

Module Handbook

Programme

Resources and Environmental Management
(Bachelor)

Faculty

Faculty of Civil and
Construction Engineering

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Module: Chemistry**Module number:** I-02**Module responsible:** Prof. Dr. Kurt Häberl**Course specialization****Course number and course name:** I1210 Chemistry**Semester** 1**Length of the Module** 1 Semester**Module frequency****Course Type** mandatory**Niveau** Bachelor**SWS** 4.0**ECTS** 5.0**Workload** attendance: 60.0 hours
Self-studying: 90.0 hours
Total: 150.0 hours**Teaching-/ course language** German**Module´s objectives**

The students should be proficient in inorganic and organic chemistry as well as the important chemical principals and processes. Building on these they should be able to analyze the decomposition processes and decomposition products of the substances, the examination results of the ecological chemistry and the measurement results of the chemical analytics.

Eligibility for admission/ recommended requirements

Basic knowledge of chemistry is desired

Content

- Basic knowledge of inorganic and organic chemistry
- Chemical analytic
- Chemistry of substances
- Chemistry of the decomposition of substances and corrosion

- Decomposition products

Teaching methods

Seminar with laboratory tutorial and internship

Specialty

Written exam, 90-120 minutes or exam seminar paper

I1210 Chemistry

Aims

Part 1: The students should be able to formulate chemical reactions of inorganic and organic chemistry and to determine chemical reaction products of chemical reactions. Additionally, they can execute stoichiometric calculations and have basic knowledge of reaction kinetics, inorganic and organic chemistry.

Part 2: The students should be able to formulate applied chemical basics, basics of decomposition processes of particulate material and the generated chemicals (gases, fluids, solids). The students have basic knowledge of biochemistry. Due to a laboratory they should be able to conduct simple analyses and select and assess analytic methods of chemistry.

Content

- Elements, periodic table, atomic construction
- Chemical adhesion, molecules
- State of compound, aggregate state
- Chemical reactions
- Chemistry of water
- (acids and bases, solubility products, buffer and indicators)
- Redox processes, electro-chemical basics
- Basics of organic chemistry (hydrocarbon, meaning of functional groups, carbon acids)
- Proteins, fats, lipids
- Biochemical basics
- Applied chemistry: mineral materials, metals and organic materials)
- Influence on materials, overview of decomposition processes of the materials
- Basics of analytics: wet chemistry, chromatography, mass spectrometry, photometric procedures, atom absorption spectrometry
- Laboratory chemistry: cation-anion analysis, quantitative analysis, acids, bases and buffer solutions, redox reactions, chemistry of mineral material and organic material

Eligibility for admission/ recommended requirements

basic knowledge of chemistry is desired

Type of examination

Written exam, 90 minutes

Methods

Seminar with laboratory tutorial

Literature

Mortimer C.E: Chemie, Thieme 2007.

For repetition: Teaching books of senior classes of grammar school

Module: Mathematics

Module number I-02

Module responsible: Prof. Dr. Rudi Marek

Course specialization

Course number and course name I1203 Mathematics

Semester 1

Length of the Module 1 Semester

Module frequency

Course Type mandatory

Niveau Bachelor

SWS 10.0

ECTS 10.0

Workload attendance: 150.0 hours
Self-studying : 150.0 hours
Total: 300 hours

Teaching-/ course language German

Module´s objectives

The students should be competent to realize mathematical problems in their latter field of activity, to formulate them correctly and to solve them with a correct method, whereby computers can be used. Additionally, due to the knowledge of the basics of mathematical methods and insight in the inner congruity, a reliable basis for self-dependent and continuative studies shall be communicated.

Content

- algebra
- geometry
- vector algebra
- linear algebra and matrices
- real functions and curves
- differential calculus of a variable
- functions of multiple variables

- series
- differential calculus
- basic knowledge of statistics and data analysis

Methods of teaching

Seminar with tutorial and blended eLearning

Specialty

Written exam, 90-150 minutes or exam seminar paper

I1203 Mathematics

Aims

The students should be competent to realize mathematical problems in their latter field of activity, to formulate them correctly and to solve them with a correct method. Knowledge of the mathematical basics and deep going understanding plays an important role in order to offer a reliable basis for the in practice occurring mathematical applications to the students. A close indentation of mathematics with applied subjects is targeted. This will be practiced in numerous realistic tasks and questions. Amendatory, Module I-06 engineer-analysis and simulation integrates numerical methods in reference to their application and relevance for practice.

Content

Part 1 (WS):

- algebra:
terms and their conversion, equivalence conversions; linear, non-linear, transcendent equation, inequations; fundamental theorem of algebra, polynomials and their zeros
- Geometry:
Plane and spatial geometry, surface area and volume; similar triangle and intercept theorem; rectangular and general triangles, law of sine and cosine
- Vector algebra:
Vectors and scalars; vectors in an area and space; applications
- Linear algebra:
Important operations on and with real matrices and determinants; singularity and solvability of linear systems of equations; solution process for linear systems of equations; applications
- Real functions and curves
Illustration and function features; critical value and continuity; coordination systems and coordination transformation planar graphs; polynomial and rational functions; power function and root function;

algebraic functions; trigonometric functions and inverse trigonometric functions; exponential and logarithm functions; hyperbolic functions and area functions

- Differential calculus of a variable:
Differentiability and derivation rules; logarithm derivations; derivations of inverse functions; implicit differentiation; higher derivations; planar graphs in parametric representation; tangent and normal equations; bend, rule of L'Hospital; discussion of planar graphs and array of curves, formulating and solving of extreme value exercises; application of differential calculus
- Integral calculus of a variable:
Definite Integral and surface area; indefinite integral and area function; anti-derivative; fundamental theorem of differential calculus and integral calculus; elementary integration rules; integration methods; improper integrals; applications
- Functions of numerous variables:
Definition, application examples and ways of illustration, partial differentiation; constrained extremum exercises; multiplication procedures; multiple integrals; application

Part 2 (SS):

- Series:
Basic terms and convergence; power, Taylor-, MacLaurin- and Fourier series; applications
- Differential functions:
Solving normal and partial differential functions, set up easier functions; separation of variables; separation approach (Bernoulli); differential functions first and higher order; complex numbers; differential systems of equation; eigenvalue and eigenvectors
- Statistics and data analysis:
Basic terms; samples; probability distribution; statistical estimation methods and test processes; correlation and regression; error and balance analysis; application

Eligibility for admission/ recommended requirements

basic knowledge of mathematics is desired

Type of examination

Written exam, 90 minutes

Methods

Seminar with tutorials, Blackboard, Overhead, blended eLearning

Literature

Papula L.: Mathematische Formelsammlung für Ingenieure und Naturwissenschaftler, Vieweg+Teubner, Wiesbaden, 9. Auflage, 2009.

Papula L.: Mathematik für Ingenieure und Naturwissenschaftler, Vieweg+Teubner, Wiesbaden, Verlag, Band 1, 12. Auflage, 2009; Band 2, 11. Auflage, 2007; Band 3, 5. Auflage, 2008.

Stöcker H.: Taschenbuch mathematischer Formeln und Verfahren, Harri Deutsch, Frankfurt, 4. Auflage, 2008.

Bartsch H.-J.: Taschenbuch mathematischer Formeln, Hanser, München, 21. Auflage, 2008.

Merziger G., Wirth T.: Repetitorium der Höheren Mathematik, Binomi Verlag, Springe, 5. Auflage, 2006

Module: Building Physics

Module number I-04

Module responsible Prof. Dr. Rudi Marek

Course specialization

Course number and course name I1204 building physics

Semester 1

Length of the Module 1 Semester

Module frequency

Course Type mandatory

Niveau Bachelor

SWS 8.0

ECTS 9.0

Workload attendance: 120.0 hours
Self-studying : 150.0 hours
Total: 210.0 hours

Teaching-/ course language German

Module ´s objectives

The students will learn about the building physics principals and the basic physical processes and mechanisms of heat and humidity transmission and acoustics. They will be able to conduct calculations and measurements and have knowledge about building physics constructions. In matters of resources protection, the energy-saving heating protection plays an important role.

Content

- Basic knowledge of building physics
- Mechanics of liquids and gases
- Thermodynamics and thermal insulation
- Moisture proofing
- Acoustics and soundproofing
- Building physics calculations with data processing

Methods of teaching

Seminar with blended eLearning and internship

Specialty

Written exam, 120-180 minutes or exam seminar paper

I1204 building physics

Aims

The students will learn about the building physics principals and the basic physical processes and mechanisms of heat and humidity transmission and acoustics. They will be able to conduct calculations, analyses and measurements correctly. An important role plays the building physics, correctly and energy-saving construction in order to ensure a damage-free, sustainable and ecological architecture. During a building physics internship the students will be taught about modern calculation methods and how to apply them.

Content

Part 1(WS):

- Basics of building physics
Area and aims of building physics, nomenclature, symbols, measurement and measurement units
- Mechanics of liquids and gases
Hydrostatic and hydrodynamic, continuity equation, Bernoulli Equation; pressure expansion and pressure loss, pipe and canal flow; aerophysics, change of air ventilation and room artificial ventilation
- Thermodynamics and thermal insulation
Thermic expansion, change of state; work, energy and power, heat and thermal flow; heat transport mechanisms (convection, radiation); electrical analogy and thermic resistance; heat transfer, transmission and air infiltration heat loss, airtightness of the building envelope, thermal bridges, knowledge and application of verification procedures, building physics thermic protection, construction examples and construction basics
- Moisture proofing
Aggregate state, moist air, Mollier diagram, saturated steam and non-saturated steam, building material and air moisture; moisture transport mechanisms; steady and non-steady moisture transport; occurrence of condensation water on surfaced and within constructions, mold formation, steam diffusion and steam condensation; knowledge and application of verification processes; building physics moisture protection, sealing of buildings, construction examples and construction basics

Part2 (SS):

- Acoustics and soundproofing
Acoustic basics (introduction, sound field parameter, vibration and waves, sound level), impact of noise (expansion of sound waves, protection through distance and cutoff, reference value and critical value for acoustic level, acoustic emission of street, rails air and water traffic as well as industry and industrial parks), building acoustics (airborne sound insulation, Bergersches mass law, coincidence effect, parameters of airborne sound protection, airborne sound insulation compound constructions, footfall sound insulation, structure borne noise and infrasound of machines), room acoustics (acoustic insulation and acoustic absorption, room acoustic parameters, diffuse-field distance, reverberation period, acoustic absorbers and resonators), proof of sound insulation (minimum sound insulation, increased sound insulation, protection against noise, protection against airborne and subsonic noise, calculations based on European norms), practical sound insulation
- building physics internship (computing based calculations of thermal insulation, moisture proofing and sound insulation)
- practical applications and exercises for deepening knowledge

Type of examination

Written exam, 90 minutes

Methods

Seminar with tutorials, Blackboard, Overhead, blended eLearning

Literature

detailed script

Hohmann R., Setzer M.J. Wehling M: Bauphysikalische Formeln und Tabellen, Werner Neuwied, 5. Aufl., 2009.

Fischer H.-M., Jenisch R., Stohrer M., Homann M., Freymuth H., Richter E., Häupl. P.: Lehrbuch der Bauphysik, Teubner+Vieweg, Wiesbaden, 6. Aufl., 2008.

Willems W. M., Schild K., Dinter S: Vieweg Handbuch Bauphysik, Bd. 1+2, Vieweg+Teubner, Wiesbaden, 2006.

Module: Materials and loading

Module number I-05

Module responsible Prof. Dr. Kurt Häberl

Course specialization

Course number and course name I1105 technical mechanics

I1111 materials

Semester 1,2

Length of the Module 2 Semester

Module frequency

Course Type mandatory

Niveau Bachelor

SWS 6.0

ECTS 6.0

Workload attendance: 90.0 hours

Self-studying : 90.0 hours

Total: 180.0 hours

Teaching-/ course language German

Module ´s Objectives

Materials:

The students should know the industrial and agricultural generated materials and be able to reviewing them in the matter of an evaluation and registration (REACH). They should know their structure and composition in order to develop further qualifications in damage potentials for environment and humans in following modules. Thereby, not only materials for industrial purpose but also other materials (raw materials to consumer goods) are included. Hereby, students can quantify characteristics of materials and evaluate them. Basic knowledge of ecological useful material is also taught.

Demands:

While working on environmentally relevant questions in the building industry, students should be able to know the structures and loading of easy constructions and construction elements. A basic understanding of technical mechanics

concerning the forces and moments, flow of forces and tension occurring in carrying structures is required.

