Mocule Card

Master Civil Engineering
HCU Hamburg

Module Number	Modul Name	Type (C/CE/E)	Semester (proposed)	Module Coordinator
BIW-M-Mod-101	Engineering Mathematics	C	1	Prof. Dr. Thomas Schramm

Subject Area	Duration
Basics	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 familiarity with and understand the advanced mathematical principles of engineering mathematics used for modeling and data analysis in civil engineering.
Contents
Elements of advanced engineering mathematics: - Complex algebra and its geometric interpretation - Multivariable real-valued functions and their Taylor expansions - Elements of vector analysis (gradient, Jacobian and Hessian matrices) - Fourier transformation, important theorems (fold, cross-correlation) and their application - Types of differential equations, systems of ordinary first-order linear differential equations, interpretation of ma-trix exponentials, simple solution methods - Going further with ordinary differential equations, fundamentals of numerical methods - Mathematical basis of the finite element method - Preview: partial differential equations The first part of the module is identical to Module GEO-M-Mod-101 Engineering Mathematics and is conducted in Eng-lish. Assignments in the form of formative e-assessments may supplement contact hours.
Recommended Literature
Kenneth A. Stroud, Dexter J. Booth, Engineering Mathematics, Palgrave Macmillan Limited, 01.01.2013 - 1155 pages Buchanan, G. R., Schaum's Outline of Fourier Analysis with Applications to Boundary Value Problems, Mcgraw-Hill Professional ,1974 Scheid, F., Schaum's Outline of Numerical Analysis, 2nd Ed., Mcgraw-Hill Professional, 1989 Spiegel, M. R., Schaum's Outline of Finite Element Analysis, Mcgraw-Hill Professional, 1995 Spiegel, M. R., Schaum's Outline of Advanced Mathematics for Engineers and Scientists, Mcgraw-Hill Profes-sional; Auflage: 1, 2009 Thomas Westermann, Mathematik für Ingenieure, 7. Auflage, Springer, Heidelberg,2015 (available as eBook)
Teaching and Learning Methods
Lecture (2 Hours per Week) + Practical Seminar (2 Hours per Week)

Exam(s)

Precondition of Examination	
Type of Examination	**Duration of Examination (if written or oral exam)**
Written Exam / eAssessment	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
every Winter Semester
Course Language
English/German

valid from	valid to	last updated
Winter Semester 15/16		25.09.2018

Mocule Card

Master Civil Engineering
HCU Hamburg

Module Number	Modul Name	Type (C/CE/E)	Semester (proposed)	Module Coordinator
BIW-M-Mod-102	Computer Science in Statics	C	1	Prof. Dr.-Ing. Klaus Liebrecht

Subject Area	Duration
Basics	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)
The finite element method (FEM) is the most widespread computer-based calculation method in statics. Due to its vivid clarity and excellent flexibility with load-bearing structures, material properties, loading and support conditions, the finite element method is used in calculating rod-shaped components and two-dimensional structures. Beginning with a theoretical introduction to the finite element method, students will be guided in unitizing and designing frameworks and two-dimensional structures on the computer and will then do so independently. Alongside learning the theoretical background and practical application of the finite element method, knowledge of the limits of the method is paramount. With their knowledge of statics, students will learn to perform independent checks on computer-aided calcu-lations and to document them according to standard procedure.
Contents

- Introduction to the theory of the finite element method (FEM)
  - Derivation of basic equations
  - Energy methods and variational principles
  - Approximation method
  - Element types
- Analysis of frameworks and two-dimensional structures
  - Fundamentals
  - Mesh generation
  - Modeling bearings
  - Elastic bedding of base plates (modulus of subgrade reaction method / constrained modulus method)
  - Modeling of effects / combinatorics
  - Definition of singularities / treatment of singularities
  - Calculation of spring stiffness
  - Punching through plates
  - Wall-like beams
- Limits of FEM calculations
- Analysis of errors in FEM calculations
- Checking and documenting computer-aided calculations

Recommended Literature
K.-J. Bathe. Finite-Elemente-Methoden. Springer-Verlag (2001) O.C. Zienkiewicz, R.L. Taylor. The Finite Element Method, Volume 1 and Volume 2. Butterworth-Heinemann (2000) Rombach, Günter: Anwendung der Finite-Elemente-Methode im Betonbau, Ernst & Sohn, Berlin (2000) Katz, Hartmann: Statik mit finiten Elementen, Springer Verlag, (2002) Werkle, Horst: Finite Elemente in der Baustatik, 2. Auflage, Vieweg Verlag (2001)
Teaching and Learning Methods
Lecture (2 Hours per Week) + Practical Seminar (2 Hours per Week)

