



HOCHSCHULE COBURG

Department of Design

Academic Program in Civil Engineering (Bachelor)

Branches

General civil engineering

Energy-efficient building design

Module Manual

SPO B BI dated July 15, 2019

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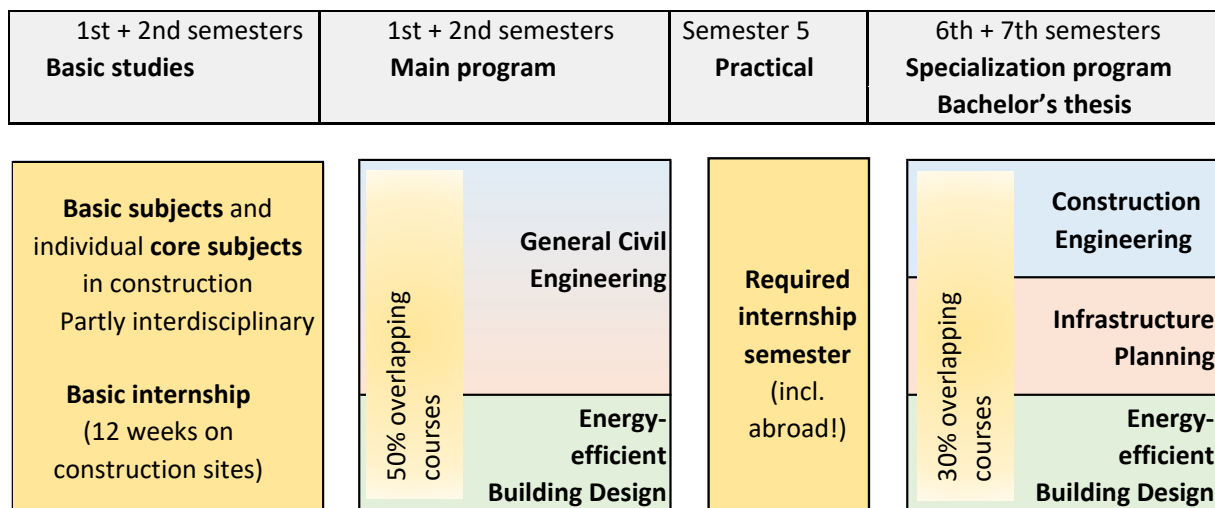
1 Curriculum of the civil engineering program (Bachelor)

The modules and examinations of the Bachelor's program in Civil Engineering are based on the program and examination regulations (SPO B BI) dated July 15, 2019, introduced for the winter semester 2019/2020. They form the legal basis for the program.

The SPO B BI supplements the general examination regulations for technical colleges (*RaPO*) and the general examination regulations of the University for Applied Sciences Coburg (*APO*) in the respective valid version.

This module manual describes the curriculum and contents of the individual subjects. It is for information purposes only, so that unannounced changes on short notice are possible.

The documents listed above are available for download on the website of Coburg University.



After completing the Bachelor's program, we recommend continuing on to the consecutive Master's program in "Sustainable Planning and Design -Civil engineering" (M.Eng.) at Coburg University.

Notes:

- A Program branch "General civil engineering"
- Ak Specialization in construction engineering
- Ap Specialization in infrastructure planning
- E Program branch "Energy-efficient building design"

Module overview SPO 2019

General civil engineering with specialization in construction engineering

Sem. 1 WS	Module 1 Mathematics 8 ECTS	Module 2 Structural Mechanics 4 ECTS	Module 4 Materials Science 8 ECTS	Module 6 Construction 1 6 ECTS	Module 7 Descriptive Geometry 2 ECTS	Module 9 Constr. Computer Science 4 ECTS	Module 14 General Law 2 ECTS
		Module 10 Support 4 ECTS		Module 12 Sustainability 4 ECTS			
Sem. 2 SS		Module 3 Structural Analysis 1 8 ECTS		Module 5 Building Physics 6 ECTS	Module 13 Constr. 4 ECTS	Module 8 CAD 2 ECTS	Module 11 Settlement Water Mgmt 1 4 ECTS
						Module 15 Academic writing 2 ECTS	
Sem. 3 WS	Module 25.1 Soil Mechanics 4 ECTS		Module 23 Materials Comprehensive Surveying 6 ECTS		Module 22 Building Technology 4 ECTS	Module 26 Street Design 4 ECTS	Module 32 Waterways 4 ECTS
Sem. 4 SS	Module 25.2 Foundation Engineering 5 ECTS	Module 31 Structural Analysis 2 6 ECTS	Module 24 Structural Concrete 1 5 ECTS	Module 21 Constr. 2 4 ECTS	Module 27 BIM 2 ECTS	Module 33 Road Construction 4 ECTS	Module 34 Surveying 2 ECTS
							Module 35 Building 2 ECTS
Sem. 5 WS	Module 51 Practical Phase					Module 52 Practical Seminar 2 ECTS	Module 53 Practice. LV 4 ECTS
Sem. 6 SS	Module 71 Special Civil Engineering 5 ECTS	Module 72 Num. Structural Analysis Area TW 5 ECTS	Module 74 Steel Construction 4 ECTS	Module 77 Compulsory Elective 1 4 ECTS	Module 62 Calculation Constr. Mgmt 4 ECTS	Module 61 Construction Law: Environmental & Guideline Planning 6 ECTS	Module 78 Compulsory elective 2 4 ECTS
Sem. 7 WS		Module 75 Timber and Composite Structures 5 ECTS	Module 73 Structural Concrete 2 5 ECTS	Module 64 Interdisc. Project 5 ECTS	Module 63 Fire Protection 2 ECTS	Module 65 Final Thesis 10+1 ECTS	

Key	Constr. engin. all (A + E)	General constr. engin. (A = Ak + Ap)	Specialization construction (Ak)	Specialization infrastructure (Ap)	Program branch EEGD (E)
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Module overview SPO 2019

General civil engineering with specialization in infrastructure planning

Sem. 1 WS	Module 1 Mathematics 8 ECTS	Module 2 Technical Mechanics 4 ECTS	Module 4 Materials science 8 ECTS	Module 6 Construction 1 6 ECTS	Module 7 Descriptive Geometry 2 ECTS	Module 9 Constr. Computer Science 4 ECTS	Module 14 General Law 2 ECTS
		Module 10 Support 4 ECTS		Module 12 Sustainability 4 ECTS		Module 8 CAD 2 ECTS	Module 11 Settlement
Sem. 2 SS		Module 3 Structural Analysis 1 8 ECTS		Module 5 Building Physics 6 ECTS	Module 13 Constructio 4 ECTS	Module 15 Academic writing 2 ECTS	Module 11 Water Mgmt 1 4 ECTS
Sem. 3 WS	Module 25.1 Soil Mechanics 4 ECTS		Module 23 Materials Comprehensive Surveying 6 ECTS		Module 22 Building Technology 4 ECTS	Module 26 Street Design 4 ECTS	Module 32 Waterway 4 ECTS
Sem. 4 SS	Module 25.2 Foundation Engineering 5 ECTS	Module 31 Structural Analysis 2 6 ECTS	Module 24 Structural Concrete 1 5 ECTS	Module 21 Constr. 2 4 ECTS	Module 27 BIM 2 ECTS	Module 33 Road Constr. 4 ECTS	Module 34 Surveying 2 ECTS Module 35 Building 2 ECTS
Sem. 5 WS	Module 51 Practical Phase					Module 52 Practical Seminar 2 ECTS	Module 53 Practice. LV 4 ECTS
Sem. 6 SS	Module 87 Compulsory Elective 1 4 ECTS	Module 88 Compulsory Elective 2 4 ECTS	Module 86 Constr. Material Recycling 3 ECTS	Module 61 Constr. Law: Environmental & Guideline Planning 6 ECTS	Module 62 Calculation Constr. Mgmt 4 ECTS	Module 84 Traffic Planning 4 ECTS	Module 81 Settlement Waterway Eng. 2 4 ECTS
Sem. 7 WS	Module 83 Embankment and Landfill Constr. 4 ECTS		Module 65 Final Thesis 10+1 ECTS	Module 64 Interdisc. Project 5 ECTS	Module 63 Fire protection 2 ECTS	Module 85 Preservation of Road Structure 4 ECTS	Module 82 Waterway Engineering 2 5 ECTS

Key	Constr. engin. all (A + E)	General constr. engin. (A = Ak + Ap)	Specialization construction (Ak)	Specialization infrastructure (Ap)	Program branch EEGD (E)
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Module overview SPO 2019

Branch of study in energy-efficient building design

Sem. 1 WS	Module 1 Mathematics 8 ECTS	Module 2 Structural Mechanics 4 ECTS Module 10	Module 4 Materials Science 8 ECTS	Module 6 Construction 1 6 ECTS Module 12	Module 7 Descriptive Geometry 2 ECTS	Module 9 Constr. Computer Science 4 ECTS	Module 14 General Law 2 ECTS
		Support 4 ECTS		Sustainability 4 ECTS	Module 13 Constr. 4 ECTS	Module 8 CAD 2 ECTS	Module 11 Settlement Water Mgmt 1 4 ECTS
Sem. 2 SS		Module 3 Structural Analysis 1 8 ECTS		Module 5 Building Physics 6 ECTS		Module 15 Academic writing 2 ECTS	
Sem. 3 WS	Module 25.1 Soil Mechanics 4 ECTS	Module 23 Materials Comprehensive Surveying 6 ECTS			Module 22 Building Technology 4 ECTS	Module 26 Street Design 4 ECTS	Module 44 Thermo & Fluid 4 ECTS
Sem. 4 SS	Module 27 BIM 2 ECTS	Module 21 Construction 2 4 ECTS	Module 24 Structural Concrete 1 5 ECTS	Module 41 Heat and Moisture Insulation 5 ECTS	Module 43 Building Technology 2 6 ECTS	Module 42 Building Energy Design 4 ECTS	Module 45 Measurement & Regulation Technology 4 ECTS
Sem. 5 WS	Module 51 Practical Phase					Module 52 Practical Seminar	Module 53 Practice. LV 4 ECTS
Sem. 6 SS	Module 61 Constr. Law Environmental & Guideline Planning 6 ECTS	Module 62 Calculation Constr. Mgmt 4 ECTS	Module 96 Construction History 2 2 ECTS Module 97 Compulsory Elective 2 ECTS	Module 92 Building Climate Control 7 ECTS	Module 93 Lighting Engineering 4 ECTS	Module 91 Building Energy Design 2 5 ECTS	Module 94 Building Automation 3 ECTS
Sem. 7 WS			Module 64 Interdisc. Project 5 ECTS	Module 95 Noise Protection: Room Acoustics 9 ECTS	Module 63 Fire Protection 2 ECTS	Module 65 Final Thesis 10+1 ECTS	
Key	Constr. engin. all (A + E)	General constr. engin.	Specialization construction (Ak)	Specialization infrastructure (Ap)	Program branch EEGD (E)		

2 Overview of courses and examinations

1	2	3	4	5	6	7	8	9
Serial no.	Courses			Examinations ¹⁾				
	Modules	SWH	Type of course ¹⁾	Type	Duration (in minutes)	AR	Weight of final grade in overall examination grade	Credits (ECTS)

1. Studies in semesters 1 and 2

1	Mathematics	8	SL, Exc	wrEx	90 - 150	PPs ³	5	8
2	Structural mechanics	4	SL, Exc, Int	wrEx	90 - 150	PPs ³	3	4
3	Structural analysis 1							
3.1	Structural analysis 1 (<i>Part 1</i>)	4	SL, Exc					4
4	Construction materials and technical chemistry	8	SL, Exc, Int, ExC	wrEx	90 - 150	PPs ^{1,3}	4	8
5	Building Physics							
5.1	Construction Physics (<i>Part 1</i>)	2	SL, Exc, Int,					2
6	Construction 1 ²⁾							
6.1	Structural Design 1	4	SL, Exc	ERP			3	4
6.2	Freehand Drawing	1	SL, Exc, Int	RPPp/f				1
6.3	Constructional Drawing	1	SL, Exc, Int	RPPp/f				1
7	Descriptive Geometry	2	SL, Exc, Int	wrEx	90 - 150	PPs ³	1	2
8	CAD	2	SL, Exc, Int	RPP		PPs ³	1	2
9	Computer Science	4	SL, Exc, Int	RPP		PPs ³	3	4
10	Load-bearing Structures	4	SL, Exc	RPP / wrEx	90 - 150		3	4
11	Urban Water Supply and Sanitation Systems 1	4	SL, Exc, Int, ExC	wrEx	90 - 150		3	4

12	Sustainability							
12.1	Principles of Sustainable Building	2	SL, Exc, ExC	wrEx	90 - 150		1	2
12.2	Circular Economy	2	SL, Exc, ExC	wrEx	90 - 150		1	2
13	Construction Operations	4	SL, Exc, Int,	wrEx	90 - 150		3	4
14	General Law	2	SL, Exc	wrEx	90 - 150		1	2
15	Academic Writing	2	SL, Exc, L, Exc	RPP or ERP			1	2

Subtotal 1 st and 2 nd semesters	60
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33	60
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2. Studies in semesters 3 and 4

1	2	3	4	5	6	7	8	9
Serial no.	Courses			Examinations ¹⁾				
	Modules	SWH	Type of course ¹⁾	Type	Duration (in minutes)	AR	Weight of final grade in overall examination grade	Credits (ECTS)

2.1 Joint program

5.2	Construction Physics (<i>Part 2</i>)	3	SL, Exc, Int,	wrEx	90 - 150	PPs ₁	4	4
21	Structural Design 2	3	L, SL, Exc	ERP, Co and Pres		PPs ₆	4	4
22	Building Technology 1	4	SL, Exc, ExC	wrEx	90 - 150		4	4
3.2	Structural Analysis 1 (<i>Part 2</i>)	4	SL, Exc	wrEx	90 - 150	PPs ³	8	4
23	Non-material-specific surveying and construction	6	SL, Exc, ExC	wrEx	90 - 150	PPs ³	6	6
24	Structural Concrete 1	4	SL, Exc, ExC	wrEx	90 - 150	PPs ³	5	5
25	Geo-technology							
25.1	Soil Mechanics ³⁾	3	SL, Exc, Int,	RPPp/f		PPs ₁	4	4
26	Road Design	4	SL, Exc, ExC	RPP and wrEx	90 - 150	PPs ₅	4	4
27	Building Information Modeling	2	SL, Exc, Int	wrEx	90 - 150	PPs ³	2	2

Subtotal Joint Program	33
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41	37
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2.2 Program branch "General civil engineering" (A)

1	2	3	4	5	6	7	8	9
Serial no.	Courses			Examinations ¹⁾				
	Modules	SWH	Type of course ¹⁾	Type	Duration (in minutes)	AR	Weight of final grade in overall examination grade	Credits (ECTS)
31	Structural Analysis 2	5	SL, Exc	wrEx	90 - 150	PPs ³	6	6
25.2	Foundation Engineering	4	SL, Exc, ExC	wrEx	90 - 150	PPs ³	5	5
32	Waterway Engineering 1	4	SL, Exc, Int,	wrEx	90 - 150	PPs ₁	4	4
33	Road Construction	4	SL, Exc, Int,	wrEx	90 - 150	PPs ₁	4	4
34	Surveying	2	SL, Exc, Int	wrEx	90 - 150	PPs ₁	2	2
35	Building History	2	SL, Exc, L,	ERP			2	2
Subtotal (A)		21	23					23
Subtotal 3rd and 4th semesters (A)		54	64					60

2.3 Program branch "Energy-efficient building design" (E)

1	2	3	4	5	6	7	8	9
Serial no.	Courses			Examinations ¹⁾				
	Modules	SWH	Type of course ¹⁾	Type	Duration (in minutes)	AR	Weight of final grade in overall examination grade	Credits (ECTS)

41	Heat and Moisture Insulation	5	SL, Exc, Int,	wrEx	90 - 150	PPs _{1.3}	5	5
42	Building Energy Design 1	4	SL, Exc, Int,	wrEx	90 - 150	PPs ₂	4	4
43	Building Technology 2	6	SL, Exc, Int,	wrEx	90 - 150	PPs ₁	6	6
44	Thermodynamics and Fluid	4	SL, Exc	wrEx	90 - 150		4	4
45	Measurement and Control	4	SL, Exc	wrEx	90 - 150		4	4

Subtotal (E)		23	23					23	
Subtotal 3 rd and 4 th semesters (E)		56	64					60	

3. Program in 5th semester (required internship)

51	Practical phase							24
52	Practical seminar ³⁾	1	S	Pres, THT, ERP				2
53	Internship-related courses ³⁾	4	SL	ERP				4

Subtotal 5 th semester (A and E)		5						30	
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4. Studies in semesters 6 and 7

1	2	3	4	5	6	7	8	9
Serial no.	Courses			Examinations ¹⁾				
	Modules	SWH	Type of course ¹⁾	Type	Duration (in minutes)	AR	Weight of final grade in overall examination grade	Credits (ECTS)

4.1 Joint program

61	Construction Law							
61.1	Construction Law	2	SL, Exc	wrEx	90 - 150		3	3
61.2	Environmental & Guideline	2	SL, Exc	wrEx	90 - 150		3	3
62	Calculation and Project	4	SL, Exc, ExC	wrEx	90 - 150		4	4
63	Fire Protection	2	SL, Exc, ExC	wrEx	90 - 150		2	2
64	Interdisciplinary Project	4	SL, Exc, ExC	ERP, Co and Pres			5	5
65	Final Thesis							
65.1	Bachelor seminar ⁴⁾	2	S, ExC	Pres		PPS ₄	1	1
65.2	Bachelor's Thesis		BT	BT			10	10

Subtotal joint program	16
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28	28
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4.2 Program branch "General civil engineering" (A)

4.2.1 Specialization construction engineering (Ak)

1	2	3	4	5	6	7	8	9
Serial no.	Courses			Examinations ¹⁾				
	Modules	SWH	Type of course ¹⁾	Type	Duration (in minutes)	AR	Weight of final grade in overall examination grade	Credits (ECTS)

