Mocule Card

Bachelor Civil Engineering
HCU Hamburg

Module Number	Modul Name	Type (C/CE/E)	Semester (proposed)	Module Coordinator
BIW-B-Mod-101	Engineering Mathematics I	C	1	Prof. Dr.-Ing. Martin Jäschke

Subject Area	Duration
Basics of Civil Engineering Methods	1 Semester

CP (according to ECTS)	Contact Hours/Week (SWS)	Self-study
5 CP (= 150 h Workload)	4 (= 42 h Contact Time)	108 h

Objectives and Contents

Objective of Qualification (competencies)
- Knowledge of the features of elementary functions of analysis - Mastery of the rules of differential and integral calculus - Application of geometric and physical/technical tasks
Contents
- Fundamentals of differential calculus; Integer sequences and limits, in particular arithmetical and geometric sequences - Differentiation of power series and rational (linear fractional) functions; Differentiation rules (factor and sum, product, quotient and chain rules), higher order derivatives; Applications: simple tangent and cross-section problems, curvature, extreme value problems - Fundamentals of integral calculus: Definite and indefinite integrals, fundamental theorem of differential and integral calculus - Integration by substitution and partial integration - Applications: calculation of surfaces, centroids, moments of plane area and solids of revolution - Properties and curve sketching, differentiation, integration of elementary functions, including inverse functions: Trigonometric functions; Trigonometric conversions / addition theorems, trigonometric equations; Exponential, (hyperbolic) and logarithm functions, logarithmic graphing; Examples of use in physics: oscillation / vector diagram
Recommended Literature
Papula, Mathematik für Ingenieure; Vieweg-Verlag, Bd. I und II Leupold, W.; u.a.: Mathematik -ein Studienbuch für Ingenieure, Fachbuchverlag Leipzig, Bd. I und II Rjasanova, K: Mathematik für Bauingenieure; Hanser-Verlag
Teaching and Learning Methods
Lecture (2 Hours per Week) + Practical Seminar (2 Hours per Week) + Tutorial

Exam(s)

Precondition of Examination	
Type of Examination	**Duration of Examination (if written or oral exam)**
Written Exam	3 h
Composition of Module Mark	
Mark of Exam	

Additional Information

Previous Knowledge / Conditions for Participation (in form and content)
Knowledge acquired in preparatory course Mathematics (recommended)
Applicability of Module
Successful completion of this module is a prerequisite for the module, Hydraulic Engineering I (required).
Frequency of Offering

every Winter Semester
Course Language
German
valid from: Sommer Semester 2017 last updated: 25.09.2018

Mocule Card

Bachelor Civil Engineering
HCU Hamburg

Module Number	Modul Name	Type (C/CE/E)	Semester (proposed)	Module Coordinator
BIW-B-Mod-103	Technical Mechanics	C	1	Prof. Dr.-Ing. Peter-Matthias Klotz

Subject Area	Duration
Basics of Civil Engineering Methods	1 Semester

CP (according to ECTS)	Contact Hours/Week (SWS)	Self-study
5 CP (= 150 h Workload)	5 (= 52,5 h Contact Time)	97,5 h

Objectives and Contents

Objective of Qualification (competencies)
Students will acquire basic knowledge about the support forces and action-effects of statically determinate strcutures. They will be able to calculate simple two-dimensional structures.
Contents
- Definition of forces and loads: Forces (effect, description, visualization), load assumptions - Central system of forces: Calculation and drawing methods for adding and breaking down forces, equilibrium of forces - Non-central system of forces: Calculation and drawing methods for adding and breaking down forces, equilibrium of forces, equilibrium of moments - Support reaction of one- and several-part frames: Upright, inclined and angled girders, hinged girders, frames, plane frames - Calculating moment diagrams: Upright, inclined and angled girders, hinged girders, frames, plane frames, torsional moment
Recommended Literature
Schneider: Bautabellen Bochmann, Michael: Statik im Bauwesen Teil 1 (Statisch bestimmte Systeme); Schumpich: Technische Mechanik Statik Lohmeyer: Baustatik 1 Grundlagen und Einwirkungen Schatz: Klausurtraining Statik
Teaching and Learning Methods
Lecture and Practical Seminar (5 Hours per Week)

Exam(s)

Precondition of Examination	
Type of Examination	**Duration of Examination (if written or oral exam)**
Written Exam	3 h
Composition of Module Mark	
Mark of Exam	

Additional Information

Previous Knowledge / Conditions for Participation (in form and content)
School-level knowledge in mathematics and physics (recommended)
Applicability of Module
Required for the modules Geotechnics I and CAE (mandatory)
Frequency of Offering
every Winter Semester
Course Language
German
valid from: Winter Semester 15/16 last updated: 25.09.2018

Mocule Card

Bachelor Civil Engineering
HCU Hamburg

Module Number	Modul Name	Type (C/CE/E)	Semester (proposed)	Module Coordinator
BIW-B-Mod-104	Constructing Material Science I	C	1	Prof. Dr.-Ing. Gesa Kapteina

Subject Area	Duration
Basics of Civil Engineering Methods	1 Semester

CP (according to ECTS)	Contact Hours/Week (SWS)	Self-study
5 CP (= 150 h Workload)	4 (= 42 h Contact Time) + 7,5 h Contact Time Practical Laboratory Course	100,5 h

Objectives and Contents

Objective of Qualification (competencies)
- Basic knowledge of building materials with reference to their composition, structure, production, processing, mechanical and hygrothermal properties and material-specific damage processes - Knowledge of measurement methods for determining characteristic material properties in the context of material testing - Knowledge of structural engineering regulations This facilitates a critical selection of building materials, and as the case may be, combinations of building materials with regard to their load-bearing capacity and fitness for use, while taking into account exposure conditions and structural engineering regulations.
Contents
- Structural engineering regulations - Structure of materials - Deformation and strength parameters - Measurement techniques, non-destructive test procedures - Metals: metallurgy fundamentals, production, properties, types and identification, welding, corrosion behavior and corrosion control - Wood and wood-based materials - Plastics - Bitumen - Glass - Laboratory practical class: testing aggressive chemicals and building materials
Recommended Literature
Neroth, G.; Vollenschaar, D.: Wendehorst Baustoffkunde, Grundlagen-Baustoffe-Oberflächenschutz, 27. Auflage, VIEWEG+TEUBNER, 2011, ISBN 978-3-8351-0225-5
Teaching and Learning Methods
Lecture and Practical Seminar (4 Hours per Week) Practical Laboratory Course I: 5 units, 7,5 h total

Exam(s)

Precondition of Examination	
Successful preliminary test performance, laboratory practical class with 80% mandatory attendance and lab protocols	
Type of Examination	Duration of Examination (if written or oral exam)
Pre-Assignment: Documentation of Practical Laboratory Course Examination: Written Exam	Written Exam 2 Hours
Composition of Module Mark	

Mark of Exam

Additional Information

Previous Knowledge / Conditions for Participation (in form and content)
Applicability of Module
Frequency of Offering
every Winter Semester
Course Language
German
valid from: Summer Semester 2017 last updated: 25.09.2018

Mocule Card

Bachelor Civil Engineering
HCU Hamburg

Module Number	Modul Name	Type (C/CE/E)	Semester (proposed)	Module Coordinator
BIW-B-Mod-105	Building Construction and CAD	C	1 + 2	Prof. Dr.-Ing. Peter-Matthias Klotz

Subject Area	Duration
Basics of Design and Construction	2 Semester

CP (according to ECTS)	Contact Hours/Week (SWS)	Self-study
12,5 CP (= 375 h Workload)	10 (= 105 h Contact Time)	265 h

Objectives and Contents

Objective of Qualification (competencies)
Students will acquire basic knowledge of supporting framework structures in building construction as well as selected issues of expansion. They will be able to plan integral structures and construction systems of individual structural com-ponents taking into consideration static and structural-physical relationships. Students will acquire basic knowledge and skills in computer-supported designing, structuring and rendering.
Contents
- Building Construction I: - Fundamentals: Types of supporting structures, regulations, load assumptions, planning procedure, construction drawings - Masonry: Types of, modular coordination, structural rules, load-bearing masonry walls, double-leaf exposed masonry - Walls: Exterior walls (types and their construction), bracing and stability, load-bearing interior and light partition walls - Stairs: Requirements, types and their construction, railing - Windows: Types, installation guidelines (statics, windproofing and airtightness, thermal insulation, sound insulation) - Building Construction II: - Ceilings: Solid ceilings, wooden beam ceilings, steel girder and composite ceilings, vault ceilings - Roofs: Roof coverings and seals, roof flashing, inclined roof construction, engineer-quality roof construction, flat roofs (warm and cold roofs) - Chimneys - Sealing and drainage: Types of seals for soil moisture, with and without water pressure, drainage - Excavations and foundations: Excavations, deepening and underpinning, shallow foundations - Skills – CAD: - Fundamentals of descriptive geometry and technical drawing - Analysis of constructions and their projection in CAD software with the aid of coordinate systems - Constructing virtual 3D models for examining functional plausibility - Development and modification of complex unitized components for efficient construction planning - Output of final plans to scale - Implementation of basic project structures of building practice in a CAD application
Recommended Literature
Frick, Knöll, Neumann, Weinbrenner: Baukonstruktionslehre Schneider, Wormuth, Dierks: Baukonstruktion Mittag: Baukonstruktionslehre Schneider: Bautabellen für Ingenieure AutoCAD Grundlagen; AutoCAD 2D; AutoCAD 3D; Herdt Verlag
Teaching and Learning Methods
Building Construction I, 5 CP: Lecture and Practical Seminar (4 Hours per Week) Building Construction II, 5 CP: Lecture and Practical Seminar (4 Hours per Week) CAD, 2,5 CP: Practical Seminar in Computer-Pool (2 Hours per Week)