Exam(s)

Precondition of Examination	
passed Pre-Assignment	
Type of Examination	Duration of Examination (if written or oral exam)
Pre-Assignment: Written Assignment (offered every semester) Examination: Written Exam	Written Exam 1,5 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 Winter Semester
Course Language
German

valid from	valid to	last updated
Winter Semester 15/16		25.09.2018

Mocule Card

Master Civil Engineering
HCU Hamburg

Module Number	Modul Name	Type (C/CE/E)	Semester (proposed)	Module Coordinator
BIW-M-Mod-103	Steel Structures	C	1	Prof. Dr.-Ing. Manuel Krahwinkel

Subject Area	Duration
Basics	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 in-depth knowledge of steel and composite construction.
Contents
- Composite construction: Multistorey composite steel and concrete buildings, composite beam design, composite flooring and supports, fire protection and fire safety design in composite structures - Steel construction: Fire protection and fire safety in steel structures, plate buckling, fatigue analysis
Recommended Literature
Krahwinkel, M.; Kindmann, R.: Stahl- und Verbundkonstruktionen, 3. Auflage, Springer Vieweg, 2016
Teaching and Learning Methods
Lecture + Practical Seminar (4 Hours per Week)

Exam(s)

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

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	valid to	last updated
Winter Semester 15/16		25.09.2018

Mocule Card

Master Civil Engineering
HCU Hamburg

Module Number	Modul Name	Type (C/CE/E)	Semester (proposed)	Module Coordinator
BIW-M-Mod-104	Concrete Strucutres	C	1	Prof. Dr.-Ing. Klaus Liebrecht

Subject Area	Duration
Basics	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 in-depth knowledge of the calculation rules and design methods for concrete structures, which will enable them to work independently on structures of an above average level of difficulty (HOAI). The key rules for de-sign will be derived paradigmatically to clarify the scientific procedure in developing design rules and equations.
Contents
- Bending stress: Stress redistribution (design oriented toward the compression zone) - Design for shear force and torsion: Special case: indirect supports / rules for single loads near supports / influence of changeable component height / joining secondary beams / connection of compression and tension flanges / designing for pure torsion / designing for shear force and torsion / structural details - Wall design: Shear walls / segmented shear walls / diaphragms / construction - Bracing: Analysis of sufficient lateral and torsional rigidity in braced structures / distribution of horizontal loads on bracing components / design of bracing components - Single compression members: Consideration of creep effects / compression members with biaxial eccentricity / construction - Special reinforced concrete components (discontinuity regions): Frame design / designing brackets, half joints, etc. - Subarea surface pressure and tensile splitting: Design and construction / bearing construction
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) Quast, Ulrich: Nichtlineare Statik im Stahlbetonbau, Bauwerk Verlag Berlin (2007) Schneider: Bautabellen für Ingenieure, ab 20. Auflage, Köln, Werner Verlag
Teaching and Learning Methods
Lecture + Practical Seminar (4 Hours per Week)

Exam(s)

Precondition of Examination	
Type of Examination	**Duration of Examination (if written or oral exam)**
Written Exam Note: Optional homework assignments will be given.	3 h
Composition of Module Mark	
Mark of Exam	

Additional Information

Previous Knowledge / Conditions for Participation (in form and content)
Applicability of Module
Compulsory Elective Special Constructions: Prestressed Concrete (recommended)

Frequency of Offering
every Winter Semester
Course Language
German

valid from	valid to	last updated
Winter Semester 16/17		28.09.2018

Mocule Card

Master Civil Engineering
HCU Hamburg

Module Number	Modul Name	Type (C/CE/E)	Semester (proposed)	Module Coordinator
BIW-M-Mod-106	Environmental Impact Assessment	C	1	Prof. Dr.-Ing. Wolfgang Dickhaut

Subject Area	Duration
Infrastructural 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 of the basics of environmental assessment in technical infrastructure planning and projects - The skill of preparing an environmental impact assessment
Contents