Content

- composition of materials (micro and macro structure)
- recognition and specification of mechanical, physical and chemical characteristics of materials
- Determination of necessary parameter for the description of material characteristics (examination, research and determination of quality)
- Components and elements
- Basics of technical mechanics

Methods of Teaching

Seminar with blended eLearning and tutorials

Specialty

I1105 Written exam, 90-120 minutes or exam seminar paper

I1111 Written exam, 90-120 minutes or exam seminar paper

I1105 Technical mechanics

Aims

In this course students will become familiar with the most important elements of technical mechanics and their conjunctions. The students will acquire the following knowledge and competencies:

- Interpret mechanical standby system
- Apply method of sections
- Formulate the conditions of equilibrium and to solve the developed systems of equations
- Calculate the inner strain of mechanic systems
- Execute stress analysis
- Calculate changes of dimension

Additionally media and key competencies will be communicated by using new media and didactic methods (e.g. student presentations and group work)

Content

- Insight in significance, composition and aims of technical mechanics
- Mastering the handling of powers and moments in a plane
- Composition and decomposition of powers and moments
- Mastering the conditions of equilibrium
- Equilibrium of powers and moments
- Application, e.g. determination of reactions on static systems
- Mastering the determination and presentation of section sizes
- Method of sections and section sizes (longitudinal force, lateral force, bending moment), superposition principle
- Proficiency in handling static systems
- Bearing structure forms and their idealization; bearer, hinged beam, half timber, easy combined system
- Determination of lateral cutting date
- Calculation of pressure and changes in shape

Type of examination

Written exam, 90 minutes

Methods

Seminar, media-based lectures with own laptop usage, eLearning, videoconferencing, tele-teaching

Literature

Technische Mechanik 1, Dietmar Gross + Werner Hauger+ Jörg Schröder, ISBN-10: 3540340874

Formeln und Aufgaben zur Technischen Mechanik 1, Dietmar Gross + Werner Hauger+ Jörg Schröder, ISBN-10: 3540340513

Technische Mechanik 1 - Statik, Russell C. Hibbeler, ISBN-10: 3827371015

I1111 Materials

Aims

The students should know the structure and composition of industrial and agricultural generated materials and evaluate their damage potentials for environment and humans in following modules. Hereby, students can quantify characteristics of materials and evaluate them and they know about their origin and operational areas.

On the basis of material-physical, mineralogical and chemical basics the students can assess the situation, acceptability, permanency and climatic, chemical, biological and physical strength of materials.

Content

- Types of materials
- Inner composition and structure of materials
- Basics of physics of materials (transport processes of material structures, mechanical conduct)
- Disperse material, solutions
- Powder and particles
- Porose materials
- Discussion of characteristics of important natural and artificial materials
- Comprehension of manufacturing process
- Realization and specification of mechanical, physical and chemical/ mineralogical characteristics
- Determination of the parameter to technically describe the characteristics of materials
- Examples of organic materials, metallic materials, inorganic material

Eligibility for admission/ recommended requirements

basic knowledge of chemistry is desired

Type of examination

Written exam, 90 minutes

Methods

Seminar, blackboard, beamer

Literature

Script

Wesche K.: Werkstoffe für tragende Bauteile, Bd. 1: Grundlagen, Bauverlag, 1996.

Wesche K.: Werkstoffe für tragende Bauteile, Bd. 2:

Beton. Mauerwerk (Nichtmetallisch-anorganische Stoffe), Bauverlag, 1993.

Wesche K.: Werkstoffe für tragende Bauteile, Bd. 3:

Stahl, Aluminium, Bauverlag, 1985.

Wesche K.: Werkstoffe für tragende Bauteile, Bd. 4:

Holz, Kunststoffe, Bauverlag, 1988.

Rostásy F.S.: Baustoffe, Kohlhammer, 1983.

Module: Engineer analysis and simulation

Module number I-06

Module responsible Prof. Dr. Rudi Marek

Course specialization

Course number and course name I1107 applied programming

I2102 engineer analysis and modeling

Semester 1,2

Length of the Module 2 Semester

Course Type mandatory

Niveau Bachelor

SWS 4.0

ECTS 6.0

Workload

attendance: 60.0 hours

Self-studying : 120.0 hours

Total: 180.0 hours

Teaching-/ course language German

Module ´s objectives

The students will gain insight in the basics of modeling real systems in technology and in the engineering area and thereby, an analytical way of thinking in these areas. They shall get to know the application of mathematical and numerical methods for solving engineer-technical questions and will be introduced to basic simulation techniques. By indenting this modular with the modular I-03 (mathematics) and I-07(transport phenomena 1), the gained analytical abilities can be applied in latter modules (e.g. I-12 transport phenomena 2)

Content

- Abstraction real technical system by identification of important parameters
- Mathematical modeling of systems with equations, differential equations and state functions
- Solution of problems with mathematical problems and algorithms
- Development and implementation of algorithms with Visual Basic for Applications (VBA)
- Presentation, Interpretation and validity check of results
- Effort of modeling and detailing

Teaching Methods

Seminar with Tutorials and project work

Specialty

I1107 written exam or seminar paper, 90-120 minutes

I2102 written exam or seminar paper, 90-120 minutes

I1107 applied programming

Aims

The students shall gain knowledge about basics in programming on the basis of Visual Basic for Applications for Excel. The hereby used problems refer to numerical and logical engineering problems.

Content

- Programming with VBA (data types, domains, condition, distinction of cases, sub-procedures, functions, recurrence)
- Usage of programming environment of Excel (Editor) and error diagnostics (Debuggen)
- Problems: Vectors and matrices and their mathematical operations, equation systems and the solution methods, methods of integration and differentiation
- Understanding of special techniques of programming, e.g. recurrence by problem ?mice searches cheese?

Type of examination

Written exam, 90 minutes

Methods

Seminar with exercises on the computer

Literature

Script

I2102 Engineering analysis and modeling

Aims

The students shall be enabled to abstract practical engineering problems from application-based subjects, model and successfully solve them. An interdisciplinary way of working is meant to develop. The basics learned in I1203 (mathematics) and I1107 applied programming) will be applied on problems of accompanying modules (e.g. I1105 technical mechanics) and thereby absorbed. An important roles plays the suitable modeling in matters of simulation expenditure and the required accurateness as well as the presentation, interpretation and examination of the results.

Content

- Abstraction of real technical systems by identification of important parameters

- Computability, uniqueness and solvability
- Mathematical system modeling with linear and non-linear equations, common and partial differential equations and state functions
- Problem solutions with mathematical methods and algorithms
- Presentation, interpretation, visualization and validity check of results
- Modeling input and detailing
- Chosen project examples

Type of examination

Written exam, 90 minutes

Methods

Seminar with exercises on the computer

Literature

www.scilab.org(Unterlagen zum Programmsystem Scilab/Scicos, jeweils aktuelle Fassung)

Campbell S., Chancelier J.-Ph., Nikoukhah R.: Modelling and Simulation in Scilab/Scicos, Springer, Berlin, 2005.

Engeln-Müllges G., Niederdrenk, K., Wodicka R.: Numerik-Algorithmen, 9. Auflage, Springer, Berlin, 2005.

Dahmen W., Reusken A.: Numerik für Ingenieure und Naturwissenschaftler, 2. korr. Auflage, Springer, Berlin, 2008

Module: Transport phenomena 1

Module number I-07

Module responsible Prof. Dr. Rudi Marek

Course specialization

Course number and course name I1108 fluid mechanics

I2103 technical thermodynamic

Semester 1,2

Length of the Module 2 Semester

Course Type mandatory

Niveau Bachelor

SWS	10.0
ECTS	11.0
Workload	attendance: 150.0 hours
	Self-studying : 180.0 hours
	Total: 330.0 hours

Teaching-/ course language German

Module ´s Objectives

The students shall get to know the basics about fluid mechanics and thermodynamics and thereby gain a deeper understanding of the in machines, buildings and nature occurring transport process of masses, impulses and energy. They will be taught about the modeling of technical facilities as abstract systems with borders and their balancing.

Content

- Basics, principles and methods of fluid mechanics
- Fluid mechanical calculations of pipe and channel hydraulics
- Application of calculation methods for problems of the water economy and for the measurement of buildings and facilities
- Basics of technical thermo dynamics
- Understanding of technical facilities for conversion of energy
- Material and energy balances of technical systems
- Ideal and real behavior of working fluid
- Changes in composition in thermal machines and facilities

Teaching Methods

Seminar with Tutorials and laboratory tutorials

Specialty

I1108 written exam or seminar paper, 90-120 minutes

I2103 written exam or seminar paper, 90-180 minutes

I1108 Fluid mechanics

Aims

The students will get to know the basics and the methods of technical thermal mechanic and learn the practical application in reference to building and facility measurement. They will be able to solve practical oriented problems on their own. The course I1108 fluid mechanics is an important basis of the following courses I2103 "Technical thermo dynamics", I4106 "Water economy" and I6106 "Project ecological Water management".

Content

- Physical characteristics of water
- Basic principles of hydrostatic
- Hydrodynamic of ideal fluids (pipes and channels)
- Principle of linear momentum
- Hydrodynamic of real fluids (pipe current, channel current, pump pressure line)
- Non-steady efflux

Type of examination

Written exam, 90 minutes

Methods

Seminar, Blackboard, beamer, laboratory tutorials

Literature

- Bollrich G.: Technische Hydromechanik; Bd. 1, Grundlagen, 6. Aufl., Berlin: Verlag Bauwesen, 2007.
- Naudascher E.: Hydraulik der Gerinne und Gerinnebauwerke; 2. Aufl., Springer-Verlag, 1992.
- Rössert R.: Hydraulik im Wasserbau; 10.Aufl., München: Oldenbourg Verlag, 1999.
- Press H., Schröder R.: Hydromechanik im Wasserbau; Berlin/München: Verlag Ernst & Sohn, 1966.
- Kozeny J.: Hydraulik; Wien: Springer-Verlag, 1953.
- Strybny J.: Ohne Panik Strömungsmechanik; 3. Aufl., Vieweg Verlag Wiesbaden, 2007.
- Martin H., Pohl R., Elze R: Technische Hydromechanik; Bd. 3, Aufgabensammlung, 3. Aufl., Berlin: Verlag Bauwesen, 2009.2103

I2103 Technical Thermo-dynamic

Aims

The students will get to know about the basics of thermodynamics and will receive and understanding about technical facilities for conversion of energy. They will be able to formulate material and energy balances in technical systems and thereby, describe their behavior. Next to the real and unreal behavior of the used working fluids they will learn about their change of state in thermic machines and facilities and how to calculate them. In this course the basic knowledge needed for I3104 "heat transfer" and I2105 "process engineering" will be taught.

Content

- Thermodynamic systems
- Characteristics of material (steam, ideal gas)
- Energy balance, heat, work
- Constitutional diagram, entropy, exergy
- Ideal gas, state, change of state
- Cycle process, thermic machines, combustion engine, gas turbines, steam power plant, cooling unit
- Moist air, air treatment facilities
- Combustion, fuel, air requirement, calorific and heat value, combustion gas

Type of examination

Written exam, 90 minutes

Methods

Seminar, Blackboard, beamer, eLearning

Literature

Langeheinecke K., Jany P., Thieleke G. Thermodynamik für Ingenieure, 7. verb. u. erw. Auflage, Vieweg+Teubner, Wiesbaden, 2008.

Cerbe G., Wilhems G.: Technische Thermodynamik, 15. aktualis. Auflage, Hanser, München, 2008.

Wilhelms G.: Übungsaufgaben Technische Thermodynamik, 3. aktualis. Auflage, Hanser, München, 2009.

Kretzschmar H.-J., Kraft I.: Kleine Formelsammlung Technische Thermodynamik, 3. Auflage, Hanser, München, 2009

Module: Foreign Language I

Module number I-08

Module responsible

Course specialization

Course number and course name I1209 english

Semester 1

Length of the Module 1 Semester

Course Type mandatory

Niveau Bachelor

SWS 4.0

ECTS 4.0

Workload attendance: 60.0 hours
Self-studying : 60.0 hours
Total: 120.0 hours

Teaching-/ course language German

Module´s Objectives

The students will receive the basic knowledge in English which will enable them to communicate in English at their work. In Module I-18 they can alternatively chose another language or continue to study English, so that people with low knowledge in English can receive a good certificate.

Eligibility for admission/ recommended requirements

Students with low knowledge in English can take courses with a lower level (A1—A2)

Content

- Learn and deepen English (level B1 English of GER)
- Vocabulary and grammar
- Listening and speaking of texts
- Reading, understanding and producing of English texts

Teaching Methods

Seminar with exercises

Specialty

Written exam, 90-120 minutes or seminar paper

I1209 English

Aims

Extend the language knowledge in matters of technical English and business English. Additionally they will receive the following competencies:

The translation and summary of economic texts. The students are able to prepare and make a presentation about a technical or economical topic. They are also enabled to understand long technical and economical texts and to get familiar with new topics.

Content

Content Technical English are e.g.:

Materials and their components and characteristics

History of construction of bridges

GPS vs Galileo

Electrical motor

Content Business English are e.g.:

Marketing and advertisement

Current economic topics and social topics (Leadership, ethics)

Beginning and ending of formal letters

Money/ investment/banking

Quality and complaint letter

Country information

The difficulty of the texts correlates to the level B1 of the GER

- English grammar
- Translation
- Correct use of dictionaries
- Oral summary of texts

Eligibility for admission/ recommended requirements

Students with a lower knowledge of English can take courses with a lower level (A1-A2 GER).

