

Vorlesungsverzeichnis

M.Sc. Natural hazards and risk in structural engineering

WiSe 2025/26

Stand 23.02.2026

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M.Sc. Natural hazards and risk in structural engineering

Informationsveranstaltung Auslandsstudium Fakultät Bau und Umwelt

A. Engelhardt

Informationsveranstaltung

Mi, Einzel, 13:30 - 15:00, Marienstraße 13 C - Hörsaal C, 19.11.2025 - 19.11.2025

Beschreibung

Wir informieren rund um das Thema Auslandsstudium und Auslandspraktikum!

- Welche Austauschplätze gibt es?
- Wann, Wo und Wie kann ich mich bewerben?
- Wie werden meine Leistungen später anerkannt?
- Möglichkeiten für Auslandspraktika?
- Finanzierungsmöglichkeiten?

Veranstalter: Fakultät Bau- und Umweltingenieurwesen und International Office

Ansprechpartner in der Info-Veranstaltung sind:

- Frau Andrea Weber (International Office)
- Frau Dr. Anne Engelhardt (International Counsellor)

Applied mathematics and stochastics for risk assessment

301012-1 Applied mathematics (Lecture)

B. Rüffer, N. Gorban

Veranst. SWS: 2

Vorlesung

Mo, wöch., 15:15 - 16:45, Marienstraße 13 C - Hörsaal D

Beschreibung

Applied mathematics:

Fundamentals of linear algebra, eigenvalue problems, fixed point principles, solvers; Fourier series, convergence, Fourier transform, Laplace transform; Solution of initial value problems, boundary value problems and eigenvalue problems for ordinary differential equations; All topics are discussed from the mathematical point of view and their implementation will be studied.

Leistungsnachweis

1 written exam

"Applied mathematics and stochastics for risk assessment" / 180 min (100%) / **WiSe** + SuSe

301012-2 Applied mathematics (Exercise)

B. Rüffer, N. Gorban

Veranst. SWS: 1

Seminar

1-Gruppe Do, gerade Wo, 15:15 - 16:45, Coudraystraße 13 B - Seminarraum 210, Group 1

2-Gruppe Do, unger. Wo, 15:15 - 16:45, Marienstraße 13 C - Hörsaal D, Group 2

Beschreibung**Applied mathematics:**

Fundamentals of linear algebra, eigenvalue problems, fixed point principles, solvers; Fourier series, convergence, Fourier transform, Laplace transform; Solution of initial value problems, boundary value problems and eigenvalue problems for ordinary differential equations; All topics are discussed from the mathematical point of view and their implementation will be studied.

Leistungsnachweis**1 written exam**

"Applied mathematics and stochastics for risk assessment" / 180 min (100%) / **WiSe** + SuSe

301012-3 Stochastics for risk assessment (Lecture) / Mathematics for risk management (MBM)

T. Lahmer, Z. Jaouadi, R. Das, N. Hazrati

Veranst. SWS: 2

Vorlesung

Di, wöch., 11:00 - 12:30, Coudraystraße 13 A - Hörsaal 2

Beschreibung**Stochastics for risk assessment:**

Introduction to probability theory with focus on situations characterized by low probabilities. Random events, discrete and continuous random variables and associated distributions. Descriptive statistics, parameter estimation. Risk Assessment by means of FORM and Monte Carlo Simulations. Introduction to reliability theory: Extreme value distributions; stochastic modeling with software tools e.g. MATLAB, Octave, Excel, R. Reliability Analysis of Systems. Catastrophic events + risk problems, Applications

Leistungsnachweis**1 written exam**

"Applied mathematics and stochastics for risk assessment" / 180 min (100%) / **WiSe** + SuSe

301012-4 Stochastics for risk assessment / Mathematics for risk management (MBM) (Exercise)

T. Lahmer, Z. Jaouadi, R. Das, N. Hazrati

Veranst. SWS: 1

Seminar

1-Gruppe Do, unger. Wo, 15:15 - 16:45, Coudraystraße 13 B - Seminarraum 210, Exercise for NHRE (Group 1) and DE

1-Gruppe Fr, wöch., 07:30 - 09:00, Marienstraße 7 B - Seminarraum 205, Tutorium for NHRE (Group 1) and DE

2-Gruppe Do, gerade Wo, 15:15 - 16:45, Marienstraße 13 C - Hörsaal D, Exercise for NHRE (Group 2)

2-Gruppe Fr, wöch., 07:30 - 09:00, Marienstraße 7 B - Seminarraum 206, Tutorium for NHRE (Group 2) and DE

Beschreibung**Stochastics for risk assessment:**

Introduction to probability theory with focus on situations characterized by low probabilities. Random events, discrete and continuous random variables and associated distributions. Descriptive statistics, parameter estimation. Risk Assessment by means of FORM and Monte Carlo Simulations. Introduction to reliability theory: Extreme value distributions; stochastic modeling with software tools e.g. MATLAB, Octave, Excel, R. Reliability Analysis of Systems. Catastrophic events + risk problems, Applications

Leistungsnachweis

1 written exam

"Applied mathematics and stochastics for risk assessment" / 180 min (100%) / **WiSe** + SuSe

Disaster management and mitigation strategies**901005 Project- and Disaster Management**

H. Bargstädt, J. Melzner, A. Azimian, B. Bode, S. Beinersdorf Verant. SWS: 2

Integrierte Vorlesung

Fr, Einzel, 13:30 - 15:00, Coudraystraße 13 A - Hörsaal 2, 14.11.2025 - 14.11.2025

Fr, Einzel, 13:30 - 15:00, Coudraystraße 13 A - Hörsaal 2, 21.11.2025 - 21.11.2025

Fr, Einzel, 13:30 - 15:00, Coudraystraße 13 A - Hörsaal 2, 05.12.2025 - 05.12.2025

Fr, Einzel, 13:30 - 16:45, Coudraystraße 13 A - Hörsaal 2, 23.01.2026 - 23.01.2026

Fr, wöch., 09:15 - 12:30, Coudraystraße 13 A - Hörsaal 2

Beschreibung

Acquisition of knowledge of the methods of the project management and acquisition of skills with their practical application:

Imparting of means and methods as well as of social and technical aspects of the project management in the construction industry (theoretical and on the basis practical examples)

Consolidate of knowledge in handling a project management soft-ware

Additional: Lecture of "Sociology of disaster"

Bemerkung

Modul "Disaster management and mitigation strategies" --> 6 ECTS

Part "Mitigation strategies" --> see lecture "Sociology of disaster"

Leistungsnachweis

1 written exam "Project and disaster management" or "sociology of disaster" / 60 min (50%) / **WiSe** + SuSe

1 Presentation + presentation paper "sociology of disaster" or "project and disaster management" (50%) / **WiSe**

To be announced with the begin of the lectures

901033 Sociology of disaster

J. Melzner, H. Bargstädt, S. Beinersdorf, B. Bode Verant. SWS: 2

Integrierte Vorlesung

Mo, wöch., 17:00 - 18:30, Marienstraße 13 C - Hörsaal D

engl. Beschreibung/ Kurzkomentar

Modul "Disaster management and mitigation strategies" --> 6 ECTS

Part "Mitigation strategies" --> see lecture "Urban Sociology"

Bemerkung

lecture starts 03.11.2025

Leistungsnachweis

1 written exam "Project and disaster management" or "sociology of disaster"/ 60 min (50%) / **WiSe** + SuSe

1 Presentation + presentation paper "sociology of disaster" or "project and disaster management" (50%) / **WiSe**

To be announced with the begin of the lectures

Earthquake engineering and structural design

Finite element methods and structural dynamics

401015-1 Finite element methods (Lecture)

S. Kollmannsberger, J. Wagner

Veranst. SWS: 2

Vorlesung

Do, wöch., 07:30 - 09:00, Marienstraße 13 C - Hörsaal D, dates by arrangement

Beschreibung

Finite element methods: (50% of semester course time)

strong and weak form of equilibrium equations in structural mechanics, Ritz and Galerkin principles, shape functions for 1D, 2D, 3D elements, stiffness matrix, numerical integration, Characteristics of stiffness matrices, solution methods for linear equation systems, post-processing and error estimates, defects of displacements based formulation, mixed finite element approaches,