Exam(s)

Precondition of Examination	
Attendance in CAD is mandatory.	
Type of Examination	**Duration of Examination (if written or oral exam)**
Building Construction I+II (Module): Term Paper and Colloquium CAD: Term Paper	
Composition of Module Mark	

Term Paper and Colloquium Building Construction I+II 80%, Term Paper CAD 20%

Additional Information

Previous Knowledge / Conditions for Participation (in form and content)
General knowledge of the Windows operating system (recommended)
Applicability of Module
Successful completion of this module is required for enrolling in the module CAE (mandatory).
Frequency of Offering
Building Construction I and CAD: every Winter Semester Buidling Construction II: every Summer Semester
Course Language
German
valid from: Winter Semester 15/16 last updated: 25.09.2018

Mocule Card

Bachelor Civil Engineering
HCU Hamburg

Module Number	Modul Name	Type (C/CE/E)	Semester (proposed)	Module Coordinator
BIW-B-Mod-201	Engineering Mathematics II	C	2	Prof. Dr.-Ing. Martin Jäschke

Subject Area	Duration
Basics of Civil Engineering Methods	1 Semester

CP (according to ECTS)	Contact Hours/Week (SWS)	Self-study
5 CP (= 150 h Workload)	4 (= 42 h Contact Time)	108 h

Objectives and Contents

Objective of Qualification (competencies)
- Knowledge of the fundamentals of the mentioned subjects, creating a facility with mathematical methods - Application to physical and technical problems
Contents
- Differential equations (DE): DE with separable variables, linear DE with 1st and 2nd order constant coefficients - Examples of application, DE problem setups - Series expansion as method of approximation: (Power) series and convergence, Taylor series, standard series combinations, application of series as approximation and numerical integration - Calculating probability and descriptive statistics: Fundamentals, combinatorics, distributions, especially: binomial, Poisson and normal Gauss distribution - Multivariable functions: Graphing, geometric applications, partial derivatives, propagation of uncertainty - Linear algebra: Elementary 2D and 3D vector analysis, scalar and vector products - Geometric applications: intersections of straight lines and planes - Matrices: multiplication, determinants - Solving systems of linear equations (Gaussian elimination among others)
Recommended Literature
Papula, Mathematik für Ingenieure; Vieweg-Verlag, Bd. I und II Leupold, W.; u.a.: Mathematik -ein Studienbuch für Ingenieure, Fachbuchverlag Leipzig, Bd. I und II Rjasanova, K: Mathematik für Bauingenieure; Hanser-Verlag
Teaching and Learning Methods
Lecture (2 Hours per Week) + Practical Seminar (2 Hours per Week) + Tutorial

Exam(s)

Precondition of Examination	
None. Pre-Assignment is not mandatory any more.	
Type of Examination	**Duration of Examination (if written or oral exam)**
Written Exam	3 h
Composition of Module Mark	
Mark of Exam	

Additional Information

Previous Knowledge / Conditions for Participation (in form and content)
Module Engineering Mathematics I (recommended)
Applicability of Module

Frequency of Offering	
every Summer Semester	
Course Language	
German	
valid from: Summer Semester 2017	last updated: 25.09.2018

Mocule Card

Bachelor Civil Engineering
HCU Hamburg

Module Number	Modul Name	Type (C/CE/E)	Semester (proposed)	Module Coordinator
BIW-B-Mod-202	Construction Physics	C	2 + 3	Prof. Dr.-Ing. Peter-Matthias Klotz

Subject Area	Duration
Basics of Civil Engineering Methods	2 Semester

CP (according to ECTS)	Contact Hours/Week (SWS)	Self-study
5 CP (= 150 h Workload)	4 (= 42 h Contact Time) + 6 h Practical Laboratory Course	102 h

Objectives and Contents

Objective of Qualification (competencies)

- Physical understanding of simple relationships in thermodynamics and acoustics as well as fundamentals of thermal insulation, humidity protection and sound insulation, including their application in building practice

- Conducting physical experiments, documentation, evaluation

Contents

- Construction Physics I: Heat and humidity
  - Introduction: motivation and overview of the contents and disciplines of construction physics
  - Fundamentals of thermal dynamics
  - Stationary heat transfer through transmission; heat conduction, heat conductivity, heat transfer; multilayered components, temperature profiles, balance of heat transfer; thermal bridges
  - Thermal radiation and summer thermal insulation
  - Unsteady-state heat transfer
  - Thermal balance of a building: losses and gains, significance of the building's shape, final and primary energy requirements, calculating transmission heat loss, ventilation, physiological foundations, ventilation rate, ventilation heat loss, solar gains, interior heat gains, select basics of the Energy Saving Regulation (EnEV), simple example calculations
  - Behavior of gases, state changes
  - Humidity: vapor pressure, saturated vapor pressure, dew point
  - Moisture transfer processes, balance of water vapor in buildings, surface condensation, water vapor diffusion (Glaser diagram), calculating condensation, moisture damage
- Practical laboratory course I: heat capacity (calorimetry) and moisture (dew point) experiments

- Construction Physics II: Sound
  - Oscillation: harmonic, damped, forced resonance, overlapping
  - Sound waves: wave types, traveling and standing waves (modes), spectral analysis
  - Amplitude: particle velocity, acoustic pressure, sound energy density, sound intensity, sound level, addition of sound energy/levels
  - Sound perception: frequency range of audible sound, loudness, A-weighting, equivalent continuous sound level
  - Sound propagation effects: sound sources and inverse square laws, reflection, absorption, transmission, sound refraction and diffraction (shielding) (basis of urban noise control)
  - Room acoustics: target values, theory of reverberation, diffuse sound field, sound absorbers, optimization and room design
  - Stationary sound field / noise mitigation measures
  - Architectural acoustics / sound insulation in building construction: Airborne sound insulation of single-leaf pliable components (mass law), sound level difference between rooms, bending waves, coincidence, weighted sound reduction index
  - Cavity walls, double wall resonance
  - Sound reduction indexes of one-leaf and cavity wall and ceiling insulations according to DIN 4109 and, if appli-cable, ISO 12354
  - Sound insulation of adjacent components
  - Influence of flanking transmission
  - Main features of impact (footfall) sound insulation
- Practical laboratory course II: experiments with oscillation and elastic modulus

Recommended Literature

Berber, J.; Bauphysik - Wärmetransport, Feuchtigkeit, Schall; Voigt-Verlag;
Hering, E.; et.al., Physik für Ingenieure; VDI-Verlag;
Krawietz, R.; Heimke; W.; Physik im Bauwesen - Grundwissen und Bauphysik ; Fachbuchverlag Leipzig im Hanser-Verlag;
Fischer, H.M. et.al.; Lehrbuch der Bauphysik; Teubner, Stuttgart
Fasold,W., Veres,E: Schallschutz und Raumakustik in der Praxis; Verlag für Bauwesen, Berlin
Liersch, K.W.: Bauphysik kompakt, Wärme-und Feuchteschutz;

Zürcher,Ch.; Bauphysik- ein Repititorium; vdf-Verlag d.Fachvereine Zürich aus der Reihe BBB; Bauwerk Verlag Berlin 200
Teaching and Learning Methods
Construction Physics I, 2,5 CP: Lecture (1 Hours per Week) + Practical Seminar (1 Hour per Week) + Tutorial Practical Laboratory Course: 2 units each 1,5 h Construction Physics II, 2,5 CP: Lecture (1 Hours per Week) + Practical Seminar (1 Hour per Week) + Tutorial Practical Laboratory Course: 2 units each 1,5 h

Exam(s)