71	Special Civil Engineering	4	SL, Exc, ExC	wrEx	90 - 150	PPs ³	5	5
72	Numerical Structural Analysis and Analysis	4	SL, Exc, ExC	wrEx	90 - 150	PPs ³	5	5
73	Structural Concrete 2	4	SL, Exc, ExC	wrEx	90 - 150	PPs ³	5	5
74	Steel Construction	3	SL, Exc, ExC	wrEx	90 - 150	PPs ³	4	4
75	Timber and Composite							
75.1	Timber Structures	3	SL, Exc, ExC	wrEx	90 - 150	PPs ³	3	3
75.2	Composite Structures	2	SL, Exc, ExC	wrEx	90 - 150	PPs ³	2	2
77.1&2	Compulsory Elective Module 1 ⁵⁾	2*2=4	SL, Exc, L, Int, ExC	sR			4	4
78.1&2	Compulsory Elective Module 2 ⁵⁾	2*2=4	SL, Exc, L, Int, ExC	sR			4	4

Subtotal specialization (Ak)	28
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32	32
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4.2.2 Specialization infrastructure

1	2	3	4	5	6	7	8	9	
Ser. no.	Courses			Examinations ¹⁾					
	Modules	SWH	Type of course ¹⁾	Type	Duration (in minutes)	AR	Weight of final grade in overall examination grade	Credits (ECTS)	
81	Urban Water Supply and	4	SL, Exc, Int,	wrEx	90 - 150		4	4	
82	Waterway Engineering 2	4	SL, Exc, Int,	wrEx	90 - 150	PPs ₁	5	5	
83	Embankment and Landfill	3	SL, Exc, ExC	wrEx	90 - 150	PPs ³	4	4	
84	Transportation	4	SL, Exc, Int,	wrEx	90 - 150	PPs ³	4	4	
85	Preservation of Road	3	SL, Exc, Int,	wrEx	90 - 150	PPs ³	4	4	
86	Construction Material	2	SL, Exc, ExC	wrEx	90 - 150		3	3	
87.1&2	Compulsory Elective Module 1 ₅₎	2*2=4	SL, Exc, L, Int, ExC	sR			4	4	
88.1&2	Compulsory Elective Module 2 ₅₎	2*2=4	SL, Exc, L, Int, ExC	sR			4	4	
Subtotal specialization (Ap)		28	32					32	
Subtotal 6 th and 7 th semesters (A)		44	60						60

4.3 Program branch "Energy-efficient building design" (E)

1	2	3	4	5	6	7	8	9
Serial no.	Courses			Examinations ¹⁾				
	Modules	SWH	Type of course ¹⁾	Type	Duration (in minutes)	AR	Weight of final grade in overall examination grade	Credits (ECTS)

91	Building Energy Design 2	4	SL, Exc, Int,	wrEx	90 - 150	PPs ³	5	5
92	Building Climate Control	6	SL, Exc, Int,	wrEx	90 - 150	PPs _{1,2,3}	7	7
93	Lighting Engineering	3	SL, Exc, Int,	wrEx	90 - 150	PPs ₁	4	4
94	Building Automation	2	SL, Exc, Int,	wrEx	90 - 150		3	3
95	Noise Protection and Room	9	SL, Exc, Int, ExC	wrEx	90 - 150	PPs _{1,3}	9	9
96	Building History	2	SL, Exc, L,	ERP			2	2
97	Compulsory Elective Module	2	SL, Exc, L, Int, ExC	sR			2	2

Subtotal (E)	28	32	32
Subtotal 6 th and 7 th semesters (E)	44	60	60

Total (A)	163
Total (E)	165

157	210
157	210

Explanation of footnotes

- 1) The Examination Committee specifies the schedule for the following semester at the end of the current semester in the program and examination plan. If no other number is specified, there is one examination.
If the final grade is formed in several partial examinations, the final grade "sufficient" or better requires that each partial examination was passed with at least the grade "sufficient." If the grade in one partial examination is "fail," the final grade is also "fail."
- 2) The final grade is determined by the submodule examination No. 6.1. Submodule examinations Nos. 6.2 and 6.3 must be passed with the "pass" grade.
- 3) Grade Pass/Fail completed.
- 4) For the first and second attempt for the Bachelor's thesis, taking the accompanying Bachelor seminar is mandatory. Students should present and defend the question, proposed solutions and methods, and the results of their Bachelor's thesis. If the Bachelor's thesis is repeated, the final grade of the associated Bachelor seminar is decisive.
- 5) As defined in Section 3, Para. 5: From this compulsory elective module group, a project module must be selected based on the available selection and capacity limits of the course.

List of Abbreviations

BT	Bachelor's thesis (Ger.: BA <i>Bachelorarbeit</i>)
ExC	Excursion or courses held locally outside of the university under the university's responsibility (Ger.: ExC)
PP(s)	Proof(s) of performance (Ger.: LNe <i>Leistungsnachweise</i>), specifically:
PPs ₁	The admission prerequisite for examination is the successful completion of experimental and exercise units associated with the subject
PPs ₂	The admission prerequisite for examination is the successful completion of one or several research papers / presentations
PPs ₃	The admission prerequisite for examination is the solution, and if applicable, presentation of exercises
PPs ₄	The admission prerequisite is attendance at individual announced courses
PPs ₅	THT/research paper (solution depending on criteria) and wrEx (90...150 min). Weighting of the final grade in relationship THT/research paper to wrEx: 1/5 to 4/5th Only students who have successfully completed the THT/research paper are admitted to the wrEx. If the THT/research paper is passed and the subsequent wrEx is not passed, only the wrEx must be repeated in the subsequent semesters.
PPs ₆	Admission prerequisite for examination is the successful completion of an interim test
THT	Take-home test (Ger.: HA <i>Hausarbeit</i>)
Co	Colloquium (Ger.: Co <i>Kolloquium</i>)
Pres	Presentation (Ger.: Prä <i>Präsentation</i>)
sR	Separate regulation in program and examination plan (Ger.: gR <i>gesonderte Regelung</i>)
Int	internship (Ger.: Pr <i>Praktikum</i>)
ERP	Examination research paper (Ger.: ERP <i>Prüfungsstudienarbeit</i>)
S	Seminar
wrEx	Written examination (Ger.: schrP <i>schriftliche Prüfung</i>)
oEx	Other examination (Ger.: sP <i>sonstige Prüfung</i>)

RPPp/f Research and project paper, only during lecture period, pass/fail (Ger.: SPAon)
RPP Research and project paper, only during lecture period with grade (Ger.: SPA)
wrPEx Written partial examination (Ger.: schrTP)
SL Seminar-type lecture (Ger.: SU *seminaristischer Unterricht*)

SWH Semester week hours
(Ger.: SWS
Semesterwochenstunden)
Exc exercise (Ger.: Ü *Übung*)
L Lecture (Ger.: L *Vorlesung*)
AR Admission requirements (Ger.: ZV *Zulassungsvoraussetzungen*)

3 Module descriptions

Coburg University, Department of Design, Academic Program in Civil

Module 1	Mathematics / Engineering Mathematics		
Title of the course(s)	Mathematics 1 and 2		
Providing university	Coburg University		
Emphasis / program branch	Civil engineering (all)		
Proof(s) of performance – admission prerequisites for examination	PPs3		
Examination(s)	Written examination SPOB		
Semester No.	1 st and 2 nd Semester		
Type of course(s)	SL, Exc		
Sem. / compulsory or elective / SS or	2	Compulsory	WS and SS
Language	German		

Submodule	Type	SWH	Credits	Students	Work load
Module 1	SL, Exc	8	8 ECTS	unlimited	240 h (120h lecture, 120h self)

Objectives / skills	
<ul style="list-style-type: none"> - Ability to think and work in a mathematical, structured, and systematic manner - Learning and applying mathematical concepts needed for the program and practical work of a civil engineer. 	
Contents	
<p>Mathematics I: Elementary functions (trigonometric functions and arc functions, polynomials, interpolation, null point calculation, Horner's method, Cardan's formula, broken rational functions, powers and roots, exponential and logarithmic functions, hyperbola and area functions), complex numbers, single-variable differential calculus, single-variable integral calculus, integration of rational functions, numerical integration, multiple integrals for the calculation of areas, volumes, centers of gravity, surface moment of inertia, systems of linear equations,</p> <p>Mathematics II: Matrices, determinants, Cramer's rule, eigenvalues, multi-variable differential calculus, partial derivatives, extreme values with constraints, writing down and solving ordinary (homogeneous and inhomogeneous) differential equations, sequences and series, power series (Taylor series), Fourier series, introduction to probability / statistics</p>	
Literature	
Current lecture scripts of instructors (contain references), textbooks by Papula	
Work forms and didactic tools	
Seminar-type classes and exercises in WS and SS, tutorial	
Prerequisites	Mathematics preparation course
Possible follow-up modules	
Sensible combination:	Module 2 (Mechanics) Module 3 (Structural Analysis)
References / script	Current lecture scripts of the instructor (Parts 1 and 2)
Contact person	Dr. Almut Lottmann-Löer
Application formalities	No, compulsory module
Event location	HS Coburg, Campus Design
Schedule and map	www.hs-coburg.de/bi
Other comments	

Coburg University, Department of Design, Academic Program in Civil

Module 2	Structural mechanics		
Title of the course(s)	Structural Mechanics		
Providing university	Coburg University		
Emphasis / program branch	Civil engineering (all)		
Proof(s) of performance – admission prerequisites for examination	PPs3: Solution and presentation (if appl.) of exercises (homework assignment)		
Examination(s)	Written examination SPOB §5 (1)		
Semester No.	1. Semester		
Type of course(s)	SL, Exc, Int		
Sem. / compulsory or elective / SS or	1	Compulsory	WS
Language	German		

(partial)	Type	SWH	Credits	Students	Work load
Module 2	SL, Exc, Int	4	4 ECTS	unlimited	120h (60h in-class, 60h self-dir.)

Objectives / skills	
Basic knowledge of mechanics of solid bodies at rest and in motion, including ability to apply this knowledge to practical applications	
Content	
<ul style="list-style-type: none"> - Explanation of basic concepts of vectors, forces, force couples, momentum, and balance - Composition and decomposition of forces, force couples, and momentum (graphically and by calculation) - Determination of support forces and bar forces in simple, static bar structures (graphically and by calculation) - Kinematics of center of mass and rigid bodies and the kinetic law of moving rigid bodies - Forces due to static, dynamic, and cable friction and resulting states of motion - Conservation of momentum, work, energy - Application of acquired theoretical knowledge on the example of specific problems with practical application (exercise) 	
Literature	
Script / textbooks	
Work forms and didactic tools	
Lecture / seminar / exercise	
Prerequisites	
Possible follow-up modules	Module 3 (Structural Analysis 1)
Sensible combination:	
References / script	Script
Contact person	Dr. Olaf Huth
Application formalities	No, compulsory module
Event location	HS Coburg, Campus Design
Schedule and map	www.hs-coburg.de/bi
Other comments	

Coburg University, Department of Design, Academic Program in Civil

Module 3	Structural Analysis 1		
Submodule 3.1	Structural Analysis 1 (Part 1)		
Title of the course(s)	Structural Analysis 1 (Part 1)		
Providing university	Coburg University		
Emphasis / program branch	Civil engineering (all)		
Proof(s) of performance – admission prerequisites for examination	See submodule 3.2 Structural Analysis 1 (Part 2): PPs3		
Examination(s)	See submodule 3.2 Structural Analysis 1 (Part 2): written		
Semester No.	2. Semester		
Type of course(s)	SL, Exc		
Sem. / compulsory or elective / SS or	1	Compulsory	SS
Language	German		

(Sub)module	Type	SWH	Credits	Students	Work load
Submodule 3.1	SL, Exc	4	4 ECTS	unlimited	120h (60h in-class, 60h self-dir.)

Objectives / skills	
<ul style="list-style-type: none"> - Determination of the type and size of effects on structures and components - Determination of support actions required for the equilibrium of static structures and associated stress resultants - Application of acquired knowledge to 2 and 3 dimensional structures 	
Contents	
<ul style="list-style-type: none"> - Load types, load assumptions, static systems, types of support - Equilibrium conditions, static determination - Support reactions for statically determined load-bearing structures with straight, folded, and bent structural axis (single span girder, cantilever beam, three-hinged frames and arches) - Stress resultants for statically determined load-bearing structures with straight, folded, and bent structural axis (single span girder, cantilever beam, three-hinged frames and arches) 	
Literature	
Textbooks, tables	
Work forms and didactic tools	
Lecture / seminar / exercise	
Prerequisites	Module 2 (Mechanics)
Possible follow-up modules	Module 3.2 (Structural Analysis 1 (Part 2))
Sensible combination:	
References / script	Script
Contact person	Dr. Olaf Huth
Application formalities	No, compulsory module
Event location	HS Coburg, Campus Design
Schedule and map	www.hs-coburg.de/bi
Other comments	

Coburg University, Department of Design, Academic Program in Civil

Module 3	Structural Analysis 1		
Submodule 3.2	Structural Analysis 1 (Part 2)		
Title of the course(s)	Structural Analysis 1 (Part 2)		
Providing university	Coburg University		
Emphasis / program branch	Civil engineering (all)		
Proof(s) of performance – admission prerequisites for examination	PPs3: Solution and presentation (if appl.) of exercises (homework assignment)		
Examination(s)	Written examination		
Semester No.	3. Semester		
Type of course(s)	SL, Exc		
Sem. / compulsory or elective / SS or	1	Compulsory	WS
Language	German		

(Sub)module	Type	SWH	Credits	Students	Work load
Submodule 3.2	SL, Exc	4	4 ECTS	unlimited	120h (60h in-class, 60h self-dir.)

Objectives / skills	
<ul style="list-style-type: none"> - Determination of cross-section values - Determination of stresses due to stress resultants - Determination and representation of stress diagrams over section - Approximate dimensions of a component using tables - Application of acquired knowledge in special cases (off-center normal force, core of section, failing tension zone) - Determination of the main stresses and of Mohr's stress circle (multi-axial stress state) 	
Contents	
<ul style="list-style-type: none"> - Calculation of center of gravity positions, moment of area and moment of resistance of sections - Stiffness (normal, shear, and compression tension from stress resultants; stress null line, stress diagram, core of sections, failing tension zone, main normal and main tension stresses, Mohr's stress circle) - Principles of assessment (safety concept, tension analysis) using tables - Application of acquired theoretical knowledge to the example of specific problems with practical application (exercise) 	
Literature	
Textbooks, tables	
Work forms and didactic tools	
Lecture / seminar / exercise	
Prerequisites	Module 2 (Mechanics) Module 3.1 (Structural Analysis 1 (Part 1))
Possible follow-up modules	(Structural Analysis 2)
Sensible combination:	
References / script	Script
Contact person	Dr. Olaf Huth
Application formalities	No, compulsory module
Event location	HS Coburg, Campus Design
Schedule and map	www.hs-coburg.de/bi
Other comments	

Coburg University, Department of Design, Academic Program in Civil

Module 4	Construction Materials and Material Chemistry		
Title of the course(s)	Construction Materials and		
Providing university	Coburg University		
Emphasis / program branch	Civil engineering (all)		
Proof(s) of performance – admission prerequisites for examination	PPs1, PPs3		
Examination(s)	Written examination SPOB §5 (1)		
Semester No.	1 st and 2 nd Semester		
Type of course(s)	SL, Exc, Int, ExC		
Sem. / compulsory or elective / SS or	2	Compulsory	WS and SS
Language	German		

(Sub)modul	Type	SWH	Credits	Students	Work load
Module 4	SL, Exc, Int, ExC	8	8 ECTS	unlimited	240 h (120h in-class, 120h self-dir. study)

Objectives / skills	
<ul style="list-style-type: none"> - Knowledge of concepts and fundamentals of construction materials - Knowledge of essential properties and characteristic values of construction and associated testing procedures - Ability to use construction materials properly in practice both under consideration of their durability and the applicable specification for safety, profitability, and environmental sustainability - Ability to perform calculations for general construction materials and concrete 	
Contents	
<ul style="list-style-type: none"> - Principles of construction material chemistry (watery solutions and dissociation, pH value, acids, bases) - Hygric properties of solid surfaces (adsorption, wettability, capillary effect) - Structure of solid construction materials (amorphous and crystalline construction materials, porosity and impermeability, types of pores, (moisture states, diffusion, capillary effect) - Mechanical properties of important construction materials (Hooke's law, elastic and plastic deformation, stress-strain diagram and derivable characteristic values) - Influences on the properties of construction materials under practical conditions (time, exposure conditions, type of use) - Knowledge of the production, structure, practical properties, quality criteria, and durability-relevant influences of important construction materials (steel, non-ferrous metals, timber and wood materials, bricks, masonry, aggregates, mineral bonding agents, masonry and plaster mortar, concrete, bitumen) - Principles of measurement and testing technology, standardized measurement and testing procedures (internship) - Concrete production after prior concrete mixture calculation and quality certification in fresh and cured state of concrete (internship) - Experimental determination of construction material properties (density, moisture, strength, elongation of fracture, modulus of elasticity) on construction material samples (internship) - Use of selected testing procedures for non-destructive determination / estimate of important construction material properties (internship) - Application of acquired theoretical knowledge to the example of specific problems with practical application (exercise) 	
Literature	
Technical literature, tables	
Work forms and didactic tools	
Lecture / seminar semester volume; internship / exercise in small groups	
Prerequisites	
Possible follow-up modules	
Module 23 (non-material-specific assessment)	

Sensible combination:	
References / script	Technical literature, tables, own script
Contact person	Dr.-Eng. Markus Weber
Application formalities	No, compulsory module
Event location	HS Coburg, Campus Design
Schedule and map	www.hs-coburg.de/bi
Other comments	

Module 5	Building Physics		
Submodule 5.1	Building Physics (Part 1)		
Title of the course(s)	Building Physics (Part 1); (heat and moisture protection)		
Providing university	Coburg University		
Emphasis / program branch	Civil engineering (all)		
Proof(s) of performance – admission prerequisites for examination	See submodule 5.2 Building Physics (Part 2): PPs1		
Examination(s)	See submodule 5.2 Building Physics (Part 2): written examination		
Semester No.	2. Semester		
Type of course(s)	SL, Exc, Int, ExC		
Sem. / compulsory or elective / SS or WS	1	Compulsory	SS
Language	German		

(Sub)module	Type	SWH	Credits	Students	Work load
Submodule 5.1	SL, Exc, Int,	2	2 ECTS	unlimited	60h (30h in-class, 30h self-dir.)

