Most lectures offer material on Opal. It is requested registering on Opal for your courses.
`https://bildungsportal.sachsen.de/opal`
- ❖ Every student has its own account at the University Computer Centre (URZ)
- ❖ Every student has an email address, mostly
`FirstName.SureName@student.tu-freiberg.de`

- ❑ Website for more information on “How to start your study in Freiberg”:
<https://tu-freiberg.de/en/start-of-studies-ss>
- ❑ Literature can be found at the University Library (use your student ID card) or online (Login via your URZ-Account).
- ❑ Lunch and other food is offered by the Mensa (you can use your student ID card for paying).
- ❑ The daily Uni-Circular-Mail UNIINFO-L contains helpful information.

Troubleshooting / FAQs

- ❖ Check out our FAQ-webpage: [MDRS FAQ site](#)
- ❖ Ask fellow students or use [buddy programme](#)
- ❖ Reach out via E-mail: bjoern.sprungk@math.tu-freiberg.de
- ❖ Please read the Exam and Study regulations
- ❖ There is no minimum number of credit points needed to progress to the next semester
- ❖ The 4 semesters are a recommendation how to study MDRS – it is not mandatory to study it within 4 semesters and not uncommon to spend 6 or 8 semesters to obtain all credit points
- ❖ For visa problems, ask the lecturers of the individual courses, whether online participation is possible.

What else?

- ❖ Languages courses like Italian, Spanish, French, German ... are offered by IUZ:
<https://tu-freiberg.de/iuz/sprachen>
- ❖ General education courses offered by „Studium Generale“:
<https://tu-freiberg.de/studium-generale>
- ❖ Sports (registration by URZ account):
<https://www.tubaf.plus>
- ❖ Student initiatives: <https://www.stura.tu-freiberg.de/de/ags-initiativen>

Contact

- ❖ Students council of the faculty: `fsr1@stura.tu-freiberg.de`

- ❖ Students council of the university:
 - ❖ `info@stura.tu-freiberg.de`
 - ❖ Agricolastraße 10, 09599 Freiberg
 - ❖ +49 3731 39-3447

- ❖ IUZ – International University Centre

<https://tu-freiberg.de/en/iuz>

- ❖ Orientation Days
- ❖ Language courses
- ❖ Exchange programmes

Contact

- ❖ Commissioner for Education: Dr. Christoph Brause
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