Precondition of Examination	
Successful preliminary examination, passing mark on term paper and laboratory practical (mandatory attendance). Term papers are offered every semester, the laboratory practical once a year.	
Type of Examination	Duration of Examination (if written or oral exam)
Construction Physics I: Pre-Assignment: Documentation of Practical, Laboratory Course, Tests Examination: Written Exam Construction Physics II: Pre-Assignment: Documentation of Practical, Laboratory Course, Tests Examination: Written Exam	Construction Physics I: Written Exam 2 h Construction Physics II: Written Exam 2 h
Composition of Module Mark	
Mark of Exam Construction Physics I 50% and Construction Physics II 50%	

Additional Information

Previous Knowledge / Conditions for Participation (in form and content)
Knowledge and skills acquired in school physics (equivalent to a min. 3 years) or the preparatory course, Physics (strongly recommended), Engineering Mathematics (strongly recommended) and for Construction Physics II, Enginee-ring Mathematics II Differential Equations (recommended)
Applicability of Module
Frequency of Offering
Construction Physics I: every Summer Semester Construction Physics II: every Winter Semester
Course Language
German
valid from: Summer Semester 2017 last updated: 27.09.2018

Mocule Card

Bachelor Civil Engineering
HCU Hamburg

Module Number	Modul Name	Type (C/CE/E)	Semester (proposed)	Module Coordinator
BIW-B-Mod-203	Theory of Material Strength	C	2	Prof. Dr.-Ing. Peter-Matthias Klotz

Subject Area	Duration
Basics of Civil Engineering Methods	1 Semester

CP (according to ECTS)	Contact Hours/Week (SWS)	Self-study
5 CP (= 150 h Workload)	4 (= 42 h Contact Time)	108 h

Objectives and Contents

Objective of Qualification (competencies)
Students will gain basic knowledge of the relationships among stress resultants, stresses, strains and slippages. They will be capable of creating simple designs using components made of homogenous building materials and documenting them.
Contents
- Stress and normal force: Definition: stress, strain, lateral strain, Young's modulus, Hooke's law; calculating stresses and strains - Stresses resulting from uniaxial bending with and without normal force: Navier's hypothesis that plane strain sections remain plane;section properties; normal stresses; compound sections; Steiner's theorem; building materials without tensile strength - Normal stresses with biaxial bending with and without normal force: Symmetrical cross-sections; asymmetrical cross-sections - Shear stresses resulting from lateral force: Shear stresses in vertical and horizontal sections (fundamentals); calculating shear stress with solid cross sections; parallel-axis compound sections - Shear stresses - Torsion: Definition of torsion, warp, twist; shear stresses in solid cross-sections and thin-walled open and closed cross-sections
Recommended Literature
Detailed reading (i.e. relevance, library availability) will be announced in the first class meeting. Schneider: Bautabellen Göttsche, Petersen: Festigkeitslehre klipp und klar Holzmann: Technische Mechanik Festigkeitslehre Lohmeyer: Baustatik 2 Bemessung und Festigkeitslehre
Teaching and Learning Methods
Lecture and Practical Seminar (4 Hours per Week)

Exam(s)

Precondition of Examination	
Type of Examination	**Duration of Examination (if written or oral exam)**
Written Exam	2 h
Composition of Module Mark	
Mark of Exam	

Additional Information

Previous Knowledge / Conditions for Participation (in form and content)
Applicability of Module
Frequency of Offering
every Summer Semester

Course Language	
German	
valid from: Winter Semester 16/17	last updated: 28.09.2018

Mocule Card

Bachelor Civil Engineering
HCU Hamburg

Module Number	Modul Name	Type (C/CE/E)	Semester (proposed)	Module Coordinator
BIW-B-Mod-204	Constructing Material Science II	C	2	Prof. Dr.-Ing. Gesa Kapteina

Subject Area	Duration
Constructing Material Science II	1 Semester

CP (according to ECTS)	Contact Hours/Week (SWS)	Self-study
5 CP (= 150 h Workload)	4 (= 42 h Contact time) + 18 h Contact Time Practical Laboratory Course)	90 h

Objectives and Contents

Objective of Qualification (competencies)
- Basic knowledge of building materials with reference to their composition, structure, production, processing, mechanical and hygrothermal properties and material-specific damage processes - Knowledge of measurement methods for determining characteristic material properties in the context of material testing - Knowledge of structural engineering regulations This facilitates a critical selection of building materials, and as the case may be, combinations of building materials with regard to their load-bearing capacity and fitness for use while taking into account exposure conditions and structural engineering regulations.
Contents
- Aggregates - Binders - Concrete, mix design, production and processing, deformation and strength parameters, material tests, non-destructive test procedures, durability, special types of concrete - Masonry - Laboratory practical class: making and testing concrete
Recommended Literature
Neroth, G.; Vollenschaar, D.: Wendehorst Baustoffkunde, Grundlagen-Baustoffe-Oberflächenschutz, 27. Auf-lage, VIEWEG+TEUBNER, 2011, ISBN 978-3-8351-0225-5 Zementmerkblätter, Herausgeber: Informationszentrum Beton GmbH, online verfügbar Hiese, W.; Backe, H.; Möhring, R.: Baustoffkunde: für Ausbildung und Praxis, Werner Verlag, 12. Auflage
Teaching and Learning Methods
Lecture and Practical Seminar (4 Hours per Week) Practical Laboratory Course I: 8 units, 18 h total

Exam(s)

Precondition of Examination	
Successful preliminary test performance, laboratory practical class with 80% mandatory attendance and lab protocols	
Type of Examination	**Duration of Examination (if written or oral exam)**
Pre-Assignment: Documentation of Practical Laboratory Course Examination: Written Exam	2 h
Composition of Module Mark	
Mark of Exam	

Additional Information

Previous Knowledge / Conditions for Participation (in form and content)

Applicability of Module
Frequency of Offering
every Summer Semester
Course Language
German
valid from: Summer Semester 2017 last updated: 25.09.2018

Mocule Card

Bachelor Civil Engineering
HCU Hamburg

Module Number	Modul Name	Type (C/CE/E)	Semester (proposed)	Module Coordinator
BIW-B-Mod-301	Statics of Structures	C	3 + 4	Prof. Dr.-Ing. Annette Bögle

Subject Area	Duration
Basics of Civil Engineering Methods	2 Semester

CP (according to ECTS)	Contact Hours/Week (SWS)	Self-study
10 CP (= 300 h Workload)	8 (= 84 h Contact Time)	216 h

Objectives and Contents

Objective of Qualification (competencies)
- Students will gain competence in basic assumptions, principles and methods of statics (idealization and discretization of static tasks, introduction to principles of work and energy and basic design methods) - Students will learn the computational analysis of load-bearing behavior by calculating the stress resultants and deformation of statically determinate and indeterminate systems - Students will acquire professional competence in interpreting and critically evaluating calculation results
Contents

- Statics of Structures I:
  - Introduction and Fundamentals: The functions of statics, model assumptions, design method basics
  - Statically determinate structures: Force and deformation values, moment diagrams, kinematics, deformation calculation methods, qualitative evaluation of bending lines, differential equation of bending line
  - Principles of work and energy & working principles: Virtual work, principle of virtual displacements, principle of virtual forces
  - Influence lines of statically determinate structures for force and displacement values
  - Fundamentals of spatial structures
- Statics of Structures II:
  - Statically determinate and statically indeterminate structures: Definitions, advantages and disadvantages, determining degree of static indeterminacy
  - Flexibility method: Fundamentals, method explanation, compatibility conditions, deformation actions, replacement of unloaded subsystems with tonguing, deformation calculation with the reduction theorem, three-moment equation for analysis of statically indeterminate continuous beams
  - Displacement method / Slope-deflection method: Basics, method explanation, kinematic determinacy, difference between general displacement method and slope-deflection method, application to computer methods
  - Influence lines of statically indeterminate structures for force and displacement values
  - Non-linear structures: Equilibrium in deformed structures, components of compromised stability: flexural buckling, effective buckling length coefficients, substitute member length, theory II. order, basics of cable geometry

Recommended Literature
Dallmann, R.: Baustatik 1, Carl Hanser Verlag, München, 2013. Dallmann, R.: Baustatik 2, Carl Hanser Verlag, München, 2012. Dallmann, R.: Baustatik 3, Carl Hanser Verlag, München, 2009. Dinkler, D.: Grundlagen der Baustatik, Springer Vieweg, Wiesbaden, 2014.
Teaching and Learning Methods
Statics of Structures I, 5 CP: Lecture and Practical Seminar (4 Hours per Week) Statics of Structures II, 5 CP: Lecture and Practical Seminar (4 Hours per Week)

Exam(s)

Precondition of Examination	
passed Pre-Assignment	
Type of Examination	**Duration of Examination (if written or oral exam)**
Statics of Structures I: Pre-Assignment: Term Paper Statics of Structures II: Pre-Assignment: Term Paper Examination (module): Written Exam	Written Exam 3 h
Composition of Module Mark	
Mark of Exam	