Objectives / skills	
<ul style="list-style-type: none"> - Knowledge of basic concepts in building physics - Familiarity with basic physical connections - Ability to apply fundamental engineering detection procedures 	
Contents	
Heat and moisture insulation	
Principles of heat transport (conduction, convection, radiation); stationary heat transport through components; transparent components, total energy transmission, characteristic values of windows, solar design of buildings; minimum air exchange, air impermeability, ventilation heat loss; heat balance of buildings and certification of heat protection according to applicable guidelines (EnEV); calculation and assessment of solar irradiation of building; condensation protection on component surfaces and minimum heat protection of components; heat bridges; condensation problems in construction and construction consequences; ventilated and unventilated roof constructions	
Literature	
Current lecture scripts of instructor (contain bibliography), textbooks, standards, regulations in current edition	
Work forms and didactic tools	
2 SWH seminar classes and exercises	
Prerequisites	
Possible follow-up modules	Module 5.2 (Building Physics: Part 2)
Sensible combination:	
References / script	
Contact person	Dr. Peter Pfrommer
Application formalities	No, compulsory module
Event location	HS Coburg, Campus Design
Schedule and map	www.hs-coburg.de/bi
Other comments	

Module 5	Building Physics		
Submodule 5.2	Building Physics (Part 2)		
Title of the course(s)	Building physics (Part 2), (building and room acoustics)		
Providing university	Coburg University		
Emphasis / program branch	Civil engineering (all)		
Proof(s) of performance – admission prerequisites for examination	PPs1: successful participation in experimental and exercise units related to subject (participation in internship)		
Examination(s)	Written examination		
Semester No.	3. Semester		
Type of course(s)	SL, Exc, Int (1 SWH), ExC		
Sem. / compulsory or elective / SS or WS	1	Compulsory	WS
Language	German		

(Sub)module	Type	SWH	Credits	Students	Work load
Submodule 5.2	SL, Exc, Int, ExC	3	4 ECTS	unlimited	120h (45h in-class, 75h self-dir. study)

Study goals	
<ul style="list-style-type: none"> - Knowledge of basic concepts in building physics - Familiarity with basic physical connections - Ability to apply fundamental engineering detection procedures - Application of a selection of measurement procedures 	
Contents	
Building and room acoustics	
Principles of acoustics; sound generation and propagation, sound perception, sound levels for room acoustics (parameters and planning procedure); parameters of building acoustics, noise insulation sound reduction index requirements pursuant to DIN 4109; sound insulation of rigid and flexible components; sound insulation of single layer and multi layer components; vertical sound transmission via flanking components; footfall sound insulation; construction consequences	
Internship	
Measurement of heat and sound parameters	
Literature	
Current lecture scripts of instructor (contain bibliography), textbooks, standards, regulations in current edition	
Work forms and didactic tools	
2 SWH seminar classes and exercises, 1 SWH internship	
Prerequisites	Module 5.1 (Building Physics Part 1)
Possible follow-up modules	
Sensible combination:	
References / script	
Contact person	Dr. Peter Pfrommer
Application formalities	No, compulsory module
Event location	HS Coburg, Campus Design
Schedule and map	www.hs-coburg.de/bi
Other comments	

Module 6	Building Construction 1		
Submodule 6.1	Building Construction 1		
Title of the course(s)	Structural Design 1		
Providing university	Coburg University		
Emphasis / program branch	Civil engineering (all), interdisciplinary with architecture		
Proof(s) of performance – admission prerequisites for examination	--		
Examination(s)	ERP: Examination research paper		
Semester No.	1. Semester		
Type of course(s)	SL, Exc		
Sem. / compulsory or elective / SS or	1	Compulsory	WS
Language	German		

(Sub)module	Type	SWH	Credits	Students	Work load
Submodule 6.1	SL, Exc	4	4 ECTS	unlimited	120h (60h in-class, 60h self-dir.)

Objectives / skills	
<ul style="list-style-type: none"> - Module participants acquire the foundations of construction, initially in standard constructions in the area of structural concrete and module order with the goal of acquiring a basic understanding of constructive joining - Recognition of connections in construction - Ability to create hand-drawn design and implementation plans in the usual drawing standards in interaction with other courses 	
Contents	
<ul style="list-style-type: none"> - Drawing conventions, measure and module order, foundations and terms in construction - Materials and joining in structural concrete - Discussion of standard construction problems in lecture: Wall constructions and connections in structural concrete, simple ceiling constructions made from steel-concrete, steep and flat roof systems with relevant details, windows, doors, basements and foundations, stair constructions - Application and implementation of the learned material in exercises / creation of work plans - Understanding and drawing exercises - Discussion and analysis of realized recent buildings - Control of learning progress 	
Literature	
References given during lecture	
Work forms and didactic tools	
Lecture / auditorium exercise / drawing exercise / M 1:1 models / correction of errors	
Prerequisites	
Possible follow-up modules	Module 21 (Building Construction 2)
Sensible combination:	Module 6.2 (sketching), Module 6.3 (Constr. Drawing)
References / script	Accompanying the lecture / handouts
Contact person	Dr. Rainer Hirth
Application formalities	No, compulsory module
Event location	HS Coburg, Campus Design
Schedule and map	www.hs-coburg.de/bi
Other comments	Joint lecture with Architecture program

Module 6	Building Construction 1 Sketching		
Submodule 6.2			
Title of the course(s)	Freehand drawing		
Providing university	Coburg University		
Emphasis / program branch	Civil engineering (all)		
Proof(s) of performance – admission prerequisites for examination	--		
Examination(s)	RPPp/f: Research and project paper, only during lecture period, pass/fail (Ger.: SPAon)		
Semester No.	1. Semester		
Type of course(s)	SL, Exc, Int		
Sem. / compulsory or elective / SS or	1	Compulsory	WS
Language	German		

Submodule	Type	SWH	Credits	Students	Work load
Submodule 6.2	SL, Exc, Int	1	1 ECTS	unlimited	30h (15h in-class, 15h self-dir.)

Objectives / skills	
Sketching for civil engineering students is to support communication with colleagues, architects, and building owners in professional life and train three-dimensional imagination. The fundamentals of free drawing are taught without additional tools. The students are enabled to represent and present the results of their work in suitable form.	
Contents	
<ul style="list-style-type: none"> • Line exercises / representation of structures and hatching • Sketches of spatial representation and proportionality • Types of parallel projection and perspective drawing • Exploded views / building instructions • Light and shade effects, colorization 	
Literature	
Current lecture scripts of the instructor (contain bibliography), textbooks by Papula	
Work forms and didactic tools	
1 SWH lecture / seminar / exercise	
Prerequisites	
Possible follow-up modules	
Sensible combination:	Submodule 6.1 (Construction 1), Submodule 6.3 (Technical Drawing)
References / script	--
Contact person	FL Wolfram Richter
Application formalities	No, compulsory module
Event location	HS Coburg, Campus Design
Schedule and map	www.hs-coburg.de/bi
Other comments	--

Module 6	Building Construction 1 Technical Drawing		
Submodule 6.3			
Title of the course(s)	Construction drawing		
Providing university	Coburg University		
Emphasis / program branch	Civil engineering (all)		
Proof(s) of performance – admission prerequisites for examination	--		
Examination(s)	RPPp/f: Research and project paper, only during lecture period, pass/fail		
Semester No.	1. Semester		
Type of course(s)	SL, Exc, Int		
Sem. / compulsory or elective / SS or	1	Compulsory	WS
Language	German		

(Sub)module	Type	SWH	Credits	Students	Work load
Submodule 6.3	SL, Exc, Int	1	1 ECTS	unlimited	30h (15h in-class, 15h self-dir.)

Objectives / skills	
<ul style="list-style-type: none"> - Knowledge of projection types and basic and technical standards for construction drawings - Ability to create standard-compliant technical drawings, 3-dimensional construction, and perspective views while adhering to applicable standards and regulations 	
Contents	
<ul style="list-style-type: none"> - Standards, regulations, and recognized rules for <ul style="list-style-type: none"> - representation - Dimensions - Labeling of plans for components and construction details - Creation of own drawings - Ability of standard-compliant application of orthogonal 2-view projection in technical drawings 	
Literature	
Current lecture scripts of instructor (contain bibliography), textbooks, standards, regulations in current edition	
Work forms and didactic tools	
1 SWH lecture / seminar / exercise / internships	
Prerequisites	
Possible follow-up modules	
Sensible combination:	Submodule 6.1 (Construction 1) Submodule 6.2 (Sketching)
References / script	Handouts
Contact person	LBA Architect Dr. Michael Glodschei
Application formalities	No, compulsory module
Event location	HS Coburg, Campus Design
Schedule and map	www.hs-coburg.de/bi
Other comments	

Module 7	Descriptive Geometry		
Title of the course(s)	Descriptive geometry		
Providing university	Coburg University		
Emphasis / program branch	Civil engineering (all)		
Proof(s) of performance – admission prerequisites for examination	PPs3: Solution and presentation (if appl.) of exercises		
Examination(s)	Written examination		
Semester No.	1. Semester		
Type of course(s)	SL, Exc, Int		
Sem. / compulsory or elective / SS or	1	Compulsory	WS
Language	German		

(Sub)modul	Type	SWH	Credits	Students	Work load
Module 7	SL, Exc, Int	2	2 ECTS	unlimited	60 h (30h in-class, 30h self-dir.)

Objectives / skills	
<ul style="list-style-type: none"> - Knowledge of all projection types used in civil engineering - Familiarity with the representation of points, lines, surfaces, and 3-dimensional objects in all representation forms used in construction - Ability to create 3-dimensional constructions and parallel perspective views - Ability to transition between parallel projections of 3-dimensional shapes and 2-dimensional representations of an object 	
Contents	
<ul style="list-style-type: none"> - Fundamental concepts in descriptive geometry - Application of projection types - orthogonal 2-view projection - parallel projection (axonometry) - coded projection - Ability to apply the orthogonal 2-view projection, coded projection, axonometry 	
Literature	
Current lecture scripts of instructor (contain bibliography), textbooks, standards, regulations in current edition	
Work forms and didactic tools	
2 SWH lecture / seminar / exercise	
Prerequisites	
Possible follow-up modules	
Sensible combination:	
References / script	Script in Moodle room
Contact person	Dr. Egbert Keßler
Application formalities	No, compulsory module
Event location	HS Coburg, Campus Design
Schedule and map	www.hs-coburg.de/bi
Other comments	

Module 8	CAD Drawing		
Title of the course(s)	CAD Drawing		
Providing university	Coburg University		
Emphasis / program branch	Civil engineering (all)		
Proof(s) of performance – admission prerequisites for examination	PPs3: Solution and presentation (if appl.) of exercises		
Examination(s)	RPP: Research and project paper, only during lecture period, with grade		
Semester No.	2. Semester		
Type of course(s)	SL, Exc, Int		
Sem. / compulsory or elective / SS or	1	Compulsory	SS
Language	German		

(Sub)module	Type	SWH	Credits	Students	Work load
Module 8	SL, Exc, Int	2	2 ECTS	unlimited	60h (30h in-class, 30h self-dir.)

Objectives / skills	
<ul style="list-style-type: none"> - Ability to create 2D drawings and 3D models with standard CAD systems for civil engineering - Knowledge of the fundamental structure of 3D building models - Knowledge of the virtual building model BIM - Knowledge of the fundamental structure of CAD systems 	
Contents	
<ul style="list-style-type: none"> - Structure of CAD systems - Creation of own technical drawings with a standard CAD system for civil engineering - Creation of 2D drawings - Creation of virtual 3D building models and their 2-dimensional representations - Fundamental knowledge of plan management systems 	
Literature	
Current lecture scripts of instructor (contain bibliography), textbooks, standards, regulations in current edition, manuals of CAD systems	
Work forms and didactic tools	
2 SWH lecture / seminar / exercise / internships	
Prerequisites	Module 7 (Descriptive Geometry) submodule 6.2 (Sketching)
Possible follow-up modules	e.g. compulsory elective subject Creation of 3D Building Models
Sensible combination:	Submodule 6.3 (Technical Drawing)
References / script	
Contact person	Dr. Egbert Keßler
Application formalities	No, compulsory module
Event location	HS Coburg, Campus Design
Schedule and map	www.hs-coburg.de/bi
Other comments	

Module 9	Computer Science		
Title of the course(s)	Computer Science		
Providing university	Coburg University		
Emphasis / program branch	Civil engineering (all)		
Proof(s) of performance – admission prerequisites for examination	PPs3: Solution and presentation (if appl.) of exercises		
Examination(s)	RPP: Research and project paper, only during lecture period, with grade SPOB §5 (1)		
Semester No.	1. Semester		
Type of course(s)	SL, Exc, Int		
Sem. / compulsory or elective / SS or	1	Compulsory	WS
Language	German		

(Sub)module	Type	SWH	Credits	Students	Work load
Module 9	SL, Exc, Int	4	4 ECTS	unlimited	120h (60h in-class, 60h self-dir.)

Objectives / skills	
<ul style="list-style-type: none"> - Knowledge and understanding of the representation of data such as numbers and strings - Ability to convert between representations - Knowledge of fundamental control and data structures of programming languages - Problem analysis and implementation of algorithmic solutions - Understanding of essential concepts of object-oriented programming - Fundamental knowledge of programming in VBA applications 	
Contents	
<ul style="list-style-type: none"> - Representation of integers in different number systems - Calculations and conversions - Boolean algebra - Syntax and semantics of language elements: - Process structures, data structures, objects, modules, and iteration - Development and representation of data process structures - Structured design and implementation, documentation, test. 	
Literature	
Current lecture scripts of instructor (contain bibliography), textbooks, standards, regulations in current edition, manuals of CAD systems	
Work forms and didactic tools	
4 SWH lecture / seminar / exercise / internships	
Prerequisites	
Possible follow-up modules	
Sensible combination:	Module 1 (Mathematics), Module 2 (Structural Mechanics)
References / script	
Contact person	Dr. Egbert Keßler
Application formalities	No, compulsory module
Event location	HS Coburg, Campus Design
Schedule and map	www.hs-coburg.de/bi
Other comments	

Module 10	Load-bearing Structures		
Title of the course(s)	Load-bearing structures		
Providing university	Coburg University		
Emphasis / program branch	Civil engineering (all)		
Proof(s) of performance – admission prerequisites for examination	--		
Examination(s)	Research and project paper, only during lecture period, with grade and/or written examination		
Semester No.	1st and 2nd Semester		
Type of course(s)	SL, Exc		
Sem. / compulsory or elective / SS or	2	Compulsory	WS and SS
Language	German		

(Sub)module	Type	SWH	Credits	Students	Work load
Module 10	SL, Exc	4	4 ECTS	unlimited	120 h (60h in-class, 60h self-dir.)

Objectives / skills	
<ul style="list-style-type: none"> - Participants learn fundamental concepts for load-bearing structures - Visual analysis of existing load-bearing structures. - Introduction to non-material-specific load-bearing structures, insights into and overview of load-bearing structures. - Recognition of connections between loads, forces, and force progression within load-bearing components. 	
Contents	
<p>Basic concepts of load-bearing structures, loads, forces, influences on load-bearing structures, body and line structures, beams, tension and pressure rods; ropes, arches, timber frameworks, frames, elasticity theory, Hook's law of elastic materials, balance conditions for standard structures.</p> <p>Explanation of requirements from use, structural stability, suitability for use, tilt security, load-bearing safety, reinforcement of buildings.</p>	
Literature	
Subject-related	
Work forms and didactic tools	
4 SWH lecture, exercise	
Prerequisites	
Possible follow-up modules	
Sensible combination:	
References / script	
Contact person	Prof. Dietmar Kirsch
Application formalities	No, compulsory module
Event location	HS Coburg, Campus Design
Schedule and map	www.hs-coburg.de/bi
Other comments	

Module 11	Urban Water Supply and Sanitation Systems 1 Basics of Urban Water Supply and Sanitation Systems 1		
Title of the course(s)	Urban Water Supply and Sanitation Systems 1		
Providing university	Coburg University		
Emphasis / program branch	Civil engineering (all)		
Proof(s) of performance – admission prerequisites for examination			
Examination(s)	Written examination		
Semester No.	2. Semester		
Type of course(s)	SL, Exc, Int, ExC		
Sem. / compulsory or elective / SS or	1	Compulsory	SS
Language	German		

(Sub)module	Type	SWH	Credits	Students	Work load
Module 11	SL, Exc, Int,	4	4 ECTS	unlimited	120h (60h in-class, 60h self-dir.)

Objectives / skills

The students learn about the most important components of municipal water supply and sanitary systems and are able to assess these components pursuant to the applicable technical regulations.

Contents

Water supply

- Introduction (general information about water supply, guidelines values for drinking water quality)
- Water requirements (determination of need, measurement time periods, usage fluctuations)
- Water sources (water cycle, precipitation, surface, ground, and spring water, protection areas)
- Water production (wells, artificial groundwater recharge, catchment systems for spring and surface water, foundations of hydrogeology)
- Water transportation (type, head, and power of pumps, pump and pipeline characteristic curves)
- Water storage (assessment and equipment of storage tanks, examples)
- Water distribution (principles of routing and measurement, hydraulic calculations)

Waste water systems (fundamentals)

- Introduction (water contamination due to waste water, goals and history of urban drainage systems, legal basis)
- Drainage systems (conventional mixture and separation system, modified systems)
- Waste water generation (components of dry weather flow, precipitation flow, precipitation levels, precipitation contribution, precipitation statistics, flow value)
- Simple sewer system calculation (hydraulic foundations, deposits in sewer systems, sewer pipe sections, assessment frequency and precipitation, time coefficient method)
- Sewer system structures (reaches, shaft, washout and junction structures, pump facilities, rain overflows, structures of the central storm water treatment and retention)

Literature

Lecture scripts of instructor with bibliography, textbooks, standards and current regulations

Work forms and didactic tools

4 SWH lecture / seminar / exercise

Prerequisites

Possible follow-up modules: Ap: Module 81 (Urban Water Supply and Sanitation Systems 2)

Sensible combination:

References / script: Script and collection of exercises

Contact person: Prof. Dieter Sitzmann

Application formalities: No, compulsory module

Event location: HS Coburg, Campus Design

Schedule and map

Other comments

Module 12 Submodule 12.1	Sustainability / fundamentals of sustainable construction / Fundamentals of Sustainable Construction		
Title of the course(s)	Principles of sustainable building		
Providing university	Coburg University		
Emphasis / program branch	Civil engineering (all)		
Proof(s) of performance – admission prerequisites for examination	--		
Examination(s)	Written examination		
Semester No.	1. Semester		
Type of course(s)	SL, Exc, ExC		
Sem. / compulsory or elective / SS or	1	Compulsory	WS
Language	German		

(Sub)module	Type	SWH	Credits	Students	Work load
Submodule	SL, Exc,	2	2 ECTS	unlimited	60h (30h in-class, 30h self-dir.)