Voraussetzungen

Bachelor Civil Engineering

Leistungsnachweis

1 written exam: "Finite element methods" /

90 min (50%) / **WiSe** + SuSe

401015-2 Finite element methods (Exercise)

S. Kollmannsberger, J. Lopez Zermeño, L. Nguyen Tuan

Veranst. SWS: 1

Seminar

1-Gruppe Mi, wöch., 07:30 - 09:00, Marienstraße 7 B - Seminarraum 205, Tutorium - Group 1

2-Gruppe Di, wöch., 07:30 - 09:00, Marienstraße 7 B - Seminarraum 205, Tutorium - Group 2

Di, wöch., 15:15 - 16:45, Marienstraße 13 C - Hörsaal B, Group 1

401014-1 Structural Dynamics (Lecture)

T. Most

Veranst. SWS: 2

Vorlesung

Mi, wöch., 11:00 - 12:30, Marienstraße 13 C - Hörsaal D, * dates by arrangement

Beschreibung

Structural Dynamics: (50% of semester course time)

- SDOF systems:

- free vibrations, harmonic, impulse and general excitation for undamped and damped systems,
 - Impulse response function, frequency response function, base excitation,
 - Time step analysis: Duhamel integral, central difference and Newmark methods;
- MDOF systems: modal analysis, modal superposition, modal damping, Rayleigh damping, Frequency response functions
- Continuous systems

Voraussetzungen

Bachelor Civil Engineering

Leistungsnachweis

1 written exam: "Structural dynamics" /

90 min (50%) / **WiSe** + SuSe

1 written report: "Numerical dynamic analysis of MDOF systems"

(Examination requirement for "Structural dynamics") / **WiSe**

401014-2 Structural Dynamics (Exercise)

T. Most, R. Das

Veranst. SWS: 1

Seminar

1-Gruppe Di, wöch., 07:30 - 09:00, Marienstraße 7 B - Projektraum 301, Tutorium - Group 1
 1-Gruppe Di, wöch., 07:30 - 09:00, Marienstraße 7 B - Seminarraum 206, Tutorium - Group 1
 2-Gruppe Mi, wöch., 07:30 - 09:00, Marienstraße 7 B - Projektraum 301, Tutorium - Group 2
 2-Gruppe Mi, wöch., 07:30 - 09:00, Marienstraße 7 B - Seminarraum 104, Tutorium - Group 2
 Di, wöch., 09:15 - 10:45, Coudraystraße 13 A - Hörsaal 2
 Di, wöch., 09:15 - 10:45, Marienstraße 7 B - Projektraum 301
 Di, wöch., 09:15 - 10:45, Marienstraße 7 B - Seminarraum 103

Bemerkung

- Complementary to the lectures

Geo- and hydrotechnical engineering

Geographical Information Systems (GIS) and building stock survey

904002 Geographical information systems (GIS) and building stock survey (Lecture)

V. Rodehorst

Veranst. SWS: 1

Integrierte Vorlesung

Do, wöch., 09:15 - 10:45, Marienstraße 13 C - Hörsaal B, dates by arrangement

Beschreibung

Students will be trained to reproduce existing natural hazard and risk related data in GIS format using GIS Software Solutions and Tools, will be able to create basic layers for hazard and risk assessment and to establish relevant links and to solve simple example tasks. Students will be trained in building stock survey, vulnerability assessment, damage interpretation and handling of tools for detailed empirical and instrumental elaboration. Training in instruments, equipment, and technologies for advanced detailed building survey (geodetic, photogrammetric, satellite data).

Content:

Fundamentals of three-dimensional positioning, photogrammetry, GIS/cartography, land management / cadastre; earthwork computation; spatial data in daily life; instruments, equipment, and technologies for advanced detailed building survey (geodetic, photogrammetric, satellite data).

Bemerkung

Zum Bestehen des Moduls und der Anrechnung von 6 CP ist die Teilnahme an Vorlesung und des zugeordneten Seminars notwendig. Prüfungsleistung wird in Form eines Projektbeleges und einer Zwischenabgabe erbracht.

In order to pass the module and to reach the credits of 6 CP the participation in lectures and the assigned seminar is necessary. Examination is in form of a Project report and an intermediate submission.

Voraussetzungen

Prüfungsleistung wird in Form eines Projektbeleges und Präsentation erbracht.

Examination is in form of a Project report and presentation.

Leistungsnachweis**1 written exam**

"Geographical Information Systems (GIS) and building stock survey" / 90 min (100%) / **WiSe** + SuSe

1 written report

"Geographical Information Systems (GIS) and building stock survey" (Examination requirement) / **WiSe**

904002	Geographical information systems (GIS) and building stock survey (Exercise/Project)
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S. Beinersdorf, J. Schwarz, H. Maiwald

Veranst. SWS: 3

Seminar

1-Gruppe Mo, wöch., 13:30 - 15:00, Marienstraße 7 B - Seminarraum 102, Group A

1-Gruppe Mo, wöch., 13:30 - 15:00, Coudraystraße 11 C - Pool-Raum 101, Group A

2-Gruppe Di, wöch., 13:30 - 15:00, Marienstraße 13 C - Hörsaal D, Group B+C

2-Gruppe Di, wöch., 13:30 - 15:00, Marienstraße 7 B - Projektraum 301, Group B+C

Beschreibung**Training in:**

Coordinate systems; global maps for the natural hazard phenomena; quality and availability of input data; layers for natural hazard related parameters (topography, geology, and subsoil); reproduction of historical events and associated parameters; layers for risk assessment and loss estimation procedures; link between layers and risk mapping procedures. In parallel, necessary foundations in scientific working are taught and trained.

Bemerkung

We will start at 21.10.2024 with the exercises.

Leistungsnachweis**1 written exam**

"Geographical Information Systems (GIS) and building stock survey" / 90 min (100%) / **WiSe** + SuSe

1 written report

"Geographical Information Systems (GIS) and building stock survey" (Examination requirement) / **WiSe**

Life-lines engineering**204019 Life-lines engineering (Lecture)**

G. Morgenthal, S. Chawdhury, G. Tondo, I. Kavrakov

Veranst. SWS: 4

Integrierte Vorlesung

Do, wöch., 13:30 - 16:45, Marienstraße 13 C - Hörsaal C, 16.10.2025 - 04.12.2025

Do, wöch., 13:30 - 16:45, Marienstraße 13 C - Hörsaal C, 11.12.2025 - 05.02.2026

Beschreibung

The students will be familiar with bridges in the context of their functions as critical infrastructure. They will be familiar with the design objectives with specific emphasis on risks associated with natural hazards and with strategies to limit damage and to ensure operability after a major natural disaster. They will be able to develop structural concepts and to carry out detailed design of such structures, including the application of relevant codes of practice.

Life-lines Engineering

History of bridge engineering; types of bridges; structural concepts and articulation; planning and design; construction methods; structural modelling and analysis; elastic and plastic design approaches; performance-based design; structural detailing; dynamic characteristics and behaviour under dynamic loading; seismic response and isolation; response to wind loading

Training in:

Structural modelling and Finite Element Analysis; design of post-tensioning systems in bridges; design and detailing of girders and piers; seismic response; wind response, analysis of cable stayed bridges

Leistungsnachweis**1 written exam**

"Life-lines Engineering" / 180 min (100%) / **WiSe** + SuSe

204019 Life-lines engineering (Exercise)

G. Morgenthal, S. Chawdhury, G. Tondo, I. Kavrakov

Veranst. SWS: 2

Seminar

Do, wöch., 17:00 - 18:30, Marienstraße 13 C - Hörsaal C, 16.10.2025 - 04.12.2025

Do, wöch., 17:00 - 18:30, Marienstraße 13 C - Hörsaal C, 11.12.2025 - 05.02.2026

Beschreibung**Training in:**

Structural modelling and Finite Element Analysis; design of post-tensioning systems in bridges; design and detailing of girders and piers; seismic response; wind response, analysis of cable stayed bridges