Knowledge of English on level B1-B2 GER

Type of examination

Written exam, 90 minutes

Methods

Seminar, tutorials, group work, partner work, listening, PC

Literature

Büchel/Mattes R./Mattes H./ Schäfer M./Schäfer W., 2005, Englisch für technische Berufe Grundkurs, 1. Auflage, Ernst Klett Verlag GmbH, Stuttgart.
Cotton/Falvey/Kent, 2005, Market Leader Intermediate Business English, 2. Auflage, Pearson Education Limited, Essex, England.

Module: technical construction and building

Module number I-09

Module responsible Prof. Dr. Kai Haase

Course specialization

Course number and course name I3101 Building construction

I2104 Technical drawing and CAD

Semester 2,3

Length of the Module 2 Semester

Course Type mandatory

Niveau Bachelor

SWS 6.0

ECTS 8.0

Workload attendance: 90.0 hours

Self-studying : 120.0 hours

Total: 210.0 hours

Teaching-/ course language German

Module ´s objective

The students shall receive an insight in display formats of the technical drawing and the meaning and application of CAD. They shall be enabled to interpret and understand technical drawings and develop easy technical drawings by themselves. With the knowledge gained from the modules I1204 "building physics", I1105 "technical mechanics" and I1111 "materials" shall enable them to gain the basic knowledge of technical construction and building with also considering creative aspects.

Content

- Basics of technical drawing
- CAD
- Basics of construction
- Principles of construction

Teaching Methods

Seminar with exercises

Specialty

I2104 written exam, 90-180 minutes or seminar paper

I3101 written exam, 120-180 minutes or seminar paper

I3101 building construction

Aims

Knowledge of the most important constructive systems of the high-building planning, solid structure and frame construction and the mixed forms, knowledge of the most important building materials, especially wood, bricks, cement and steel, their constructive possibilities and borders. Ability to develop easy high-building constructions. Ability to use primary and secondary construction elements for a complete and functioning construction with consideration of statically, building-physical and creative aspects.

Content

- Constructive systems of frame construction and solid structure
- Basics of timber work
- Basics of stonework construction
- Basics of reinforced concrete construction
- Formation, walls, roof
- Methodology of primary and secondary construction elements

Eligibility for admission/ recommended requirements

Technical drawing and CAD (I2104)

Type of examination

Written exam, 90 minutes

Methods

Seminar, exercises, beamer, blackboard, trips and group work

Literature

Ronner, Kölliker, Rysler: **Baustruktur;**
1995; Birkhäuser Verlag

Walter Belz **Zusammenhänge;**
1993; Rudolf Müller Verlag; Köln

Lehrstuhl für Baukonstruktion
und Entwerfen RWTH Aachen

1999; Wissenschaftsverlag Mainz

Heinrich Schmitt

Hochbaukonstruktion;

Vieweg & Sohn; Braunschweig / Wiesbaden

Natterer, Herzog, Volz:

Holzbauatlas zwei;

1991; Institut für internationale
Architekturdokumentation, München

Josef Kolb

Systembau mit Holz;

1992; Baufachverlag Lignum; Zürich

Pfeiffer, Liebers, Reiners

Der neue Holzbau;

1998; Callwey Verlag; München

v. Büren, Mooser, Villar

Neuer Holzbau im Bild;

1997; Lignum, Schweizerische Arbeitsge-
meinschaft
für das Holz; Zürich

C. Günzenhauser

Baukonstruktionen in Holz;

Original 1911; Nachdruck 1997; Manuscriptum
Verlagsbuchhandlung

Lips-Ambs

Holzbau heute;

1999; DRW-Verlag; Leinfelden - Echterdingen

Mikado;

Magazin für Holzbau und Ausbau; erscheint
monatlich; WEKA Verlag; Augsburg

Informationsdienst Holz;

Kostenlose Informationsbroschüren über aktuelle
Themen des Holzbaus; erhältlich bei:

Arbeitsgemeinschaft Holz e. V., Postfach 300141,
40401 Düsseldorf

I2104 Technical Drawing and CAD

Aims

The students shall get to know the tools (tools for drawing etc.) and the basics term (scale, dimensioning, notations) of technical drawing. They will receive knowledge about notation and content of drawings of different engineering areas. Therefore, they learn about different tools for drawing, read drawings from different areas and develop own floor plan, cuts and details by hand and with CAD.

Content

- Basics of architectural drawing:
Engineering standards, tools for drawing, scales, types of lines, inscription and dimensioning
- Types of architectural drawings and presentation:
General plan, preliminary draft plan, draft plan, execution plan, floor plan, cuts, views and details
- Drawing in machine building
- Drawing of chosen engineering disciplines, stonework construction, wood work, reinforced concrete construction, concrete construction, machine building
- Application of CAD:
Basics of handling, drawing of 2D-details, floor plans, cuts, dimensioning and plotting, model- vs. layout views

Type of examination

Written exam, 90 minutes

Methods

Seminar with tutorials, use of computers

Literature

Script

Module: Resource and environment I

Module number I-10

Module responsible Prof. Konrad Deffner

Course specialization

Course number and course name

I2105 building planning and physical planning

I3102 ecological construction and landscape
planning

Semester 2,3

Length of the Module 2 Semester

Course Type mandatory

Niveau Bachelor

SWS 6.0

ECTS 6.0

Workload attendance: 90.0 hours

Self-studying : 90.0 hours

Total: 180.0 hours

Teaching-/ course language German

Module´s Objectives

The students shall receive an insight in the basic relations of areal planning and legal basics of construction planning and planning law. Additionally they will get to know about the planning and construction processes for building planning, landscaping planning and high-building construction, especially concerning ecology, sustainability and resources protection. They will be enabled to judge planning and assist in planning processes of building planning and high-building planning, considering ecological aspects. Interdisciplinary knowledge with the use of the resources landscape, nature and ground will be communicated.

Content

Building Planning and physical planning

Insight in the basics of law of building planning and physical planning (regional and state planning, communal development planning; building planning law and building law, national and state laws, local government law, authorization to

present building documents). Overview of tasks and execution of building planning (content, instruments and aims, planning principle; composition, presentation and arrangement possibilities and assembly techniques of land use plans; reliability of building project. Insight in anticipatory environmental precautions for planning and constructing (emission control, nature protection, purification of air, water and soil, monument preservation; environmental review, legal basics)

Ecological construction and landscape planning

- Building planning
 - General residential building area
 - Town construction
 - Traffic system
- Landscape planning
 - Basics and terms of landscape ecology
 - Category of resources
 - Instruments of landscape planning
 - Planning levels of landscape planning
 - Basic principles of impact regulation under nature protection law
- High-building planning
 - Energetic optimized building concepts and construction elements
 - Ecology of materials

Teaching methods

Seminar with exercises

Specialty

I2105 written exam, 120-180 minutes or seminar paper

I3102 written exam, 90-150 minutes of seminar paper

I2105 Building planning and physical planning

Aims

Knowledge of the basics of the public building law that becomes relevant when applying regionally significant and other construction projects. Important is the knowledge about necessity, meaning and process of regional planning procedures and planning approval procedures as well as knowledge about approval requirements, responsibilities, approval demand and possibilities of single building projects and areas of building construction law.

Knowledge about planning levels of physical planning and building planning and their content.

Knowledge about the important planning procedures, relevant planning parameters and their interdependency as well as planning methodology and presentation of planning results.

Content

- Sources of law of public building law
- Regional planning procedure
- Rights and significance of the building planning
- Dependability and approval of single building plans, relevant rules of the BauGB and BAUNVO
- Significance and knowledge of building regulation laws
- History of city planning
- Elements of city construction planning
Housing, industry, traffic, special functions
- Distance spacing
- Land development plan
Form, content and procedure
- State and regional planning

Type of examination

Written exam, 90 minutes

Methods

Seminar with tutorials, case studies, beamer, blackboard

Literature

Baugesetzbuch BauGB;

Bayerische Bauordnung BayBO;

Gert Albers, 1992, Stadtplanung, eine praxisorientierte Einführung, 2. Aufl., Primusverlag, Darmstadt, ISBN 3-89678-002-6;

N.N.

I3102 ecological construction and landscape planning

Aims

Constructive to module I2105 "building planning and physical planning" additional knowledge about planning and building processes in the building planning, landscaping planning and high-building planning, especially concerning ecology, sustainability and resource protection will be communicated. The students will be enabled to judge planning and assist in planning processes of building planning and high-building planning, considering ecological and resource-protecting aspects. The knowledge communicated in module I3101 "building construction" will be deepened from the ecological point of view, whereby knowledge of module I1111 "materials" will be included as well.

Content

- Building planning
 - General residential building area
 - Town construction and use of solar
 - Traffic system
- Landscape planning
 - Basics and terms of landscape ecology
 - Category of resources
 - Instruments of landscape planning
 - Planning levels of landscape planning
 - Basic principles of impact regulation under nature protection law
- High-building planning
 - Energetic optimized building concepts and construction elements
 - Ecology of materials

Type of examination

Written exam, 90 minutes

Methods

Seminar with tutorials, case studies, beamer, blackboard

Literature

script

Detlef Glücklich, Ökologisches Bauen, von der Grundlage zu Gesamtkonzepten, Deutsche Verlags-Anstalt GmbH, München, 2005; ISBN 3-421-03541-5

Module: Law

Module number I-11

Module responsible

Course specialization

Course number and course name I3207 basics of law

Semester 3

Length of the Module 1 Semester

Course Type mandatory

Niveau Bachelor

SWS 4.0

ECTS 4.0

Workload attendance: 60.0 hours
Self-studying : 60.0 hours
Total: 120.0 hours

Teaching-/ course language German

Module ´s Objectives

The students shall receive an understanding of the European and German law in the matters of private law, environmental law and criminal law. This includes the differentiation of public law, criminal law and civil law and the knowledge about the composition of laws. The students will apply legal determinations in connection with natural resources. The will receive competencies to identify important public, environmental and civil law issues and the right association with resulting problems. All in all the students will receive important basics for the development of understanding of laws which will be required in later modules.

Content

- Presentation of features of Civil Law Code, code of commercial law, criminal code and the relevant environmental laws (BImSchG and soil protection laws)
- Introduction in the public law, especially the basics for conclusion of contracts (offer, acceptance, error etc.)
- Introduction in the basics of the commercial law
- Introduction in the BImSchG, soil protection law, circular flow economy law and waste law

- Introduction in the StGb, especially specific environment crime

Teaching Methods

Seminar with beamer, exercises and role plays

Specialty

Written exam, 90-150 minutes or seminar paper

I3207 basics of law

Aims

The students will get to know the basics of important legal requirements of the EU and the German republic, concerning private law, environment law and criminal law. They will learn the composition of laws and application of basic assignation in connection with resources of nature. They will acquire the competencies to identify important private, environmental and civil law issues and the correct acquaintance with problems.

Content

The basics of the Civil Code, the commercial law, the criminal law and the relevant environmental law, especially the BImSchG and the soil protection laws will be communicated.

Eligibility for admission/ recommended requirements

The focus is based on the basic knowledge concerning environment and resources

Type of examination

Written exam, 90 minutes

Methods

Seminar, exercises, beamer, role plays

Literature

vorlesungsbegleitendes Skriptmaterial,
zusätzlich:

Kapellmann K.D., Langen W.: Einführung in die VOB/B, 18. Aufl., Werner, Neuwied, 2009.

Englert K., Motzke G., Wirth A.: Baukommentar, 2. Aufl., Werner, Neuwied, 2009.

Markus J., Kaiser S., Kapellmann S.: AGB-Handbuch Bauvertragsklauseln, 2. Aufl., Werner, Neuwied, 2008.

Koch H.-J.: Umweltrecht, 2. Aufl., Heymanns, München 2007

Module:Transport phenomena II

Module number I-12

Module responsible Prof. Dr. Rudi Marek

Course specialization

Course number and course name I3105 process engineering

I3104 thermal transfer

Professor Prof. Dr. Andrea Deininger

Semester 3

Length of the Module 1 Semester

Course Type mandatory

Niveau Bachelor

SWS 8.0

ECTS 9.0

Workload attendance: 120.0 hours

Self-studying : 150.0 hours

Total: 270.0 hours

Teaching-/ course language German

Module´s Objectives

The students will receive, based upon thermal transport mechanisms, an insight into the thermal transportation in technical devices and system in order to optimize technical system in matters of heat. At the same time an analytical problem-solving competency will be conveyed. The students will learn about the for construction and operation of devices and systems important basics. Additionally they will gain an overview of useful procedural methods and areas of use.