Objectives / skills	
Students learn about basic concepts and subject areas in "sustainable building". The courses should help shine light on and address the social responsibilities of future engineers in all fields of activity.	
Contents	
<ul style="list-style-type: none"> - Principles of sustainable action (concepts, history) - Climate change and climate protection - Energy (energy needs, energy generation fossil/renewable, energy self-sufficiency) - Gray energy (construction materials) - Building design - Policy/laws (EnEV (Energy Saving Ordinance), EEWärmeG (Renewable Energies Heat Act), EEG (Renewable Energies Act)) - Evaluation systems for sustainable building (DGNB, Leed, Breeam...) - Demographic development - Transportation and urban development 	
Literature	
Current lecture scripts of instructor (contain bibliography), textbooks, standards, regulations in current edition	
Work forms and didactic tools	
2 SWH lecture / seminar	
Prerequisites	
Possible follow-up modules	Module 12.2 (Circular Economy)
Sensible combination:	
References / script	
Contact person	Prof. Friedemann Zeitler
Application formalities	No, compulsory module
Event location	HS Coburg, Campus Design
Schedule and map	www.hs-coburg.de/bi
Other comments	Other academic programs may take this course as an elective

Module 12	Sustainability Circular Economy		
Submodule 12.2			
Title of the course(s)	Circular Economy		
Providing university	Coburg University		
Emphasis / program branch	Civil engineering (all)		
Proof(s) of performance – admission prerequisites for examination	none		
Examination(s)	Written examination		
Semester No.	2. Semester		
Type of course(s)	SL, Exc		
Sem. / compulsory or elective / SS or	1	Compulsory	SS
Language	German		

(Sub)module	Type	SWH	Credits	Students	Work load
Submodule 12.2	SL, Exc	2	2 ECTS	unlimited	60h (30h in-class, 30h self-dir.)

Objectives / skills	
<p>Students learn about the concepts, legal framework, and the origin and composition of waste in the recycling industry. The focus lies on understanding and optimizing cycle processes under the given framework conditions. The principal functions of selected treatment plants round off the overview. Students will then have a well-founded overview of this entire subject in the disposal industry and can support corresponding processes in a competent manner.</p>	
Contents	
<p>1 Introduction and foundations</p> <ul style="list-style-type: none"> - Historic developments, basic structure, concepts, waste generation and composition <p>2 Legal regulations</p> <ul style="list-style-type: none"> - Circular economy laws and secondary regulations - Electronic detection procedure - Waste transportation <p>3 Disposal logistics</p> <ul style="list-style-type: none"> - Collection, handling, transportation - Ecology and economy <p>4 Mechanical waste treatment</p> <ul style="list-style-type: none"> - Dual systems - Industrial waste <p>5 Construction waste recycling</p> <ul style="list-style-type: none"> - Controlled demolition - Material flows and treatment plants (foundations) - Economy <p>6 Biological waste treatment</p> <ul style="list-style-type: none"> - Composting and fermentation - MBA concepts <p>7 Thermal waste treatment</p> <ul style="list-style-type: none"> - Waste incineration plants <p>8 Removal</p> <ul style="list-style-type: none"> - Construction, operation, and control 	
Literature	
Lecture scripts of instructor with bibliography, textbooks, standards and current regulations	
Work forms and didactic tools	
Lecture	
Prerequisites	Module 12.1 (Principles of Sustainable Building)
Possible follow-up modules	Ap: Module 86 (Construction Material Recycling)
Sensible combination:	
References / script	Technical literature, laws, standards, regulations
Contact person	Dr.-Eng. Markus Weber

Application formalities	No, compulsory module
Event location	HS Coburg, Campus Design
Schedule and map	www.hs-coburg.de/bi
Other comments	Excursion(s)

Coburg University, Department of Design, Academic Program in Civil

Module 13	Construction Operations		
Title of the course(s)	Construction operations		
Providing university	Coburg University		
Emphasis / program branch	Civil engineering (all)		
Proof(s) of performance – admission prerequisites for examination	--		
Examination(s)	Written examination		
Semester No.	2. Semester		
Type of course(s)	SL, Exc, Int, ExC		
Sem. / compulsory or elective / SS or	1	Compulsory	SS
Language	German		

(Sub)module	Type	SWH	Credits	Students	Work load
Module 13	SL, Exc, Int,	4	4 ECTS	unlimited	120h (60h in-class, 60h self-dir.)

Objectives / skills	
<ul style="list-style-type: none"> - Familiarity with business administration fundamentals for businesses - Ability to apply this knowledge for specific business administration-related decisions - Ability to understand construction operations as a whole - Ability to apply the procedures of construction operations to practice - in construction businesses, engineering firms, or public agencies – in order to be able to plan, organize, coordinate, and monitor the progress of planning and implementation of the individual trades 	
Contents	
<ul style="list-style-type: none"> - Business administration fundamentals - Overview of balance sheets, taxes, and insurance - Legal and tax-related business duties - Overview of the construction business as a branch of economics - Overview of the foundations of construction operations processes - in businesses and on construction sites - Knowledge in tender process, award, and invoicing (AVA) - Principles of work preparation - Construction machines and operations technology - Planning the construction site installations - Organization of businesses, offices, and construction sites 	
Literature	
Current lecture scripts of instructor (contain bibliography), textbooks, standards, regulations in current edition	
Work forms and didactic tools	
4 SWH lecture / seminar / exercise	
Prerequisites	
Possible follow-up modules	
Sensible combination:	
References / script	
Contact person	Dr. Egbert Keßler
Application formalities	No, compulsory module
Event location	HS Coburg, Campus Design
Schedule and map	www.hs-coburg.de/bi
Other comments	

Coburg University, Department of Design, Academic Program in Civil

Module 14	Basics of Law and Business Management (German Civil Code-BGB) / Introduction to Law		
Title of the course(s)	Introduction to law		
Providing university	Coburg University		
Emphasis / program branch	Civil engineering (all)		
Proof(s) of performance – admission prerequisites for examination			
Examination(s)	Written examination		
Semester No.	1. Semester		
Type of course(s)	SL, Exc		
Sem. / compulsory or elective / SS or	1	Compulsory	WS
Language	German		

Submodule	Type	SWH	Credits	Students	Work load
Module 14	SL,	2	2 ECTS	unlimited	60h (30h in-class, 30h self-dir.

Objectives / skills	
<ul style="list-style-type: none"> - Familiarity with the fundamental concepts of the German Civil Code (<i>BGB</i>) - Ability to recognize the legal foundations, risks, and consequences of the activity of a civil engineer and consider legal aspects in professional decisions - Ability to assess with some certainty whether additional legal council may be necessary 	
Contents	
<ul style="list-style-type: none"> - Basic concepts of law - Overview of basic concepts of civil law - Doctrine on legal transactions - Insights into labor and social law; - Insights into basic concepts of commercial law and industrial codes 	
Literature	
Current lecture scripts of instructor (contain bibliography), textbooks, standards, regulations in current edition	
Work forms and didactic tools	
2 SWH lecture / seminar / exercise	
Prerequisites	
Possible follow-up modules	Module 61 (Construction Law Fundamentals)
Sensible combination:	
References / script	
Contact person	LBA Ludwig Frenking
Application formalities	No, compulsory module
Event location	HS Coburg, Campus Design
Schedule and map	www.hs-coburg.de/bi
Other comments	

Coburg University, Department of Design, Academic Program in Civil

Module 15	Academic writing		
Title of the course(s)	Academic Writing		
Providing university	Coburg University		
Emphasis / program branch	Civil engineering (all)		
Proof(s) of performance – admission prerequisites for examination	none		
Examination(s)	RPP or ERP		
Semester No.	2. Semester		
Type of course(s)	SL, Exc, L, ExC		
Sem. / compulsory or elective / SS or	1	Compulsory	SS
Language	German		

(Sub)modul	Type	SWH	Credits	Students	Work load
15	SL, Exc, L, ExC	2	2 ECTS	unlimited	60h (30h in-class, 30h self-dir.)

Objectives / skills	
<p>In this course, students learn how to apply the foundations of academic writing to their studies and to their everyday work later on; they also learn about what contents technical reports and presentation should have, and how they should be structured. Students are familiarized with research, citing sources, correct citations, and writing a technical report in lectures and exercises. The learned material is applied in a technical report. The students then learn the foundations necessary to create a technical report, PowerPoint slide show, and a presentation.</p>	
Contents	
<ol style="list-style-type: none"> 1. Introduction/overview of the subject <ul style="list-style-type: none"> - Why techniques of academic writing are important - For instance, structural stability certifications, test reports, certificates etc. 2. Searching for and finding literature <ul style="list-style-type: none"> - Principles of research - Analytical attitude: Questioning the “obvious” - Introduction basic literature for civil engineers 3. Research <ul style="list-style-type: none"> - Where to find knowledge: successful research - Reading strategies - Different types of sources, reading technical literature 4. Citations / sources / indexes <ul style="list-style-type: none"> - Examples of source / literature in civil engineering - Citations - Stating sources - Bibliography, list of illustrations, list of tables... 5. Writing <ul style="list-style-type: none"> - Segmentation - Structure and content of the paper - Wiring the paper - Types of citations 6. Presentation <ul style="list-style-type: none"> - Presentation - Handout 	
Literature	
Work forms and didactic tools	
Lecture in seminar form	
Prerequisites	
Possible follow-up modules	
Sensible combination:	
References / script	Handout

Contact person	Dr. Eng. Jonas Schmidt
Application formalities	No, compulsory module
Event location	HS Coburg, Campus Design
Schedule and map	www.hs-coburg.de/bi
Other comments	

Module 21	Building Construction Building Construction 2		
Title of the course(s)	Structural design 2		
Providing university	Coburg University		
Emphasis / program branch	Civil engineering (all)		
Proof(s) of performance – admission prerequisites for examination	PPs6		
Examination(s)	ERP, Co and Pres		
Semester No.	4. Semester		
Type of course(s)	L, SL, Exc		
Sem. / compulsory or elective / SS or	1	Compulsory	SS
Language	German		

(Sub)module	Type	SWH	Credits	Students	Work load
Module 21	L, SL, Exc	3	4 ECTS	unlimited	120h (45h in-class, 75h self-study)

Objectives / skills	
<ul style="list-style-type: none"> - Successful module participants learn the foundations of construction in the area of timber structures and structural concrete and the ability to plan a building at a lower level of complexity - Recognition of connections in construction - Ability to create digital design and implementation plans using standard industry conventions - in conjunction with other courses 	
Contents	
<ul style="list-style-type: none"> - Materials and joining in timber structures and structural concrete - Development of constructive standard problems - Wall and ceiling constructions for timber structures and structural concrete - Preproduction, bracing, and joint formation - Fire protection in multi-floor timber structures - Discussion and analysis of material on relevant recently constructed buildings - Control of learning progress 	
Literature	
References given during lecture	
Work forms and didactic tools	
Lecture / auditorium exercise / drawing exercise / models / correction of errors	
Prerequisites	Module 6 (Building Construction 1, Sketching and Constr. Drawing)
Possible follow-up modules	
Sensible combination:	
References / script	Accompanying the lecture / handouts
Contact person	LBA O. Lederer
Application formalities	No, compulsory module
Event location	HS Coburg, Campus Design
Schedule and map	www.hs-coburg.de/bi
Other comments	

Module 22	Building technology 1/ Energy and Building Technology 1		
Title of the course(s)	Building technology 1		
Providing university	Coburg University		
Emphasis / program branch	Civil engineering (all)		
Proof(s) of performance – admission prerequisites for examination	--		
Examination(s)	Written examination		
Semester No.	3. Semester		
Type of course(s)	SL, Exc, ExC		
Sem. / compulsory or elective / SS or	1	Compulsory	WS
Language	German		

Submodule	Type	SWH	Credits	Students	Work load
Module 22	SL, Exc,	4	4 ECTS	unlimited	120h (60h in-class, 60h self-dir.)

Objectives / skills	
Students acquire a basic knowledge of all segments of technical building equipment, with particular consideration of energy efficiency, sustainability, and profitability in new construction / renovation and operation of building technology	
Contents	
<ul style="list-style-type: none"> - Overview of segments, installation principles - Principles of heat transmission, physiology, comfort, etc. - Electric building equipment and supply - Sanitary technology, hot water preparation - Heating technology - Ventilation technology - Solar technology - ... 	
Literature	
Current lecture scripts of instructor (contain bibliography), textbooks, standards, regulations in current edition	
Work forms and didactic tools	
4 SWH lecture / seminar / exercise	
Prerequisites	
Possible follow-up modules	E: Module 43 (Building Technology 2)
Sensible combination:	
References / script	
Contact person	Dr. Manfred Casties
Application formalities	No, compulsory module
Event location	HS Coburg, Campus Design
Schedule and map	www.hs-coburg.de/bi
Other comments	

Module 23	Non-material-specific Assessment and Construction / Design Fundamentals for Structural Analysis		
Title of the course(s)	Non-material-specific Surveying and Construction		
Providing university	Coburg University		
Emphasis / program branch	Civil engineering (all)		
Proof(s) of performance – admission prerequisites for examination	PPs3		
Examination(s)	Written examination		
Semester No.	3. Semester		
Type of course(s)	SL, Exc, ExC		
Sem. / compulsory or elective / SS or	1	Compulsory	WS
Language	German		

(Sub)module	Type	SWH	Credits	Students	Work load
Module 23	SL, Exc, ExC	6	6 ECTS	unlimited	180 h (90h in-class, 90h self-dir.)

Objectives / skills	
<ul style="list-style-type: none"> - Assessing simple components made from structural steel, timber, and masonry - Choice of the best suited material for the respective function 	
Contents	
<ul style="list-style-type: none"> - Principles of structural optimization - Material properties of concrete, steel-concrete, structural steel, masonry, and timber - Safety concept for material-specific stress resultant determination - Determining assessment stress resultants for bending, normal force, and shear force - Verification of load capacity for standard constructions in limit of load capacity and limit of serviceability - Verification of simple joints in steel construction and timber structures - Methods of model building - Using measurement procedure and tools - Recognizing and assessing qualities and differences of different materials 	
Literature	
Subject-related; lecture manuscript of instructor (contain bibliography)	
Work forms and didactic tools	
6 SWH lecture / exercise	
Prerequisites	
Possible follow-up modules	Module 24 (Structural Concrete 1) Module 74 (Steel Construction) Module 75.1 (Steel Construction)
Sensible combination:	
References / script	
Contact person	Dr.-Eng. Holger Falter
Application formalities	No, compulsory module
Event location	HS Coburg, Campus Design
Schedule and map	www.hs-coburg.de/bi
Other comments	

Module 24	Structural Concrete 1 / Structural Concrete 1		
Title of the course(s)	Structural Concrete 1		
Providing university	Coburg University		
Emphasis / program branch	Civil engineering (all)		
Proof(s) of performance – admission prerequisites for examination	PPs3: Solution and presentation (if appl.) of exercises		
Examination(s)	Written examination		
Semester No.	4. Semester		
Type of course(s)	SL, Exc, ExC		
Sem. / compulsory or elective / SS or	1	Compulsory	SS
Language	German		

(Sub)module	Type	SWH	Credits	Students	Work load
Module 24	SL, Exc, ExC	4	5 ECTS	unlimited	150 h (60h in-class, 90h self-dir.)