Primary hazards and risks**202001 Primary hazards and risks: Seismic monitoring / Regional ground motion**

J. Schwarz, L. Abrahamczyk, C. Kaufmann, S. Beinersdorf Verant. SWS: 4

Integrierte Vorlesung

1-Gruppe Di, wöch., 13:30 - 15:00, Coudraystraße 11 C - Pool-Raum 101, Exercise Group A
 2-Gruppe Mo, wöch., 13:30 - 15:00, Coudraystraße 13 B - Pool Fak. B 007, Exercise Group B
 3-Gruppe Mo, wöch., 17:00 - 18:30, Marienstraße 7 B - Projektraum 301, Exercise Group C
 Do, wöch., 11:00 - 12:30, Marienstraße 13 C - Hörsaal D
 Do, wöch., 13:30 - 15:00, Marienstraße 13 C - Hörsaal D

Beschreibung

Seismic Monitoring

Basics of Engineering Seismology (parameters of source, path, attenuation; site conditions and shaking);
 Macroseismic scales, Intensity measures and correlations; Time- and frequency dependent description of seismic
 action; recording instruments, input parameters for seismic hazard assessment; EQ-Action for building design;
 Measurements for site response evaluation; site categorization and response studies; Building Monitoring Systems:
 tasks and developments, analysis of instrumental data; identification of dynamic and structural parameters

Regional Ground Motion

Identification of hazard describing parameters; seismic networks, availability/ elaboration of ground motion data and
 records; strong-Motion Databases; selection of site-related ground motion; handling of data files; Ground Motion
 Prediction Equations (GMPEs); application of ground motions models and tools to the study area and target site; re-
 interpretation of national code background.

Voraussetzungen

Bachelor Civil Engineering

Leistungsnachweis

1 Project report

"Regional Ground Motion" (17%) / **WiSe**

2 written exams

"Seismic Monitoring" / 180 min (50%) / **WiSe + SuSe**

"Wind Engineering" / 90 min (33%) / **WiSe + SuSe**

204017 Primary hazards and risks: Wind Engineering

G. Morgenthal, I. Kavrakov, A. Athanasiou, S. Beinersdorf, G. Verant. SWS: 2

Tondo

Integrierte Vorlesung

Fr, wöch., 09:15 - 12:30, LH B M13B* dates by arrangement Time schedule will be announced by the responsible lecturers.
 Lecture shares time slot with lecture Structural engineering.

Beschreibung

Wind Risk Mitigation in Structural Engineering

meteorology, stochastic wind effects including aeroelasticity, extreme value analysis; risk chain, storm
 tracks with high damage accumulation, hazard maps; basics of wind resistant design and environmental
 planning, wind tunnel technology, monitoring and simulations, risk control (control of exposition, shelter
 projects, wind effects at new types of infrastructures), examples and applications

Leistungsnachweis

1 Project report

"Regional Ground Motion" (17%) / **WiSe**

2 written exams

"Seismic Monitoring" / 180 min (50%) / **WiSe + SuSe**

"Wind Engineering" / 90 min (33%) / **WiSe + SuSe**

Structural engineering**205032 Structural engineering – Reinforced and post-tensioned concrete structures (Exercise)**

G. Morgenthal, S. Chawdhury, I. Kavrakov, S. Rau, C. Taube, G. Tondo Verant. SWS: 1

Seminar

1-Gruppe Fr, wöch., 13:30 - 16:45, Bauhausstraße 11 - R 015, Group 1 dates by arrangement

2-Gruppe Fr, Einzel, 13:30 - 16:45, Marienstraße 13 C - Hörsaal C, Group 2 dates by arrangement, 21.11.2025 - 21.11.2025

2-Gruppe Fr, wöch., 13:30 - 16:45, Steubenstraße 6, Haus F - Hörsaal K20, Group 2 dates by arrangement

205032 Structural engineering – Reinforced and post-tensioned concrete structures (Lecture)

G. Morgenthal, S. Chawdhury, I. Kavrakov, S. Rau, G. Tondo Verant. SWS: 2

Vorlesung

Fr, wöch., 09:15 - 12:30, Marienstraße 13 C - Hörsaal B, dates by arrangement

Beschreibung**Structural Engineering – Standard systems:**

History of structures; building materials; structural form and structural behavior; actions on structures; structural reliability and codes of practice; mechanical modelling of structures; design of reinforced concrete and steel structures

Leistungsnachweis**2 written exams**

"Reinforced and post-tensioned concrete structures" / 90 min (50%) / **WiSe + SuSe**

"Steel structures" / 90 min (50%) / **SuSe + WiSe**

Structural parameter survey and evaluation**Special Project****NHM17-50(Special Project (Introduction)****S. Beinersdorf**

Projekt

Mo, Einzel, 17:00 - 18:30, Marienstraße 13 C - Hörsaal D, in LH B Introduction to SP, 13.10.2025 - 13.10.2025

Mi, Einzel, 13:30 - 16:00, Marienstraße 7 B - Seminarraum 205, Final Presentation SP EDAC, 11.03.2026 - 11.03.2026

Beschreibung

Introduction to Special projects in LH 6, C9A

Elective compulsory modules
401011 Applied structural dynamics

A. Athanasiou

Veranst. SWS: 2

Vorlesung

Mi, wöch., 09:15 - 10:45, Marienstraße 13 C - Hörsaal D

Beschreibung

Appl. SD (winter semester): The students will be introduced to the theory of structural dynamics and apply such theory to solve problems occurring in engineering practice. In particular, the students shall: (i) learn how to formulate the dynamic equilibrium of idealised structural systems, (ii) implement analytical and numerical methods for dynamic response simulations under earthquake and wind excitation, and (iii) predict and evaluate the performance of single- and multi- story buildings in seismic and wind environments, excited in the linear and nonlinear range of response.

Course content:

free and forced vibrations, dynamic equilibrium, analytical and numerical solutions, modal analysis, response spectrum, vibration of buildings under earthquake and wind excitation, seismic response of linear and nonlinear systems, dynamic wind response simulation, comprehensive and realistic in-class examples.

Leistungsnachweis

1 midterm exam (written or oral) (30 min, 30%), 1 final written exam "Applied structural dynamics" (40 min, 40%), 25% assignments, 5% in class quizzes/activities / WiSe + SuSe

253001 Structural design and performance assessment (for extreme loading conditions)

L. Abrahamczyk, H. Maiwald, J. Schwarz, P. Hasan, A.

Veranst. SWS: 6

Uzair, S. Beinersdorf

Vorlesung

Di, wöch., 17:00 - 18:30, Marienstraße 7 B - Seminarraum 205, Lecture *dates by arrangement

Do, wöch., 09:15 - 12:30, Marienstraße 7 B - Seminarraum 205, Lecture / Exercise

Do, wöch., 09:15 - 12:30, Marienstraße 7 B - Projektraum 301, Lecture / Exercise

Beschreibung

Students will acquire knowledge of methods for structural performance assessment, compliance criteria, and design principles for masonry building types. They will develop the ability to evaluate the quality of masonry structures, interpret the seismic performance under horizontal actions, derive suitable analytical models, and determine the applicability of equivalent or simplified modelling approaches. The course introduces students to equivalent frame modelling, both local and global out-of-plane failure mechanisms, and the theoretical foundations of seismic design and assessment according to Eurocode 6 and 8.

In addition, students will be introduced to ongoing research projects and recent developments that are directly linked to the course topics, including opportunities for further academic qualification (e.g., master's thesis). The course aims to strengthen students' capacity to apply methods reflecting the current state of practice in the assessment of masonry structures. They will learn to use modern software tools to transform buildings into dynamic models and to evaluate their seismic response characteristics. Depending on the design situation and performance-based requirements, students will be guided to identify design deficiencies and to assess the adequacy of strengthening measures.

Structural design and performance assessment – Masonry structures (L)

URM in seismic regions, failure mechanism, modelling techniques, equivalent frame method; Nonlinear constitutive relationships, failure mode interaction, correlation to observed damages; Basics of masonry design (EN1996), code requirements and calculation examples; Simple masonry buildings (EN1998), design rules, evaluation criteria and calculation examples; Out of plane collapse, flange effect, irregular openings, limitations of the equivalent frame method; Assessment of dynamic soil-structure interaction; Evaluation of existing structures - strengthening (EN 1998-3).