Additional Information

Previous Knowledge / Conditions for Participation (in form and content)
For this module knowledge and skills from the modules Technical Mechanics and Engineering Mathematics I are recommended.
Applicability of Module
Frequency of Offering
Statics of Structures I: every Winter Semester Statics of Structures II: every Summer Semester
Course Language
German
valid from: Winter Semester 15/16 last updated: 25.09.2018

Mocule Card

Bachelor Civil Engineering
HCU Hamburg

Module Number	Modul Name	Type (C/CE/E)	Semester (proposed)	Module Coordinator
BIW-B-Mod-302	Basics of Designing Building Structures	C	3	Prof. Dr.-Ing. Annette Bögle

Subject Area	Duration
Basics of Design and Construction	1 Semester

CP (according to ECTS)	Contact Hours/Week (SWS)	Self-study
5 CP (= 150 h Workload)	4 (= 42 h Contact Time)	108 h

Objectives and Contents

Objective of Qualification (competencies)
- Students will gain competence in and basic knowledge of structural design in the context of architecture, load-bearing forms, structural framework design, construction and engineering performance. - Students will acquire the skill of recognizing various types of support structures in real projects as well as the ability to formulate their respective requirements. - Students gain competence in identifying and analyzing building structures with regards to their main supporting features.
Contents
- Structural design as part of engineering competence: Fundamentals of design, collaboration between architects and engineers assignment of project planning and framework planning tasks) - Load-bearing structure requirements: Design, function, value; cost effectiveness: building costs, maintenance expenses; sustainability, durability; planning and realization processes: planning time, construction period - Designing load-bearing structures: Load transfer principles and static systems: cable, arch, truss, beam, frame, disk, supporting member; bracing systems; preliminary dimensioning, measuring with empirical formulas - Load-bearing structure analysis: Identification of load-bearing components, design, hierarchy and static systems - Rendering load-bearing structures: Introduction to model making
Recommended Literature
Allen, E.; u.a.: Form and Forces, john Wiley and Sons, Hoboken, 2010. Block, P.; u.a.: Faustformel Tragwerksentwurf, Deutsche Verlags-Anstalt, München, 2013. Muttoni, A.: The Art of Structures, EPFL Press, Lausanne, 2011. Staffa, M.: Tragwerkslehre Grundlagen, Gestaltung, Beispiele, Beuth Verlag GmbH, Berlin Wien Zürich, 2014. Stöffler, J.; Samberg, S.: Tragwerksentwurf für Architekten und Bauingenieure, Bauwerk Verlag GmbH, Berlin,
Teaching and Learning Methods
Lectures and Workshops (4 Hours per Week)

Exam(s)

Precondition of Examination	
Type of Examination	**Duration of Examination (if written or oral exam)**
Term Paper	
Composition of Module Mark	
The term paper consists of various tasks. The exact composition of the overall grade will be announced at the begin-ning of the semester.	

Additional Information

Previous Knowledge / Conditions for Participation (in form and content)
Applicability of Module

Prerequisite for the module Designing Building Structures (recommended)
Frequency of Offering
every Winter Semester
Course Language
German
valid from: Winter Semester 15/16 last updated: 25.09.2018

Mocule Card

Bachelor Civil Engineering
HCU Hamburg

Module Number	Modul Name	Type (C/CE/E)	Semester (proposed)	Module Coordinator
BIW-B-Mod-303	Geotechnics I	C	3	Prof. Dr.-Ing. habil. Kerstin Lesny

Subject Area	Duration
Structural Engineering	1 Semester

CP (according to ECTS)	Contact Hours/Week (SWS)	Self-study
5 CP (= 150 h Workload)	4,4 (= 48 h Contact Time)	102 h

Objectives and Contents

Objective of Qualification (competencies)
Students will learn various soil types and be able to describe and classify them. They will understand the soil mechanic behavior of soils, such as deformation and strength behavior, as well as their behavior when influenced by groundwater flow. They will be able to solve relevant problems. Further, they will gain familiarity with site investigation methods as well as soil mechanical laboratory and field experiments for determining soil parameters.
Contents
- Soil types and their formation; description and classification of soils - Site investigation procedures - Water in soil; groundwater flow - Deformation behavior of soils (subsidence and consolidation) - Strength behavior of soils (states of failure, earth pressure and earth resistance - Determination of soil mechanical parameters
Recommended Literature
for example: Kolymbas, D. (2011): Geotechnik : Bodenmechanik, Grundbau und Tunnelbau, Springer Verlag, Berlin Möller, G. (2013): Geotechnik: Bodenmechanik, 2. Auflage, Verlag Ernst & Sohn, Berlin Möller, G. (2012): Geotechnik: Grundbau, 2. Auflage, Verlag Ernst & Sohn, Berlin
Teaching and Learning Methods
Lecture and Practical Seminar (4 Hours per Week) Practical Laboratory Course (4 h, Compulsory Attendance)

Exam(s)

Precondition of Examination	
passed Pre-Assignment	
Type of Examination	**Duration of Examination (if written or oral exam)**
Pre-Assignment: Laboratory Practical Course and Documentation (offered only Winter Semester) Examination: Written Exam	Written Exam 2 h
Composition of Module Mark	
Mark of Exam	

Additional Information

Previous Knowledge / Conditions for Participation (in form and content)
Prerequisites include: the knowledge and skills acquired in the modules Engineering Mathematics I and II, Strength of Materials and Statics of Structures. The module Technical Mechanics must be completed upon enrolment (mandatory).
Applicability of Module
Frequency of Offering

every Winter Semester	
Course Language	
German	
valid from: Summer Semester 2017	last updated: 25.09.2018

Mocule Card

Bachelor Civil Engineering
HCU Hamburg

Module Number	Modul Name	Type (C/CE/E)	Semester (proposed)	Module Coordinator
BIW-B-Mod-304	Basics of Law	C	3	Prof. Martin Wickel Prof. Friedrich-Karl Scholtissek

Subject Area	Duration
Construction Management	1 Semester

CP (according to ECTS)	Contact Hours/Week (SWS)	Self-study
5 CP (= 150 h Workload)	4 (= 42 h Contact Time)	108 h

Objectives and Contents

Objective of Qualification (competencies)
Attainment of the competence to recognize the central instruments of public building law and to be able to integrate them into the constitutional and administrative context
Contents
Public Building Law (FaSt Basics, BS-B-Mod-003): 1. Constitutional foundations of building law (i.e. fundamental rights, state organization, especially legisla-tive and administrative powers) 2. Administrative foundations of building law (i.e. sources of law, administrative organization, administrative procedures) 3. Plans 3.1 Urban land-use planning (zoning) 3.1.1Procedures and content requirements 3.1.2BauNVO 3.2 Spatial development and technical planning 4. Construction projects (residence, administration, infrastructure, industry) 4.1 Building permit 4.2 Legal material requirements 4.3 Other forms of permission (i.e. license for emission control handling; planning approval) 4.4 Requirements of environmental law Private Building Law: 1. Introduction to the basic concepts of law 2. Contract for services in accordance with the Federal Building Code (BGB) 3. Accepted engineering standards 4. Fee Structure for Architects and Engineers (HOAI) 5. Federal Construction Contract Procedures (VOB) – Sections A, B, and C
Recommended Literature
Public Building Law: literature varies by term, will be announced at first meeting
Teaching and Learning Methods
Public Building Law, 2,5 CP: Lecture (2 Hours per Week) Private Building Law, 2,5 CP: Lecture (2 Hours per Week)

Exam(s)

Precondition of Examination	
Type of Examination	**Duration of Examination (if written or oral exam)**
Public Building Law: Written Exam Private Building Law: Written Exam	Public Building Law: Written Exam 1,5 h Private Building Law: Written Exam 1,5 h
Composition of Module Mark	
Mark of exam: Written Exam Public Building Law 50% and Private Building Law 50%	

Additional Information

Previous Knowledge / Conditions for Participation (in form and content)

Applicability of Module	
Frequency of Offering	
every Winter Semester	
Course Language	
German	
valid from: Winter Semester 15/16	last updated: 25.09.2018

Mocule Card

Bachelor Civil Engineering
HCU Hamburg

Module Number	Modul Name	Type (C/CE/E)	Semester (proposed)	Module Coordinator
BIW-B-Mod-306	Hydraulic Engineering I	C	3	Prof. Dr.-Ing. habil. Kerstin Lesny

Subject Area	Duration
Technical Infrastructure	1 Semester

CP (according to ECTS)	Contact Hours/Week (SWS)	Self-study
5 CP (= 150 h Workload)	4,3 (= 45 h Contact Time)	105 h