Objectives / skills	
<ul style="list-style-type: none"> - Measurement of simple solid steel-concrete components - Representing the measurement results in the form of sketches while observing the construction rules 	
Contents	
<ul style="list-style-type: none"> - Principles of structural optimization - Verification of load capacity for standard constructions - Principles of reinforcement configuration and constructive design of steel-concrete structures - Principles of representation of formwork and reinforcement plans - Methods of model building - Measurement procedure and tools - Reading formwork and reinforcement plans and creating reinforcement sketches for standard components - Design and pre-dimensioning of simple steel-concrete structures 	
Literature	
Subject-related; lecture manuscript of instructor (contains bibliography)	
Work forms and didactic tools	
4 SWH lecture / exercise	
Prerequisites	Module 23 (Non-material-specific Surveying and Construction)
Possible follow-up modules	Ak: Module 73 (Structural Concrete 2)
Sensible combination:	
References / script	
Contact person	Dr. Holger Falter
Application formalities	No, compulsory module
Event location	HS Coburg, Campus Design
Schedule and map	www.hs-coburg.de/bi
Other comments	

Module 25 Submodule 25.1	Geotechnics / Soil Mechanics		
Title of the course(s)	Soil Mechanics / Earth Work		
Providing university	Coburg University		
Emphasis / program branch	Civil engineering (all)		
Proof(s) of performance – admission prerequisites for examination	PPs1; participation in internship, creation of internship reports, exercises, research paper		
Examination(s)	RPPp/f, Grade Pass/Fail completed.		
Semester No.	3. Semester		
Type of course(s)	SL, Exc, Int, ExC		
Sem. / compulsory or elective / SS or	1	Compulsory	WS
Language	German		

(Sub)module	Type	SWH	Credits	Students	Work load
Submodule 25.1	SL, Exc, Int, ExC	3	4 ECTS	unlimited	120 h (45h in-class, 75h self-study)

Objectives / skills	
<p>Students</p> <ul style="list-style-type: none"> - Will know why and with what methods soil studies are performed - Will be able to name and classify soil types and develop a construction soil model - Will have an understanding of the properties of construction soil and able to consider the properties of the construction soil in planning and implementation - Will know the physical and soil mechanics characteristic values of different soil types and how to determine them in the field and lab as well as their use and application in practical earthwork and foundation engineering - Will be able to understand, evaluate, and use information in geotechnical reports for further planning and calculations - Will understand soil mechanics principles in order to solve geotechnical problems 	
Contents	
<p>Creation and composition of construction soils, principles of geology and mineralogy, construction soil study, geotechnical studies, soil identification, construction soil model, homogeneous areas, soil classification pursuant to DIN 18196, soil state and construction properties, water permeability, frost sensitivity, compressibility, consolidation, total and effective stresses, shear parameters, general physical soil parameters, parameters for state description, parameter for technical earthworks testing procedure, compression technologies and controls, load capacity measurements, procedure for construction soil improvement, and earth pressure calculation</p>	
Literature	
<p>Current lecture scripts of instructor (contain bibliography), textbooks, standards, regulations in current edition</p>	
Work forms and didactic tools	
<p>The applied teaching takes place in form of seminars in combination with lab internships (field and lab studies).</p>	
Prerequisites	Module 4 (Construction Materials)
Possible follow-up modules	A: Module 25.2 (Soil Engineering)
Sensible combination:	
References / script	Currents lecture script of instructor
Contact person	Dr. Almut Lottmann-Löer
Application formalities	No, compulsory module
Event location	HS Coburg, Campus Design
Schedule and map	www.hs-coburg.de/bi
Other comments	

Module 25 Submodule 25.2	Geotechnics Soil Engineering		
Title of the course(s)	Foundation Engineering		
Providing university	Coburg University		
Emphasis / program branch	General civil engineering		
Proof(s) of performance – admission prerequisites for examination	Module 25.1 "Soil Mechanics" passed		
Examination(s)	wrEx		
Semester No.	4. Semester		
Type of course(s)	SL, Exc, ExC		
Sem. / compulsory or elective / SS or	1	Compulsory (A)	SS
Language	German		

(Sub)module	Type	SWH	Credits	Students	Work load
Submodule 25.2	SL, Exc, ExC	4	54 ECTS	unlimited	150 h (60h in-class, 90h self-study)

Objectives / skills	
<p>The students</p> <ul style="list-style-type: none"> - Will have an understanding of the properties of construction soil and able to consider the properties of the construction soil in planning and implementation - Will know the physical and soil mechanics characteristic values of different soil types and how to determine them in the field and lab as well as their use and application in practical earthwork and foundation engineering - Will know the fundamental design principles of geotechnical components and structures - Will be able to design, plan, and calculate spread foundations (foundations and supporting structures) (verification of structural stability pursuant to EC 7 and DIN 	
Contents	
<p>Foundation types, measures for construction soil improvement, planning and design of spread foundations depending on construction soil, geotechnical assessment of spread foundations, simplified verification for surveying foundations with determination of contact pressure and contact resistance pursuant to DIN 1054, geotechnical verification of structural stability and serviceability (slipping, ground seepage, overall structural stability, tilting, floating, settlement calculation using vertical stresses and using settlement formulas, permissible eccentricity / open gaps, foundation distortion), and planning and calculating supporting structures</p>	
Literature	
<p>Current lecture scripts of instructor (contain bibliography), textbooks, standards, regulations in current edition</p>	
Work forms and didactic tools	
<p>Lecture in seminar form</p>	
Prerequisites	Module 25.1 (Soil Mechanics)
Possible follow-up modules	Ak: Module 71 (Soil Mechanics) Ap: Module 83 (Embankment and Landfill Construction)
Sensible combination:	
References / script	Currents lecture script of instructor
Contact person	Dr. Almut Lottmann-Löer
Application formalities	No, compulsory module (A)
Event location	HS Coburg, Campus Design
Schedule and map	www.hs-coburg.de/bi
Other comments	

Module 26	Road Planning		
Title of the course(s)	Road design		
Providing university	Coburg University		
Emphasis / program branch	Civil engineering (all)		
Proof(s) of performance – admission prerequisites for examination	PPs ₅ : THT/research paper (solution depending on criteria) and wrEx (90...150 min). Weighting of the final grade in relationship THT/research paper to wrEx: 1/5 to 4/5th Only students who have successfully completed the THT/research paper are admitted to the wrEx. If the THT/research paper is passed and the subsequent wrEx is not passed, only the wrEx must be repeated in the subsequent semesters.		
Examination(s)	RPP and written examination (wrEx)		
Semester No.	3. Semester		
Type of course(s)	SL, Exc, ExC		
Sem. / compulsory or elective / SS or	1	Compulsory	WS
Language	German		

Submodule	Type	SWH	Credits	Students	Work load
Module 26	SL, Exc, ExC	4	4	unlimited	120h (60h in-class, 60h self-study)

Objectives / skills	
<p>Complete overview of road planning and its guidelines. In addition, an exercise from practical planning e.g. a bypass or comparable (research paper). Familiarity in working with the guidelines and specifications, and implementing them in practice. Ability to understand complex problems (also in practice) and derive proposed solutions / implementations (from insights in lecture).</p>	
Contents	
<ul style="list-style-type: none"> - History of roads, basics: Goals, laws, procedure of road planning - Environmental planning, guidelines in road planning - Driving dynamics, principles of design, design elements in site plan and geological profile - Design of highways - Design of main roads - Line management in layout (site plan); clothoids as transitional arches - Line management in vertical section (geological profile); curvature string - Intersection design - Spatial line management - Street environment design, design elements etc. - Roundabouts - Stationary traffic - Research paper with practical problem 	
Literature	
Current lecture scripts of instructor (contain bibliography), textbooks, standards, regulations in current edition	
Work forms and didactic tools	
3 SWH lecture / seminar / exercise, 1 SWH internship (research paper)	
Prerequisites	
Possible follow-up modules	
Sensible combination:	
References / script	
Contact person	Dr. Timo Bertocchi
Application formalities	No, compulsory module
Event location	HS Coburg, Campus Design

Schedule and map	www.hs-coburg.de/bi
Other comments	

Module 27	BIM / Building Information Modeling		
Title of the course(s)	BIM / Building Information Modeling		
Providing university	Coburg University		
Emphasis / program branch	Civil engineering (all)		
Proof(s) of performance – admission prerequisites for examination			
Examination(s)	Written examination		
Semester No.	4. Semester		
Type of course(s)	SL, Exc, Int		
Sem. / compulsory or elective / SS or	1	Compulsory	SS
Language	German		

(Sub)module	Type	SWH	Credits	Students	Work load
Module 27	SL, Exc, Int	2	2 ECTS	unlimited	60h (30h in-class, 30h self-dir.)

Objectives / skills	
<ul style="list-style-type: none"> - Overview of the different fields of digitalization of construction processes - Knowledge of structure of BIM-based project implementation and its individual work steps - Knowledge of the fundamental structure of 3D building models 	
Contents	
<ul style="list-style-type: none"> - Use and combination of different data sources - Examination of data consistency - Implementation of individual work steps in the BIM process - Fundamental knowledge of plan management systems 	
Literature	
Current lecture scripts of instructor (contain bibliography), textbooks, standards, regulations in current edition, manuals of CAD systems	
Work forms and didactic tools	
2 SWH lecture / seminar / exercise / internships	
Prerequisites	
Possible follow-up modules	
Sensible combination:	
References / script	
Contact person	Dr. Egbert Keßler
Application formalities	No, compulsory module
Event location	HS Coburg, Campus Design
Schedule and map	www.hs-coburg.de/bi
Other comments	

Coburg University, Department of Design, Academic Program in Civil

Module 31	Structural Analysis 2 / Structural Analysis 2		
Title of the course(s)	Structural analysis 2		
Providing university	Coburg University		
Emphasis / program branch	General civil engineering (A)		
Proof(s) of performance – admission prerequisites for examination	PPs3: Solution and presentation (if appl.) of exercises		
Examination(s)	Written examination		
Semester No.	4. Semester		
Type of course(s)	SL, Exc		
Sem. / compulsory or elective / SS or	1	Compulsory (A)	SS
Language	German		

(Sub)module	Type	SWH	Credits	Students	Work load
Module 31	SL, Exc	5	6 ECTS	unlimited	180 h (75h in-class, 105h self-study)

Objectives / skills	
<ul style="list-style-type: none"> - Calculation of stress resultants and deformation of statically determined and simple statically undetermined planar stick structures under stationary loads as a basis for further assessment - Application of energy methods - Assessment of the stability of frame structures 	
Contents	
<ul style="list-style-type: none"> - Methods of model building and calculation procedure - Qualitative assessment of stress resultant paths and deformations of planar stick structures - Principle of virtual work (P.d.v.L and P.d.v.K) - Flexibility method and reduction rate - Loads and restraints - Determination of stress resultants for statically determined and simple statically undetermined structures - Deformation of statically determined and simple statically undetermined structures - Determination of folding lengths of movable and immovable frames 	
Literature	
Subject-related; lecture manuscript of instructors (contain bibliography)	
Work forms and didactic tools	
5 SWH lecture / exercise	
Prerequisites	Module 2 (Mechanics) Module 3 (Structural Analysis 1)
Possible follow-up modules	Module 72 (Numerical Structural Analysis)
Sensible combination:	
References / script	
Contact person	Dr. Martin Synold
Application formalities	No, compulsory module (A)
Event location	HS Coburg, Campus Design
Schedule and map	www.hs-coburg.de/bi
Other comments	

Coburg University, Department of Design, Academic Program in Civil

Module 32	Hydraulic Engineering 1 / Hydraulic Engineering 1		
Title of the course(s)	Waterway engineering 1		
Providing university	Coburg University		
Emphasis / program branch	General civil engineering (A)		
Proof(s) of performance – admission prerequisites for examination	PPs1: successful participation in exercise units related to the subject (participation in hydraulic engineering internships and report attestations)		
Examination(s)	Written examination		
Semester No.	3. Semester		
Type of course(s)	SL, Exc, Int, ExC		
Sem. / compulsory or elective / SS or	1	Compulsory (A)	WS
Language	German		

Submodule	Type	SWH	Credits	Students	Work load
Module 32	SL, Exc, Int,	4	4 ECTS	unlimited	120h (60h in-class, 60h self-dir.)

Objectives / skills	
Students will become acquainted with the most important problems in hydraulic engineering and learn to assess simple hydraulic engineering systems, channels, and pipelines	
Contents	
<ul style="list-style-type: none"> - Introduction (view of flow processes and behavior of a system, typical hydraulic assessing tasks in hydraulic engineering, formula symbols and units) - Concepts of technical hydraulics (hydraulics as applied hydromechanics, classification of fluids, types of flow) - Effect of stationary water (hydrostatics: pressure, pressure distribution, pressure on straight and curved surfaces, displacement, swimming) - Basic equations of hydraulics (continuity condition, definition of average speed, Bernoulli equation, momentum equation) - Calculation of high-water relief systems and weir openings (frontal inflow to straight spillways, flared spillways, side weirs, overflow siphons, outflow under flood gates and openings of limited width) - Calculation of pressure pipelines (determination of pipe friction losses, Darcy-Weisbach equation, law of resistance according to Prandtl-Colebrook, pressure loss tables, consideration of local losses, pump and pipe characteristic curves) - Calculation of channel flows (normal flow, extremal principle, flow states and transitions) - Practical exercises in water lab: spillway, outflow under flood gates, overflow siphons, pipe flow, hydraulic jumps, venturi channels - Excursion into hydraulic engineering systems in the environment 	
Literature	
Lecture scripts of instructor with bibliography, textbooks	
Work forms and didactic tools	
4 SWH lecture / exercise / internship in groups	
Prerequisites	
Possible follow-up modules	
Ap: Module 82 (Hydraulic Engineering 2)	
Sensible combination:	
References / script	
Script and collection of exercises	
Contact person	
Prof. Dieter Sitzmann	
Application formalities	
No, compulsory module (A)	
Event location	
HS Coburg, Campus Design	
Schedule and map	
Other comments	

Coburg University, Department of Design, Academic Program in Civil

Module 33	Road Construction Road Construction
Title of the course(s)	Road construction
Providing university	Coburg University
Emphasis / program branch	General civil engineering (A)
Proof(s) of performance – admission prerequisites for examination	PPs ₁ = The admission prerequisite for examination is the successful completion of experimental and exercise units associated with the subject
Examination(s)	Written examination (wrEx)
Semester No.	4. Semester
Type of course(s)	SL, Exc, Int (1 SWH), ExC
Sem. / compulsory or elective / SS or	1 Compulsory (A) SS
Language	German

Submodule	Type	SWH	Credits	Students	Work load
Module 33	SL, Exc, Int,	4	4	unlimited	120h (60h in-class, 60h self-study)

Objectives / skills	
<p>Integrated overview of road construction and its most important guidelines, examinations, and testing methods.</p> <p>Familiarity in working with the guidelines and specifications and implementing them in practice.</p> <p>Ability to understand complex problems (also in practice) and derive proposed solutions / implementations (from insights in lecture).</p>	
Contents	
<ul style="list-style-type: none"> - Construction materials in road construction - Subsoil / substructure – requirements - Road bed (subbases without bonding agents (ToB), subbases with hydraulic bonding agents, asphalt subbases, asphalt binders, asphalt types (asphalt concrete, stone mastic asphalt, mastic asphalt...), concrete roads, stone pavements) - Assessment of traffic surfaces (e.g. RStO) - Road construction technology (asphalt construction; concrete construction) - Quality assurance in road construction (certification of suitability, self-monitoring examinations, control examinations, additional examinations) - Lab technology – creation a suitability test - Preservation constructions in road construction (brief overview) and illustration of a few select methods 	
Literature	
Current lecture scripts of instructors (contain bibliography), textbooks, standards, regulations in current edition.	
Work forms and didactic tools	
3 SWH lecture / seminar / exercise; 1 SWH internship	
Prerequisites	
Possible follow-up modules	Ap: Module 85 (Preservation of Road Structure)
Sensible combination:	
References / script	
Contact person	Dr. Timo Bertocchi
Application formalities	No, compulsory module (A)
Event location	HS Coburg, Campus Design
Schedule and map	www.hs-coburg.de/bi
Other comments	

Coburg University, Department of Design, Academic Program in Civil

Module 34	Construction Surveying		
Title of the course(s)	Surveying		
Providing university	Coburg University		
Emphasis / program branch	General civil engineering (A)		
Proof(s) of performance – admission prerequisites for examination	PPs1: successful participation in exercise units related to the subject (participation in construction surveying internships and report attestations)		
Examination(s)	Written examination		
Semester No.	4. Semester		
Type of course(s)	SL, Exc, Int		
Sem. / compulsory or elective / SS or	1	Compulsory (A)	SS
Language	German		

(Sub)module	Type	SWH	Credits	Students	Work load
Module 34	SL, Exc, Int	2	2 ECTS	unlimited	60h (30h in-class, 30h self-dir.)

Objectives / skills	
Students get to know the most important tasks in surveying, practice using surveying instruments (tape measure, angle prism, level, theodolite), and are able to perform surveying calculations.	
Contents	
<ul style="list-style-type: none"> - Principles of surveying (reference surfaces, coordinate systems, dimensions, errors) - Position measurements (staking out straight lines, straight cuts, staking out orthogonal angles, position and distance measurements) - Topographic reconnaissance (parcel surveying: orthogonal procedure, extension procedure, polar procedure, surveying samples, field book) - Area calculation (Gauß' trapeze / triangular formula for area calculation) - Coordinate calculation (altitude and altitude point, calculation of intermediate points on a line, calculation of intermediate points not on the the line, calculation of intersections of two straight lines, direction angle and distances, coordinates of points recorded using polar method) - Altitude measurement (leveling instruments, principles of NN systems, performing line leveling and area leveling, longitudinal and transverse profiles) - Angle measurement (theodolite, performing angle measurements, determining the height of a tower, calculation of polygons) 	
Literature	
Lecture scripts of instructor with bibliography, textbooks, standards	
Work forms and didactic tools	
2 SWH lecture / exercise / internship in groups	
Prerequisites	
Possible follow-up modules	
Sensible combination:	
References / script	
Script and collection of exercises	
Contact person	
Prof. Dieter Sitzmann	
Application formalities	
No, compulsory module (A)	
Event location	
HS Coburg, Campus Design	
Schedule and map	
Other comments	

Coburg University, Department of Design, Academic Program in Civil

Module 35	History of Buildings and Architecture History of Buildings and Architecture		
Title of the course(s)	History of Buildings and Architecture		
Providing university	Coburg University		
Emphasis / program branch	General civil engineering (A)		
Proof(s) of performance – admission prerequisites for examination			
Examination(s)	Examination research paper		
Semester No.	4. Semester		
Type of course(s)	SL, Exc, L, ExC		
Sem. / compulsory or elective / SS or	1	Compulsory (A)	SS
Language	German		

(Sub)module	Type	SWH	Credits	Students	Work load
Module 35	SL, Exc, L, ExC	2	2 ECTS	unlimited	60 h (30h in-class, 30h self-study)

Objectives / skills	
<ul style="list-style-type: none"> - Students learn to classify buildings and cityscapes in term of typology and time period. - They develop their own attitude towards the cultural responsibility of everyday engineering work by analyzing examples. 	
Contents	
<ul style="list-style-type: none"> - Principles of architecture and urban development - Significance and context of buildings and cityscapes in social perception - Construction art and construction culture 	
Literature	
Subject-related	
Work forms and didactic tools	
2 SWH lecture / exercise	
Prerequisites	
Possible follow-up modules	
Sensible combination:	
References / script	
Contact person	Dr. Jochen Driller
Application formalities	No, compulsory module (A)
Event location	HS Coburg, Campus Design
Schedule and map	www.hs-coburg.de/bi
Other comments	

Coburg University, Department of Design, Academic Program in Civil

Module 41	Heat and Moisture Protection		
Title of the course(s)	Heat and Moisture Insulation		
Providing university	Coburg University		
Emphasis / program branch	Energy-efficient building design (E)		
Proof(s) of performance – admission prerequisites for examination	PPs1: successful participation in experimental and exercise units related to subject (participation in internship) PPs3: Solution and presentation (if appl.) of exercises		
Examination(s)	Written examination		
Semester No.	4. Semester		
Type of course(s)	SL, Exc, Int (1 SWH), ExC		
Sem. / compulsory or elective / SS or WS	1	Compulsory	SS
Language	German		

Submodule	Type	SWH	Credits	Students	Work load
Module 41	SL, Exc, Int,	5	5 ECTS	unlimited	150h (75h in-class, 75h self-dir.)