Earthquake Performance Assessment of Unreinforced Masonry Structures – (E, P)

Advanced modelling techniques for nonlinear analysis and earthquake performance evaluation of unreinforced masonry (URM) structures; determination of building capacity and corresponding performance objectives for different seismic acceleration levels; performing of a detailed damage prognosis; comparison with existing building type specific fragility functions.

Language Coaching

The course will be taught bilingually (German and English). Parallel German language coaching is offered by the Bauhaus-Universität Weimar Language Centre. The language component is not part of the course evaluation.

Leistungsnachweis

1 Project report (written report + oral presentation) 100% / WiSe

202005 Risk projects and evaluation of structures

J. Schwarz, L. Abrahamczyk, H. Maiwald, P. Hasan, A. Uzair, S. Beinersdorf

Veranst. SWS: 4

Vorlesung

Mo, wöch., 15:15 - 16:45, Marienstraße 7 B - Seminarraum 101, lecture
Di, wöch., 11:00 - 12:30, Marienstraße 7 B - Seminarraum 205, exercise

Beschreibung

Students will be familiar with the different risk elements in disaster mitigation studies and problems encountered in the design of buildings against earthquake and wind action. Students will be able to apply methods and current state in natural hazard and risk assessment integrating research and practical applications to urban settlements or structure-specific risk analysis and planning decisions. Students will be familiar with different analysis methods, knowledge-based techniques and tools of empirical and analytical vulnerability assessment. Students will be familiar with the existing building typologies and be able to evaluate the quality of structural systems, to interpret the performance under horizontal action. Students are encouraged to contribute reports of regionally particular building types to World Housing Encyclopedia and/or NHRE database (collection of world-wide case studies à wind or earthquake dominated design; tall & high-rise buildings à comparison of horizontal actions).

Methods for risk assessment of buildings and urban settlements (L)

Lessons from recent events (earthquake, wind, flood) and field missions; assessment of hazard phenomena; reinterpretation of observed response for different building types; building taxonomies; knowledge-based exposure modelling; empirical and analytical vulnerability assessment; damage classification and fragility functions; damage modelling for large building stocks (earthquake, wind, flood); social risk modelling; decision support systems for OEF, EEW and RRE; building assessment criteria for existing and new building stock; assessment of structural performance under wind and earthquake.

Response estimate for disastrous events (E, P)

Training in risk scenarios: elaboration of input data for the target area (home countries), generation of shake maps; elaboration of fragility functions; generation of risk scenarios for testbeds or virtual cities and application of decision support system; simulation of mitigation measures.

Studies on Recent Natural Hazard Events (P)

Description and assessment of hazard phenomena; affected regions; building types; reinterpretation of observed damages for different building types; conclusions from rapid response actions; initiated/necessary mitigation measures (consequences of the event); recent developments in design and construction.

Voraussetzungen

B.Sc.

Seismic Monitoring / Earthquake Engineering

Leistungsnachweis

1 written exam "Risk evaluation for buildings and urban settlements" 90 min (50%) / **WiSe** + SuSe

1 Project presentation (oral) "Response estimate for disastrous and recent events" (35%) / **WiSe**

1 Project presentation (oral) "Studies on Recent Natural Hazard Events" (15%) / **WiSe**

205007 Modelling of steel structures and numerical simulation (L + E)

M. Kraus, S. Ibañez Sánchez, S. Chowdhury

Veranst. SWS: 4

Vorlesung

Mi, Einzel, 17:45 - 19:15, Marienstraße 13 C - Hörsaal B, Exercise, 22.10.2025 - 22.10.2025

Mi, Einzel, 17:45 - 19:15, Marienstraße 13 C - Hörsaal B, Exercise, 12.11.2025 - 12.11.2025

Mi, Einzel, 17:45 - 19:15, Marienstraße 13 C - Hörsaal B, Exercise, 26.11.2025 - 26.11.2025

Mi, Einzel, 17:45 - 19:15, Marienstraße 13 C - Hörsaal B, Exercise, 10.12.2025 - 10.12.2025

Di, wöch., 17:00 - 18:30, Marienstraße 7 B - Seminarraum 105, Lecture, ab 06.01.2026

Mi, wöch., 17:00 - 18:30, Marienstraße 7 B - Seminarraum 105, Exercise, ab 07.01.2026

Beschreibung

The students will be familiar with skills and expertise in the field of nonlinear structural analyses. Extensive knowledge of theoretical basics and modern modelling methods, including numerical representations are the aim of the course. The students will acquire skills in handling advanced tools for the analysis and the design of structures.

Design of steel structures using finite element methods; basics of the design; modelling of structures and loads; nonlinear material behaviour, numerical analyses of steel-members and structures regarding geometric and physical nonlinearities; stability behaviour of members including flexural and lateral torsional buckling

Voraussetzungen

B.Sc.

Mechanics

Leistungsnachweis

1 Project report

"Modelling of steel structures and numerical simulation" (0%) / **WiSe**

1 written exam

"Modelling of steel structures and numerical simulation"/ 120 min (100%) / **WiSe + SuSe**

205014-1 Design and interpretation of experiments: Signal Processing, Design of Experiments and System Identification

T. Lahmer, Z. Jaouadi, R. Das

Veranst. SWS: 2

Integrierte Vorlesung

1-Gruppe Mi, unger. Wo, 09:15 - 10:45, Marienstraße 7 B - Projektraum 301, Exercise

2-Gruppe Mi, gerade Wo, 09:15 - 10:45, Marienstraße 7 B - Projektraum 301, Exercise

3-Gruppe Mi, unger. Wo, 11:00 - 12:30, Marienstraße 7 B - Projektraum 301, Exercise

4-Gruppe Mi, gerade Wo, 11:00 - 12:30, Marienstraße 7 B - Projektraum 301, Exercise

Di, wöch., 13:30 - 15:00, Marienstraße 13 C - Hörsaal C, Signal Processing, Design of Experiments and System Identification, 14.10.2025 - 02.12.2025

Di, wöch., 13:30 - 15:00, Marienstraße 13 C - Hörsaal C, Signal Processing, Design of Experiments and System Identification, 09.12.2025 - 03.02.2026

Beschreibung

Students will be familiar with following: Design and setup as well as evaluation and interpretation of experimental testing in structural engineering. Provision of techniques linking experimental and mathematical / numerical modelling. Parallel assessment of steps being part of any verification and validation procedure. Discussion of common techniques of optimal experimental designs

Bemerkung

The course gives an overview on experiments and their evaluation regarding different tasks and scopes of structural engineering. Next to different testing techniques applied for diverse aims, the equipment and measuring devices employed for testing are treated as well.

Besides the experiment itself, it is an important question, how we can use the experimental data for the calibration and validation of models in engineering. In this course, we give insights to techniques called parameter and system identification.

As often signals are not useable directly, transforms are necessary, like filtering, Fourier Transform, Wavelet Transform and, in particular for signals with noise, averaging techniques. Having models at hand, the experiment can be designed virtually by means of nonlinear optimization.

Leistungsnachweis

1 written exam / 120 min / WiSe + SuSe including

"Experiments in Structural Engineering" and

"Signal Processing, Design of Experiments and System Identification"

205014-2 Design and interpretation of experiments: Experiments in Structural Engineering

M. Kraus, S. Ibañez Sánchez

Veranst. SWS: 2

Integrierte Vorlesung

Di, wöch., 15:15 - 16:45, Marienstraße 13 C - Hörsaal C, Experiments in structural engineering, 14.10.2025 - 02.12.2025

Di, wöch., 15:15 - 16:45, Marienstraße 13 C - Hörsaal C, Experiments in structural engineering, 09.12.2025 - 03.02.2026

Beschreibung

Students will be familiar with following: Design and setup as well as evaluation and interpretation of experimental testing in structural engineering. Provision of techniques linking experimental and mathematical / numerical modelling. Parallel assessment of steps being part of any verification and validation procedure. Discussion of common techniques of optimal experimental designs

Bemerkung

The course gives an overview on experiments and their evaluation regarding different tasks and scopes of structural engineering. Next to different testing techniques applied for diverse aims, the equipment and measuring devices employed for testing are treated as well.