Objectives and Contents

Objective of Qualification (competencies)
Students will understand the meaning of hydromechanics within the specialist disciplines, hydrology/water management and hydraulic engineering. They will master the fundamentals of hydrostatics and hydrodynamics as well as the sedi-ment transport. Building on this, they will be able to perform simple hydraulic calculations for pipes and open channels. They will be further familiarized with the possibilities and limits of hydraulic laboratory practice.
Contents
- Meaning of hydromechanics within the specialist disciplines hydrology/water management/hydraulic engineering - Hydrostatics (i.e. water pressure on flat and curved surfaces, buoyancy) - Laws of hydrodynamics (conservation of mass, conservation of energy, momentum equation, energy and friction losses) - Description and calculation of pipe and open-channel flow - Fundamentals of sediment transport - Hydrodynamics of coastal areas (tides, waves and swell) - Hydraulic laboratory practice (modeling regularities, hydromechanical models, conducting simple experiments to understand hydromechanical processes)
Recommended Literature
for example: Aigner, D.; Bollrich, G. (2015): Handbuch der Hydraulik: für Wasserbau und Wasserwirtschaft (1), Beuth Verlag, Berlin Lechler, K.; Lühr, H.-P., Zanke, U. (2015): Taschenbuch der Wasserwirtschaft, Verlag Springer Vieweg, Wiesbaden Zanke, U. C. E. (2002) Hydromechanik der Gerinne und Küstengewässer, Paul-Parey Buchverlag, Berlin.
Teaching and Learning Methods
Lecture and Practical Seminar (4 Hours per Week) Practical Laboratory Course (3 h, Compulsory Attendance)

Exam(s)

Precondition of Examination	
passed Pre-Assignment	
Type of Examination	**Duration of Examination (if written or oral exam)**
Pre-Assignment: Laboratory Practical Course and Documentation (offered only Winter Semester) Examination: Written Exam	
Composition of Module Mark	
Mark of Exam	

Additional Information

Previous Knowledge / Conditions for Participation (in form and content)
Prerequisites include: knowledge and skills acquired in the modules, Engineering Mathematics I, Engineering Mathe-matics II and Technical Mechanics (recommended). The module, Engineering Mathematics I must be completed (man-datory).
Applicability of Module

Frequency of Offering
every Winter Semester
Course Language
German
valid from: Summer Semester 2017 last updated: 25.09.2018

Mocule Card

Bachelor Civil Engineering
HCU Hamburg

Module Number	Modul Name	Type (C/CE/E)	Semester (proposed)	Module Coordinator
BIW-B-Mod-402	Designing of Building Structures	C	4	Prof. Dr.-Ing. Annette Bögle

Subject Area	Duration
Basics of Design and Construction	1 Semester

CP (according to ECTS)	Contact Hours/Week (SWS)	Self-study
5 CP (= 150 h Workload)	2 (= 21 h Contact Time)	129 h

Objectives and Contents

Objective of Qualification (competencies)
- Students will acquire the skills necessary to apply their knowledge of load-bearing structure design in their own discipline-specific project. - Students will acquire the skill of integrating installments into the design and planning processes. - Students gain competence in independently conducting a design project in the field of load-bearing structures.
Contents

- Introduction to the task: Presentation of the context of the design task: location and content
- Input workshops on specific subjects:
  - Team formation and acquaintance with the task
  - Project-relevant subjects (such as frame, functionality, executing an idea, detailing)
  - Rendering (plans, models)
- Corrective feedback: Students and teachers will meet in voluntary and mandatory feedback sessions distributed throughout the semester. The students' current state of progress and any arising issues will be addressed; problems will be addressed and solutions formulated.
- Presentation: Mandatory presentations occur on specific dates throughout the semester. They are an opportuni-ty to convey one's own project to an audience as well as for the teachers to discuss students' individual projects.
- Independent discipline-specific teamwork

Recommended Literature
Albert, A. (Hrsg.): Schneider Bautabellen für Ingenieure, Bundesanzeiger Verlag GmbH, Köln, 2014. Block, P.; u.a.: Faustformel Tragwerksentwurf, Deutsche Verlags-Anstalt, München, 2013. Kister, J.: Neufert Bauentwurfslehre, Vieweg & Sohn Verlag, Wiesbaden, 2012. Staffa, M.: Tragwerkslehre Grundlagen, Gestaltung, Beispiele, Beuth Verlag GmbH, Berlin Wien Zürich, 2014. Stöffler, J.; Samberg, S.: Tragwerksentwurf für Architekten und Bauingenieure, Bauwerk Verlag GmbH, Berlin, 2002. Wüstenrot Stiftung (Hrsg.): Raumpilot Grundlagen, Karl Kraemer Verlag, Stuttgart und Zürich, 2014.
Teaching and Learning Methods
Lecture and Project (2 Hours per Week)

Exam(s)

Precondition of Examination	
Mandatory Attendance at (interim) Presentations, Workshops and Excursions	
Type of Examination	**Duration of Examination (if written or oral exam)**
Documentation and Presentation	
Composition of Module Mark	
Presentation and Documentation are graded. The composition of the overall grade will be announced at the beginning of the semester.	

Additional Information

Previous Knowledge / Conditions for Participation (in form and content)
Skills and knowledge acquired in Basics of Designing Building Structures (recommended)

Applicability of Module	
Frequency of Offering	
every Summer Semester	
Course Language	
German	
valid from: Winter Semester 15/16	last updated: 27.09.2018

Mocule Card

Bachelor Civil Engineering
HCU Hamburg

Module Number	Modul Name	Type (C/CE/E)	Semester (proposed)	Module Coordinator
BIW-B-Mod-403	Geotechnics II	C	4	Prof. Dr.-Ing. habil. Kerstin Lesny

Subject Area	Duration
Structural Engineering	1 Semester

CP (according to ECTS)	Contact Hours/Week (SWS)	Self-study
5 CP (= 150 h Workload)	4 (= 42 h Contact Time)	108 h

Objectives and Contents

Objective of Qualification (competencies)
Students will understand the basic principles of various geotechnical structures, such as shallow and deep foundations as well as simple systems of revetment and dewatering. They will be able to describe the static system as well as the load transfer behavior of these systems and to dimension these according to the Eurocode 7 and DIN 1054 design rules.
Contents
- Safety concept and design rules according to Eurocode 7 and DIN 1054 - Load-bearing capacity and fitness for use of shallow foundations (individual and strip footing) - Load-bearing capacity and fitness for use of pile foundations (axially loaded piles) - Slope stability - Building pit sheeting design for simple static systems - Dewatering basics
Recommended Literature
for example: Kolymbas, D. (2011): Geotechnik : Bodenmechanik, Grundbau und Tunnelbau, Springer Verlag, Berlin Möller, G. (2012): Geotechnik: Grundbau, 2. Auflage, Verlag Ernst & Sohn, Berlin Ziegler, M. (2012): Geotechnische Nachweise nach EC 7 und DIN 1054, Verlag Ernst & Sohn, Berlin
Teaching and Learning Methods
Lecture and Practical Seminar (4 Hours per Week)

Exam(s)

Precondition of Examination	
Type of Examination	**Duration of Examination (if written or oral exam)**
Written Exam	2h
Composition of Module Mark	
Mark of Exam	

Additional Information

Previous Knowledge / Conditions for Participation (in form and content)
Prerequisites include: the knowledge and skills acquired in the modules, Engineering Mathematics I and II, Strength of Materials and Statics of Structures (recommended). The module, Technical Mechanics, must be completed upon en-rolment (mandatory).
Applicability of Module
Frequency of Offering
every Summer Semester
Course Language

German	
valid from: Winter Semester 16/17	last updated: 28.09.2018

Mocule Card

Bachelor Civil Engineering
HCU Hamburg

Module Number	Modul Name	Type (C/CE/E)	Semester (proposed)	Module Coordinator
BIW-B-Mod-404	Steel and Timber Structures	C	4 + 5	Prof. Dr.-Ing. Manuel Krahwinkel

Subject Area	Duration
Structural Engineering	2 Semester

CP (according to ECTS)	Contact Hours/Week (SWS)	Self-study
10 CP (= 300 h Workload)	8 (= 84 h Contact Time)	216 h

Objectives and Contents

Objective of Qualification (competencies)
Students will master the fundamentals of structural components and connections as well as the structural detailing of load-bearing structures in timber and steel construction engineering.
Contents

- Steel construction engineering
  - Examples of completed steel structures
  - Elastic and plastic limit loads of cross-sections
  - Welded and screwed connections
  - Design and construction of a load-bearing structure
  - Flexural buckling, lateral torsional buckling, plate buckling
- Timber engineering
  - Examples of completed timber structures
  - Wood as material
  - Design
  - Connections
  - Sideways buckling
  - Saddle roof girders