Content

- Thermal transport mechanisms (conduction of heat, convection and radiation)
- Mass and energy balance
- Steady and non-steady procedures
- Thermo technical devices (pipes, container, stirrer tank, heat exchanger)
- Procedural methods (distillation, rectification, absorption, extraction, adsorption and drying)

Teaching Methods

I3104 written exam, 90-120 minutes or seminar paper

I3105 written exam, 90-120 minutes or seminar paper

I3105 process engineering

Aims

The students will get to know the basics about material transmission and the analogy to the heat transmission which will be a reliable basis to the understanding of construction and procedural facilities and devices. They will gain an overview of process and environment engineering procedures. They will be put in situations to model easy systems and to analyze their operating behavior, in which computing-simulations will play a role as well.

Content

- Introduction, definition of basic terms (facility, devices, procedures, batch process), flow diagrams
- Basics of mass transfer and the analogy of mass and heat transfer
- Mechanical procedures for surface enlargement, separation of fluids, degradation of solid mixtures, material combination
- Thermal procedure for solids separation and separation of fluids, introduction of chemical reaction techniques
- Creation of energy and material balances of easy systems with concentrated parameter, modeling and differential equation systems
- Basics of computer simulation of easy procedural processes
- Wastewater treatment and cleaning

Type of examination

Written exam, 90 minutes

Methods

Seminar with exercises

Literature

- Hemming W., Wagner W.: Verfahrenstechnik, 10. korr. Auflage, Vogel, Würzburg, 2008.
- Schwister K. (Hrsg.): Taschenbuch der Verfahrenstechnik, 3. aktualis. u. verb. Auflage, Hanser, München, 2007.
- Bierwerth W.: Tabellenbuch Chemietechnik, Europa-Lehrmittel, Haan-Gruiten, 2009.
- Ignatowitz E.: Chemietechnik, 9. Auflage, Europa-Lehrmittel, Haan-Gruiten, 2009.
- Kraume M.: Transportvorgänge in der Verfahrenstechnik, Springer, Berlin, 2004.

I3104 Thermal transfer

Aims

The students will become acquainted with the basics of thermal transfer in order to establish an understanding of thermal transport in technical facilities and systems. They will be enabled to recognize transport mechanisms, describe them mathematically in order to display technical systems and optimize them. An analytical problem solving competencies will be conveyed. The knowledge gained in module I1205 "building physics" will be extended and deepened.

Content

- Thermal transport mechanisms (heat, heat flow, temperature, heat conduction, convection, heat radiation)
- Basics of heat conduction (Fourier, beginning and marginal condition, solutions, electrical analogy and thermal resistance)
- One and multi-dimensional steady and non-steady heat conduction
- Convection (free and forced convection, laminar and turbulent stream)
- Arrangements for influencing thermal transports (fin, needle, critical dam strength)
- Heat transmission (coflow, counter flow, cross flow heat transmission)
- Heat radiation (Stefan-Boltzmann-law, black and grey bodies, multibody systems, radioactive-physical characteristics)

Type of examination

Written exam, 90 minutes

Methods

Seminar with exercises and blended eLearning

Literature

script

Marek R., Nitsche K.: Praxis der Wärmeübertragung, Hanser, München, 2007, ISBN: 978-3-446-40999-6

VDI-Wärmeatlas, 10. Auflage, VDI-Verlag, Düsseldorf, 2008

Module:Resources and environment II

Module number I-13

Module responsible

Course specialization

Course number and course name I3106 biomass, regenerative energy and material techniques, recycling

Semester 3

Length of the Module 1 Semester

Course Type mandatory

Niveau Bachelor

SWS 6.0

ECTS 6.0

Workload attendance: 30.0 hours
Self-studying : 30.0 hours
Total: 60.0 hours

Teaching-/ course language German

Module´s Objectives

Additionally to the gained knowledge about procedures for energy production for buildings from I1204 "building physics" and I2103 "technical thermodynamics" the students will learn about regenerative energy production and advantages and disadvantages as well as potentials of the single procedures. Thereby they will learn the important basics for module I-16 "energy and building techniques". The students will get to know different recycling methods and disposal systems and will be enabled to develop disposal concepts. They will become acquainted with

process engineering processes of recycling and the appending material and energy balances. They will get familiar with the relevant laws and guide lines of the environment protection. The knowledge of regenerative energies and recycling are the basis for a sustainable handling with resources.

Content

- Overview of forms of regenerative energies
- Potentials of regenerative energies
- Biogas and biogas technology
- Wind generators
- Electrical and thermic solar plants
- Water generators
- Geothermal use and heat pump
- Overview of recycling methods and disposal systems
- Knowledge of procedural processes
- Compile material and energy balances
- Development of disposal concepts

Teaching Methods

Seminar with laboratory tutorials

Specialty

Written exam, 90-120 minutes or seminar paper

I3106 Biomasses, regenerative energy and material techniques, recycling

Aims

Biomasses

The students shall gain knowledge in biology, process technology and system engineering for construction and operation of biogas facilities required for the energetic use of biomasses. They will gain practical experience in relevant laboratory analytics. They will be put in situations to plan facility projects and judge them in matters of cost effectiveness.

Regenerative energy and material techniques

The students will become acquainted with all form of regenerative energies and their advantages and disadvantages and potentials.

Recycling

The students will get to know common recycling methods and disposal systems and will be able to develop disposal concepts. They will learn about procedural processes of recycling and setting up material and energy balances. They will get to know about the laws and guide lines of environment protection.

Content

- Biomass potential of usage of biogas and similar regenerative energies
- Biological process technologies, anaerobic methanogenic condition, optimization of biology for maximization of gas yield
- Laboratory experiment: microscopy of bacteria, concentration determination of dry solids and fatty acids
- Installation engineering: installation and operation of bio gas facilities, space loading, dwell period, substrate evaluation
- Operating efficiency consideration and planning of bio gas facilities
- Practical use of the bio gas facilities at Deggendorf Institute of Technology
- Excursion
- Regenerative energy and material techniques

Use of regenerative energy source

Waterpower

- Running-water power station and storage power station; tidal power plant

Solar energy

- Solar offer, thermic solar use, foto-voltais energy conversion

Wind energy

- Construction and operation of wind analysis, solar updraft tower
- Geothermal energy use and heat pumps
- Current energy supplying systems and consumption pattern
Energy supply in the near future and future perspectives

Recycling

- Overview of recycling methods and disposal systems
- Knowledge of procedural processes
- Alignment of material and energy balances
- Development of disposal concepts

Type of examination

Written exam, 90 minutes

Methods

Seminar with exercises and laboratorial exercises

Literature

Script

Zahoransky R.A.: Energietechnik, 4. überarb. u. aktualis. Auflage, Vieweg+Teubner, Wiesbaden, 2009.

Module: Environment biology and environment chemistry

Module number I-14

Module responsible Prof. Dr. Kurt Häberl

Course specialization

Course number and course name I6101 Environment biology

I6102 Environment chemistry

Semester 6

Length of the Module 1 Semester

Course Type mandatory

Niveau Bachelor

SWS 4.0

ECTS 4.0

Workload attendance: 60.0 hours

Self-studying : 60.0 hours

Total: 120.0 hours

Teaching-/ course language German

Module´s Objectives

The students will be put into a situation to realize the emissions and contaminant caused by humans and to quantify the contaminant influenced on humans and organisms as well as their ecological impacts. They will be prepared for jobs for producers, industrial and manual users of material, for trade, for service sector and environmental authorities.

Materials and environmental chemistry

The students will be able to appraise the exposition scenario of materials during its life cycle. They will be able to execute e.g. the registration and rating of chemicals within products, disposal and agriculture of producers, importers,

trader, bottler, industrial and manual users. The composition of documents and rating of identity, categorization, impact on health of humans as well as environment and ecology plays an important role. As a consequence they will be able to elaborate suggestions for actions and additional analysis. Next to the avoidance of harmful materials, the elimination of materials and the decontamination in a company or buildings play an important role. The learnt chemical, biological and ecological knowledge is relevant for the formulation of disposal concepts and practical contaminant elimination (modules I3106 and I7101).

Environment Biology and Ecology

Next to the categorization of the biological impact on environment and ecology, the students should be able to elaborate expertise of ecological impacts of contaminants. They should show solutions for the reduction of ecological effects. Additionally, they should elaborate the biological preliminary work for contaminant elimination in nature. As a consequence the students can use their gained knowledge for agencies in cities and country.

Eligibility for admission/ recommended requirements

Basic knowledge in chemistry and materials

Content

The basic knowledge gained from the modules "chemistry", "materials" and "ecological construction" will be deepened in an environmental-chemical and environmental-biological way. All materials and substances environment-critical and ecology harming effects of industry and chemical industry, disposal, plant protection or agriculture will be discussed for a rating and restriction. Most important are the biological and ecological aspects. The knowledge will be deepened in a project group work.

Environment chemistry

- Harmful chemicals and materials, chemical basics
- Appraisal and rating of the existing materials in a building
- Appraisal and rating of the existing or cause toxic materials in a company, the materials of agriculture and producer as well as the already in nature existing toxic and ecology harmful materials
- Environment chemical and environment biology analysis methods
- Air pollutant
- Radio-active material
- Fibers
- Legal basics, guide line, REACH; detection threshold and allowed concentration

Environment biology

- Means of distribution
- Interdependency of material and contaminants

- Toxicology
- Ecology

Teaching Methods

Seminar with laboratory and outdoor tutorials, project work with laboratory exercises

Specialty

I6101 written exam, 90-120 minutes or seminar paper

I6102 written exam, 90-120 minutes or seminar paper

I6101 environment biology

Aims

The students shall recognize the biological and ecological consequences of our industrialized society and depict them to producer and agencies. This concerns the emissions with biological effects. They will be able to classify toxic and environmentally harmful materials (emitted punctual, large area or regional defined) in their ecological effects. Due to the knowledge of toxicology and ecology, the students can take over coordinating functions when working with biologists, ecologists, producer and causer of emissions. They are able to analyze ecological studies with biological content, experimental results and laboratory value and suggest appropriate actions. They will be able to appraise ecological and biological extent of loss. It is the aim to reduce the biological impacts on environment and humans.

Content

- ecological situation
- basics of ecology
- emissions
- means of distribution of contaminants
- toxicology
- basics of ecology
- case study of contaminants
- concepts (e.g. investigations, identification, visual observation)

Eligibility for admission/ recommended requirements

Chemistry, biology (school)

Type of examination

Written exam, 90 minutes

Methods

Seminar, laboratory and outdoor exercises, project work in groups

Literature

script

Nentwig W.: Ökologie kompakt, 2. Aufl., Spektrum, Akademischer Verlag, Heidelberg, 2009.

Reineke W., Schlörmann M.: Umweltmikrobiologie, Spektrum Akademischer Verlag, Heidelberg, 2007.

Vaccari D.A., Strom P.F., Alleman J.E.: Environmental Biology for Scientists and Engineers, Wiley & Sons, 2005.

Townsend C.R., Begon M.; Harper J.L.: Ökologie, 2. Aufl., Springer, Berlin, 2009.

I6102 environment chemistry

Aims

The students shall recognize and quantify new chemical material, arising by actions of humans in economy, industry and craft in order to analyze the impacts on organisms, humans and ecology (in connection with module I6101 "environment biology").

Content

- exposition cause
- types, development and emission sources of chemicals as contaminants (air polluter, gas and smoke, contaminant in materials and buildings, solid materials, gases, solution, contaminant of cleaning supplies, contaminants of daily life, contaminants of industrial production and application, industrial chemicals)
- contaminant research, active ingredient test
- appraisal and rating of the toxic materials in a building (construction biology)
- appraisal and rating of the existing and produced toxic materials in a company, materials of agriculture and for user
- fiber
- critical values, analysis methods, REACH
- chemical-technical behavior of contaminant in the environment, changes
- contamination through contaminants, ways of chemicals from use to human, plant and animal

Eligibility for admission/ recommended requirements

Chemistry

Type of examination

Written exam, 90 minutes

Methods

Seminar, laboratory and outdoor exercises, project work in groups

Literature

script

Fränze S., Markert B., Wünschmann S.: Technische Umweltchemie, ecomed Verlag, Landsberg/Lech, 2007.

Feßmann J.: Angewandte Chemie und Umweltchemie für Ingenieure, ecomed Verlag, Landsberg/Lech, 2002.

Hites R.A.: Environmental Chemistry, Wiley-Inter-science, Hoboken N.J., 2007.

Bliefert C.: Umweltchemie, Wiley-VCH, Weinheim, 2002.

Fent K.: Ökotoxikologie, 3. Aufl., Thieme, Stuttgart, 2007.