Objectives / skills	
<ul style="list-style-type: none"> - Knowledge of heat and moisture properties of construction materials and components and their constructive consequences - Ability to assess the heat and moisture properties of the building shell of residential and non-residential buildings (e.g. EnEV Annex 11) - Mastery and deeper understanding of calculation methods of heat and moisture 	
Contents	
Thermal insulation	
<ul style="list-style-type: none"> - Energetic characteristic values of building shell and their assessment - Basic calculation procedure for heat protection of buildings - Stationary and non-stationary heat transport through components - Temperatures in components and buildings under stationary conditions - Thermal certifications according to legal construction regulations - Calculation and assessment of heat bridges - Thermal insulation of landmarked buildings (interior insulation) - Minimum heat protection level according to DIN 4108-2 and constructive consequences - Windows, glass, and usable solar heat energy, solar design - Calculation of air flow, ventilation heat loss - Assessment of air impermeability and leakage, application of Blower-Door measurements 	
Moisture protection	
<ul style="list-style-type: none"> - Moisture-related parameters - Hygrothermal behavior of buildings - Protection from condensation moisture and mold - Moisture-related assessment of heat bridges - Moisture transport mechanisms and dynamic hygrothermal simulation - Consequences of non-stationary heat and moisture transport mechanisms - Practical moisture protection, protection of buildings and sealing technology - Protection from driving rain, back-ventilated constructions 	
Internship	
<ul style="list-style-type: none"> - Measurement of heat and sound parameters 	
Literature	
Current lecture scripts of instructor (contain bibliography), textbooks, standards, regulations in current edition	
Work forms and didactic tools	
4 SWH seminar classes and exercises, 1 SWH internship	
Prerequisites	

Possible follow-up modules	
Sensible combination:	
References / script	
Contact person	Dr. Peter Pfrommer
Application formalities	No, compulsory module
Event location	HS Coburg, Campus Design
Schedule and map	www.hs-coburg.de/bi
Other comments	Subject also for students of other technical programs (prerequisites: Engineering Mathematics, Principles of Physics)

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Module 42	Building energy design 1
Title of the course(s)	Building Energy Design 1
Providing university	Coburg University
Emphasis / program branch	Energy-efficient building design (E)
Proof(s) of performance – admission prerequisites for examination	PPs2: successful completion of one or several research papers and / or presentations
Examination(s)	Written examination
Semester No.	4. Semester
Type of course(s)	SL, Exc, Int, ExC
Sem. / compulsory or elective / SS or	1 Compulsory (E) SS
Language	German

Submodule	Type	SWH	Credits	Students	Work load
Module 42	SL, Exc, Int, ExC	4	4 ECTS	unlimited	120h (60h in-class, 60h self-dir.)

Objectives / skills	
Students learn and apply the basics of energetic balancing for residential buildings. The course covers new construction and existing buildings / renovations in consideration of the respective applicable legal regulations. As part of a research paper, the students create a consulting report meeting the guidelines for a BAFA on-site consultation.	
Contents	
<ul style="list-style-type: none"> - Basics of energetic balancing for buildings according to DIN L 4108-6 and DIN L 4701-10/12 - Legal requirements (EnEV, EEWärmeG) - Energetically optimized building design - Air-impermeability and heat bridges - Development of components structures with sensible energetic, physical, and structural properties - Renovation measures - Public support 	
Literature	
Current lecture scripts of instructor (contain bibliography), textbooks, standards, regulations in current edition	
Work forms and didactic tools	
4 SWH lecture / seminar / exercise	
Prerequisites	Module 12.1 (Principles of sustainable building)
Possible follow-up modules	E: Module 91 (Building Energy Design 2)
Sensible combination:	
References / script	
Contact person	Prof. Friedemann Zeitler
Application formalities	No, compulsory module (E)
Event location	HS Coburg, Campus Design
Schedule and map	www.hs-coburg.de/bi
Other comments	The lecture takes place together with architecture students and other academic programs may select it as an elective

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Module 43	Building Technology 2/ Energy and Building Technology 2		
Title of the course(s)	Building Technology 2		
Providing university	Coburg University		
Emphasis / program branch	Energy-efficient building design (E)		
Proof(s) of performance – admission prerequisites for examination	PPs1: successful participation in experimental and exercise units related to subject (participation in internship)		
Examination(s)	Written examination		
Semester No.	4. Semester		
Type of course(s)	SL, Exc, Int (2 SWH), ExC		
Sem. / compulsory or elective / SS or	1	Compulsory (E)	SS
Language	German		

Submodule	Type	SWH	Credits	Students	Work load
Module 43	SL, Exc, Int,	6	6 ECTS	unlimited	180h (90h in-class, 90h self-dir.)

Objectives / skills	
Students acquire a deeper knowledge of relevant segments of technical building equipment and learn to assess, plan, and dimension corresponding systems, with particular consideration of energy efficiency, sustainability, and profitability in new construction / renovation and operation of building technology	
Contents	
<ul style="list-style-type: none"> - Heating, sanitary, solar technology: Design and layout of systems, including heating load, hot water preparation, pipeline network calculation, heating surface layout, and layout of thermal solar systems - Ventilation technology: Design and layout of air-conditioning systems, incl. determination of cooling load and air exchange rate, air conditioning processes, sewer system calculation, and cooling technology/ systems - Photovoltaics - Energy consumption / characteristic values 	
Internship	
<ul style="list-style-type: none"> - Fundamental experiments in ventilation, climate control, heating, and solar technology. Use of 	
Literature	
Current lecture scripts of instructor (contain bibliography), textbooks, standards, regulations in current edition	
Work forms and didactic tools	
4 SWH lecture / seminar / exercise; 2 SWH internship	
Prerequisites	Module 44 (Thermo- and fluid dynamics) Module 22 (Building
Possible follow-up modules	
Sensible combination:	
References / script	
Contact person	Dr. Manfred Casties
Application formalities	No, compulsory module (E)
Event location	HS Coburg, Campus Design
Schedule and map	www.hs-coburg.de/bi
Other comments	

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Module 44	Thermo- and Fluid Dynamics		
Title of the course(s)	Thermo- and Fluid Dynamics		
Providing university	Coburg University		
Emphasis / program branch	Energy-efficient building design (E)		
Proof(s) of performance – admission prerequisites for examination	--		
Examination(s)	Written examination		
Semester No.	3. Semester		
Type of course(s)	SL, Exc		
Sem. / compulsory or elective / SS or	1	Compulsory (E)	WS
Language	German		

Submodule	Type	SWH	Credits	Students	Work load
Module 44	SL, Exc	4	4 ECTS	unlimited	120h (60h in-class, 60h self-dir.)

Objectives / skills	
Students become familiar with mechanical-thermal energy forms, their transmission and transformation into each other, and the treatment of fluids flows; they also learn how to use technical solution methods for complex problems	
Contents	
<ul style="list-style-type: none"> - Principles of thermodynamics (temperature, heat, energy types, phase changes, ideal gases,...) - Cycles, technically important processes - Thermodynamic states variables of moist air - H-x diagram - Heat transfer <ul style="list-style-type: none"> - Heat conduction - Heat convection - Heat radiation - Heat throughput - Heat exchangers - Introduction to hydrostatics and hydrodynamics - Pipe hydraulics 	
Literature	
Current lecture scripts of instructor (contain bibliography), textbooks, standards, regulations in current edition	
Work forms and didactic tools	
4 SWH lecture / seminar / exercise	
Prerequisites	
Possible follow-up modules	E: Module 43 (Building Technology 2)
Sensible combination:	
References / script	
Contact person	LBA Dr. Thomas Gebauer, (Dr. Casties)
Application formalities	No, compulsory module (E)
Event location	HS Coburg, Campus Design
Schedule and map	www.hs-coburg.de/bi
Other comments	

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Module 45	Measurement and Control Technology		
Title of the course(s)	Measurement and Control Technology		
Providing university	Coburg University		
Emphasis / program branch	Energy-efficient building design (E)		
Proof(s) of performance – admission prerequisites for examination	--		
Examination(s)	Written examination		
Semester No.	4. Specialized semester (E)		
Type of course(s)	SL, Exc		
Sem. / compulsory or elective / SS or	1	Compulsory	SS
Language	German		

Submodule	Type	SWH	Credits	Students	Work load
Module 45	SL, Exc	4	4 ECTS	unlimited	120h (60h in-class, 60h self-dir.)

Objectives / skills	
Students learn about measurement devices and measurement methods for physical and building technology parameters and learn to assess measurement procedures critically. Furthermore, they receive a basic understanding of technical control systems as a prerequisite of later courses (building automation)	
Contents	
Measurement Technology <ul style="list-style-type: none"> - Development of measurement technology - Basic concepts, definitions, SI units - Static and dynamic behavior - Measurement deviations, measurement errors, error propagation - Sensors - Measurement of physical parameters Control technology <p>Control circuit elements</p> <ul style="list-style-type: none"> - Basic concepts of control circuits - Controller types (e.g. P, PI, PID controllers) - Control circuit elements (e.g. P, PT1, I, IT1, D, DT1 elements) - System characteristics - Model building - Description procedure in time and frequency domain <p>of control circuits</p> <ul style="list-style-type: none"> - Properties of a circuit structure - Control and error behavior - <p>typical sample applications</p>	
Literature	
Current lecture scripts of instructor (contain bibliography), textbooks, standards, regulations in current edition	
Work forms and didactic tools	
4 SWH lecture / seminar / exercise	
Prerequisites	
Possible follow-up modules	E: Module 94 (Building Automation)
Sensible combination:	
References / script	
Contact person	Dr. Marcus Baur, Dr. Oliver Koch, (Dr. Casties)
Application formalities	No, compulsory module (E)
Event location	HS Coburg, Campus Design
Schedule and map	www.hs-coburg.de/bi
Other comments	

Coburg University, Department of Design, Academic Program in Civil

Module 61 Submodule 61.1	Building Law and Contracts Building Law and Contracts		
Title of the course(s)	Building Law and Contracts (VOB, BGB, HOAI)		
Providing university	Coburg University		
Emphasis / program branch	Civil engineering (all)		
Proof(s) of performance – admission prerequisites for examination	SPOB §5 (2)		
Examination(s)	Written examination		
Semester No.	6. Semester		
Type of course(s)	SL, Exc		
Sem. / compulsory or elective / SS or	1	Compulsory	SS
Language	German		

Submodule	Type	SWH	Credits	Students	Work load
Submodule 61.1	SL, Exc	2	3 ECTS	unlimited	90h (30h in-class, 60h self-dir.)

Objectives / skills	
Introduction to principles of building law and contracts	
Contents	
<ul style="list-style-type: none"> - Principles of building contracts - Legal relationships in planning and implementation of construction services - Introduction to architectural and engineering services pursuant to HOAI - Overview of principles of architectural and engineering contracts - Particularities for public clients - Award of construction orders - Invoicing of construction orders - Handling addenda - Deadlines and deadline extensions 	
Literature	
Current lecture scripts of instructor (contain bibliography), specialized texts, legal texts, applicable regulations	
Work forms and didactic tools	
2 SWH lecture / seminar / exercise	
Prerequisites	Module 14 (General Law)
Possible follow-up modules	
Sensible combination:	
References / script	
Contact person	LBA Ludwig Frenking
Application formalities	No, compulsory module
Event location	HS Coburg, Campus Design
Schedule and map	www.hs-coburg.de/bi
Other comments	

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Module 61 Submodule 61.2	Building law principles Environmental Building Planning		
Title of the course(s)	Environmental and Building Planning (BBO and Building Code)		
Providing university	Coburg University		
Emphasis / program branch	Civil engineering (all)		
Proof(s) of performance – admission prerequisites for examination	SPOB §5 (2)		
Examination(s)	Written examination		
Semester No.	6. Semester		
Type of course(s)	SL, Exc		
Sem. / compulsory or elective / SS or	1	Compulsory	SS
Language	German		

Submodule	Type	SWH	Credits	Students	Work load
Submodule 61.2	SL, Exc	2	3 ECTS	unlimited	90h (30h in-class, 60h self-dir.)

Objectives / skills	
Introduction to the principles of planning services and the legal contexts of planning, building, and environmental planning	
Contents	
<ul style="list-style-type: none"> - Insights into planning tools of regional development, state and regional planning - Overview of state building codes using the example of Bavaria - Overview of the responsibilities and implementation of urban development planning - Insights into environmental foresight in planning and building - Knowledge of connections between planning and implementation - Responsibility of planner for environmental planning, construction implementation, and the structure 	
Literature	
Current lecture scripts of instructor (contain bibliography), specialized texts, legal texts, applicable regulations	
Work forms and didactic tools	
2 SWH lecture / seminar / exercise	
Prerequisites	
Possible follow-up modules	
Sensible combination:	
References / script	
Contact person	LBA Ludwig Frenking
Application formalities	No, compulsory module
Event location	HS Coburg, Campus Design
Schedule and map	www.hs-coburg.de/bi
Other comments	

Coburg University, Department of Design, Academic Program in Civil

Module 62	Calculation and Project Management		
Title of the course(s)	Calculation and Project Management		
Providing university	Coburg University		
Emphasis / program branch	Civil engineering (all)		
Proof(s) of performance – admission prerequisites for examination	SPOB §5 (2)		
Examination(s)	Written examination		
Semester No.	6. Semester		
Type of course(s)	SL, Exc, ExC		
Sem. / compulsory or elective / SS or	1	Compulsory	SS
Language	German		

Submodule	Type	SWH	Credits	Students	Work load
Module 62	SL, Exc, ExC	4	4 ECTS	unlimited	120h (60h in-class, 60h self-dir.)

Objectives / skills	
<ul style="list-style-type: none"> - Ability to prepare a construction project and its implementation with the building owner and planner, and to advise building owner and planner in terms of technical and economic aspects - Familiarity with basics of work planning, management, and monitoring of operational processes and with building price determination - Ability to plan, coordinate, and monitor an entire construction project 	
Contents	
<ul style="list-style-type: none"> - Objectives and responsibilities of project implementation and construction operations - Planning and implementation phases of a construction site - Cost determination during planning phase - Compilation and assessment of specification of services - Documentation of construction activities and site supervision - Ability to determine construction price and familiarity with construction cost accounting - Tender process, award, and invoicing (AVA) - Calculation, construction cost accounting - Process planning with bar, line, and network plans 	
Literature	
Current lecture scripts of instructor (contain bibliography), textbooks, standards, regulations in current edition	
Work forms and didactic tools	
4 SWH lecture / seminar / exercise	
Prerequisites	Module 13 (Construction Operations)
Possible follow-up modules	
Sensible combination:	
References / script	
Contact person	Dr. Egbert Keßler
Application formalities	No, compulsory module
Event location	HS Coburg, Campus Design
Schedule and map	www.hs-coburg.de/bi
Other comments	

Coburg University, Department of Design, Academic Program in Civil

Module 63	Fire Protection
Title of the course(s)	Fire Protection
Providing university	Coburg University
Emphasis / program branch	Civil engineering (all)
Proof(s) of performance – admission prerequisites for examination	SPOB §5 (2)
Examination(s)	Written examination
Semester No.	7. Semester
Type of course(s)	SL, Exc, ExC
Sem. / compulsory or elective / SS or	1 Compulsory WS
Language	German

Submodule	Type	SWH	Credits	Students	Work load
Module 63	SL, Exc, ExC	2	2 ECTS	unlimited	60h (30h in-class, 30h self-dir.)

Objectives / skills	
Students acquire basic knowledge of constructional and technical fire protection.	
Contents	
<ul style="list-style-type: none"> - Principles of fires, explosions - Principles of fire protection (definitions, concepts, legal principles, ...) - Constructional fire protection: <ul style="list-style-type: none"> - Standards, guidelines - Bulkhead principle, fire compartments - Building classes - Evacuation and rescue routes - Fire fighting areas - Construction products - Fire protection constructions - Securing circuit systems, etc. - Technical fire protection: <ul style="list-style-type: none"> - Fire alarm and extinguishing systems - Smoke alarm and extraction systems - Planned fire protection - Fire protection concepts, etc. 	
Literature	
Current lecture scripts of instructor (contain bibliography), textbooks, standards, regulations in current edition	
Work forms and didactic tools	
2 SWH lecture / seminar	
Prerequisites	
Possible follow-up modules	
Sensible combination:	
References / script	
Contact person	Dr. Manfred Casties
Application formalities	No, compulsory module
Event location	HS Coburg, Campus Design
Schedule and map	www.hs-coburg.de/bi
Other comments	Other academic programs may take this course as an elective

Coburg University, Department of Design, Academic Program in Civil

Module 64	Interdisciplinary Project		
Title of the course(s)	Interdisciplinary Project		
Providing university	Coburg University		
Emphasis / program branch	Civil engineering (all)		
Proof(s) of performance – admission prerequisites for examination	SPOB §5 (2)		
Examination(s)	Examination research paper, colloquium, and presentation		
Semester No.	7. Semester		
Type of course(s)	SL, Exc, ExC		
Sem. / compulsory or elective / SS or	1	Compulsory	WS
Language	German		

(Sub)module	Type	SWH	Credits	Students	Work load
Module 64	SL, Exc, ExC	4	5 ECTS	unlimited	150 h (60h in-class, 90h self-study)

Objectives / skills	
<ul style="list-style-type: none"> - Design and construction of an engineering project using a multidisciplinary approach - Better understanding of the concerns and constraints of other departments involved in the design process 	
Contents	
<ul style="list-style-type: none"> - Assessment and consideration of multidisciplinary design criteria - Procedure in preliminary design, design, and pre-measurement of a stated design task 	
Literature	
Project-related	
Work forms and didactic tools	
4 SWH lecture / exercise	
Prerequisites	
Possible follow-up modules	
Sensible combination:	
References / script	
Contact person	Academic program director BI
Application formalities	No
Event location	HS Coburg, Campus Design
Schedule and map	www.hs-coburg.de/bi
Other comments	

Coburg University, Department of Design, Academic Program in Civil

Module 65 Submodule 65.1	Final Thesis Bachelor Seminar / Technical Communications		
Title of the course(s)	Bachelor Seminar		
Providing university	Coburg University		
Emphasis / program branch	Civil engineering (all)		
Proof(s) of performance – admission prerequisites for examination	PPs4: Attendance at individual announced courses SPOB §5 (2)		
Examination(s)	Presentation		
Semester No.	7. Semester		
Type of course(s)	S, ExC		
Sem. / compulsory or elective / SS or	1	Compulsory	WS, SS
Language	German		