Besides the experiment itself, it is an important question, how we can use the experimental data for the calibration and validation of models in engineering. In this course, we give insights to techniques called parameter and system identification.

As often signals are not useable directly, transforms are necessary, like filtering, Fourier Transform, Wavelet Transform and, in particular for signals with noise, averaging techniques. Having models at hand, the experiment can be designed virtually by means of nonlinear optimization.

Leistungsnachweis

1 written exam / 120 min / WiSe + SuSe including

"Experiments in Structural Engineering" and

"Signal Processing, Design of Experiments and System Identification"

303005 Object-oriented Modeling and Programming in Engineering

C. Koch, M. Artus

Veranst. SWS: 4

Vorlesung

1-Gruppe Di, wöch., 15:15 - 16:45, Marienstraße 7 B - Projektraum 301, ExerciseNHRE

3-Gruppe Fr, wöch., 11:00 - 12:30, Marienstraße 7 B - Projektraum 301, ExerciseDEM

4-Gruppe Fr, wöch., 11:00 - 12:30, Marienstraße 7 B - Projektraum 302, ExerciseDEM

Fr, Einzel, 11:00 - 12:30, Coudraystraße 13 B - Hörsaal 3, 17.10.2025 - 17.10.2025

Do, wöch., 11:00 - 12:30, Marienstraße 13 C - Hörsaal B, lecture

Beschreibung

Objektorientierte Modellierung und Programmierung für Ingenieure

In diesem Modul wird fundamentales Wissen vermittelt, um objektorientierte Softwarelösungen für Ingenieuraufgaben zu konzipieren und zu implementieren. Dies beinhaltet Fähigkeiten zur Analyse von Ingenieurproblemen, um entsprechende objektorientierte Modelle zu erzeugen und geeignete Algorithmen auszuwählen. Die verwendete Programmiersprache ist Java. Da die Basiskonzepte allgemeingültig beschrieben werden, werden die Studierenden in die Lage versetzt, auch andere modernen Programmiersprachen zu einzusetzen.

Inhalte:

- Kontrollstrukturen (alternatives, loops, sequences)
- Grundlegende Datenstrukturen und Algorithmen
- Prinzipien der objektorientierten Softwareentwicklung (Datenkapselung, Vererbung, Polymorphie)
- Unified Modeling Language als Werkzeug für Softwareentwurf und -dokumentation
- Entwicklung grafischer Nutzerschnittstellen mithilfe des Model-View-Controller-Entwurfsmusters

engl. Beschreibung/ Kurzkomentar

Object-oriented Modeling and Programming in Engineering

This module covers the basic knowledge needed to develop and implement object-oriented software solutions for engineering problems. This includes the ability to analyse an engineering problem, so that corresponding object-oriented models can be created and suitable algorithms can be selected. The programming language used in this

module is Java. However, the since fundamental concepts are described in general, students will be able to program in other modern programming languages.

Content:

- Essential programming constructs (alternatives, loops, sequences)
- Fundamental data structures and algorithms
- Principles of object oriented software development (encapsulation, inheritance and polymorphism)
- The Unified Modeling Language as a tool for software design and documentation

Development of graphical user interfaces using the Model-View-Controller pattern

Leistungsnachweis

schriftliche Klausur

1 written exam

"Object-oriented Modeling and Programming in Engineering"

120min (100%) / **WiSe** + SuSe

906023 Advanced geotechnical engineering

P. Staubach, G. Aselmeyer, C. Rodríguez Lugo

Veranst. SWS: 4

Integrierte Vorlesung

Mo, wöch., 13:30 - 15:00, Coudraystraße 11 C - Seminarraum (geologische Sammlung) 202

Di, wöch., 09:15 - 10:45, Coudraystraße 11 C - Seminarraum (geologische Sammlung) 202

Beschreibung

This module aims to enhance students' skills in managing geotechnical risks posed by natural hazards such as earthquakes and heavy rainfall. Students will learn advanced techniques for investigating and monitoring potentially unstable soil and rock masses. They will deepen their understanding of slope stability analysis under both static and seismic conditions and become proficient in methods of geotechnical earthquake engineering to assess the risk of geotechnical failure due to seismic events. Students will also gain the ability to study slope stability using the finite element method. Additionally, they will learn various slope stabilization methods and soil improvement techniques to mitigate risks from natural hazards. An engineering-geological aim is to identify various natural discontinuity planes in a rock mass and their properties to independently assess their impact on the stability of slopes and embankments. The theoretical knowledge gained will be applied in a project work.

Bemerkung

Different methods of slope stability analysis in cases of static and seismic loading (pseudo-static method, Newmark sliding block analysis); Slope investigation and monitoring; Slope stabilization methods; Analysis of slope stability by means of the finite element method; Seismic design of retaining structures; Soil improvement techniques; Seismic ground response analysis; Stability of rock masses

Voraussetzungen

Geo- and hydrotechnical Engineering (Soil Mechanics)

Leistungsnachweis

1 Project report

"Advanced geotechnical engineering" (33%) / **WiSe**

1 written exam

"Advanced geotechnical engineering"/ 90 min (67%) / **WiSe** + SuSe

Elective Modules

Seit Wintersemester 2018/19 besteht an der Bauhaus-Universität Weimar ein zusätzliches Angebot an fächerübergreifenden Lehrveranstaltungen im Rahmen der Bauhaus.Module. **Studierende des NHRE können Bauhaus.Module aus dem Bereich Master belegen.** Inwiefern diese Module des **Wahlbereichs** ersetzen können, muss individuell mit der Fachstudienberatung geklärt werden. Das Angebot der Bauhaus.Module findet sich unter weimar.de/bauhausmodule.

Bemerkung:

- nur Masterkurse der BUW
- besonders engl. Kurse

Wunsch nach Einteilung der BM im bison nach Sprachen

204034 Analysis and Design of Concrete Structures

G. Morgenthal, S. Chawdhury, G. Tondo

Veranst. SWS: 4

Integrierte Vorlesung

Fr, wöch., 09:15 - 12:30, LectureRoom LH B M13C* dates by arrangementTime schedule will be announced by the responsible lecturers. Lecture shares time slot with lecture Structural engineering / Wind Engineering.

Fr, wöch., 13:30 - 16:45, ExerciseRoom H BH11 / Audimax St6 (see the announcements by the lecturers)* dates by arrangementTime schedule will be announced by the responsible lecturers. Exercise shares time slot with lecture Structural engineering / Wind Engineering.

Beschreibung

Students will be familiar with the history of structures and structural forms, with building materials and building methods. They will understand the concepts of structural engineering design, including safety concepts, loads and structural design codes. They will be able to convert a structural concept into a mechanical model to determine internal demand and to design and detail the components of the structure, with an emphasis on reinforced concrete as well as steel and steel-concrete composite structures.

Content: History of structures; building materials; structural form and structural behaviour; actions on structures; structural reliability and codes of practice; mechanical modelling of structures; design of reinforced concrete structures

Bemerkung

This module is comprised of:

"Analysis and Design of Reinforced Concrete Structures" (Lecture, 2 SWS)

"Analysis and Design of Reinforced Concrete Structures" (Exercise, 1 SWS)

"Analysis and Design of Reinforced Concrete Structures" (Project, 1 SWS)

Voraussetzungen

B.Sc.

Leistungsnachweis

Written exam (60%),

Project (40%)

303013 Collaboration in BIM projects**L. Abrahamczyk, O. Kammler, C. Koch, S. Schneider**

Veranst. SWS: 2

Vorlesung

Mi, wöch., 17:00 - 18:30

Beschreibung

Adopting BIM means establishing a continuous flow of information, as with BIM, information is collected digitally to be available when it is needed, wherever it is needed, during every phase of the building process. Students will be familiar with well-structured workflows, multidisciplinary collaboration processes, defined standards, open workflows and model-centred communication. They will be informed that collaborative working brings significant project benefits. BIM collaborative approach advantages are elaborated and trained such as: possibility for each professional to use the best software solutions for their specific discipline without any risk of incompatibility or loss of data; workflows integration; reduction of errors caused by lack of coordination and updating; complete accessibility to data contained in the BIM model; information sharing, verification, review and validation. Students should be able to apply the BIM collaborative approach on a simple example. Students get introduced to Revit Software. Students will be trained the principles and application of BIM workflow, as well as the accomplishment of a project among an interdisciplinary team.