Module: Resources and environment II

Module number I-15

Module responsible Prof. Bernhard Peintinger

Course specialization

Course number and course name I7101abandoned site and disposal,
contaminants
I6103 geo-technique

Semester 6, 7

Length of the Module 2 Semester

Course Type mandatory

Niveau Bachelor

SWS 8.0

ECTS 9.0

Workload attendance: 120.0 hours
Self-studying : 150.0 hours
Total: 270.0 hours

Teaching-/ course language German

Module ´s Objectives

As an extension of the knowledge gained in Module 14 "Environmental biology and environmental chemistry" the students will get to know about the procedures of disposal and landfilling of abandoned sites as well as rehabilitation measures of contaminants in buildings and technical facilities. They will get to know the legal general framework and be enabled to execute disposals, recycling and rehabilitation measures in practice. For the decontamination of solid and ground water as well as the ecological water construction and high water protection, the students will be taught the basics of geo-technology.

Content

- geo-technology basics
- abandoned site and disposal
- abolition and rehabilitation measures of contaminants in buildings, constructions and technological facilities

Teaching Methods

Seminar with exercises

Specialty

I6103 written exam, 120-180 minutes or seminar paper

I7101 written exam, 90-180 minutes or seminar paper

I7101 abandoned site and disposal, contaminants

Aims

The students develop a basic understanding of environment relevant effects with the existence of contamination in soil, water, and construction substance as well as a way of thinking and acting during the planning and execution of construction planning. They will learn about the influences of different disposal and recycling methods on the execution of building measures. They can realize situations in which contamination can occur and they know about systematic approaches for evaluating and rating. They know the important methods of exploration, disposal and recycling. The students will also gain knowledge about abandonment, recycling and maintenance works with buildings contaminated and the necessary measure following the parameter of circular flow economy and disposal law, hazardous material regulations and technical rules for dangerous substances (TRGS).

Content

- abandoned site and disposal
- historical development of environment consciousness and environment techniques
- definitions, occurrence and appearance of abandoned sites
- allocation of contaminants, description and evaluation
- exploration, approaches, techniques, recycling and security measures, land recycling, possibilities of allocation, description, practical examples
- ways of recycling and disposal, allocation, examples, disposal concepts, legal requirements, verification process
- abandonment and demolition, exploration, overview of techniques, disposal concepts
- construction and procedures for groundwater purification and waste air purification, overview
- working protection for working with contaminated materials
- practical examples and excursions
- contaminants in building, constructions and technical facilities
- possible contaminants (e.g. asbestos, mineral fibers)
- legal requirements, hazardous materials requirements and TRGS, technical guide lines
- recycling concepts
- examples

Type of examination

Written exam, 90 minutes

Methods

Seminar, laboratory and outdoor exercises, project work in groups

Literature

Themenbereich Altlasten und Entsorgung:

H. H. Weber: "Altlasten - Erkennen, Bewerten, Sa-nieren", Springer Verlag Berlin, 3. Auflage, 1996.

J. Michels, T. Track, U. Gehrke, D. Sell: "Leitfaden biologische Verfahren zur Bodensanierung", Umwelt-bundesamt, Erich Schmid Verlag Berlin, 2000.

Vauck / Müller: "Grundoperationen chemischer Ver-fahrenstechnik", VCH-Verlag, Weinheim, 8. Auflage, 1990, ISBN 3-527-28031-6.

Römpp: "Chemie Lexikon", Thieme Verlag, Stutt-gart, 10. Auflage, 1997, ISBN-10: 3137348102 .

Bank M.: "Basiswissen Umwelttechnik", Vogel Buch-verlag, 3. Auflage, 1995, ISBN 3-8023-1550-2.

Stanley E. Manahan: "Environmental Chemistry", Lewis Publishers, 6. Auflage, 1994, ISBN 1-56670-088-4.

Lippok J., Korth D.: "Abbrucharbeiten - Grundlagen, Vorbereitung, Durchführung", Rudolf Müller, 2004, ISBN 3-481-02031-7.

N.N.

I6103 geo-techniques

Aims

The students shall be enabled to classify the soil as building area and building material and describe soil physical properties. They shall be able to work on geotechnical questions in the area of high water protection, protection and exploitation of ground water and environmental remediation in building areas and groundwater. The basic information for the use of the resources soil and water will be taught. Hereby, the students will get to know the common soil-mechanical procedures. They are able to classify typical types of soil. They receive an insight in soil mechanics as well as receiving knowledge in the area of ground water streams, stability of embankment and construction procedures for the production of sealing in subsoil. This will enable them to work on geotechnical question in this area.

Content

- introduction in soil and rock mechanics
building geology, soil mechanics, rock mechanics, basics of change in formation and solidity analysis
- physical characteristics of soils

characteristics of phase systems, characteristics of single grain, naming and classifying types of soil, density parameters and compression characteristics, hydraulic characteristics, characteristics of frost and compression, shear strength characteristics

- ground water stream
plane steady stream (circulation of bulkhead plate, flow of a dam on impenetrable underground), stream on free surface
- soil mechanical basics
tension distribution in elastic isotropic half-space, deferral in elastic isotropic half-space, limit load carrying capacity of building area, earth pressure
- embankment stability
limit equilibrium on flat anti-friction surface, limit equilibrium on constant radius anti-friction surface, influence on water pressure
- building method for assembling of sealing in underground
slotted wall, soil grounding, mixed-in-place procedure

Type of examination

Written exam, 90 minutes

Methods

Seminar, tutorials, laboratory, blackboard, beamer

Literature

Script

Module: Energy and building technology

Module number I-16

Module responsible Prof. Dr. Rudi Marek

Course specialization

Course number and course name I6104 building climate control
I6103building technology

Semester 4-6

Length of the Module 3 Semester

Course Type mandatory

Niveau Bachelor

SWS 4.0

ECTS 5.0

Workload attendance: 60.0 hours
Self-studying : 90.0 hours
Total: 150.0 hours

Teaching-/ course language German

Module ´s Objectives

The students shall gain an overview of planning basics of technical building services in areas of heater, air conditioning, climate and coldness techniques. They will be enabled to construct easy facilities. An important role for the protection of natural resources is the achievement of a comfortable indoor temperature and the energy saving by realization of adequate building measurements and abandonment of mechanical cool measurements. The students shall get to know the main aspects of summery warmth protection and day light use in matters of high total energy efficiency and execute the proofs and calculations. Important are the aspects at the intersection oh building physics and building techniques.

Content

- overview of facilities of technical building services (TGA) for heating, ventilation and cooling
- planning basics of TGA
- building climate control and thermal comfortableness
- summery heat protection
- daylight use
- simulations

Teaching methods

Seminar with tutorials

Specialty

I4101 written exam, 90-120 minutes or seminar paper

I6104 written exam, 90-120 minutes or seminar paper

I6104 building climate control

Aims

The students shall get to know the main influences of indoor temperature in buildings and thermal comfortableness. They will get to know the radiation-physical parameters of encapsulation and shading. They will be put in a situation to execute the proofs for rating the summery heat protection. The students will gain an overview of the possibilities of regenerative cooling. Additionally, day light technical aspects will be taught. The gained knowledge will be deepened by computer simulations.

Content

- comfortableness
comfortableness criteria, air, heat radiation, heat release of humans, degree of function and garment
- encapsulation and sun protection facilities
basis glasses and covering, pane blanks and gas filling, specific value of encapsulation, building sun protection, rigid and moveable sun protection, calculation of whole energy transmittance
- minimum requirement and summery heat protection
goal and influence factors, simplified evaluation, proof of DIN 4108-2, examples, engineering calculation methods, convenience evaluation (SIA 2021)
- day light techniques
day light quotient, optical parameters of encapsulation and sun protection facilities
- simulations

Type of examination

Written exam, 90 minutes

Methods

Seminar with tutorials and e-Learning modules and computer simulations

Literature

Virtual documents and with interactive elements

Fischer H.-M., Jenisch R., Stohrer M., Homann M., Freymuth H., Richter E., Häupl. P.: Lehrbuch der Bauphysik, Teubner+Vieweg, Wiesbaden, 6. Aufl., 2008

I4101 Building techniques

Aims

The students will gain an insight in planning and layout basics of technical building services in the area of heating, air conditioning, climate and coldness techniques, whereby aspects and intersections to other crafts in matters of integral planning processes play an important role. Important for the technical equipment of buildings is the rational energy use in connection with optimal use of techniques in order to achieve low investment and operation costs when having a high building quality.

Content

- tasks and achievements of supply engineering
- fee structure for architects and engineers (HOAI) in the area of TGA
- heating facilities
requirements, systems, heat generator, blowpipe, safety technique, exhaust facilities, heat station, domestic water heating, dimensioning and application, investment and operation costs
- ventilation and air conditioning (RLT)
arrangement, ventilation and air conditioning facilities, Mollier-Diagram, components of RLT facilities, air distribution, air guide, facility systems, building technical measurements, cooling ceiling, investment and operation costs
- refrigeration engineering
compression and absorption refrigeration processes, building elements, refrigerant fluids, water re-cooling, regenerative cooling, refrigeration store, building technical measurements

Type of examination

Written exam, 90 minutes

Methods

Seminar

Literature

script

Schramek E.-R. (Hrsg.): Taschenbuch für Heizung + Klimatechnik 09/10, 74. Aufl., Oldenbourg, München, 2009.

Pistohl W.: Handbuch der Gebäudetechnik, Werner, Neuwied, Bd. 1, Allgemeines, Sanitär, Elektro, Gas, 7. Aufl., 2009, Bd 2: Heizung, Lüftung, Beleuchtung, Energiesparen, 7. Aufl., 2009.

Laasch T., Laasch E.: Haustechnik, 12. Auflage, Vieweg+Teubner, Wiesbaden, 2009.

Module: Business economics

Module number I-17

Module responsible Prof. Dr. Volker Wirth

Course specialization

Course number and course name I4102 Business economics

Semester 4

Length of the Module 1 Semester

Course Type mandatory

Niveau Bachelor

SWS 4.0

ECTS 4.0

Workload attendance: 60.0 hours
Self-studying : 60.0 hours
Total: 120.0 hours

Teaching-/ course language German

Module ´s Objectives

The students shall become familiar with the economical basics and way of thinking, which are important for the productivity and companies profitability, and thereby, gain important management competencies.

Content

- basics of business economics
- entrepreneurial actions and thinking

Teaching Methods

Seminar with tutorials

Specialty

Written exam, 90-120 minutes or seminar paper

I4102 business economics

Aims

The students will get to know the economical and entrepreneurial way of thinking: The success of businesses is composed of the sum of the projects results. Thereby, the students will learn about important management competencies. Role plays will train the central, cross-functional competencies. Additionally the students should get to know the basic of business economics:

- rules of accounting
 - short-term project profitability analysis
 - interplay of engineers and business people
- Knowledge:
- basics of double accounting
 - basics of balance sheet and income statement
 - internal cost allocation
 - job-order costing
 - project-cost calculation
 - short-term income statement
- Skills:
- easy journal entries
 - determination of project results
- Competencies:
- realization of project losses
 - constructive communication with controller

Content

- basics of accounting
- case study: journal entries
- basics of cost and performance analysis
- case study: project cost calculation
- role play: communication engineers and business men

Type of examination

Written exam, 90 minutes

Methods

Seminar with tutorials and role plays

Literature

Bernd Breunig: Kapitel Nr. 3 "Unternehmenscontrolling" in Volker Wirth (Hrsg.), Controlling in der Baupraxis, 2. Auflage, Werner Verlag, München/ Neuwied, (2006)

Bernd Breunig: Text- und Arbeitsbuch zur Vorlesung: Rechnungswesen Bau, Beiträge zum Baubetrieb, Bd. 25, Karlsruhe 2002, 2. Auflage

Module: Foreign language II

Module number I-18

Module responsible

Course specialization

Course number and course name I3208 foreign language

Semester 3

Length of the Module 1 Semester

Course Type mandatory

Niveau Bachelor

SWS 4.0

ECTS 4.0

Workload attendance: 60.0 hours
Self-studying : 60.0 hours
Total: 120.0 hours

Teaching-/ course language German

Module ´s Objectives

The students shall deepen their knowledge gained in module I-08 foreign language I. Students can alternatively chose another language than English, or can continue to study English.

Content

- learning English or another foreign language on a level based on previous knowledge
- vocabulary and grammar
- listening and speaking of foreign language texts
- reading, understanding and producing foreign language texts

Teaching methods

Seminar with exercises

Specialty

Written exam. 90-120 minutes or seminar paper

I3208 foreign language

Aims

The students can additionally to module I1209 "English" study another foreign language or continue to learn English on a higher level. Students with a lower English level have the possibility to gain more competencies in communication and correspondence in English.

Content

A new foreign language will begin at level A1, but if there is already previous knowledge a higher level is also possible. The difficulty of the English texts depends from level B1 to C1.