Recommended Literature
Kindmann, R.; Krüger, U.: Stahlbau, Teil 1: Grundlagen, 5. Auflage, Ernst & Sohn, 2013 Colling, F.: Holzbau, 4. Auflage, Springer Vieweg, 2014 Krahwinkel, M.; Kindmann, R.: Stahl- und Verbundkonstruktionen, 3. Auflage, Springer Vieweg, 2016
Teaching and Learning Methods
Steel and Timber Structures I, 5 CP: Lecture and Practical Seminar (4 Hours per Week) Steel and Timber Structures II, 5 CP: Lecture and Practical Seminar (4 Hours per Week)

Exam(s)

Precondition of Examination	
Type of Examination	**Duration of Examination (if written or oral exam)**
Steel and Timber Structures I+II (module): Written Exam	3 h
Composition of Module Mark	
Mark of Exam	

Additional Information

Previous Knowledge / Conditions for Participation (in form and content)
Prerequisites include: knowledge and skills acquired in Technical Mechanics, Strength of Materials and Statics of Structures (recommended).
Applicability of Module
Frequency of Offering
Steel and Timber Structures I: every Summer Semester

Steel and Timber Structures II: every Winter Semester
Course Language
German
valid from: Winter Semester 16/17 last updated: 28.09.2018

Mocule Card

Bachelor Civil Engineering
HCU Hamburg

Module Number	Modul Name	Type (C/CE/E)	Semester (proposed)	Module Coordinator
BIW-B-Mod-405	Concrete Structures	C	4 + 5	Prof. Dr.-Ing. Klaus Liebrecht

Subject Area	Duration
Structural Engineering	2 Semester

CP (according to ECTS)	Contact Hours/Week (SWS)	Self-study
10 CP (= 300 h Workload)	8 (= 84 h Contact Time)	216 h

Objectives and Contents

Objective of Qualification (competencies)
Students will learn basic knowledge and skills of calculation methods in concrete construction and of the dimensioning and building of structural elements commonly used in the structural engineering of concrete structures. On completion of the module students should be able to design and dimension simple concrete structures. The basic principles learned will enable students to expand their knowledge accordingly to meet the demands of practice.
Contents
1.Fundamentals - Load-bearing structural forms and structural elements in reinforced concrete construction / material properties - Load-bearing characteristics of concrete structures/durability/safety concept 2. Features of internal forces determination - Bearing length / moment distribution / section moments 3. Bending analysis - Fundamentals of bending calculation / design method - Calculation of square cross-sections and T-beam cross-sections - Limiting span/depth ratio 4. Shear design - Fundamentals / design method / shear force roofing 5. Types of reinforcement and reinforcement guidelines - General reinforcement guidelines / bond stresses / anchorages - Overlap joints / tensile roof covering / layout of reinforcement 6. Design and construction of continuous beams - Determining permissible stress / design / structural details / rules of reinforcement 7. Design and construction of uniaxial and biaxial plate load-bearing structures - Determining permissible stress / design / structural details / rules of reinforcement 8. Design and construction of stairs - Load-bearing structural forms / determining permissible stress / reinforcement layout 9. Design for bending and normal force - Uniaxial bending and normal force / biaxial bending and normal force 10. Buckling safety checks - Effective length and slenderness / centrically loaded supports - Fundamentals of theory II order - Simplified design methods for isolated compression members with uniaxial relative eccentricity 11. Centrically loaded foundation - Strip and pad foundations; reinforced / unreinforced foundations 12. Analysis of usability limit state - Analysis of steel stress; analysis of concrete compressive stresses; analysis of crack width
Recommended Literature
Goris, Alfons: Stahlbetonbau-Praxis nach Eurocode 2, Band I u. II, ab 5. Auflage, Beuth-Verlag, Berlin – Wien - Zürich (2013) Avak, Conchon, Aldejohann: Stahlbetonbau in Beispielen Teil 1, ab 7. Auflage, Bundesanzeiger Verlag, Köln (2016) Wommelsdorff: Stahlbetonbau – Bemessung und Konstruktion Teil 1, ab 8. Aufl., Wolters Kluwer Verlag (2005) Schneider: Bautabellen für Ingenieure, ab 20. Auflage, Köln, Werner Verlag
Teaching and Learning Methods
Concrete Structures I, 5 CP: Lecture and Practical Seminar (4 Hours per Week) Concrete Structures II, 5 CP: Lecture and Practical Seminar (4 Hours per Week)

Exam(s)

Precondition of Examination	
Type of Examination	Duration of Examination (if written or oral exam)

Concrete Structures I+II (module): Written Exam Note: A voluntary homework assignment will be given.	3 h
Composition of Module Mark	
Mark of Exam	

Additional Information

Previous Knowledge / Conditions for Participation (in form and content)
Prerequisites include: knowledge and skills acquired in Theory of Material Strength and Statics of Structures (recom-mended).
Applicability of Module
Frequency of Offering
Concrete Structures I: every Summer Semester Concrete Structures II: every Winter Semester
Course Language
German
valid from: Winter Semester 16/17 last updated: 28.09.2018

Mocule Card

Bachelor Civil Engineering
HCU Hamburg

Module Number	Modul Name	Type (C/CE/E)	Semester (proposed)	Module Coordinator
BIW-B-Mod-406	Hydraulic Engineering II	C	4	Prof. Dr.-Ing. habil. Kerstin Lesny

Subject Area	Duration
Technical Infrastructure	1 Semester

CP (according to ECTS)	Contact Hours/Week (SWS)	Self-study
5 CP (= 150 h Workload)	4,3 (= 45 h Contact Time)	105 h

Objectives and Contents

Objective of Qualification (competencies)
Students will gain mastery of the standard hydrological basics and become familiar with the essential aspects of water management planning and development tasks. They will become acquainted with various approaches to the development of flowing water, including river engineering facilities and renaturation. They will understand the construction, expansion and principles of operation of navigable waterway construction and flood protection facilities and are able to design and calculate the main features of simple structures.
Contents
- Fundamentals of hydrology (water circulation, soil moisture regime, groundwater, flood routing), water ecology - Fundamentals of water management planning and development tasks - Development of flowing waters - Weir and dam facilities - Navigable waterway construction facilities - Flood protection facilities
Recommended Literature
for example: Dickhaut, W.; Schwark, A.; Franke, K. (2006): Fließgewässerrenaturierung heute – auf dem Weg zur Umsetzung der Wasserrahmenrichtlinie, Hamburg Giesecke, J.; Heimerl, S. (2013): Wasserkraftanlagen – Planung, Bau und Betrieb, Verlag Springer Vieweg, Berlin Lechler, K.; Lühr, H.-P., Zanke, U. (2015): Taschenbuch der Wasserwirtschaft, Verlag Springer Vieweg, Wiesbaden Patt, H.; Jüpner, R. (2013): Hochwasser-Handbuch – Auswirkungen und Schutz, Springer Verlag, Berlin, Heidelberg Patt, H.; Jürging, P.; Kraus, W. (2011): Naturnaher Wasserbau - Entwicklung und Gestaltung von Fließgewässern. Springer Verlag, Berlin, Heidelberg Zumbroich, T.; Müller, A.; Friedrich, G. (1999): Strukturgüte von Fließgewässern - Grundlagen und Kartierung. Springer Verlag, Berlin, Heidelberg http://www.hamburg.de/wrrl/ https://www.umweltbundesamt.de/daten/gewaesserbelastung/fliessgewaesser
Teaching and Learning Methods
Lecture and Practical seminar (4 Hours per Week)

Exam(s)

Precondition of Examination	
Type of Examination	Duration of Examination (if written or oral exam)
Written Exam	2 h
Composition of Module Mark	
Mark of Exam	

Additional Information

Previous Knowledge / Conditions for Participation (in form and content)
Prerequisites include: knowledge and skills acquired in Engineering Mathematics, I, Engineering Mathematics II and Technical

Mechanics (recommended). Engineering Mathematics I must be completed (mandatory).
Applicability of Module
Frequency of Offering
every Summer Semester
Course Language
German
valid from: Winter Semester 16/17 last updated: 28.09.2018

Mocule Card

Bachelor Civil Engineering
HCU Hamburg

Module Number	Modul Name	Type (C/CE/E)	Semester (proposed)	Module Coordinator
BIW-B-Mod-501	CAE	C	5	Prof. Dr.-Ing. Frank Wellershoff

Subject Area	Duration
Structural Engineering	1 Semester

CP (according to ECTS)	Contact Hours/Week (SWS)	Self-study
5 CP (= 150 h Workload)	4 (= 42 h Contact Time)	108 h

Objectives and Contents

Objective of Qualification (competencies)
- Efficient and effective use of high-quality CAD software. This requires an understanding of the mathematical description of complex geometries (NURBS) as well as methods of parameterization. - Controlled data interchange between a CAD program and frame design software - Confident use of complex frame design software. This requires working knowledge of numerical computerized techniques (calculation algorithms) as well as how to evaluate results.
Contents
- Introduction to CAD software: Learning and deepening the grasp of fundamentals and basic drawing comments, drawing design and data backup and data transfer to frame design software - Introduction to frame design software: Theory of consistent deformations method, theory I, II and III. order, theory of calculation algorithms, input, monitoring and editing a CAD model, frame design model setup, creating load cases and load case combinations for measuring fitness for use and load-bearing capacity, selection of calculation parameters, readouts, checking and reading program messages and calculation results, creation of documented and verifiable statics
Recommended Literature
Pottmann et. al.: Architekturgeometrie, Springer Verlag Helmut Schober: Transparente Schalen, Ernst & Sohn Verlag Tedeschi: Parametric Architecture with Grashopper, Le Penseur Lumpe; Gensichen: Evaluierung der linearen und nichtlinearen Stabstatik in Theorie und Software, Ernst & Sohn Verlag
Teaching and Learning Methods
Seminar (4 Hours per Week) in Computer-Pool

Exam(s)

Precondition of Examination	
Type of Examination	**Duration of Examination (if written or oral exam)**
Term Paper The term paper consists of subtasks worked on throughout the semester.	
Composition of Module Mark	
The highest mark for the term paper is 100 points. It determines students' overall mark.	