- Environmental assessment – theoretical approaches, limits and possibilities, assessment values/limiting values, interaction
- Legal bases in planning/programs and projects of technical infrastructure
- Strategic environmental assessment of plans and programs as well as environmental impact assessment of projects
  - Procedure – actors, process, participation
  - Methods
  - Protected resources – entitlement to protection and effects of plans/projects
  - Project examples
- Environmental impact assessment of concrete examples

Recommended Literature
Gassner, Winkelbrandt, Bernotat; UVP und strategische Umweltprüfung – rechtliche und fachliche Anleitung für die Umweltprüfung; 2010 Fürst, Scholles; Handbuch Theorien und Methoden der Raum- und Umweltplanung; 2008 Morris, Therivel; Methods of Environmental Impact Assessment; 2009
Teaching and Learning Methods
Lecture and Seminar (4 Hours per Week) Excursion (optional)

Exam(s)

Precondition of Examination	
Compulsory Attendance 80%	
Type of Examination	**Duration of Examination (if written or oral exam)**
Written Assignment and Presentation	
Composition of Module Mark	
Mark of Written Assignment 70% / Presentation 30%	

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	valid to	last updated
Winter Semester 16/17		30.10.2018

Mocule Card

Master Civil Engineering
HCU Hamburg

Module Number	Modul Name	Type (C/CE/E)	Semester (proposed)	Module Coordinator
BIW-M-Mod-201	Structures of Underground Engineering	C	2	Prof. Dr.-Ing. habil. Kerstin Lesny

Subject Area	Duration
Basics	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 familiarity with more complex geotechnical constructions and selected methods of underground engineering and will be able to assess their mode of operation and suitability for various applications. Students will be familiar with pertinent design methods and will be able to assess their suitability on a case-by-case basis. They will be fluent in a practical engineering software program suitable for addressing selected problems in this field.
Contents
- Foundations (laterally loaded piles, pile groups, combined pile raft foundations) - Low-grade deformation excavation sheeting, deep excavations, excavations in water, supporting/retaining structures - Earth and landfill construction procedures; measures for improving excavations - Introduction to the GGU software suite and computing selected geotechnical structures
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 Witt, K. J., Hrsg. (2009): Grundbau-Taschenbuch, Bd. 1-3, Verlag Ernst & Sohn
Teaching and Learning Methods
Lecture + Practical Seminar (2 Hours per Week) Excursion (optional)

Exam(s)

Precondition of Examination	
Type of Examination	**Duration of Examination (if written or oral exam)**
Written Assignment and Presentation The examination is offered only in summer semester.	
Composition of Module Mark	
mark of Written Assignment	

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	valid to	last updated
Summer Semester 2017		30.10.2018

Mocule Card

Master Civil Engineering
HCU Hamburg

Module Number	Modul Name	Type (C/CE/E)	Semester (proposed)	Module Coordinator
BIW-M-Mod-202	Maintenance and Restoration of Buildings	C	2	Prof. Dr.-Ing. Gesa Kapteina

Subject Area	Duration
Basics	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 gained about building materials and their interaction with the environment will enable students to identify critical aspects of a structure with regards to durability. - Given a problem based in practice, students will be able to select an appropriate diagnostic method and will have the knowledge required analyze and apply it. - Selection of restoration concepts depending on cause of damage, as well as knowledge of the use and processing of restoration materials.
Contents
- In-depth knowledge of building materials (i.e. concrete, glass, plastic, wood) and their mechanisms of damage - Properties of and processing restoration materials - Recognizing damage and damage diagnostics of structures and assessment procedures - Maintenance (comparison of actual and nominal conditions, remaining service life, restoration concepts) - Restoration planning using selected examples
Recommended Literature
Stark, J.; Wicht, B.: Dauerhaftigkeit von Beton, Springer Vieweg, 2013, ISBN 978-3-642-35278-2 Raupach, M.; Orlowsky, J.: Erhaltung von Betonbauwerken. Vieweg +Teubner, 2008, ISBN 978-3-8351-0120-3 Grunau, E.: Lebenserwartung von Baustoffen, Funktionsdauer von Baustoffen u. Bauteilen; Wirtschaftlichkeit durch langlebige Baustoffe. Vieweg, 1980; ISBN-13:978-3-528-08847-7
Teaching and Learning Methods
Lecture + Practical Seminar (4 Hours per Week) Excursion (optional)

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	valid to	last updated
Summer Semester 2017		30.10.2018