- Grammar and vocabulary
- Translation
- Right use of dictionary
- Oral summary of texts

Eligibility for admission/ recommended requirements

Individual knowledge of students will be considered. They can choose one of the alternatives offered (compulsory optional subject)

Type of examination

Written exam, 90 minutes

Methods

Seminar, exercises, single, partner and group work, understanding, computer

Module: Negotiations and communication

Module number I-19

Module responsible Prof. Dr. Volker Wirth

Course specialization

Course number and course name I4204 Negotiation Management

Semester 4

Length of the Module 1 Semester

Course Type mandatory

Niveau Bachelor

SWS 2.0

ECTS 4.0

Workload attendance: 60.0 hours
Self-studying : 60.0 hours
Total: 120.0 hours

Teaching-/ course language German

Module ´s Objectives

The students will be made familiar with the important techniques of negotiations in order to successfully have business negotiations. The taught management competencies are important for other modules and the overall study course aim. The basics will be taught in the 4th semester before the internship. Following the internship, a deepening of knowledge and competencies will occur.

Content

- Negotiation techniques
- Situation of conflicts and moderation

Methods of teaching

Seminar with exercises

Specialty

Written exam, 90-120 minutes or seminar paper

I4204 Negotiation Management

Aims

The students will apply the knowledge of negotiation techniques in practical situations. Thereby, they will communicate verbally and non-verbally. The solution of conflict situations and basics of moderation will be taught.

Knowledge

- Communication, negotiation and presentation techniques

Skills

- Handling objections
- Questioning techniques
- Directing a structured negotiation
- Presentation with argumentation of use for solutions and options

Competencies

- Directing negotiations with agents and employers
- Solving of conflict situations between agents and employers

Content

Basics

- Questioning techniques
- Handling objections
- 9 graduated scheme of negotiations
- Role plays

Deepening

- Argumentation of use
- Moderation
- Body language
- Role plays

Type of examination

Written exam, 90 minutes

Methods

Seminar with exercises and role plays (video analysis)

Literature

Schulze-Seeger, J.: Die Kunst des Überzeugens in 'Erfolgsfaktor Nachtragsmanagement im Bauwesen', expert verlag, Renningen-Malmsheim, 2000, Herausgeber: Wirth, Volker

Module: Ecological water management

Module number I-20

Module responsible Prof. Rudolf Metzka

Course specialization

Course number and course name I4105 environment information systems

I4106 Water economy I

I4107 Water economy II

Semester 4

Length of the Module 1 Semester

Course Type mandatory

Niveau Bachelor

SWS 8.0

ECTS 9.0

Workload attendance: 120.0 hours

Self-studying : 150.0 hours

Total: 270.0 hours

Teaching-/ course language German

Module ´s Objectives

Students will develop integrated planning and management systems for the management of water in settlement areas and river areas. They will be taught expert knowledge and functional competencies as well as elements of management, organization and communication and the cross-linked thinking and acting.

Content

- Basics of Water economy
- Water and environment chemistry
- Water management in settlement areas
- Ecological waters development and expansion
- Integrated high water protection
- River basin models and river basin management
- Expert information technology

Methods of teaching

Seminar with exercises

Specialty

I4105 written exam, 90-120 minutes

I4106 written exam, 90-120 minutes or seminar paper

I4107 written exam, 90-180 minutes

I4105 Environment information systems

Aims

- Environment information systems play an important role in ecological water management
- Knowledge
Composition, function and operation method of environment information systems
- Skills
Basic ways of works and the contact with application (software application e.g. ArcGIS and single solutions)
- Competencies
Use of environment information systems for different areas of problems
Execution of basic operation. e.g. data entry and query of data

Content

- Basics of geo and environment informatics
Operational area of information systems, basic data structures, data sources and mathematical backgrounds
- Application and handling of chosen desktop programs
Reading of data, applying of projects and easy handling operations, possibility of data output
- Distributed architectures, earth-viewer and webgis
Operational area of GIS systems in internet and basic complex data management, e.g. in networks as well as composition and functioning of Web-GIS and Earth-viewer systems
- Introduction, composition and application of GIS-systems in engineering offices, administration and corporations
Basics of software introduction, data organization and functioning with GIS in project teams, corporations and government agencies

Type of Examination

Written exam, 90 minutes

Methods

Seminar with exercises and group works

Literature

Script

I4106 Water economy I

Aims

Knowledge

- Important aims and methods of sustainable water economy

Skills

- Important planning, calculation and measurement principals of water engineering

Competencies

- Development of concepts for different questions of water economy

Application of different planning and measurement instruments on different problem of water engineering and economy

Content

- Aims of water economy
High water protection, waters protection, recovery at waters, energy production, water supply, sewerage disposal
- Hydrology
Element of water circulation, determination of important parameters for calculation and measurements in water economy
- Constructions of water engineering
Functionality, areas of operation and construction characteristics of constructions, basics of planning and measurement
- Nature-oriented water engineering and waters development
- Integrated methods in water economy
High water risk management, river management, water resource management

Eligibility for admission/ recommended requirements

I1108 fluid mechanics

Type of examination

Written exam, 90 minutes

Methods

Seminar with exercises and group works

Literature

- Schneider: Bautabellen für Ingenieure; Werner Verlag, aktuelle Ausgabe
- Bretschneider H.: Taschenbuch der Wasser-wirt-schaft; Verlag Paul Parey
- Bollrich G.: Technische Hydromechanik; Verlag Bauwesen
- Schröder W.: Grundlagen des Wasserbaus; Werner Verlag
- DWA/DVWK Merkblätter
- Bayer. Staatsministerium für Landesentwicklung und Umweltfragen: Wasserland Bayern ? Nach-haltige Wasserwirtschaft in Bayern

- Bayer. Landesamt für Wasserwirtschaft: Spektrum Wasser 1: Hochwasser, Eigenverlag
- Schröder W., Römisch K.: Gewässerregulierung, Binnenverkehrswasserbau Bayer. Landesamt für Wasserwirtschaft: Fließgewässerlandschaften in Bayern, Eigenverlag

I4107 Water economy II

Aims

Knowledge:

- Aims and methods of sustainable water disposal and sewerage disposal

Skills:

- Important planning, calculation and measurement principals of water disposal and sewerage disposal

Competencies:

- Development of competencies for different questions of water disposal and sewerage disposal

Application of important planning and measurement instruments on different problems on water disposal and sewerage disposal

Content

Water supply:

- Principals of water supply
Presentation of winning, preparation and distribution of water on the basis of the overall system
- Measurement criteria of water supplying systems
Basics of measurement of supplying systems and determination of water supply and water demand and necessary water parameters
- Presentation of chosen equipment
Description of functionality, effect in overall systems and relevant basics for the measuring
- Measuring of chosen equipment

Sewerage disposal:

- Principles of disposal
- Methods of dewatering and cleaning
- Measurement criteria for sewerage disposal systems
Basics of measurements and determination of volume of sewerage and important sewerage parameters
- Presentation of chosen equipment
Description of functioning, effect on overall systems and relevant basics for the measurement
- Measuring of chosen equipment

Eligibility for admission/ recommended requirements

I1108 fluid mechanics

Type of examination

Written exam, 90 minutes

Methods

Seminar with exercises, laboratory exercises and group works

Literature

- Karger/Cord-Landwehr/Hoffmann: Wasserver-sorgung, Teubner Verlag.
 - Mutschmann/Stimmelmayer: Taschenbuch der Wasserversorgung, Vieweg Verlag.
 - Technische Merkblätter und Regeln des DVGW
 - Hosang W., Bischof W: Abwassertechnik, 11. Neub. u. erw. Auflage, Teubner, Leipzig 1998
 - Deutsche Vereinigung für Wasserwirtschaft, Abwasser, Abfall e.V.: DWA-Regelwerk
 - Imhoff, Karl & Klaus R.: Taschenbuch der Stadtentwässerung, 29. Auflage, R. Oldenbourg Verlag, München, Wien 1999
- Umdruckmaterial zur Lehrveranstaltung

Module: Traffic management

Module number I-21

Module responsible Prof. Dr. Bernhard Bösl

Course specialization

Course number and course name I4108 transport management

Semester 4

Length of the Module 1 Semester

Course Type mandatory

Niveau Bachelor

SWS 8.0

ECTS 9.0

Workload attendance: 120.0 hours

Self-studying : 150.0 hours

Total: 270.0 hours

Teaching-/ course language German

Module ´s Objectives

The students shall become familiar with the basics of transport and transport management. They will learn about road construction and rail traffic. Additionally they will be taught the basics of surveying. The special characteristics of different traffic carriers are meant to be recognized and introduced correctly. Next to the functional competencies and knowledge, this module will teach cross-functional competencies of management, e.g. analytic thinking, development of cognitive competencies and consciousness of problems. Additionally, teamwork and organization are trained.

The students will get to know the basics of traffic planning with the ability to realize problems of environment effects of traffic. The students shall estimate, arrange and apply the characteristics of different traffic carriers. An important role plays the road traffic. Knowledge about rail traffic will be communicated. Thereby, basics for public transport are given. A seminar paper will train important soft skills like team work and organization.

As basics for all areas of traffic the basics of mapping will be communicated so that students get familiar with the acquisition and handling with geo data.

Content

- Traffic system
- Road works
- Rail traffic
- Mapping

Methods of teaching

Seminar with exercises and examples in practice, project work

Specialty

Written exam, 90-180 minutes or seminar paper

I4108 Traffic Management**Aims**

The students shall gain basic knowledge about traffic planning with the capability of problem realization of environmental effects of traffic. The students will know the characteristics of different traffic carriers and how to apply them. An important role plays the road traffic. Knowledge about rail traffic will be communicated. Thereby, basics for public transport are given. A seminar paper will train important soft skills like team work and organization.

As basics for all areas of traffic the basics of mapping will be communicated so that students get familiar with the acquisition and handling with geo data.

Content

- Traffic system
 - Types of traffic
 - Traffic projections
 - Public mass passenger transport
 - Stationary traffic
 - Traffic security, noise prevention
- Road works
 - Legal and physical basics
 - Planning of rural roads
 - Planning of city roads
 - Basics of roadwork techniques
- Rail traffic
 - Legal basics
 - Wheel-rail-system
 - Basics of line management
 - Basics of junction plate
 - Creation of railway construction
- Mapping
 - Frameworks and coordination systems
 - Basics for horizontal measurement
 - Basics for vertical measurement

Type of examination

Written exam, 90 minutes

Methods

Seminar with exercises, practical examples and project work

Literature

script

G. Wolf und A. Bracher, Straßenplanung, Werner Verlag Düsseldorf, 2009

S. Velske, P. Eymann, H. Mentlein, Straßenbautechnik, Werner Verlag Düsseldorf, 2009

V. Matthews, Bahnbau, Vieweg + Teubner Verlag, 2007

Module: Contract management

Module number I-22

Module responsible Prof. Dr. Volker Wirth

Course specialization

Course number and course name I7102 contract management

Semester 7

Length of the Module 1 Semester

Course Type mandatory

Niveau Bachelor

SWS 2.0

ECTS 2.0

Workload attendance: 30.0 hours
Self-studying : 30.0 hours
Total: 60.0 hours

Teaching-/ course language German

Module´s Objectives

The students will have to conclude contracts in their working life as well as contract negotiation. Therefore, they shall learn the contract and amendment management as early as possible.

Content

- Types of contracts
- Amendments
- Legal framework

Methods of Teaching

Seminar with exercises

Specialty

Written exam, 90-120 minutes or seminar paper

I7102 contract management

Aims

The students will gain an insight in the legal basics of contract management, based on the knowledge gained in module I3207. They will become familiar with contract managements in order to be able to conclude contracts in practice.

Knowledge:

- Elements of contracts
- Special arrangements
- Writing protocol

Skills:

- Posting of contracts
- Analysis of contracts

Competencies:

- Processing of contracts
- Understanding of both sides of AG and AN
- Minimization of conflicts
- Communication with problems/crisis
- Extrajudicial agreement

Content

- Legal basics (BGB; VOB; AGB)
- Forms of contracts (unit price contract, lump sum contract, individual contract)
- Enforcement of amendments
- Defending of amendments
- Organization of projects
- Elements of contracts
- Role plays

Type of examination

Written exam, 90 minutes

Methods

Seminar with exercises and role plays

Literature

Wirth A. (Hrsg.): Handbuch zur Vertragsgestaltung, Vertragsabwicklung und Prozessführung im privaten und öffentlichen Baurecht, 2. Aufl. Werner Verlag, Düsseldorf, 2001.

Module: Profitability of technical systems

Module number I-23

Module responsible Prof. Dr. Rudi Marek

Course specialization

Course number and course name I6105 profitability analysis

Semester 6

Length of the Module 1 Semester

Course Type mandatory

Niveau Bachelor

SWS 2.0

ECTS 3.0

Workload attendance: 30.0 hours
Self-studying : 60.0 hours
Total: 90.0 hours

Teaching-/ course language German

Module ´s Objectives

The students shall get to know the basics of profitability analysis of technical systems and how to apply them on different questions.

Content

- Building physical and energy-economical basics
- Statistical profitability procedures
- Dynamical profitability procedures

Methods of teaching

Seminar with exercises and project work

Specialty

Written exam. 90-120 minutes or seminar paper

I6105 profitability analysis

Aims

Constitutive to the knowledge gained in module I4101 the students will gain knowledge in statically and dynamical profitability procedures. They will analyze the profitability of technical systems.