Additional Information

Previous Knowledge / Conditions for Participation (in form and content)
Prerequisites include: Technical Mechanics, Building Construction and CAD (mandatory).
Applicability of Module
Frequency of Offering
every Winter Semester

Course Language		
German		
valid from:	Winter Semester 15/16	last updated: 25.09.2018

Mocule Card

Bachelor Civil Engineering
HCU Hamburg

Module Number	Modul Name	Type (C/CE/E)	Semester (proposed)	Module Coordinator
BIW-B-Mod-502	Construction Management	C	5 + 6	Prof. Dr.-Ing. Peter-Matthias Klotz

Subject Area	Duration
Construction Management	2 Semester

CP (according to ECTS)	Contact Hours/Week (SWS)	Self-study
7,5 CP (= 225 h Workload)	6 (= 63 h Contact Time)	162 h

Objectives and Contents

Objective of Qualification (competencies)
Students will acquire basic knowledge in the subject areas of building industry and construction management. They will be able to plan, manage and carry out construction projects.
Contents

- Construction Management and Operations I:
  - Building industry: Business-management basics, operational accounting, finances, operating taxes, operational insurance, working groups
  - Site management: Site facilities, construction equipment and construction methods, formwork and scaffolding
  - Safety technology: A certificate can be earned in accordance with RAB 30, annex B, “Occupational Safety and Health Proficiency,” as well as the knowledge and skills for branch-specific training as an occupational health and safety practitioner, Level III, P V “building sector.”
- Construction Management and Operations II:
  - Scheduling
  - Specification of services: Model format for building services specifications, standard service catalog, freestyle texts with German Construction Contract Procedures (VOB)
  - Construction price calculation: Setup, execution, budgeting and cost processing

Recommended Literature
Detailed information (i.e. relevance, availability in the library) will be given in the first class meeting. Krause: Zahlentafeln für den Baubetrieb Berner: Grundlagen der Baubetriebslehre Krause: Beispiele für die Baubetriebspraxis Schach: Baustelleneinrichtung
Teaching and Learning Methods
Construction Management I, 5 CP: Lecture and Practical Seminar (4 Hours per Week) Construction Management II, 2,5 CP: Lecture (2 Hours per Week)

Exam(s)

Precondition of Examination	
passed Pre-Assignment	
Type of Examination	**Duration of Examination (if written or oral exam)**
Construction Management I: Pre-Assignment: Exam in Safety Engineering Construction Management I+II (module): Term Paper	Pre-Assignment: Written Exam 1 h
Composition of Module Mark	
Mark of Term Paper	

Additional Information

Previous Knowledge / Conditions for Participation (in form and content)
Applicability of Module

Frequency of Offering
Construction Management I: every Winter Semester Construction Management II: every Summer Semester
Course Language
German
valid from: Winter Semester 15/16 last updated: 25.09.2018

Mocule Card

Bachelor Civil Engineering
HCU Hamburg

Module Number	Modul Name	Type (C/CE/E)	Semester (proposed)	Module Coordinator
BIW-B-Mod-503	Transport Planning and Traffic Infrastructure	C	5	Prof. Dr.-Ing. Martin Jäschke

Subject Area	Duration
Technical Infrastructure	2 Semester

CP (according to ECTS)	Contact Hours/Week (SWS)	Self-study
10 CP (= 300 h Workload)	8 (= 84 h Contact Time)	216 h

Objectives and Contents

Objective of Qualification (competencies)
Knowing, understanding and using the basic principles and interrelations of road and railway transportation
Contents

- Transport Planning and Infrastructure I:
  - Basic principles of transport: Mobility and transport, spatial development and transport; ecological, social and economic effects and interdependency, assessment methods, selection, emissions prevention and reduction, main focus: noise
  - Designing road transportation sites: Traffic surveys, prognoses, distribution (modal split) and assignment; calculating junctions, manual and compu-ter-assisted; elements of design, site plan, topographic map and cross section; optical range analysis;substantiation of transport quality; road drainage; cross section design; bicycle traffic; stationary traffic
- Transport Planning and Infrastructure II:
  - Road construction and maintenance: Rode surface construction codes, stresses and strains, dimensioning and building techniques; building methods of federal highways and municipal roads; road maintenance and the pavement management system (PMS)
  - Designing railway sites, railway construction and operation: Legal foundations; road and vehicle interaction; standard operating procedure; occupational safety and safety measures; railway operation and timetable; planning and building railway systems; crossings

Recommended Literature
Becker: Grundwissen Verkehrsökologie; Steierwald: Stadtverkehrsplanung; Lippold: Der Elsner 20xx; Matthews: Bahnbau; Pachl: Systemtechnik des Schienenverkehrs; Internet: FGSV, BASt, UBA, EBA
Teaching and Learning Methods
Transport Planning and Traffic Infrastructure I, 5 CP: Lecture and Practical Seminar (4 Hours per Week) Transport Planning and Traffic Infrastructure II, 5 CP: Lecture and Practical Seminar (4 Hours per Week)

Exam(s)

Precondition of Examination	
Type of Examination	**Duration of Examination (if written or oral exam)**
Transport Planning and Traffic Infrastructure I+II (module): Written Exam	3 h
Composition of Module Mark	
Mark of Exam	

Additional Information

Previous Knowledge / Conditions for Participation (in form and content)
Applicability of Module
Frequency of Offering

Transport Planning and Traffic Infrastructure I: every Winter Semester Transport Planning and Traffic Infrastructure II: every Summer Semester
Course Language
German
valid from: Winter Semester 16/17 last updated: 28.09.2018

Mocule Card

Bachelor Civil Engineering
HCU Hamburg

Module Number	Modul Name	Type (C/CE/E)	Semester (proposed)	Module Coordinator
BIW-B-Mod-506	Surveying Engineering	C	5 + 6	Prof. Dr.-Ing. Harald Sternberg

Subject Area	Duration
Surveying Engineering	2 Semester

CP (according to ECTS)	Contact Hours/Week (SWS)	Self-study
2 x 2,5 CP (= 2 x 75 h Workload)	2 x 2 (= 2 x 21 h Contact Time)	2 x 54 h

Objectives and Contents

Objective of Qualification (competencies)
- Basic principles in understanding and implementing simple surveying techniques - Simple position and height measurements - Necessary calculation, analysis and representation methods in surveying technology
Contents

- Geodesy (from GEO-B-Mod-101)
  - Survey of Geomatic Engineering, history, standardizations (DIN, SI), reference and coordinate systems, height reference surfaces,using levels and optical plummets (leveling and centering), basic measuring techniques (orthogonal, polar, simple leveling)
- Geodesy practical course
  - Fundamentals of coordinate and height systems
  - Using instruments: leveling, optical-mechanical theodolites, electronic tachymeters
  - Position measurement: orthogonal and polar techniques
  - Height measurement: geometric and trigonometric leveling

Recommended Literature
Witte, B., Sparla, P.: Vermessungskunde und Grundlagen der Statistik für das Bauwesen (8. Auflage, 2015) Möser, Hoffmeister, Müller, Schlemmer, Staiger, Wanninger: Handbuch Ingenieurgeodäsie : Grundlagen (4. Auflage, 2012) Resnik, B., Bill, R.:Vermessungskunde für den Planungs-, Bau- und Umweltbereich (3. Auflage, 2009) Kahmen, H.: Angewandte Geodäsie: Vermessungskunde (20. Auflage, 2005)
Teaching and Learning Methods
Geodesy I, 2,5 CP: Lecture (2 Hours per Week) Practical Course Geodesy, 2, 5 CP:Ppractical Course (2 Hours per Week)

Exam(s)