Mocule Card

Master Civil Engineering
HCU Hamburg

Module Number	Modul Name	Type (C/CE/E)	Semester (proposed)	Module Coordinator
BIW-M-Mod-206	Paradigm Change in the Field of Technical Infrastructure	C	2	Prof. Dr.-Ing. Martin Jäschke

Subject Area	Duration
Infrastructural 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)
To be able to recognize, assess and take part in shaping paradigm shifts in the field of technical infrastructure
Contents

- Paradigm shifts and their formation in the past
- Theoretical basics: i.e. change management
- Examples of current paradigm shifts:
  - Energy-efficient building planning, i.e. energy planning and design (form follows energy)
  - Strategies of the Smart City
  - Transport, i.e. electromobility, car sharing, shared space, car-free districts or mobility stations
  - Water management, i.e. decentralized rain water management or separation of flow streams in wastewater treatment
  - Energy supply and power grids, i.e. switching to regenerative energy or solar cells on noise barriers
  - Environmental protection, i.e. open data, combined effects or salutogenesis
- Technologies for the above
- Focus: processes, responsibilities, barriers, instruments
- Exemplary projects

Recommended Literature
Lauer: Change Management: Grundlagen und Erfolgsfaktoren;
Teaching and Learning Methods
Lecture and Seminar (4 Hours per Week) Excursion (optional)

Exam(s)

Precondition of Examination	
Compulsory Attendance 80%	
Type of Examination	**Duration of Examination (if written or oral exam)**
Written Assignment and Presentation	
Composition of Module Mark	
Mark of Written Assignment 70% / Presentation 30%	

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	valid to	last updated
Winter Semester 16/17		30.10.2018

Mocule Card

Master Civil Engineering
HCU Hamburg

Module Number	Modul Name	Type (C/CE/E)	Semester (proposed)	Module Coordinator
BIW-M-Mod-207	Urban Waters	C	2	Prof. Dr.-Ing. Wolfgang Dickhaut

Subject Area	Duration
Infrastructural 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)
- Competence in the modification and ecological development of urban waters - Skills in elaborating a plan for urban water development
Contents
- Urban waters – specific constraints and challenges - Urban water development objectives according to WRRL, HWRMR and WHG; coordination with urban development - Methods of evaluation - Planning and implementation: spatial planning, technical planning - Measures for creating a good ecological state/potential, for example: - Managing run-off - Water structure: bottom, slope - Structures on the water, effects on urban development - Continuity of structures - Flood protection - Structures: bridges, operational discharge - Leisure and recreation - Maintenance and care - Landscape preserving design - Exemplary projects
Recommended Literature
DWA_Merk- und Arbeitsblätter LAWA_Richtlinien 2006 W.Dickhaut, A.Schwark, K.Franke: Fließgewässerrenaturierung heute – auf dem Weg zur Umsetzung der Wasserrahmenrichtlinie. Hamburg. 2010 H.Patt, P.Jürging, W.Kraus: Naturnaher Wasserbau - Entwicklung und Gestaltung von Fließgewässern. Berlin,Heidelberg 1999 T.Zumbroich, A.Müller, G.Friedrich: Strukturgüte von Fließgewässern - Grundlagen und Kartierung. berlin, Heidelberg http://www.hamburg.de/wrrl/ https://www.umweltbundesamt.de/daten/gewaesserbelastung/fliessgewaesser
Teaching and Learning Methods
Lecture and Seminar (4 Hours per Week) Excursion (optional)

Exam(s)

Precondition of Examination	
Compulsory Attendance 80%	
Type of Examination	**Duration of Examination (if written or oral exam)**
Written Assignment and Presentation	
Composition of Module Mark	
Mark of Written Assignment 70% / Presentation 30%	

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	valid to	last updated
Winter Semester 16/17		30.10.2018

Mocule Card

Master Civil Engineering
HCU Hamburg

Module Number	Modul Name	Type (C/CE/E)	Semester (proposed)	Module Coordinator
BIW-M-Mod-208	Planning Processes Restructuring/ Retrofitting of Technical Infrastructure	C	2	Prof. Dr.-Ing. Martin Jäschke