Submodule	Type	SWH	Credits	Students	Work load
Submodule 65.1	S, ExC	2	1 ECTS	unlimited	30h (30h in-class)

Objectives / skills	
The Bachelor Seminar teaches students to describe the problem, approaches, and methods as well as to present in writing / defend orally the results of their Bachelor's thesis	
Contents	
<ul style="list-style-type: none"> - Planning and formal completion of a Bachelor's thesis - Content structure of a Bachelor's thesis - Notes on academic writing and analysis of results - Content and formal design of paper - Content and formal design of presentations - Presentation of Bachelor's thesis in front of an audience 	
Literature	
Script	
Work forms and didactic tools	
Seminar-type lectures, verbal instruction by mentor	
Prerequisites	
Possible follow-up modules	
Sensible combination:	Submodule 65.2 (Bachelor's Thesis)
References / script	
Contact person	All examiners
Application formalities	No, compulsory module
Event location	HS Coburg, Campus Design
Schedule and map	www.hs-coburg.de/bi
Other comments	

Coburg University, Department of Design, Academic Program in Civil

Module 65 Submodule 65.2	Final Thesis / Bachelor's Thesis		
Title of the course(s)	Bachelor's Thesis		
Providing university	Coburg University		
Emphasis / program branch	Civil engineering (all)		
Proof(s) of performance – admission prerequisites for examination	SPOB §7 (3)		
Examination(s)	Bachelor's thesis		
Semester No.	7. Semester		
Type of course(s)	Bachelor's thesis		
Sem. / compulsory or elective / SS or	1	Compulsory	WS, SS
Language	German		

Submodule	Type	SWH	Credits	Students	Work load
Submodule 65.2	Bachelor's	--	10 ECTS	unlimited	300h (300h self-dir. study)

Objectives / skills	
The Bachelor's thesis should show that the students are able to work on a problem in civil engineering on a scientific basis	
Contents	
Literature	
Subject-related	
Work forms and didactic tools	
Oral instruction by mentor	
Prerequisites	
Possible follow-up modules	
Sensible combination:	Submodule 65.1 (Bachelor Seminar)
References / script	
Contact person	Dr. Peter Pfrommer
Application formalities	In coordination with the examiner
Event location	HS Coburg, Campus Design
Schedule and map	www.hs-coburg.de/bi
Other comments	

Coburg University, Department of Design, Academic Program in Civil

Module 71	Special Foundations		
Title of the course(s)	Special Foundations		
Providing university	Coburg University		
Emphasis / program branch	Specialization construction engineering (Ak)		
Proof(s) of performance – admission prerequisites for examination	PPs3: Solution and presentation (if appl.) of exercises; SPOB §5 (2)		
Examination(s)	wrEx		
Semester No.	6. Semester		
Type of course(s)	SL, Exc, ExC		
Sem. / compulsory or elective / SS or	1	Compulsory	SS
Language	German		

Submodule	Type	SWH	Credits	Students	Work load
Module 71	SL, Exc, ExC	4	5 ECTS	unlimited	150h (60h in-class, 90h self-study)

Objectives / skills	
<p>Students</p> <ul style="list-style-type: none"> - Will learn systems for construction of building pits (excavation) and can select a suitable pit lining system for the construction task - Will become familiar with anchor systems for excavation pit walls (anchors, piles) - Will be able to assess excavation pit walls and anchor systems (manually and using software) - Will be able to design and assess water-proof excavation pits with piling wall, sealing base, and tension piles for anti-floating purposes - Will become familiar with measures for ground water retention - Will have mastered the design and dimensioning of piled foundations - Will learn additional procedures to create pile-like elements in the area of special foundations 	
Contents	
<p>Excavation pit walls, wall types, installation procedure and materials, assessment of piling system manually and using software, calculation of anchor depth of excavation pit walls, assessment of wall sections, verification of the vertical balance, protection against stinking components, anchoring (composite anchor: multi-strand anchors, single-rod anchor), systems, corrosion protection (short-term, anchor, permanent anchor), production and installation of anchoring, tensioning and fixing anchoring, verification of pull-out resistance, anchor examinations, determination and assessment of creep, determination of calculated free steel length, verification of structural stability in deep slip surface, excavation pits in groundwater, sealing beds, groundwater lowering, protection against hydraulic soil seepage, protection against floating, anti-floating tension piles, piled foundations, pile types, production and material, design and calculation of systems of axially loaded piles, pile resistance from test loads, pile resistance from results of construction soil tests (experience values based on EA piles), evidence for pile groups, pile-like elements (vibrated stone columns, CSV pillars, jet grouting procedure, FMI procedure)</p>	
Literature	
<p>Current lecture scripts of instructor (contain bibliography), textbooks, standards, regulations in current edition</p>	
Work forms and didactic tools	
<p>Seminar-type lectures, application of design software in computer lab</p>	
Prerequisites	<p>Module 25.1 (Soil Mechanics) Module 25.2 (Soil Engineering)</p>
Possible follow-up modules	
Sensible combination:	
References / script	<p>Currents lecture script of instructor</p>
Contact person	<p>Dr. Almut Lottmann-Löer</p>
Application formalities	<p>No, compulsory module (Ak)</p>
Event location	<p>HS Coburg, Campus Design</p>

Schedule and map	www.hs-coburg.de/bi
Other comments	

Module 72	Numerical Structural Analysis and Analysis of Plane Load-bearing Structures		
Title of the course(s)	Numerical Structural Analysis and Analysis of Plane Load-		
Providing university	Coburg University		
Emphasis / program branch	Specialization construction engineering (Ak)		
Proof(s) of performance – admission prerequisites for examination	PPs3: Solutions and presentation (if appl.) of exercises SPOB §5 (2)		
Examination(s)	Written examination		
Semester No.	6. Semester		
Type of course(s)	SL, Exc, ExC		
Sem. / compulsory or elective / SS or	1	Compulsory	SS
Language	German		

Submodule	Type	SWH	Credits	Students	Work load
Module 72	SL, Exc, ExC	4	5 ECTS	unlimited	150h (60h in-class, 90h self-study)

Objectives / skills	
<ul style="list-style-type: none"> - Calculation of stress resultants and deformations of plane load-bearing structures - Model building and calculation of rod and plane load-bearing structures - Assessment of computer-aided calculations 	
Contents	
<ul style="list-style-type: none"> - Theoretical principles and calculation of analysis of plane load-bearing structures - Theoretical principles for formulation of finite element method in structural analysis - Practical application and implementation in a commercial program system - Historical development and concept as well as versatile use of finite element method in structural analysis; Transferability and application of the methodology to other areas - Mathematical principles of methodology and derivation of element stiffness matrices of select isoparametric elements and their initial function - Derivation of linear spring, timber framework, rod, and surface elements - Programming implementation of methodology and numerical treatment of large systems of equations - Practical use of methodology for structural analysis problems: Subject areas such as Solver, application limitations, quality of the results, precision, and error sources and their causes - Practical exercises 	
Literature	
Current lecture scripts of instructor (contain bibliography), textbooks, standards, regulations in current edition	
Work forms and didactic tools	
4 SWH lecture / seminar / exercise	
Prerequisites	A: Module 31 (Structural Analysis 2)
Possible follow-up modules	
Sensible combination:	
References / script	
Contact person	Dr. Martin Synold
Application formalities	No, compulsory module (Ak)
Event location	HS Coburg, Campus Design
Schedule and map	www.hs-coburg.de/bi
Other comments	

Module 73	Structural Concrete 2 / Structural Concrete 2		
Title of the course(s)	Structural concrete 2		
Providing university	Coburg University		
Emphasis / program branch	Specialization construction engineering (Ak)		
Proof(s) of performance – admission prerequisites for examination	PPs3: Solutions and presentation (if appl.) of exercises SPOB §5 (2)		
Examination(s)	Written examination		
Semester No.	7. Semester		
Type of course(s)	SL, Exc, ExC		
Sem. / compulsory or elective / SS or	1	Compulsory	WS
Language	German		

(Sub)module	Type	SWH	Credits	Students	Work load
Module 73	SL, Exc, ExC	4	5 ECTS	unlimited	150 h (60h in-class, 90h self-dir.)

Objectives / skills	
<ul style="list-style-type: none"> - Ability to undertake material-specific design, construction, and measurement of standard constructions and simple special constructions, each tailored to specific requirements due to use - Assessment of load-bearing behavior and structural stability - Ability to question computed results critically 	
Contents	
<ul style="list-style-type: none"> - Verification of serviceability of standard constructions - Verification of load capacity of special constructions - Principles of reinforcement configuration and constructive design of special structures - Principles of pre-stressed concrete and verification of load capacity - Principles of the "Assessing with concrete truss models" method - Special constructions with the concrete truss model method for modeling and assessing - Reading formwork and reinforcement plans and creating reinforcement sketches for special components - Calculation of specific load-bearing elements: stairs, individual foundations, elastically embedded floor plates, punching through flat ceilings 	
Literature	
Subject-related; lecture manuscript of instructor (contains bibliography)	
Work forms and didactic tools	
4 SWH lecture / exercise	
Prerequisites	Module 24 (Structural Concrete 1)
Possible follow-up modules	
Sensible combination:	
References / script	
Contact person	Dr.-Eng. Holger Falter
Application formalities	No, compulsory module (Ak)
Event location	HS Coburg, Campus Design
Schedule and map	www.hs-coburg.de/bi
Other comments	

Module 74	Steel Construction Steel Construction		
Title of the course(s)	Steel construction		
Providing university	Coburg University		
Emphasis / program branch	Specialization construction engineering (Ak)		
Proof(s) of performance – admission prerequisites for examination	PPs3: Solution and presentation (if appl.) of exercises SPOB §5 (2)		
Examination(s)	Written examination		
Semester No.	6. Semester		
Type of course(s)	SL, Exc, ExC		
Sem. / compulsory or elective / SS or	1	Compulsory	SS
Language	German		

(Sub)module	Type	SWH	Credits	Students	Work load
Module 74	SL, Exc, ExC	3	4 ECTS	unlimited	120 h (45h in-class, 75h self-dir.)

Objectives / skills	
<ul style="list-style-type: none"> - Ability to design, construct, and assess steel constructions for simple structures and their connections - Recognizing and assessing components and constructions with impaired stability - Assessment of structures with the elastic-plastic method 	
Contents	
<ul style="list-style-type: none"> - Verification of structural stability and serviceability of tension rods, pressure rods, bending girders, continuous beams, and frames - Constructive design of steel components and joints and spatial stabilization of steel structures - Complex screw joints and butt plate joints (pretensioned and not pretensioned) and welded joints - Principles of steel construction-specific stability phenomena (torsional flexural buckling) - Long-term strength (fatigue) 	
Literature	
Subject-related; lecture manuscript of instructor (contains bibliography)	
Work forms and didactic tools	
3 SWH lecture / exercise	
Prerequisites	Module 23 (Non-material-specific Surveying and Construction)
Possible follow-up modules	
Sensible combination:	
References / script	
Contact person	Dr.-Eng. Holger Falter
Application formalities	No, compulsory module (Ak)
Event location	HS Coburg, Campus Design
Schedule and map	www.hs-coburg.de/bi
Other comments	

Module 75 Submodule 75.1	Timber and Composite Structures Timber Structures		
Title of the course(s)	Timber Structures		
Providing university	Coburg University		
Emphasis / program branch	Specialization construction engineering (Ak)		
Proof(s) of performance – admission prerequisites for examination	PPs3: Solutions and presentation (if appl.) of exercises SPOB §5 (2)		
Examination(s)	Written examination		
Semester No.	7. Semester		
Type of course(s)	SL, Exc, ExC		
Sem. / compulsory or elective / SS or	1	Compulsory	WS
Language	German		

Submodule	Type	SWH	Credits	Students	Work load
Submodule 75.1	SL, Exc, ExC	3	3 ECTS	unlimited	90h (45h in-class, 45h self-study)

Objectives / skills	
<ul style="list-style-type: none"> - Ability to provide all essential verification for timber structures and designing simple timber structures - Knowledge and application of the most important load-bearing systems in timber structures 	
Contents	
<ul style="list-style-type: none"> - Deeper knowledge for Module 23 (Non-material-specific Assessment and Construction) - Detailed knowledge of timber as a construction material and derived materials as well as their load capacity and behavior - Ability to assess timber structures in terms of load capacity and serviceability - Ability to design joints and provide joining means - Assessment in case of fire - Ability to design, verify, and structural design of timber structures 	
Literature	
Current lecture scripts of instructor (contain bibliography), textbooks, standards, regulations in current edition	
Work forms and didactic tools	
3 SWH lecture / seminar / exercise	
Prerequisites	Module 23 (Non-material-specific Assessment and Constr.) Module 74 (Steel Construction)
Possible follow-up modules	
Sensible combination:	Module 75.2 (Composite Structures)
References / script	
Contact person	Dr. Martin Synold
Application formalities	No, compulsory module (Ak)
Event location	HS Coburg, Campus Design
Schedule and map	www.hs-coburg.de/bi
Other comments	

Module 75 Submodule 75.2	Timber and Composite Structures Composite Structures		
Title of the course(s)	Composite Structures		
Providing university	Coburg University		
Emphasis / program branch	Specialization construction engineering (Ak)		
Proof(s) of performance – admission prerequisites for examination	PPs3: Solutions and presentation (if appl.) of exercises SPOB §5 (2)		
Examination(s)	Written examination		
Semester No.	7. Semester		
Type of course(s)	SL, Exc, ExC		
Sem. / compulsory or elective / SS or	1	Compulsory	WS
Language	German		

Submodule	Type	SWH	Credits	Students	Work load
Submodule 75.2	SL, Exc, ExC	2	2 ECTS	unlimited	60h (30h in-class, 30h self-study)

Objectives / skills	
<ul style="list-style-type: none"> - Ability to provide essential verification of steel-concrete composite structures and of timber-concrete composite structures - Structural design of simple composite structures 	
Contents	
<ul style="list-style-type: none"> - Expanded knowledge for Module 23 (Non-material-specific Assessment and Construction), Module 74 (Steel Construction), and Module 75.1 (Timber Structures) - Detailed knowledge of the composition of steel elements with concrete and timber materials with concrete - Load capacity and behavior - Ability to assess steel composite structures in terms of load capacity and serviceability - Ability to assess timber composite structures in terms of load capacity and serviceability - Ability to design joints and provide joining means - Ability to design, verify, and structurally design composite structures 	
Literature	
Current lecture scripts of instructor (contain bibliography), textbooks, standards, regulations in current edition	
Work forms and didactic tools	
2 SWH lecture / seminar / exercise	
Prerequisites	Module 23 (Non-material-specific Assessment and Constr.) Module 24 (Structural Concrete) Module 74 (Steel Construction)
Possible follow-up modules	
Sensible combination:	Module 75.1 (Timber Structures) Module 73 (Structural Concrete 2)
References / script	
Contact person	Dr. Martin Synold
Application formalities	No, compulsory module (Ak)
Event location	HS Coburg, Campus Design
Schedule and map	www.hs-coburg.de/bi
Other comments	

Module 77.1 and 77.2	Compulsory Elective Modules 1.1 and 1.2 / Electives 1.1 and 1.2		
Title of the course(s)	Compulsory Elective Modules 1.1 and 1.2		
Providing university	Coburg University		
Emphasis / program branch	Specialization construction engineering (Ak)		
Proof(s) of performance – admission prerequisites for examination	sR Separate regulation in program and examination plan SPOB §5 (2)		
Examination(s)	sR Separate regulation in program and examination plan		
Semester No.	6. Semester		
Type of course(s)	SL, Exc, L, Int, ExC		
Sem. / compulsory or elective / SS or	1	Compulsory	SS
Language	German		

Submodule	Type	SWH	Credits	Students	Work load
Module 77	SL, Exc, L, Int, ExC	2*2=4	4 ECTS	unlimited	120h (60h in-class, 60h self-dir. study)

Objectives / skills
<p>Methodological skills</p> <ul style="list-style-type: none"> - Know and understand factors for successful team work, and implement methods and rules of successful team work in practice - Perform research related to project topics in data bases, the internet, and the library - Analyze complex texts critically, i.e. recognize structures and connections, uncover contradictions, and differentiate facts from interpretations - Use specific theories, models, and skills in defined practical contexts - Create and perform proper and target group-specific presentation of project contents - Document, segment, and prepare project results according to scientific criteria (project report / project manual, final report, final presentation) <p>Technical and interdisciplinary skills</p> <ul style="list-style-type: none"> - Knowing, classifying, interpreting, and applying phases, methods, and criteria of project management (e.g. planning steps and continually verifying, using resources sensibly...) - Reflecting value-related aspects in an interdisciplinary perspective (e.g. social justice, sustainability) - Expanding / deepening and applying disciplinary competences (knowledge and skills) in a project-specific manner (e.g. basic knowledge of particular target groups and/or special problems and/or fields of action of the academic program; knowing, understanding, classifying, and using social / legal conditions relevant to the academic program) - Singling out and verifying disciplinary theories, models, and concepts and comparing them with interdisciplinary solutions and verifying them - Marking, explaining, and actively using a change perspective <p>Personnel skills (communication skills)</p> <ul style="list-style-type: none"> - Consciously considering the perspectives of other departments - Communicating audience-specifically in the interdisciplinary context - Knowing, understanding, and applying binding standards of professional verbal and written communication - Transferring and applying scientific knowledge appropriately in project-related situations and contexts - Using technical and scientific terminology and weighing its use critically - Reflecting on their own problem resolution behavior and actions and regulating them
Contents

The academic program, together with the Examination Committee of the Academic Center for Sciences and Humanities, specifies in more detail the interdisciplinary compulsory elective modules at the end of the semester for the following semester.

From this compulsory elective module group, a project module must be selected based on the available selection and capacity limits of the course.