Students will

- gain proficiency in working with BIM software tools commonly used in the industry (create, edit, and manage 3D models, generate drawings, perform clash detection, and extract data from BIM models);
- acquire competences in managing and integrating data within the BIM environment;
- learn how to collaborate effectively within multidisciplinary teams and coordinate information across different stakeholders in a BIM project;
- develop skills in creating comprehensive project documentation using BIM, including drawings, schedules, reports, and presentations.

Collaboration in BIM projects (P, L)

Concepts of Building Information Modelling: Introduction, terminology, reference standards, technical specifications and guidelines; BIM roles for architects, engineers, construction and facility management; BIM execution plan: workflows, information requirements, integrated project delivery, common data environment, modelling and visualization, management of incompatibilities; BIM tools and platforms: concepts of platform and tools, interoperability, IFC format.

Students will develop a design proposal for a pre-defined purpose (e.g. pavilion) as a team of architecture, structural engineer and management students to hands on train BIM collaborative approach

The course will start on 22nd of October. Unfortunately, we can only accommodate a limited number of participants. Therefore, please send an **enrolment request and an e-mail to lars.abrahamczyk@uni-weimar.de till 15th of October.** We will send the final admissions by 17th of October.

Leistungsnachweis

1 Group project presentation (oral) "Collaboration in BIM projects" (60%) / **WiSe**

1 Group project report: „Collaboration in BIM projects" (40%) / **WiSe**

203027 typotopie+ – Schrift. Struktur. Szenografie. auf der Leipziger Buchmesse (Grundlagen +Ausführung)

M. Herrmann, T. Müller

Veranst. SWS: 8

Projekt

Mi, gerade Wo, 13:30 - 16:45, Coudraystraße 11 C - Seminarraum/Hörsaal 001, ab 15.10.2025

Mi, Einzel, 13:30 - 16:45, Coudraystraße 13 B - Seminarraum 208, 05.11.2025 - 05.11.2025

Mi, unger. Wo, 13:30 - 16:45, Coudraystraße 11 C - Seminarraum/Hörsaal 001, ab 12.11.2025

Beschreibung

typotopie ist ein interdisziplinäres Gestaltungsmodul im Kontext von Typografie, Raum, Struktur, Material, Licht und Inszenierung. Ihr entwickelt und realisiert experimentelle Konzepte für den Auftritt der Bauhaus-Universität zur Leipziger Buchmesse, inspiriert von den Idealen Reduktion, Konstruktion, Klarheit und Idee.

Pappe, Holz und Licht bilden das Konstruktionsgerüst, Typografie die erzählerische Struktur. Wir suchen Ideen, die mehr sind als Räume, sie sollen lesbar, erlebbar, sprechend sein. Am Ende steht unser gemeinsames Ziel, wir auf der Buchmesse.

Die Vorkurse des Moduls sind handwerklich ausgerichtet. Ihr erprobt materialsparende leichte Konstruktionen in Form von Stab-, Faltwerken und Membranen. Die Lichtkünstlerin Cornelia Erdmann wird Euch Licht als Material näherbringen. Euren Vorschlag für einen herstellbaren Messestand bearbeitet Ihr am besten im Team. Ihr könnt das Wissen aus den Vorkursen nutzen. Ab Februar werden wir gemeinsam mit dem Bau beginnen und Ihr könnt Eure handwerklichen Fähigkeiten erweitern.

Bestandteil des Seminars ist der Auf- und Abbau des Messestandes während der Buchmesse vom 19. - 22. März 2026.

Infos unter: https://www.instagram.com/typotopie_buw_buchmesse/

typotopie is an interdisciplinary design module in the context of typography, space, structure, material, light and staging. You will develop and implement experimental concepts for the Bauhaus University's presentation at the Leipzig Book Fair, inspired by the ideals of reduction, construction, clarity and ideas.

Cardboard, wood and light form the structural framework, typography the narrative structure. We are looking for ideas that are more than just spaces; they should be legible, tangible and expressive. Ultimately, our common goal is to be at the book fair.

The preliminary courses for the module focus on craftsmanship. You will experiment with lightweight, material-saving constructions in the form of rods, folded structures and membranes. Light artist Cornelia Erdmann will introduce you to light as a material. It is best to work on your proposal for a producible exhibition stand in a team. You can use the knowledge you have gained in the preliminary courses. We will start construction together in February, and you will have the opportunity to expand your technical skills.

Part of the seminar is the assembly and dismantling of the exhibition stand during the book fair from 19 to 22 March 2026.

Information at: https://www.instagram.com/typotopie_buw_buchmesse/

Bemerkung

Starttermin: 15. Oktober, 13.30 Uhr

Die Studierenden des Moduls verpflichten sich in der vorlesungsfreien Zeit bis zum Ende der Buchmesse zur Teilnahme.

Leistungsnachweis

Projektbeleg und Präsentation

Die Abgabeleistungen für B.Sc. und M.Sc. unterscheiden sich in der Bearbeitungstiefe und Aufgabenstellung.

2909020 Macroscopic Transport Modelling

K. McFarland, L. Thiebes, U. Plank-Wiedenbeck, J. Uhlmann Verant. SWS: 4

Integrierte Vorlesung

Di, wöch., 11:00 - 15:00, Marienstraße 7 B - Projektraum 302

Di, wöch., 11:00 - 15:00, Marienstraße 7 B - PC-Pool Luna-red

Beschreibung

Part A: Principles in Transport Modelling

We will consider the transport modelling framework, incl. methodologies, procedures, data-requirements (e.g. land-use-data, behavioral data, operational and network data). The standard 4-step modelling approach and related methods and algorithms will be discussed.

Part B: Transport Model Development

We get known both sides of transport modelling - demand side (passenger) and supply side (e.g. network, transport modes). Modelling from infrastructure modelling, traffic generation, traffic destinations, mode choice and route choice calculation methods are considered

Part C: Transport Model Quality

The value of a transport model is determined by its quality. Quality evaluation is based on model validation and calibration. Which are suitable empirical data (e.g. meaning of traffic counts) and how can they be used for quality evaluation?

Part D: Transport Model Application

We discuss the meaning of transport models for other disciplines like transport planning. Within selected use cases model setup and configuration are considered according to different planning tasks.

Part E: Practical Exercises

Practical exercises on transport modelling are provided in parallel to the lectures. Within these guided exercises macroscopic transport modelling software (PTV Visum) will be applied. Application of learned methodological approach(es) and critical reflection of the model outputs. Perspectives in transport modelling. Student presentation.

Voraussetzungen

Teilnehmeranzahl auf 15 begrenzt. Bestätigung der Professur Verkehrssystemplanung notwendig

Bewerbung bis 14.10.2025 ausschließlich per Mail an vsp@bauing.uni-weimar.de. Bitte kurz den fachlichen Hintergrund und die Motivation für die Kursteilnahme schildern.

Notwendig: Vorkenntnisse in der Modellierung/ Simulation und Verkehrsplanung und-technik. **Sollten keine Vorkenntnisse im Bereich der Verkehrsplanung vorliegen muss zuerst der Kurs "International Case Studies in Transportation" belegt werden.**

Leistungsnachweis

Part 1: based on section E

Project work and presentation, english, 50%

IMPORTANT: Submission of the project is a prerequisite for participation in exam.

Part 2: based on sections A, B, C, D:

Written exam (120 Min), english, 50%

325230027 Robotic Tectonics III – Roboterbasierte Lehr- und Lernumgebung für automatisierte Bauprozesse

J. Willmann, L. Abrahamczyk, M. Braun, M. Haweyou, KuG Verant. SWS: 2
Wissenschaftsmodul
Fr, wöch., 11:00 - 12:30, Raum: D-LAB (Geschwister-Scholl-Straße 13), 24.10.2025 - 06.02.2026

Beschreibung

Die Veranstaltung findet auf Englisch statt. Über die Sprachumschaltflagge (oben rechts) gelangen Sie zur englischsprachigen Beschreibung.