Subject Area	Duration
Infrastructural 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)
- To be able to carry out planning and approval procedures in converting and rehabilitating technical infrastruc-ture in the urban context (i.e. costs, time, acceptance, environmental compatibility - To be able to select and involve relevant actors and design cooperative planning procedures
Contents
- Review and deepen knowledge of the legal bases of planning and approval procedures, in particular for the conversion/rehabilitation of the plan approval procedures (Administrative Procedure Act, VwVfG) relevant to technical infrastructure (i.e. Regional Planning Procedures, ROG; IT master plan (BauGB) - Relevant requirements in immissions, water protection, soil conservation and environmental protection laws - Designing planning and approval procedures (i.e. actor analysis and selection, designing cooperative planning processes, conflict strategies) - Organizing appointments for actors and citizen participation (i.e. moderation techniques, mediation, conducting discussions) - Structuring public relations (i.e. informational materials, press work)
Recommended Literature
ROG, BauGB, BauNVO: Texte und Kommentare; VDI 7000 und 7001
Teaching and Learning Methods
Lecture and Seminar (4 Hours per Week) Excursion (optional)

Exam(s)

Precondition of Examination	
Compulsory Attendance 80%	
Type of Examination	**Duration of Examination (if written or oral exam)**
Written Assignment and Presentation	
Composition of Module Mark	
Mark of Written Assignment 70% / Presentation 30%	

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	valid to	last updated
Winter Semester 16/17		30.10.2018

Mocule Card

Master Civil Engineering
HCU Hamburg

Module Number	Modul Name	Type (C/CE/E)	Semester (proposed)	Module Coordinator
BIW-M-Mod-209	Construction Techniques Restructuring / Retrofitting of Technical Infrastructure	C	2	Prof. Dr.-Ing. Ingo Weidlich

Subject Area	Duration
Infrastructural 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 gain advanced competence in the planning and execution of restructuring and retrofitting measures for technical infrastructure. Central subjects include: security of energy supplies, maintenance strategies, rehabilitation planning and their exemplary application in a fictional project.
Contents

- Planning inspections and implementation of supply and waste lines
- Maintenance strategies
  - Grid-based strategies
  - Activity-based strategies
  - Staffing strategies
- Theories of aging (damage accumulation, fatigue, statistics)
- Life cycle management with the reliability theory (according to Herz and Weibull)
- Repair design, renovation practices
  - General
  - Planning and calculation (according to DWA ATV A 127 T2, GSTT Information)
  - Exemplary projects
- Use of innovative methods (i.e. temporarily flowable backfill materials)
- Cost-benefit analysis
- Technical dependencies of different infrastructures
- Excursion

Recommended Literature
Stein D., Stein R., „Instandhaltung von Kanalisationen“, 1008 S., ISBN 978-3-9810648-4-1 | Verlag Prof. Dr.-Ing. Stein & Partner GmbH, 2014 Stein, D., 1. Auflage, Gebundene Ausgabe - 1166 Seiten, Ernst & Sohn Verlag, 2003, ISBN: 3433017786 Willoughby D:A: „Horizontal Directional Drilling: Utility and Pipeline Applications” Digital Engineering Library @ McGraw-Hill - The McGraw-Hill Companies, Inc., 2005 Weidlich I., „Erddruck auf Rohre“, 1. Auflage, ISBN 3-89999-027-7, 227 Seiten, 2012
Teaching and Learning Methods
Lecture and Seminar (4 Hours per Week) Excursion (optional)

Exam(s)

Precondition of Examination	
Compulsory Attendance 80%	
Type of Examination	**Duration of Examination (if written or oral exam)**
Written Assignment and Presentation	
Composition of Module Mark	
Mark of Written Assignment 70% / Presentation 30%	

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	valid to	last updated
Winter Semester 16/17		01.11.2018

Mocule Card

Master Civil Engineering
HCU Hamburg

Module Number	Modul Name	Type (C/CE/E)	Semester (proposed)	Module Coordinator
BIW-M-Mod-306	Design of Technical Infrastructure	C	3	Prof. Dr.-Ing. Martin Jäschke

Subject Area	Duration
Infrastructural Engineering	1 Semester

CP (according to ECTS)	Contact Hours/Week (SWS)	Self-study
10 CP (= 300 h Workload)	4 (= 42 h Contact Time)	258 h