Content

- Basics and definitions
Facility, building and energy management, approaches and sustainable constructions, utilization of flexibility, minimization of techniques and optimization of techniques, integrated building planning
- Repetition of building physical basics
Heat transfer coefficient, thermal insulation composite system, encapsulation, total energy transmittance, heat bridges, thermo technical parameters, demand of annual thermal heat, passive solar energy use, primary energy demand, equivalent U- value, parameters and examples
- Energy-economical basics
Primary energy carries, primary energy winning and use, marginal conditions of energy supply, energy conversion, energy prices, emission, contracting, measures for budgeting energy, heat and fuel value
- Profitability calculation
Tasks, calculation methods, separation of cost calculation, dynamical methods of calculation (annuity methods acc. to VDI 2067 and VDI 6025)
- Profitability structural measures
Economic heat protection, K-Value-Hyperbola, heat insulation, encapsulation, case studies
- Profitability of building technological facilities
Investments and operation costs of RLT facilities and heat supply facilities, case studies

Types of examination

Written exam, 90 minutes

Methods

Seminar with exercises and project work

Literature

Script

Warnecke H.-J., Bullinger H.-J., Hichert R. Voegelé A.A.:
Wirtschaftlichkeitsrechnung für Ingenieure, 3. überarb. Auflage, Hanser,
München, 2003

Module: Project work

Module number I-24

Module responsible Prof. Rudolf Metzka

Course specialization

Course number and course name I6107 project traffic management

I6106 project ecological waters
management

Semester 6

Length of the Module 1 Semester

Course Type mandatory

Niveau Bachelor

SWS 12.0

ECTS 20.0

Workload attendance: 180.0 hours

Self-studying : 420.0 hours

Total: 600.0 hours

Teaching-/ course language German

Module´s Objectives

The students shall apply the learnt theory in a project work with the topic of ecological water management or traffic management. Their experiences of their internship will be included as well. The results will be presented in role play so that important soft skills will be trained. Additionally the skills and knowledge acquired in other modules will be included in the project work. The module offers the option between I6106 "project ecological waters management" and I6107 "project traffic management".

Eligibility for admission/ recommended requirements

I-11 Law

I-19 Negotiation and communication

I-20 Ecological waters management

I-21 Traffic management

Content

- Ecological waters management
- Traffic management
- Project management
- Legal framework

Methods of teaching

Seminar with exercises and project work

Specialty

I6106 written exam, 90-180 minutes or seminar paper

I6107 written exam, 90-180 minutes or seminar paper

I6107 Project traffic management**Aims**

The topics of the basic subject, especially traffic management, law and planning will be deepened in a project work with a given question. The students shall work on a given question with concern of ecological aspects and present their results. Additionally the management concepts learnt in other modules should be applied.

Content

The students receive an assignment which refers to a project of traffic work.

The first step is to analyze the assignment and work out single detailed questions.

Additionally those single questions are to be worked on and the solution statements should be connected with other questions.

Chosen subzones will then be elaborated by students. The results will be presented.

Eligibility for admission/ recommended requirements

I-11 Law

I-19 Negotiation and communication

I-21 Traffic management

Type of examination

Written exam, 90 minutes

Methods

Seminar

processing of single questions in small groups

presentations by single students

presentation of project work by students

I6106 Project ecological Waters management

Aims

The topics of the basic subject, especially water economy, law, planning and environment information systems will be deepened in a project work with a given question. Additionally the management concepts learnt in other modules should be applied.

Content

- Legal basics and there relevance for practice
Water general guidelines, water budget act, high water risk guideline, planning approval and planning allowances procedures, environmental review
- Structural competence
Waters development, landscape planning, water engineering, economical analysis, communication and public participation in planning process, interdisciplinary planning and working
- Application of modern planning instruments
CAD, GIS, stream calculation and simulation, hydrological modeling, erosion calculation
- Project handling on the basis of a practical planning examples
Use of mentioned methods, instruments and applications by students in project groups (case study)

Eligibility for admission/ recommended requirements

I-11 Law

I-19 Negotiation and communication

I-20 ecological waters management

Type of examination

Written exam, 90 minutes

Methods

Seminar with outdoor exercises, project and group work

Literature

See literature "ecological waters management"

Module: Civil and criminal law

Module number I-25

Module responsible

Course specialization

Course number and course name I7103 labor, insurance, criminal and process law

I6108 contract law

Semester 6,7

Length of the Module 2 Semester

Course Type mandatory

Niveau Bachelor

SWS 8.0

ECTS 8.0

Workload attendance: 120.0 hours

Self-studying : 120.0 hours

Total: 240.0 hours

Teaching-/ course language German

Module´s Objectives

The module is divided into different laws which are important for area- and resource referring methods in practice.

Constitutive to Module I-3207 "basics of law" the students will get to know the most important legal requirements of the European Union and of Germany in the areas of energy law, environment law and criminal law. They will get to know the composition of laws and learn about the application of basics laws in connection with energy and resources in nature.

Additionally the competencies concerning the realization of important private, environment and criminal laws for the correct use will be increased.

They will be made familiar with the following areas:

- Private contract law
- Private procurement law
- Labor law
- Insurance law
- Criminal law
- Process law

Skills and Competencies:

The students will have to take over leading positions in a company. They shall be able to work alone and in teams on all the questions concerning law in connection with contracts, work contract, insurance and case of damage. They know about the criminal law danger and learn about the responsibility of their actions.

Eligibility for admission/ recommended requirements

I3207 basics of law

Content

In the seminars the details of the Civil code, the Commercial code and the Criminal code will be presented. The distinctiveness of contracts in the area of energy economy and the connection with the protection of resource and environment will be dealt with.

Relevant environment laws (BImSchG, BodenschutzG, Kreislaufwirtschaft- and AbfallG) will be taught as well as a deepening in StGB, especially environment crimes.

Knowledge about Labor contract law, insurance contract law and process right will be communicated.

Methods of teaching

Lecture with beamer, seminar paper and exercises as well as role plays

Specialty

I6108 written exam, 90-180 minutes or seminar paper

I7103 written exam. 90-180 minutes or seminar paper

I7103 Labor, insurance, criminal and process law

Aims

The students shall be enabled to systematically realize a question pursuant to labor and insurance law and introduce according measures.

The criminal law part will communicate the composition of the criminal law and criminal justice. An overview of elements of crimes of resource and environment management will be given.

The students will have to take over leading positions in a company. They shall be able to work alone and in teams on all the questions concerning law in connection with contracts, work contract, insurance and case of damage. They know about the criminal law danger and learn about the responsibility of their actions.

Content

- Labor law
Basics of labor contracts, distinctiveness
Employment relationship (temporary employment, labor leasing, freelancers)

- Dissuasion and denunciation possibilities
- Insurance law
 - Distinctiveness of insurance contracts, significance of ARG
 - Insurance of building work
 - Execution of insurance cases
- Criminal law
 - Differentiation criminal law/ administrative offences Act
 - Legal basis; StGB, OWiG
 - Systematic of StGB: general part, special part
 - Features of sentencing scheme: monetary fine, imprisonment
 - Function of criminal justice systems: court, prosecution, advocate
 - Basics of responsibilities of courts and instances
 - Special part: analysis of single elements of crimes of the economy, building and environment criminal law
- Process law
 - Basics of civil process law, structure of courts

Eligibility for admission/ recommended requirements

I3207 Basics of law

Type of examination

Written exam, 90 minutes

Methods

Seminar with exercises

Literature

script

Langenecker J. Maurer M.: Handbuch des Bauar-beitsrechts, Werner, München, 2004.

Thomas H., Putzo H.: Zivilprozessordnung (ZPO) Kommentar, 30. Aufl., Beck, München, 2009.

Theobald C., Nill-Theobald C.: Energierecht, 7. Aufl., Beck, München, 2009.

Koch H.-J.: Umweltrecht, 2. Aufl., Heymanns, Mün-chen 2007.

I6108 Contract law

Aims

The students shall be enabled to execute systematic measures in resource and environment management. Therefore, basic knowledge of contract law will be communicated in order to be able to conclude service, sales and work contracts. The students will be enabled to take over leading positions in a company. They will be able to solve occurring legal questions concerning environment solely and in a team.

Content

Especially for contracts of the energy economy and in connection with protection of resources and management, the environment laws (BImSchG etc) will be dealt with.

Eligibility for admission/ recommended requirements

I3207 Basics of law

Type of examination

Written exam, 90 minutes

Methods

Seminar with exercises and seminar papers

Literature

script

zusätzlich:

Kapellmann K.D., Langen W.: Einführung in die VOB/B, 18. Aufl., Werner, Neuwied, 2009.

Englert K., Motzke G., Wirth A.: Baukommentar, 2. Aufl., Werner, Neuwied, 2009.

Markus J., Kaiser S., Kapellmann S.: AGB-Handbuch Bauvertragsklauseln, 2. Aufl., Werner, Neuwied, 2008.

Koch H.-J.: Umweltrecht, 2. Aufl., Heymanns, München 2007.

Theobald C., Nill-Theobald C.: Energierecht, 7. Aufl., Beck, München, 2009.

Module: Public Law I

Module number I-26

Kommentar [J1]: Existiert zweimal

Module responsible Prof. Dr. Klaus Englert

Course specialization

Course number and course name I7103 labor, insurance, criminal and process law

I7104 traffic and environment rights, public business law

Semester 7

Length of the Module 1 Semester

Course Type mandatory

Niveau Bachelor

SWS 8.0

ECTS 8.0

Workload attendance: 120.0 hours

Self-studying : 120.0 hours

Total: 240.0 hours

Teaching-/ course language German

Module´s Objectives

The students will get to know important knowledge in the areas of traffic right, environment right and public business law, especially industrial law and insolvency law. Additionally the students will learn the rules of realty law, especially its composition, effect and information content of the registers and the realty cadaster.

Eligibility for admission/ recommended requirements

I3207 Basics of law

Content

- Traffic law
- Environment law
- Public business law
- Register and property law

Methods of teaching

Seminar with exercises

Specialty

I7104 written exam, 90-180 minutes or seminar paper

I7105 written exam, 90-120 minutes or seminar paper

I7103 Labor, insurance, criminal and process law

Aims

The students shall be enabled to systematically realize a question pursuant to labor and insurance law and introduce according measures.

The criminal law part will communicate the composition of the criminal law and criminal justice. An overview of elements of crimes of resource and environment management will be given.

The students will have to take over leading positions in a company. They shall be able to work alone and in teams on all the questions concerning law in connection with contracts, work contract, insurance and case of damage. They know about the criminal law danger and learn about the responsibility of their actions.

Content

- Labor law
 - Basics of labor contracts, distinctiveness
 - Employment relationship (temporary employment, labor leasing, freelancers)
 - Dissuasion and denunciation possibilities
- Insurance law
 - Distinctiveness of insurance contracts, significance of ARG
 - Insurance of building work
 - Execution of insurance cases
- Criminal law
 - Differentiation criminal law/ administrative offences Act
 - Legal basis; StGB, OWiG
 - Systematic of StGB: general part, special part
 - Features of sentencing scheme: monetary fine, imprisonment
 - Function of criminal justice systems: court, prosecution, advocate
 - Basics of responsibilities of courts and instances
 - Special part: analysis of single elements of crimes of the economy, building and environment criminal law
- Process law
 - Basics of civil process law, structure of courts

Eligibility for admission/ recommended requirements

I3207 Basics of law

Type of examination

Written exam, 90 minutes

Methods

Seminar with exercises

Literature

script

Langenecker J. Maurer M.: Handbuch des Bauar-beitsrechts, Werner, München, 2004.

Thomas H., Putzo H.: Zivilprozessordnung (ZPO) Kommentar, 30. Aufl., Beck, München, 2009.

Theobald C., Nill-Theobald C.: Energierecht, 7. Aufl., Beck, München, 2009.

Koch H.-J.: Umweltrecht, 2. Aufl., Heymanns, Mün-chen 2007.

I7104 traffic and environment law, public business law**Aims**

The students shall be prepared for their later work in the area of resource and environment management. Therefore they will learn about the assignments in the area of construction and maintenance of roads, rails and water traffic routes. Additionally the knowledge about public business law, especially industrial and insolvency laws, will be communicated.

Content

- Traffic law
 - Basics of road traffic law
 - Compensations in traffic law
 - Legal basics for construction and maintenance of traffic routes (roads, rails, water)
- Environment law
 - Sources of rights in environment law: EU-law, federal law, state law, commune law
 - Emission protection law with attachment and act
 - Water law
 - Disposal law
 - Noise protection
 - Soil protection
 - Environmental criminal law
 - Environment code law
 - Civil and criminal responsibility for contamination
 - Circuit economy law, illicit treatment of waste
- Public business law
 - Basics of insolvency law
 - Basics of industrial law

Eligibility for admission/ recommended requirements

I3207 Basics of law

Type of examination

Written exam, 90 minutes

Methods

Seminar with exercises

Literature

Script,

Ferner W., Al-Jumali D.: Handbuch Straßenverkehrsrecht, 2. Aufl., Luchterhand, Neuwied, 2003.