Bemerkung

Bitte beachten Sie die entsprechende Studienordnung.

Leistungsnachweis

Voraussetzungen für das Bestehen der Lehrveranstaltung sind a) die regelmäßige und aktive Teilnahme an den Sitzungen (mind. 80%); b) die Erarbeitung und Abhaltung eines eigenen Referats; und c) das Einreichen einer Hausarbeit zum Semesterende mit positiver Benotung

424260000 Mechanics of Engineering Materials

L. Göbel Verant. SWS: 4
Integrierte Vorlesung
Mo, wöch., 13:30 - 15:00, Marienstraße 7 B - Seminarraum 106, 13.10.2025 - 02.02.2026
Di, wöch., 09:15 - 10:45, Marienstraße 7 B - Seminarraum 105, 14.10.2025 - 03.02.2026

Beschreibung

Essential contents comprise: Structure of materials, basic concepts of computational mechanics (stresses, strains, tensor algebra), elasticity, plasticity and failure (stress-strain diagrams, plasticity theory, hardness), fracture mechanics, viscoelasticity, creep, rheology.

Bemerkung

Please be sure to register in the corresponding Moodle room for the course. All organizational announcements and online events are made via this platform. The learning material is also made available there.

Voraussetzungen

Mandatory requirements: none

Recommended requirements: Building materials science, technical mechanics

Leistungsnachweis

Written exam (180 minutes)

Prüfungen

202001 Seismic Monitoring / Regional Ground Motion (Exam)

J. Schwarz, C. Kaufmann
Prüfung
Fr, Einzel, 13:30 - 15:30, Steubenstraße 6, Haus F - Hörsaal K20, Final exam, 20.02.2026 - 20.02.2026

Voraussetzungen

Bachelor Civil Engineering

Leistungsnachweis

1 Project report "Regional Ground Motion" (17%) / **WiSe**

2 written exams

"Seismic Monitoring" / 120 min (50%) / **WiSe** + SuSe

"Wind Engineering" / 90 min (33%) / **WiSe** + SuSe

204017 Wind Engineering (Exam)

G. Morgenthal, A. Athanasiou

Prüfung

Do, Einzel, 13:00 - 14:30, Marienstraße 13 C - Hörsaal B, Final exam, 05.03.2026 - 05.03.2026

Do, Einzel, 13:00 - 14:30, Marienstraße 13 C - Hörsaal D, Final exam, 05.03.2026 - 05.03.2026

Leistungsnachweis

1 Project report "Regional Ground Motion" (17%) / **WiSe**

2 written exams

"Seismic Monitoring" / 120 min (50%) / **WiSe** + SuSe

"Wind Engineering" / 90 min (33%) / **WiSe** + SuSe

205032 Reinforced and post-tensioned concrete structures (Exam)

G. Morgenthal

Prüfung

Mo, Einzel, 13:00 - 14:30, Marienstraße 13 C - Hörsaal B, Final exam, 16.02.2026 - 16.02.2026

Mo, Einzel, 13:00 - 14:30, Marienstraße 13 C - Hörsaal D, Final exam, 16.02.2026 - 16.02.2026

Leistungsnachweis**2 written exams**

"Standard systems" / new name "Reinforced and post-tensioned concrete structures" / 90 min (50%) / **WiSe** + SuSe

"Advanced systems" / new name "Steel structures" / 90 min (50%) / **SuSe** + WiSe

301012 Applied mathematics and stochastics for risk assessment (Exam)

T. Lahmer, B. Rüffer, N. Gorban

Prüfung

Mo, Einzel, 13:00 - 16:00, Marienstraße 13 C - Hörsaal B, Final exam, 23.02.2026 - 23.02.2026

Mo, Einzel, 13:00 - 16:00, Marienstraße 13 C - Hörsaal D, Final exam, 23.02.2026 - 23.02.2026

Leistungsnachweis**1 written exam**

"Applied mathematics and stochastics for risk assessment" / 180 min (100%) / **WiSe** + SuSe

401014 Structural Dynamics (Exam)

T. Most

Prüfung

Mi, Einzel, 09:00 - 10:30, Marienstraße 7 B - Seminarraum 205, Final exam, 18.02.2026 - 18.02.2026

Mi, Einzel, 09:00 - 10:30, Marienstraße 7 B - Seminarraum 206, Final exam, 18.02.2026 - 18.02.2026

Mi, Einzel, 09:00 - 10:30, Marienstraße 7 B - Seminarraum 101, Final exam, 18.02.2026 - 18.02.2026

Mi, Einzel, 09:00 - 10:30, Marienstraße 7 B - Seminarraum 102, Final exam, 18.02.2026 - 18.02.2026

Voraussetzungen

Bachelor Civil Engineering

Leistungsnachweis

1 written exam: "Structural dynamics" / 90 min (50%) / **WiSe** + SuSe

401015 Finite element methods (Exam)

S. Kollmannsberger

Prüfung

Fr, Einzel, 09:00 - 10:30, Marienstraße 13 C - Hörsaal B, Final exam, 27.02.2026 - 27.02.2026

Fr, Einzel, 09:00 - 10:30, Marienstraße 13 C - Hörsaal D, Final exam, 27.02.2026 - 27.02.2026

Voraussetzungen

Bachelor Civil Engineering

Leistungsnachweis

1 written exam: "Finite element methods" / 90 min (50%) / **WiSe** + SuSe

904002 Geographical information systems (GIS) and building stock survey (Exam)

V. Rodehorst, S. Beinersdorf, J. Schwarz

Veranst. SWS: 4

Prüfung

Mi, Einzel, 09:00 - 10:30, Marienstraße 13 C - Hörsaal B, Final examsurname first letter A to N, 25.02.2026 - 25.02.2026

Mi, Einzel, 09:00 - 10:30, Marienstraße 13 C - Hörsaal D, Final examsurname first letter P to Y, 25.02.2026 - 25.02.2026

Leistungsnachweis

1 written exam "Geographical Information Systems (GIS) and building stock survey" / 90 min (100%) / **WiSe** + SuSe

1 written report "Geographical Information Systems (GIS) and building stock survey" (Examination requirement) / **WiSe**

202002 Re-examination: Earthquake engineering and structural design

J. Schwarz, L. Abrahamczyk

Prüfung

Di, Einzel, 13:00 - 16:00, Marienstraße 7 B - Seminarraum 205, Re-examination, 17.02.2026 - 17.02.2026

Bemerkung

Re-examination

Leistungsnachweis**1 written exam** "Earthquake engineering" / 150 min (67%) / **SuSe** + WiSe**1 Project report + Project presentation** "Structures in Earthquake Regions/Design of RC frames" / (33%) / **SuSe**

202003	Re-examination: Geo- and hydrotechnical engineering - Part: "Flood Hazard and Vulnerability Assessment"
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H. Maiwald, J. Schwarz

Prüfung

Do, Einzel, 10:00 - 11:30, Marienstraße 7 B - Seminarraum 205, Re-examination, 19.02.2026 - 19.02.2026

Bemerkung

Re-examination

Leistungsnachweis**1 written exam** "Flood Hazard and Vulnerability Assessment" / 90 min (50%) / **SuSe** + WiSe

204018	Re-examination: Structural parameter survey and evaluation
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G. Morgenthal, V. Rodehorst

Prüfung

Fr, Einzel, 09:00 - 11:00, Marienstraße 13 C - Hörsaal B, Re-examination, 06.03.2026 - 06.03.2026

Bemerkung

Re-examination

Leistungsnachweis**1 written exam** "Structural parameter survey and evaluation" / 120 min (100%) / **SuSe** + WiSe

205013, 205033	Re-examination: Structural engineering - Advanced systems (205013), until SuSe 22 Steel structures (205033), from SuSe 23
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M. Kraus