Objectives and Contents

Objective of Qualification (competencies)
- Ability to conduct complex design projects in the area of planning technical infrastructure - Demonstrate experience in structuring planning processes by working independently on various phases (base analysis, variant analysis, design, dimensioning and construction) of a real complex project in disciplinary planning teams. - Ability to discuss and present planning content and results - Knowledge, understanding and ability to take into account the particularities of interdisciplinary project work
Contents
Interdisciplinary Project: - Formation of “engineering offices” (work groups). 3 -4 students create an “engineering office,” which must elaborate all planning phases. - Introductory events/orientation. Explanation of the procedure and organization of the study project, presentation of the task, presentation of key marginal conditions - Presentations on specialist topics: In the initial weeks of the project, introductory talks (“expert input sessions”) will be given on individual specialist topics of particular importance to the working process. If students wish to have expert input sessions beyond these they must be planned for later. Here talks by students are especially desirable. - Advisory units: Students periodically give a condensed report on their project status. Questions that arise will be addressed. The advisory units also serve as a performance review (possibly to set a deadline for tasks not completed according to schedule) - Planning meetings. In the course of the project seminar, the "engineering offices" regularly submit interim reports (as oral presentations by the students). As part of the oral presentations, problems are identified and so-lutions are presented in general terms. The planning meetings also serve as a performance review and are to be recorded or documented by the students. - Independent work. Working out the basics, developing planning content, preparing presentations, compiling the final report (drafts, calculations, drawings, models)
Recommended Literature
To be announced based on the project assignment
Teaching and Learning Methods
Project (4 Hours per Week) Exkursion (optional)

Exam(s)

Precondition of Examination	
Compulsory Attendance 80%	
Type of Examination	Duration of Examination (if written or oral exam)
Documentationand Presentation	
Composition of Module Mark	
Mark of Documentation 70% / Presentation 30%	

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	valid to	last updated
Winter Semester 16/17		26.10.2018

Mocule Card

Master Civil Engineering
HCU Hamburg

Module Number	Modul Name	Type (C/CE/E)	Semester (proposed)	Module Coordinator
BIW-M-Mod-307	Water Sensitive Urban Design	C	3	Prof. Dr.-Ing. Wolfgang Dickhaut

Subject Area	Duration
Infrastructural 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)
- Advanced knowledge of the basics of water-sensitive urban development, in particular integrated planning (water, landscape, city/building) at different levels of scale - Ability to carry out a in water-sensitive urban design project
Contents
- Urban development and water management – developments and dependencies - Water-sensitive urban design in international perspective - Water management fundamentals – review - Citywide planning: requirements, methods, examples - District-level planning: requirements, methods, measures, examples - Site-level planning: requirements, methods, measures, design, examples - Reconstruction of existing buildings and its challenges
Recommended Literature
Hoyer, Dickhaut, et al; Water sensitive urban design; 2011 Dreiseitl, Grau; Wasserlandschaften; 2006 Sieker, Kaiser, Sieker; Dezentrale Regenwasserbewirtschaftung; 2006 DWA_Arbeits- und Merkblätter
Teaching and Learning Methods
Lecture and Seminar (4 Hours per Week) Excursion (optional)

Exam(s)

Precondition of Examination	
Compulsory Attendance 80%	
Type of Examination	**Duration of Examination (if written or oral exam)**
Written Assignment and Presentation	
Composition of Module Mark	
Mark of Written Assignment 70% / Presentation 30%	

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	valid to	last updated
Winter Semester 16/17		30.10.2018

Mocule Card

Master Civil Engineering
HCU Hamburg

Module Number	Modul Name	Type (C/CE/E)	Semester (proposed)	Module Coordinator
BIW-M-Mod-308	Road Design	C	3	Prof. Dr.-Ing. Martin Jäschke

Subject Area	Duration
Infrastructural 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 gain a current overview of the state of the debate on the topic of urban transport - students get to know the most important topics on road concepts and road design - students deepen individual design aspects by means of examples
Contents

- Mobility in cities, a historical classification
- State of the present debate on mobility in cities
  - Transport modes, how is the transport organized
  - Influences on transport in cities, from transport development plans to neighbourhood mobility concepts
- Urban road space
  - Requirements under different demands: Connections, how much space is needed for movement? Place to stay, is it necessary? Delivery traffic, annoying, but we keep on ordering “on demand”; Stationary traffic; Autonomous driving, a profit or a risk for the city? Cycle traffic, also needs space?
  - The capacity of roads: rough calculation of nodes; LISA+, an overview; VISSIM, a simulation of traffic flows
  - Design elements, what is important?
  - Urban technology, what is lying under the road?
- Special infrastructure
  - Systems of cycle traffic; for example fast lane for bicycles
  - Mobility-hubs
- The planning process, is there a recipe for success?
- Deepening of individual issues by means of examples
- Excursion, which road space is sustainable?