Precondition of Examination	
Compulsory Attendance in Practical Course 80%	
Type of Examination	**Duration of Examination (if written or oral exam)**
Geodesy I: Written Exam Practical Course Geodesy: Term Paper, Colloquium	Written Exam 1,5 h
Composition of Module Mark	
50% Written Exam Geodesy I and 50% Term Paper	

Additional Information

Previous Knowledge / Conditions for Participation (in form and content)
For the internship in the 6th semester participation in the theoretical part of Geodesy 1 is required in the 5th semester (mandatory).
Applicability of Module
Frequency of Offering

Geodesy I: every Winter Semester Practical Course Geodesy: every Summer Semester
Course Language
German
valid from: Summer Semester 2017 last updated: 25.09.2018

Mocule Card

Bachelor Civil Engineering
HCU Hamburg

Module Number	Modul Name	Type (C/CE/E)	Semester (proposed)	Module Coordinator
BIW-B-Mod-601	Thesis (ASPO 2015)	C	6	Prof. Dr.-Ing. Annette Bögle

Subject Area	Duration
Thesis	1 Semester

CP (according to ECTS)	Contact Hours/Week (SWS)	Self-study
10 CP (= 300 h Workload)		300 h

Objectives and Contents

Objective of Qualification (competencies)
The bachelor's thesis is an examination paper. It will demonstrate the candidate's ability to work through a problem in civil engineering independently, according to scientific methods and by a predetermined deadline.
Contents
The exam consists of a problem from the bachelor's curriculum in civil engineering. The first examiner will hand out the topic.
Recommended Literature
Varies by subject
Teaching and Learning Methods
Independent Written Term Paper For further information, see "Informationen zur Bachelor-/Masterthesis" on the homepage

Exam(s)

Precondition of Examination	
Preconditions for the examination paper are stipulated in the general and degree-specific examination regulations of HCU Hamburg.	
Type of Examination	**Duration of Examination (if written or oral exam)**
Thesis 2 copies (each with a hard copy and a digital copy on CD)	12 Weeks
Composition of Module Mark	
Thesis mark worth 100% (first and second examiners' marks each comprise one half of the evaluation)	

Additional Information

Previous Knowledge / Conditions for Participation (in form and content)
Applicability of Module
Frequency of Offering
any time
Course Language
German
valid from: Winter Semester 15/16 last updated: 25.09.2018

Mocule Card

Bachelor Civil Engineering
HCU Hamburg

Module Number	Modul Name	Type (C/CE/E)	Semester (proposed)	Module Coordinator
BIW-B-Mod-604	Sanitary Environmental Engineering	C	6	Prof. Dr.-Ing. Wolfgang Dickhaut

Subject Area	Duration
Structural Engineering	1 Semester

CP (according to ECTS)	Contact Hours/Week (SWS)	Self-study
5 CP (= 150 h Workload)	4 (= 42 h contact time)	108 h

Objectives and Contents

Objective of Qualification (competencies)
- Knowledge about fundamental problems concerning sanitary environmental engineering, methods of resoluti-on and systems - Ability to calculate simple property and district related measurings
Contents
- Basics of Sanitary Environmental Engineering: Strategies of a sustainable Sanitary Environmental Engineering; Biological, chemical and hydraulic basics; Legal requirements: objectives from the perspective of water protection, water quality, waste-water and rain-water inflow and discharge, quality and quantity, drainage processes - Systems of Sanitary Environmental Engineering on regional and urban level: (operating modes, techniques/materials, measurement basis), water supply (e.g. requirements, supply, sup-port, cleaning, distribution) – an overview; sewage disposal: systems for rainwater usage (mixed and seperate sewer system – operating principle; systems e.g. sewer system, pump stations, stormwater overflow and a stormwater tank) – planning and calculation; sewage treatment: systems for waste water cleaning/sewage tre-atment plants (development of mechanical and biological cleaning, e.g. preclarification, revival, elimination of phosphate, Secondary clarification) – an overview - Systems of Sanitary Environmental Engineering on district and property level: (operating modes, techniques/materials, measurement basis) - planning and calculation; decentralized rainwa-ter usage (e.g. evaporation, infiltration, retention, usage); waste water cleaning (decentralized systems, e.g. separation and treatment of material flow, grey water recycling, planted soil filters)
Recommended Literature
DWA_Regelwerke Gujer, Willi; Siedlungswasserwirtschaft; 2006
Teaching and Learning Methods
Lecture and Practical Seminar (4 Hours per Week)

Exam(s)

Precondition of Examination	
Type of Examination	**Duration of Examination (if written or oral exam)**
Written Exam	2 h
Composition of Module Mark	
Mark of Exam	

Additional Information

Previous Knowledge / Conditions for Participation (in form and content)
This module builds on knowledge acquired in the module Hydraulic Engineering (recommended).
Applicability of Module
Frequency of Offering
every Summer Semester

Course Language		
German		
valid from:	Winter Semester 16/17	last updated: 28.09.2018

Mocule Card

Bachelor Civil Engineering
HCU Hamburg

Module Number	Modul Name	Type (C/CE/E)	Semester (proposed)	Module Coordinator
BIW-B-Mod-605	Elective	CE	5	Prof. Dr.-Ing. Annette Bögle

Subject Area	Duration
Compulsory Elective	1 Semester

CP (according to ECTS)	Contact Hours/Week (SWS)	Self-study
5 CP (= 150 h Workload) or 2 x 2,5 CP (= 2 x 75 h Workload)	4 (= 42 h Contact Time) or 2 x 2 (= 2 x 21 h Contact Time)	108 h or 2 x 54 h

Objectives and Contents

Objective of Qualification (competencies)
- Increasing breadth and depth of particular disciplinary knowledge - Profiling the personal portfolio
Contents
- A course worth 5 CP is to be chosen from the catalog of mandatory electives for the civil engineering program. OR - Two courses worth 2.5 CP each are to be chosen from the catalog of mandatory electives for the civil enginee-ring program.
Recommended Literature
Varies by course
Teaching and Learning Methods
Lecture + Practical Course (4 Hours per Week or 2 x 2 Hours per Week)

Exam(s)

Precondition of Examination	
Varies by course	
Type of Examination	**Duration of Examination (if written or oral exam)**
Varies by course	
Composition of Module Mark	
Varies by type of examination	

Additional Information

Previous Knowledge / Conditions for Participation (in form and content)
To be determined by the teacher of the course
Applicability of Module
Frequency of Offering
every Semester
Course Language
German
valid from: Winter Semester 15/16 last updated: 25.09.2018

Mocule Card

Bachelor Civil Engineering
HCU Hamburg

Module Number	Modul Name	Type (C/CE/E)	Semester (proposed)	Module Coordinator
SK-B-Mod-002 (BIW)	Skills: Instruments for Analysis and Visualization	CE	2 + 3	Prof. Dr. rer. nat. Thomas Schramm, Dipl.-Ing. Jens Köster

Subject Area	Duration
Interdisciplinary Studies	2 Semester

CP (according to ECTS)	Contact Hours/Week (SWS)	Self-study
2 x 2,5 CP (= 2 x 75 Std. Workload)	2 x 2 (= 2 x 21 h Contact Time)	2 x 54 h

Objectives and Contents

Objective of Qualification (competencies)
- SKILLS (selectable): - Interdisciplinary competences in analysis and visualization to understand and design urban environment - Computer Science: - Calculation and visualization by spreadsheets - Solution of simple programming tasks - Simple calculations with statics programs
Contents
- SKILLS (selectable): Teaching of instruments for analysis and visualization, e.g.: - Typical design software like adobe photoshop, InDesign, Illustrator - CAD - Geo-information systems - Film - Foto - and others - Computer Science: - Introduction to Excel: Learning and improvement of basic calculation functions, presentation of results in diagrams - Introduction to VBA: development of functions and programs - Introduction to programs for shell structures as well as a common statics program: entering of systems and loads, calculation of cut sizes and deformation
Recommended Literature
Computer Science: Excel und VBA (Verlag Springer Vieweg) Excel 20113 – Automatisierung und Programmierung (RRZN-Handbuch Leibniz Universität Hannover)
Teaching and Learning Methods
SKILLS (selectable), 2,5 CP: Seminar (2 Hours per Week) Computer Science, 2,5 CP: Practical course (2 Hours per Week) in Computer Pool

Exam(s)

Precondition of Examination	
Compulsory Attendance 80%	
Type of Examination	**Duration of Examination (if written or oral exam)**
SKILLS (selectable): varies by course Computer Science: Written Exam	Computer Science: Written Exam 1,5 h
Composition of Module Mark	
Mark of Exam Comuter Science 50%, Mark of Skills (selectable) 50%	

Additional Information

Previous Knowledge / Conditions for Participation (in form and content)

Computer Skills
Applicability of Module
Frequency of Offering
every Winter Semester
Course Language
German
valid from: Winter Semester 15/16 last updated: 25.09.2018