Prüfung

Mo, Einzel, 09:00 - 10:30, Marienstraße 13 C - Hörsaal D, Re-examination, 02.03.2026 - 02.03.2026

Bemerkung

Re-examination

Leistungsnachweis**2 written exams**"Reinforced and post-tensioned concrete structures" / 90 min (50%) / **WiSe** + SuSe

"Steel structures" / 90 min (50%) / **SuSe** + WiSe

906014 Re-examination: Geo- and hydrotechnical engineering - Part: "Geotechnical Engineering"

P. Staubach

Prüfung

Di, Einzel, 13:00 - 14:30, Marienstraße 13 C - Hörsaal D, Re-examination, 24.02.2026 - 24.02.2026

Bemerkung

Re-examination

Leistungsnachweis

1 written exam

"Geotechnical Engineering" / 90 min (50%) / **SuSe** + WiSe

204019 Life-lines engineering (Exam)

G. Morgenthal, S. Chawdhury, G. Tondo, I. Kavrakov

Prüfung

Di, Einzel, 09:00 - 12:00, Marienstraße 13 C - Hörsaal B, Final exam, 03.03.2026 - 03.03.2026

Di, Einzel, 09:00 - 12:00, Marienstraße 13 C - Hörsaal D, Final exam, 03.03.2026 - 03.03.2026

Beschreibung

The students will be familiar with bridges in the context of their functions as critical infrastructure. They will be familiar with the design objectives with specific emphasis on risks associated with natural hazards and with strategies to limit damage and to ensure operability after a major natural disaster. They will be able to develop structural concepts and to carry out detailed design of such structures, including the application of relevant codes of practice.

Life-lines Engineering

History of bridge engineering; types of bridges; structural concepts and articulation; planning and design; construction methods; structural modelling and analysis; elastic and plastic design approaches; performance-based design; structural detailing; dynamic characteristics and behaviour under dynamic loading; seismic response and isolation; response to wind loading

Training in:

Structural modelling and Finite Element Analysis; design of post-tensioning systems in bridges; design and detailing of girders and piers; seismic response; wind response, analysis of cable stayed bridges

Leistungsnachweis

1 written exam

"Life-lines Engineering" / 180 min (100%) / **WiSe** + SuSe

2901033 Disaster management and mitigation strategies: Sociology of disaster (Exam)

J. Melzner, H. Bargstädt, B. Bode

Prüfung

Do, Einzel, 13:00 - 14:00, Marienstraße 13 C - Hörsaal B, Final exam, 19.02.2026 - 19.02.2026

Leistungsnachweis

1 written exam "sociology of disaster"/ 60 min (50%) / **WiSe** + SuSe

1 Presentation + presentation paper "project and disaster management" (50%) / **WiSe**

401011 Applied Structural Dynamics (Exam)

A. Athanasiou

Prüfung

Mi, Einzel, 11:00 - 12:00, Marienstraße 7 B - Seminarraum 205, Final exam, 18.02.2026 - 18.02.2026

Mi, Einzel, 11:00 - 12:00, Marienstraße 7 B - Seminarraum 206, Final exam, 18.02.2026 - 18.02.2026

Mi, Einzel, 11:00 - 12:00, Marienstraße 7 B - Seminarraum 101, Final exam, 18.02.2026 - 18.02.2026

Leistungsnachweis

1 midterm exam (written or oral) (30 min, 30%),

1 final written exam "Applied structural dynamics" (40 min, 40%),

25% assignments, 5% in class quizzes/activities / **WiSe** + SuSe

401012 Re-Examination: Applied Finite element methods

S. Kollmannsberger

Prüfung

Fr, Einzel, 11:00 - 12:30, Marienstraße 7 B - Seminarraum 205, Re-examination, 27.02.2026 - 27.02.2026

Leistungsnachweis

1 written exam: "Applied finite element methods" / 90 min (50%) / WiSe + **SuSe**

202004 Re-examination: Multi-hazard and risk assessment

S. Beinersdorf, J. Schwarz

Prüfung

Do, Einzel, 13:00 - 14:30, Marienstraße 7 B - Seminarraum 205, 26.02.2026 - 26.02.2026

Leistungsnachweis

1 written exam "Multi-hazard and risk assessment" / 90 min (50%) / **SuSe** + WiSe

1 Project report (SYMULTHAN) (50%) / **SuSe**

303001 Re-examination: Advanced building information modeling

C. Koch

Veranst. SWS: 4

Prüfung

Di, Einzel, 13:00 - 15:00, Marienstraße 13 C - Hörsaal B, 03.03.2026 - 03.03.2026

Leistungsnachweis

1 written exam + 1 group project report + 1 presentation: "Advanced building information modelling"120 min exam (50%) / WiSe + **SuSe**;written report (35%) + presentation (15%) / **SuSe****451002 Re-examination: Introduction to Optimization****T. Lahmer**

Prüfung

Fr, Einzel, 09:00 - 10:30, Marienstraße 7 B - Seminarraum 205, Re-examination, 20.02.2026 - 20.02.2026

Bemerkung

Re-examination

Leistungsnachweis**1 written or oral exam** (depending on the number of participants)"Introduction to Optimization" (3 credits) / **SuSe** + WiSe**451007 Re-Examination: Stochastic Simulation Techniques and Structural Reliability****T. Lahmer**

Prüfung

Do, Einzel, 09:00 - 10:30, Marienstraße 7 B - Seminarraum 205, Re-examination, 26.02.2026 - 26.02.2026

Leistungsnachweis**1 written or oral exam** (3 credits) / **SuSe** + WiSe**1 project** (3 credits) / **SuSe** + WiSe**205007 Modelling of steel structures and numerical simulation (Exam)****M. Kraus**

Prüfung

Mi, Einzel, 09:00 - 11:00, Marienstraße 7 B - Seminarraum 205, Re-examination, 04.03.2026 - 04.03.2026

Bemerkung

Re-examination

Leistungsnachweis**1 Project report** "Modelling of steel structures and numerical simulation" (0%) / **SuSe****1 written exam** "Modelling of steel structures and numerical simulation" / 120 min (100%) / **SuSe** + WiSe**205014 Design and interpretation of experiments (Exam)****M. Kraus, T. Lahmer**

Prüfung

Do, Einzel, 09:00 - 11:00, Marienstraße 13 C - Hörsaal D, Final exam, 05.03.2026 - 05.03.2026

Leistungsnachweis

1 written exam / 120 min / WiSe + SuSe including

"Experiments in Structural Engineering" and

"Signal Processing, Design of Experiments and System Identification"

253001 Structural design and performance assessment (for extreme loading conditions) (Exam)

L. Abrahamczyk, A. Athanasiou

Prüfung

Mo, Einzel, 09:00 - 11:00, Marienstraße 7 B - Seminarraum 205, Final exam, 16.02.2026 - 16.02.2026

Leistungsnachweis

1 Project report: "Application of base-isolation to unreinforced masonry and RC structures" (33%) / **WiSe**

1 written exam: "Assessment of structural performance (under extreme loading conditions)" / 90 min (67%) / **WiSe + SuSe**

303005 Object-oriented Modeling and Programming in Engineering (Exam)

C. Koch, M. Artus, J. Wagner

Veranst. SWS: 4

Prüfung

Fr, Einzel, 13:00 - 15:00, 06.03.2026 - 06.03.2026

Leistungsnachweis

1 written exam "Object-oriented Modeling and Programming in Engineering" 120min (100%) / **WiSe + SuSe**

906016, 906023 Secondary hazards and risks (906016), until WiSe 2023/24; Advanced geotechnical engineering (906023), from WiSe 2024/25 (Exam)

P. Staubach, G. Aselmeyer

Prüfung

Mi, Einzel, 13:00 - 14:30, Coudraystraße 13 B - Seminarraum 208, Final exam, 25.02.2026 - 25.02.2026

Voraussetzungen

Geo- and hydrotechnical Engineering (Soil Mechanics)

Leistungsnachweis

1 Project report

"Secondary Hazards and Risks" (33%) / **WiSe**

1 written exam

„Secondary Hazards and Risks“ / 120 min (67%) / **WiSe+ SuSe**