Recommended Literature
RASt 06, FGSV ESG, Empfehlungen zur Straßenraumgestaltung, FGSV Schöne Straßen und Plätze, Hrg. Dr. Harald Heinz Städte für Menschen, Jan Gehl Handbuch der kommunalen Verkehrsplanung, Bracher Dziekan, Gies, Huber, Kiepe, Reutter, Saary, Schwedes Stadtstruktur und Stadtgestaltung, Gerhard Curdes Radialer Städtebau, Abschied von der autogerechten Stadtregion, H. Bodenschatz, A. Hofmann, C. Polinna (Hrg.)
Teaching and Learning Methods
Lecture and Seminar (4 Hours per Week) Excursion (optional)

Exam(s)

Precondition of Examination	
Compulsory Attendance 80%	
Type of Examination	**Duration of Examination (if written or oral exam)**
Written Assignment and Presentation	
Composition of Module Mark	

Mark of Written Assignment 70% / Presentation 30%

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	valid to	last updated
Winter Semester 16/17		30.10.2018

Mocule Card

Master Civil Engineering
HCU Hamburg

Module Number	Modul Name	Type (C/CE/E)	Semester (proposed)	Module Coordinator
BIW-M-Mod-309	Immission Control / Noise Control	C	3	Prof. Dr.-Ing. Martin Jäschke

Subject Area	Duration
Infrastructural 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)
- Detailed knowledge, understanding application and evaluation of immission and noise control - Knowledge and understanding of various scientific methods and solution strategies - To be able to explore a new subject area independently - Persuasive presentation and discussion, both written and oral, of a topic of the student's choosing, responding appropriately to critical questions; ability to work in a team
Contents
- Selected aspects of immission and noise control will be addressed in depth, including: - Scientific foundations and interdisciplinary relationships - Effects on the environment, health, quality of life and human wellbeing - Methods of data collection and evaluation: measurements, calculations, surveys; cumulative impact - Avoidance, reduction and other measures - Examples, projects, practical aids, information sources, contact persons Main subjects include fundamental and current issues. Noise is one focus, in particular the EC Environmental Noise Directive, which is exemplary many respects. Other immissions (air pollutants, smells, etc.) will also be covered.
Recommended Literature
Sinambari & Sentpali: Ingenieurakustik; Fachzeitschrift: Immissionsschutz; Fachzeitschrift: Lärmbekämpfung
Teaching and Learning Methods
Lecture and Seminar (4 Hours per Week) Excursion (optional)

Exam(s)

Precondition of Examination	
Compulsory Attendance 80%	
Type of Examination	**Duration of Examination (if written or oral exam)**
Written Assignment and Presentation	
Composition of Module Mark	
Mark of Written Assignment 70% / Presentation 30%	

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	valid to	last updated
Winter Semester 16/17		30.10.2018

Mocule Card

Master Civil Engineering
HCU Hamburg

Module Number	Modul Name	Type (C/CE/E)	Semester (proposed)	Module Coordinator
BIW-M-Mod-401/402/403/404	Compulsory Elective	C	4	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 engineering program.
Recommended Literature
Varies by course
Teaching and Learning Methods
Lecture and Practical Seminar (4 Hours per Week or 2 x 2 Hours per Week) Excursion (optional)

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)
Applicability of Module
Frequency of Offering
every Semester
Course Language
German or English

valid from	valid to	last updated
Winter Semester 15/16		30.10.2018

Mocule Card

Master Civil Engineering
HCU Hamburg

Module Number	Modul Name	Type (C/CE/E)	Semester (proposed)	Module Coordinator
BIW-M-Mod-403	Thesis (ASPO 2015)	C	4	Prof. Dr.-Ing. Annette Bögle

Subject Area	Duration
Thesis	1 Semester

CP (according to ECTS)	Contact Hours/Week (SWS)	Self-study
20 CP (= 600 h Workload)		600 h

Objectives and Contents

Objective of Qualification (competencies)
The master'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 master'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, Presentation, Colloquium 2 copies (each with a hard copy and a digital copy on CD)	
Composition of Module Mark	
Thesis 80%, presentation and colloquium 20% (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	valid to	last updated
Winter Semester 15/16		26.09.2018