Wiesinger M., Markuske S.: Straßenrecht, Schmidt, Berlin, 2003.

Umweltgesetzbuch (UGB), Beck, München, 2009.

Storm P.C.: Umweltrecht (UmwR), 20. Aufl., Beck, München, 2009.

Hansmann K.: Grundzüge des Umweltrechts, 3. Aufl., Schmidt, Berlin, 2007.

Becker C.: Insolvenzrecht, 2. Aufl., Heymann, München, 2008.

Robinski, S.: Gewerberecht, 2. Aufl., Beck, München, 2002.

Module: Traffic and environment law, public business law

Module number I-26

Module responsible Prof. Dr. Klaus Englert

Course specialization

Course number and course name I7105 register and property law

I7104 traffic and environment rights, public
business law

Semester 7

Length of the Module 1 Semester

Course Type mandatory

Niveau Bachelor

SWS 6.0

ECTS 6.0

Workload attendance: 90.0 hours

Self-studying : 90.0 hours

Total: 180.0 hours

Teaching-/ course language German

Module´s Objectives

The students will get to know important knowledge in the areas of traffic right, environment right and public business law, especially industrial law and insolvency law. Additionally the students will learn the rules of realty law, especially its composition, effect and information content of the registers and the realty cadaster.

Eligibility for admission/ recommended requirements

I3207 Basics of law

Content

- Traffic law
- Environment law
- Public business law
- Register and property law

Methods of teaching

Seminar with exercises

Specialty

I7104 written exam, 90-180 minutes or seminar paper

I7105 written exam, 90-120 minutes or seminar paper

I7105 register and property law

Aims

The students shall get familiar with the property right in general as well as the composition and content of the register and realty cadasters. They shall deepen their already gained knowledge of the register and therefore study real estate rights and effects of register. Additionally they will be taught about the systematics and composition of the realty cadasters as a legal index for properties in the register. With the basics of case of compulsory auction proceedings in respect of immovable property and real estate regulations according to the BauBG, the students shall gain more competencies.

Content

- Legal questions for acquisition, disposal or rearrangement (separation, union) of property
- Content, composition and effect of register
- Content, composition and effect of realty cadasters
- Legal basics of register and cadasters
- Handling with real estate rights, e.g. condominium and part-ownership, building lease
- Use of site-related data in geographical information systems (GIS)
- Excursion to land registry with deepening the knowledge of compulsory auction
- Excursion to land surveying office with deepening the knowledge of land boundaries
- Automatic data exchange between land registry and land surveying office

Eligibility for admission/ recommended requirements

Basic knowledge of BGB and administrative law

Type of examination

Written exam, 90 minutes

Methods

Seminar with exercises

Literature

Püschel/Harreiter: Handbuch zu Grundbuch und Liegenschaftskataster, 1. Auflage, Boorberg-Verlag, Stuttgart, 2008.

Schriftenreihe zur Ausbildung: Das Liegenschaftskataster, Landesamt für Vermessung und Geoinformation München, 2008 (wird gegen Unkostenbeitrag gestellt).

I7104 traffic and environment law, public business law

Aims

environment management. Therefore they will learn about the assignments in the area of construction and maintenance of roads, rails and water traffic routes. Additionally the knowledge about public business law, especially industrial and insolvency laws, will be communicated.

Content

- Traffic law
 - Basics of road traffic law
 - Compensations in traffic law
 - Legal basics for construction and maintenance of traffic routes (roads, rails, water)
- Environment law
 - Sources of rights in environment law: EU-law, federal law, state law, commune law
 - Emission protection law with attachment and act
 - Water law
 - Disposal law
 - Noise protection
 - Soil protection
 - Environmental criminal law
 - Environment code law
 - Civil and criminal responsibility for contamination
 - Circuit economy law, illicit treatment of waste
- Public business law
 - Basics of insolvency law
 - Basics of industrial law

Eligibility for admission/ recommended requirements

I3207 Basics of law

Type of examination

Written exam, 90 minutes

Methods

Seminar with exercises

Literature

Skriptum,

Ferner W., Al-Jumali D.: Handbuch Straßenverkehrsrecht, 2. Aufl., Luchterhand, Neuwied, 2003.

Wiesinger M., Markuske S.: Straßenrecht, Schmidt, Berlin, 2003.

Umweltgesetzbuch (UGB), Beck, München, 2009.

Storm P.C.: Umweltrecht (UmwR), 20. Aufl., Beck, München, 2009.

Hansmann K.: Grundzüge des Umweltrechts, 3. Aufl., Schmidt, Berlin, 2007.

Becker C.: Insolvenzrecht, 2. Aufl., Heymann, München, 2008.

Robinski, S.: Gewerberecht, 2. Aufl., Beck, München, 2002.

Module: Public law II

Module number I-27

Module responsible Prof. Dr. Klaus Englert

Course specialization

Course number and course name I7106 public procurement and contract law

Semester 7

Length of the Module 1 Semester

Course Type mandatory

Niveau Bachelor

SWS 6.0

ECTS 6.0

Workload attendance: 90.0 hours
Self-studying : 90.0 hours
Total: 180.0 hours

Teaching-/ course language German

Module ´s Objectives

The students will get to know the systematics of public procurement and the structure of the contract law. They will gain further knowledge in construction contract law, concerning the VOB, VOF and HOAI.

Eligibility for admission/ recommended requirements

I6108 contract law

Content

- Public procurement law
- Contract law

Methods of teaching

Seminar with exercises

Specialty

Written exam, 90-180 minutes or seminar paper

I7106 public procurement and contract law

Aims

The students will get to know the systematics of public procurement and the structure of the contract law. Additionally to the knowledge gained in module "contract law" I-6108, the students will learn about the construction contract law involving parts B and C of the VOB. They will gain an overview of the systematics of scope of design and rewards of architects and engineering contracts.

The students shall gain the skills to work on contracts, especially architects and engineering contracts as well as other procedures in the environment and resource sector.

Content

Characteristics of contracts in the areas of energy economy and in relation with the protection of resources and environment (relevant environment laws (BImSchG, BodenschutzG etc)

- Legal nature of HOAI, VOB and VOF
- Composition and significance of part A, B, C of VOB
- VOB Part A: knowledge of public procurement law and the possibility of remedy with public procurement procedures
- VOB Part B: legal nature, systematics, basis for a claim, roles of contracting body and contractor, systematics of compensation arrangement and liability for defects
- VOB Part C: significance, composition, model cases
- Significance of VOF and VOL
- Presentation and contract content of planning contracts
- Liability law of architects, engineers
- Knowledge of systematic of HOAI
- Current judicature for public procurement law as well as VOB and HOAI
- Cases

Eligibility for admission/ recommended requirements

I6108 contract law

Type of examination

Written exam, 90 minutes

Methods

Seminar with exercises

Literature

vorlesungsbegleitendes Skriptmaterial,
zusätzlich:

Kapellmann K.D., Langen W.: Einführung in die VOB/B, 18. Aufl., Werner, Neuwied, 2009.

Englert K., Motzke G., Wirth A.: Baukommentar, 2. Aufl., Werner, Neuwied, 2009.

Schalk G.: Handbuch Nebenangebote- Sondervor-schläge im Vergabe- und Bauvertragsrecht, Werner, Düsseldorf, 2009.

Markus J., Kaiser S., Kapellmann S.: AGB-Handbuch Bauvertragsklauseln, 2. Aufl., Werner, Neuwied, 2008.

Theobald C., Nill-Theobald C.: Energierecht, 7. Aufl., Beck, München, 2009.

Koch H.-J.: Umweltrecht, 2. Aufl., Heymanns, München 2007.

Module: Practical Seminar

Module number I-28

Module responsible Prof. Dr. Volker Wirth

Course specialization

Course number and course name I5101 presentation techniques, building site safety, presentation

Semester 5

Length of the Module 1 Semester

Course Type mandatory

Niveau Bachelor

SWS 5.0

ECTS 5.0

Workload attendance: 75.0 hours
Self-studying : 75.0 hours
Total: 150.0 hours

Teaching-/ course language German

Module´s Objectives

Before their internship, the students will gain knowledge about presentations and the technical documentation. With this knowledge they are able to present their results in their internship. For their practical actions they will receive an introduction in the safety regulations on building sites.

Content

- Composition and content of a presentation
- Devices for a presentation
- Execution of presentation
- Knowledge of building site safety

Methods of Teaching

Seminar with exercises and presentations

Specialty

Written exam, 90-150 minutes or seminar paper/presentation

I5101 presentation techniques, building site safety, presentation

Aims

Presentation techniques:

The students shall get to know the main techniques of a presentation in order to be able to present convincingly in practice. Important management competencies are communicated as well.

Knowledge:

- Instruments of presentations
- Slide design
- Structures
- Technical descriptions
- Orientation of target audience
- Argumentation of use

Skills:

- Use of the knowledge mentioned above in a presentation or technical documentation

Competencies:

- Convincing presentation of products and services

Building site security:

The students shall be able to recognize the principles of working security and health protection in connection with the regulations for the different planning and building phases. Therefore, the students gain knowledge about the legal surrounding, the handling of federal legal requirements, the use in building planning and building execution, compiling of risk assessment as a basis of use with working security and health protection as well as the realization of risk factors and the order of measures for a secure working surrounding. The students will get to know the working security as an integrated part of the construction procedures.

Presentation:

The students shall constructive to the part "presentation techniques" talk about their work at their internship. They show their ability for having a technical documentation with a presentation.

Content

Presentation techniques:

- Instruments of presentations
- Slide design
- Structures
- Orientation of target audience
- Argumentation of use
- Case studies

Building site safety:

- Introduction of the aims of working security and legal requirements
- Contents of accident prevention regulation, federal instructions
- Ranking of achievement of aims of working security
- Realizing factors of danger and defining measures
- Rating of factors of danger as a basis of realizing the working safety requirements
- Realization of connection of danger and endangerment with the help of working procedures, accidents and their prevention
- Aims of working security and construction operation

Presentation:

- Presentations of work at internship
- Presentation and documentation
- Media competency and key qualifications

Type of examination

Written exam, 90 minutes

Methods

Seminar with exercises and case studies, presentations

Literature

Presentation techniques:

Hartmann M.: Präsentieren, Beltz, Weinheim, 2008.

Litzcke S.: Präsentationstechnik für Ingenieure, VDE-Verlag, Berlin, 2009.

Building site security:

Aktuelle Ausgaben der Schriften der Berufsgenossenschaften und anderer gesetzlichen Unfallversicherungsträger: www.hvbg.de, www.dguv.de etc.

Aktuelle Rechtstexte zu Arbeitssicherheit:

ArbSchG, BetrSichV, BaustellV, ArbStättV etc.

www.baua.de (Bundesanstalt für Arbeitsschutz)

Module: Internship

Module number I-29

Module responsible Prof. Dr. Volker Wirth

Course specialization

Course number and course name I5102 internship

Semester 5

Length of the Module 1 Semester

Course Type mandatory

Niveau Bachelor

SWS 20.0

ECTS 25.0

Workload Self-studying : 750.0 hours

Total: 750.0 hours

Teaching-/ course language German

Module ´s Objectives

The students shall get to know their future occupational surrounding and apply the learnt theory in practice of the resource and environment management.

Eligibility for admission/ recommended requirements

I5101 presentation techniques, building site safety and presentation

Content

- Practical work
- Application of academic basics
- Different operational areas

Methods of teaching

Practical work

Specialty

I5101 presentation

I5101 Internship

Aims

The students will apply the learnt theory in the areas of energy, resources, management and law in an internship. They will receive a deeper insight in their future work.

Content

- Practical work in the area of engineering and expert offices
- Consultant engineers
- Operator of environment engineering facilities and constructions
- Companies of environment engineering and environment protection
- Administration of government service

Eligibility for admission/ recommended requirements

I5101 presentation techniques, building site security, presentation

Type of examination

Written exam, 90 minutes

Methods

Practical work

Module: Bachelor thesis

Module number I-30

Module responsible Prof. Dr. Bernhard Bösl

Course specialisation

Course number and course name

Semester

Length of the Module -9998 semester

Course Type

Niveau Bachelor

SWS 0.0

ECTS 0.0

Workload

Total: 0.0 hours

Teaching-/ course language German

Module´s Objectives

The students prove the achievement of the aim of the study course by writing a bachelor thesis

Eligibility for admission/ recommended requirements

I5101 presentation techniques, building site security, presentation

Content

- Application of academic methods
- Academic documentation
- Interdisciplinary working
- Interface competencies

Methods of teaching

Academic working

Specialty

Thesis