Module Description
24-M-M2 Mathematics 2

Faculty of Mathematics

Version dated May 20, 2026

This module guide reflects the current state and is subject to change. Up-to-date information and the latest version of this document can be found online via the page

https://ekvv.uni-bielefeld.de/sinfo/publ/modul/472480633

The current and valid provisions in the module guide are binding and further specify the subject-related regulations (German "FsB") published in the Official Announcements of Bielefeld University.

Non-official translation of the module descriptions. Only the German version is legally binding.

24-M-M2 Mathematics 2

Faculty

Faculty of Mathematics

Person responsible for module

Prof. Dr. Lubomir Banas

Regular cycle (beginning)

Every semester

Credit points

10 Credit points

Competencies

Students deepen their fundamental technical knowledge and skills in selected disciplines of mathematics that are relevant to mathematical physics. On the one hand, they can expand the competences already acquired in modules 24-M-M1 and, on the other hand, increase the breadth of their knowledge and skills.

They have gained a broad overview of mathematical contexts and in-depth insights into the content and methods of mathematics. They are able to specialise further afterwards.

Content of teaching

Content from the following subject areas will be studied in greater depth:

Algebra/representation theory
Differential geometry
Analysis
Probability theory/stochastic analysis
Numerics of dynamical systems

Recommended previous knowledge

–

Necessary requirements

–

Explanation regarding the elements of the module

A specialisation course forms a unit in terms of content and corresponds to a project seminar with 90 hours of contact time (this corresponds to 6 SWS). Together with the self-study component, the specialisation course comprises 7 CP.
The variants reflect the possibilities of combining a specialisation course from different courses. One of the 5 variants must be studied.
One of the 5 variants is offered each semester.

Module structure: 1-2 SL, 1 bPr [1]

Courses

Title	Type	Regular cycle	Workload [5]	LP[2]
Mathematics 2 - Variant 1 *Variant 1 consists of a lecture with integrated tutorial (in connection with lecture/seminar)*	lecture with exercises	WiSe&SoSe	210 h (90 + 120)	7 [SL]
Mathematics 2 - Variant 2 part 1 *For variant 2, two courses (part 1 and part 2) must be combined*	lecture with exercises	WiSe&SoSe	120 h (60 + 60)	4 [SL]
Mathematics 2 - Variant 2 part 2 *For variant 2, two courses (part 1 and part 2) must be combined*	lecture with exercises	WiSe&SoSe	90 h (45 + 45)	3 [SL]
Mathematics 2 - Variant 3 part 1 *For variant 3, two courses (part 1 and part 2) must be combined*	lecture with exercises	WiSe&SoSe	120 h (60 + 60)	4 [SL]
Mathematics 2 - Variant 3 part 2 *For variant 3, two courses (part 1 and part 2) must be combined*	seminar	WiSe&SoSe	90 h (30 + 60)	3 [SL]
Mathematics 2 - Variant 4 part 1 *For variant 4, two courses (part 1 and part 2) must be combined*	lecture with exercises	WiSe&SoSe	90 h (45 + 45)	3 [SL]
Mathematics 2 - Variant 4 part 2 *For variant 4, two courses (part 1 and part 2) must be combined*	project	WiSe&SoSe	120 h (30 + 90)	4 [SL]
Mathematics 2 - Variant 5 part 1 *For variant 5, two courses (part 1 and part 2) must be combined*	lecture with exercises	WiSe&SoSe	120 h (60 + 60)	4 [SL]

Mathematics 2 - Variant 5 part 2 *For variant 5, two courses (part 1 and part 2) must be combined*	project	WiSe&SoSe	90 h (30 + 60)	3 [SL]

Study requirements

Allocated examiner	Workload	LP[2]
Teaching staff of the course **Mathematics 2 - Variant 1 (lecture with exercises)** *Regular completion of the exercises with recognisable solutions. Collaboration in the exercise groups (twice when asked to do the exercises. The organiser may replace part of the exercises with face-to-face exercises).*	see above	see above
Teaching staff of the course **Mathematics 2 - Variant 2 part 1 (lecture with exercises)** *Regular completion of the exercises with recognisable solutions. Collaboration in the exercise groups (twice when asked to do the exercises. The organiser may replace part of the exercises with face-to-face exercises).*	see above	see above
Teaching staff of the course **Mathematics 2 - Variant 2 part 2 (lecture with exercises)** *Regular completion of the exercises with recognisable solutions. Collaboration in the exercise groups (twice when asked to do the exercises. The organiser may replace part of the exercises with face-to-face exercises).*	see above	see above
Teaching staff of the course **Mathematics 2 - Variant 3 part 1 (lecture with exercises)** *Regular completion of the exercises with recognisable solutions. Collaboration in the exercise groups (twice when asked to do the exercises. The organiser may replace part of the exercises with face-to-face exercises).*	see above	see above
Teaching staff of the course **Mathematics 2 - Variant 3 part 2 (seminar)** *Scientific presentation with written elaboration (5 -10 pages) Contributions to scientific discussions in the seminar, in particular comments and questions on the presentations are considered.*	see above	see above
Teaching staff of the course **Mathematics 2 - Variant 4 part 1 (lecture with exercises)** *Regular completion of the exercises with recognisable solutions. Collaboration in the exercise groups (twice when asked to do the exercises. The organiser may replace part of the exercises with face-to-face exercises).*	see above	see above

Teaching staff of the course **Mathematics 2 - Variant 4 part 2 (project)** *Participation in project development and subsequent presentation (in a presentation or written elaboration)*	see above	see above
Teaching staff of the course **Mathematics 2 - Variant 5 part 1 (lecture with exercises)** *Regular completion of the exercises with recognisable solutions. Collaboration in the exercise groups (twice when asked to do the exercises. The organiser may replace part of the exercises with face-to-face exercises).*	see above	see above
Teaching staff of the course **Mathematics 2 - Variant 5 part 2 (project)** *Participation in project development and subsequent presentation (in a presentation or written elaboration)*	see above	see above

Examinations

Allocated examiner	Type	Weighting	Workload	LP[2]
Prüfende*r ist die*der Lehrende*r der Veranstaltung. Die Modulprüfung wird von einer Person abgenommen, es sei denn es wurden zwei Modulelemente gewählt, die von verschiedenen Lehrenden abgehalten wurden. In diesem Fall wird die Modulprüfung von zwei Personen abgenommen. *A written examination usually lasts between 90 and 120 minutes. An oral examination usually lasts 20 - 30 minutes. All elements of the module are examined.*	e-Klausur o. Klausur o. mündliche e-Prüfung o. mündliche Prüfung	1	90h	3

Legend

1	The module structure displays the required number of study requirements and examinations.
2	LP is the short form for credit points.
3	The figures in this column are the specialist semesters in which it is recommended to start the module. Depending on the individual study schedule, entirely different courses of study are possible and advisable.
4	Explanations on mandatory option: "Obligation" means: This module is mandatory for the course of the studies; "Optional obligation" means: This module belongs to a number of modules available for selection under certain circumstances. This is more precisely regulated by the "Subject-related regulations" (see navigation).
5	Workload (contact time + self-study)
SoSe	Summer semester
WiSe	Winter semester
SL	study requirement
Pr	Examination
bPr	Number of examinations with grades
uPr	Number of examinations without grades