Literature	
Current lecture scripts of instructor (contain bibliography), textbooks, manuals, regulations in current edition	
Work forms and didactic tools	
2*2=4 SWH lecture / seminar / exercise / internships, self-study, project papers	
Prerequisites	
Possible follow-up modules	
Sensible combination:	
References / script	
Contact person	Respective instructor responsible for compulsory elective module
Application formalities	Application list; SPOB §3 (8)
Event location	HS Coburg, Campus Design
Schedule and map	www.hs-coburg.de/bi
Other comments	

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Modules 78.1 and 78.2	Compulsory Elective Modules 2.1 and 2.2 / Electives 2.1 and 2.2		
Title of the course(s)	Compulsory Elective Modules 2.1 and 2.2		
Providing university	Coburg University		
Emphasis / program branch	Specialization construction engineering (Ak)		
Proof(s) of performance – admission prerequisites for examination	sR Separate regulation in program and examination plan SPOB §5 (2)		
Examination(s)	sR Separate regulation in program and examination plan		
Semester No.	6. Semester		
Type of course(s)	SL, Exc, L, Int, ExC		
Sem. / compulsory or elective / SS or	1	Compulsory	SS
Language	German		

Submodule	Type	SWH	Credits	Students	Work load
Module 78	SL, Exc, L, Int, ExC	2*2=4	4 ECTS	unlimited	120h (60h in-class, 60h self-dir. study)

Objectives / skills
<p>Methodological skills</p> <ul style="list-style-type: none"> - Know and understand factors for successful team work and implement methods and rules of successful team work in practice - Perform research related to project topics in data bases, the internet, and the library - Analyze complex texts critically, i.e. Recognize structures and connections, uncover contradictions, and differentiate facts from interpretations - Use specific theories, models, and skills in defined practical contexts - Create and perform proper and target group-specific presentation of project contents - Document, segment, and prepare project results according to scientific criteria (project report / project manual, final report, final presentation) <p>Technical and interdisciplinary skills</p> <ul style="list-style-type: none"> - Knowing, classifying, interpreting, and applying phases, methods, and criteria of project management (e.g. planning steps and continually verifying, using resources sensibly...) - Reflecting value-related aspects in an interdisciplinary perspective (e.g. social justice, sustainability) - Expanding / deepening and applying disciplinary competences (knowledge and skills) in a project-specific manner (e.g. basic knowledge of particular target groups and/or special problems and/or fields of action of the academic program; knowing, understanding, classifying, and using social / legal conditions relevant to the academic program) - Singling out and verifying disciplinary theories, models, and concepts and comparing them with interdisciplinary solutions and verifying them - Marking, explaining, and actively using a change perspective <p>Personnel skills (communication skills)</p> <ul style="list-style-type: none"> - Consciously considering the perspectives of other departments - Communicating audience-specifically in the interdisciplinary context - Knowing, understanding, and applying binding standards of professional verbal and written communication - Transferring and applying scientific knowledge appropriately in project-related situations and contexts - Using technical and scientific terminology and weighing its use critically - Reflecting on their own problem resolution behavior and actions and regulating them
Contents

The academic program, together with the Examination Committee of the Academic Center for Sciences and Humanities, specifies in more detail the interdisciplinary compulsory elective modules at the end of the semester for the following semester.

From this compulsory elective module group, a project module must be selected based on the available selection and capacity limits of the course.

Literature	
Current lecture scripts of instructor (contain literature references), textbooks, manuals, regulations in current edition	
Work forms and didactic tools	
2*2=4 SWH lecture / seminar / exercise / internships, self-study, project papers	
Prerequisites	
Possible follow-up modules	
Sensible combination:	
References / script	
Contact person	Respective instructor responsible for compulsory elective module
Application formalities	Application list; SPOB §3 (8)
Event location	HS Coburg, Campus Design
Schedule and map	www.hs-coburg.de/bi
Other comments	

Module 81	Urban Water Supply and Sanitation Systems 2 / Storm		
Title of the course(s)	Urban Water Supply and Sanitation Systems 2		
Providing university	Coburg University		
Emphasis / program branch	Specialization infrastructure planning (Ap)		
Proof(s) of performance – admission prerequisites for examination	SPOB §5 (2)		
Examination(s)	Written examination		
Semester No.	6. Semester		
Type of course(s)	SL, Exc, Int, ExC		
Sem. / compulsory or elective / SS or	1	Compulsory	SS
Language	German		

Submodule	Type	SWH	Credits	Students	Work load
Module 81	SL, Exc, Int,	4	4 ECTS	unlimited	120h (60h in-class, 60h self-dir.)

Objectives / skills	
Students learn about buildings for mixed and storm water treatment in the separate and mixing system as well as drainage-related seepage, they are able to assess all system components based on applicable technical rules.	
Contents	
Drainage systems development	
<ul style="list-style-type: none"> - Measures catalog for an ecological urban drainage system (natural treatment of storm water) - Elevation and slope of waste and storm water channels in development measures - Representation of the channels on site plan and cross section - Specification of runoff areas 	
Storm water treatment in separate system (DWA-M 153)	
<ul style="list-style-type: none"> - Assessment of qualitative water contamination and structures for water protection - Assessment of quantitative water contamination 	
Structures of central mixed and storm water treatment	
<ul style="list-style-type: none"> - Storm water retention tank (ATV-A 117) and storm water spillways (ATV-A 111) - Rain water spillway tank and storage channels (ATV-A 128) - Technical equipment of systems 	
Precipitation water seepage (DWA-M 138)	
<ul style="list-style-type: none"> - Seepage systems (implementation and assessment: Area, trough, trench, pipe, shaft, retention area seepage, pipe-trench and trough-trench systems) 	
Storm water drainage near the surface	
<ul style="list-style-type: none"> - Concepts of flood prevention according to pamphlet DWA-M 119) 	
Literature	
Lecture scripts of instructor with bibliography, textbooks, standards and current regulations	
Work forms and didactic tools	
4 SWH lecture / seminar / exercise	
Prerequisites	Module 11 (Urban Water Supply and Sanitation Systems 1)
Possible follow-up modules	
Sensible combination:	
References / script	Script and collection of exercises
Contact person	Prof. Dieter Sitzmann
Application formalities	No, compulsory module (Ap)
Event location	HS Coburg, Campus Design
Schedule and map	
Other comments	

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Module 82	Hydraulic Engineering 2 / Hydraulic Engineering 2
Title of the course(s)	Waterway engineering 2
Providing university	Coburg University
Emphasis / program branch	Specialization infrastructure planning (Ap)
Proof(s) of performance – admission prerequisites for examination	PPs1: successful participation in experimental and exercise units related to subject (participation in hydraulic engineering internship with report attestations) SPOB §5 (2) SPOB §5 (2)
Examination(s)	Written examination
Semester No.	7. Semester
Type of course(s)	SL, Exc, Int, ExC
Sem. / compulsory or elective / SS or	1 Compulsory WS
Language	German

Submodule	Type	SWH	Credits	Students	Work load
Module 82	SL, Exc, Int,	4	5 ECTS	unlimited	150h (60h in-class, 90h self-dir.)

Objectives / skills	
Students learn about the elements of the water cycle and the most important problems in engineering hydrology and are able to assess simple high water retention tanks with all technical components. The knowledge of channel and pipe hydraulics is expanded.	
Contents	
Elements of the water cycle	
<ul style="list-style-type: none"> - Precipitation (precipitation measurement, quantitative description of precipitation, regional precipitation, statistical analysis of precipitation) - Evaporation and seepage - Drainage (drainage measurement, implementation and analysis of drainage measurements) 	
High water retention tanks	
<ul style="list-style-type: none"> - Precipitation retention (drainage formation and concentration, calculation of high water waves) - Lake retention (water supply balance equation, retention calculation) - Assessment and design of high water retention spaces (operation, assessment frequency, target water levels and freeboard assessment, high water relief systems, determination of extremely high water drainage, bottom outlets) 	
Internship and excursion	
<ul style="list-style-type: none"> - Practical exercises in water lab: Seepage, flow measurement in channels - Excursion to hydraulic engineering system in the surrounding area 	
Literature	
Lecture scripts of instructor with bibliography, textbooks, standards and current regulations	
Work forms and didactic tools	
4 SWH lecture / exercise / internship in groups	
Prerequisites	A: Module 32 (Hydraulic Engineering 1)
Possible follow-up modules	
Sensible combination:	
References / script	Script and collection of exercises
Contact person	Prof. Dieter Sitzmann
Application formalities	No, compulsory module (Ap)
Event location	HS Coburg, Campus Design
Schedule and map	www.hs-coburg.de/bi
Other comments	

Module 83	Embankment and Landfill Construction		
Title of the course(s)	Embankment and Landfill Construction		
Providing university	Coburg University		
Emphasis / program branch	Specialization infrastructure planning (Ap)		
Proof(s) of performance – admission prerequisites for examination	PPs3: Solution and presentation (if appl.) of exercises; SPOB §5 (2)		
Examination(s)	wrEx		
Semester No.	7. Semester		
Type of course(s)	SL, Exc, ExC		
Sem. / compulsory or elective / SS or	1	Compulsory	WS
Language	German		

Submodule	Type	SWH	Credits	Students	Work load
Module 83	SL, Exc, ExC	3	4 ECTS	unlimited	120 h (45h in-class, 75h self-study)

Objectives / skills	
Students learn how to plan and assess embankments for roads, dams, and landfills under geotechnical aspects.	
Contents	
Embankments and landfills – use and requirements, landfill classification, location selection, landfill principle of construction, surface and base sealing, design and construction of earth embankments, earthwork technology, construction materials and machines, compression methods and requirements for road, rails, and dam embankments, use of geosynthetics, structural stability verification for embankments and landfills (e.g. verification against slippage of layers parallel to slope, verification of safety against embankment slope seepage), structural stability of nailed embankment slopes, design and assessment of steep embankment slopes reinforced with geogrids, dam embankment seals, filters, drainage systems, seepage line, verification of hydraulic safety (e.g. filter verification for mineral and geotextile filters, verification of safety against suffosion, verification of safety against erosion soil seepage, against hydraulic ground seepage, and against floating), requirements for embankment subsoil, measures for subsoil improvement and sealing, special civil engineering procedures, monitoring, measurement systems (e.g. deformation, earth pressure, level, pore water pressure, seepage water volume, and	
Literature	
Current lecture scripts of instructor (contain bibliography), textbooks, standards, regulations in current edition	
Work forms and didactic tools	
Seminar-type lectures, application of software in computer lab	
Prerequisites	Module 25.1 (Soil Mechanics) Module 25.2 (Soil Engineering)
Possible follow-up modules	
Sensible combination:	A: Module 33 (Road Construction) Ap: Module
References / script	Currents lecture script of instructor
Contact person	Dr. Almut Lottmann-Löer
Application formalities	No, compulsory module (Ap)
Event location	HS Coburg, Campus Design
Schedule and map	www.hs-coburg.de/bi
Other comments	

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Module 84	Traffic System
Title of the course(s)	Traffic System
Providing university	Coburg University
Emphasis / program branch	Specialization infrastructure planning (Ap)
Proof(s) of performance – admission prerequisites for examination	PPs3: Solution and presentation (if appl.) of exercises; SPOB §5 (2)
Examination(s)	Written examination (wrEx)
Semester No.	6. Semester
Type of course(s)	SL, Exc, Int, ExC
Sem. / compulsory or elective / SS or	1 Compulsory SS
Language	German

Submodule	Type	SWH	Credits	Students	Work load
Module 84	SL, Exc, Int,	4	4 ECTS	unlimited	120 h (60h in-class, 60h self-study)

Objectives / skills	
<p>Overview of traffic system principles and methods, clarified by sample applications from the practical world using the respective valid guidelines.</p> <p>Familiarity in working with the principles and methods and implementing them in practice.</p> <p>Ability to understand complex problems (also in practice) and derive proposed solutions / implementations (from insights in lecture).</p>	
Contents	
<ul style="list-style-type: none"> - Principles of traffic technology (introduction, traffic flow, traffic progress) - Notes on traffic management, introduction to LSA - Mobility, mobility parameters, development of traffic - Area usage and traffic (city and urban development, area use, and urban development planning) - Planning theory, planning process - Traffic surveys - Traffic generation, destination selection - Selection of transportation, routes, rerouting - Noise - network design etc. 	
Literature	
<p>Current lecture scripts of instructor (contain bibliography), textbooks, standards, regulations in current edition.</p>	
Work forms and didactic tools	
<p>4 SWH lecture / seminar / exercise</p>	
Prerequisites	
Possible follow-up modules	
Sensible combination:	
References / script	
Contact person	
<p>Dr. Timo Bertocchi</p>	
Application formalities	
<p>No, compulsory module (Ap)</p>	
Event location	
<p>HS Coburg, Campus Design</p>	
Schedule and map	
<p>www.hs-coburg.de/bi</p>	
Other comments	

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Module 85	Preservation of Road Structure		
Title of the course(s)	Preservation of Road Structure		
Providing university	Coburg University		
Emphasis / program branch	Specialization infrastructure planning (Ap)		
Proof(s) of performance – admission prerequisites for examination	PPs3: Solution and presentation (if appl.) of exercises; SPOB §5 (2)		
Examination(s)	Written examination (wrEx)		
Semester No.	7. Semester		
Type of course(s)	SL, Exc, Int, ExC		
Sem. / compulsory or elective / SS or	1	Compulsory	WS
Language	German		

Submodule	Type	SWH	Credits	Students	Work load
Module 85	SL, Exc, Int,	3	4	unlimited	120 h (45h in-class, 75h self-study)

Objectives / skills	
<p>Integrated overview of constructive preservation possibilities in road construction and their most important guidelines, examinations, and testing methods.</p> <p>Familiarity in working with the guidelines and specifications and implementing them in practice.</p> <p>Ability to understand complex problems (also in practice) and derive proposed solutions / implementations (from insights in lecture).</p>	
Contents	
<ul style="list-style-type: none"> - Goals of constructive preservation of roads - Road constructions - Status measurement and analysis - Planning preservation measures - Constructive preservation of asphalt roads - Constructive preservation of concrete roads - Bitumen emulsions - Reuse of construction and residual materials - Construction sites on roads etc - Excavations 	
Literature	
Current lecture scripts of instructor (contain bibliography), textbooks, standards, regulations in current edition	
Work forms and didactic tools	
3 SWH lecture / seminar / exercise	
Prerequisites	Module 26 (Road Engineering)
Possible follow-up modules	
Sensible combination:	
References / script	
Contact person	Dr. Timo Bertocchi
Application formalities	No, compulsory module (Ap)
Event location	HS Coburg, Campus Design
Schedule and map	www.hs-coburg.de/bi
Other comments	

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Module 86	Recycling of Building Materials Recycling of Building Materials		
Title of the course(s)	Recycling Technology and Recycling of Building Materials		
Providing university	Coburg University		
Emphasis / program branch	Specialization infrastructure planning (Ap)		
Proof(s) of performance – admission prerequisites for examination	PPs3: Solution and presentation (if appl.) of exercises; SPOB §5 (2)		
Examination(s)	Written examination		
Semester No.	6. Semester		
Type of course(s)	SL, Exc, ExC		
Sem. / compulsory or elective / SS or	1	Compulsory	SS
Language	German		

(Sub)modul	Type	SWH	Credits	Students	Work load
Module 86	SL, Exc, ExC	2	3 ECTS	unlimited	90h (30h in-class, 60h self-dir.)

Objectives / skills	
<p>Students get to know the recycling units, plants, and processes that are used in waste disposal and in particular for construction material recycling. The focus lies on understanding and optimizing recycling processes. The overview is rounded off with knowledge of function and assessment of the different types of recycling plants. Students will then have a well-founded overview of the foundations necessary for planning technical processes and are able to support corresponding processes competently.</p>	
Contents	
<p>1 Recycling technology</p> <ul style="list-style-type: none"> - Foundations - Task - Conveyor system - Shredding - Classification - Sorting - Condensation <p>2 Recycling plant concepts</p> <ul style="list-style-type: none"> - Flowcharts - Sankey diagrams <p>3 Construction material recycling</p> <ul style="list-style-type: none"> - Foundations - Excavation material - Road materials - Construction rubble - Construction waste 	
Literature	
Lecture scripts of instructor with bibliography, textbooks, standards and current regulations	
Work forms and didactic tools	
Lecture	
Prerequisites	Module 12.2 (Circular Economy)
Possible follow-up modules	
Sensible combination:	
References / script	Technical literature, laws, standards, regulations
Contact person	Dr.-Eng. Markus Weber
Application formalities	No, compulsory module (Ap)
Event location	HS Coburg, Campus Design
Schedule and map	www.hs-coburg.de/bi
Other comments	Excursion

Coburg University, Department of Design, Academic Program in Civil

Module 87.1 and 87.2	Compulsory Elective Modules 1.1 and 1.2 / Electives 1.1 and 1.2		
Title of the course(s)	Compulsory Elective Modules 1.1 and 1.2		
Providing university	Coburg University		
Emphasis / program branch	Specialization infrastructure planning (Ap)		
Proof(s) of performance – admission prerequisites for examination	sR Separate regulation in program and examination plan SPOB §5 (2)		
Examination(s)	sR Separate regulation in program and examination plan		
Semester No.	6. Semester		
Type of course(s)	SL, Exc, L, Int, ExC		
Sem. / compulsory or elective / SS or	1	Compulsory	SS
Language	German		

Submodule	Type	SWH	Credits	Students	Work load
Module 87	SL, Exc, L, Int, ExC	2*2=4	4 ECTS	unlimited	120h (60h in-class, 60h self-dir. study)

Objectives / skills
<p>Methodological skills</p> <ul style="list-style-type: none"> - Know and understand factors for successful team work and implement methods and rules of successful team work in practice - Perform research related to project topics in data bases, the internet, and the library - Analyze complex texts critically, i.e. recognize structures and connections, uncover contradictions, and differentiate facts from interpretations - Use specific theories, models, and skills in defined practical contexts - Create and perform proper and target group-specific presentation of project contents - Document, segment, and prepare project results according to scientific criteria (project report / project manual, final report, final presentation) <p>Technical and interdisciplinary skills</p> <ul style="list-style-type: none"> - Knowing, classifying, interpreting, and applying phases, methods, and criteria of project management (e.g. planning steps and continually verifying, using resources sensibly...) - Reflecting value-related aspects in an interdisciplinary perspective (e.g. social justice, sustainability) - Expanding / deepening and applying disciplinary competences (knowledge and skills) in a project-specific manner (e.g. basic knowledge of particular target groups and/or special problems and/or fields of action of the academic program; knowing, understanding, classifying, and using social / legal conditions relevant to the academic program) - Singling out and verifying disciplinary theories, models, and concepts and comparing them with interdisciplinary solutions and verifying them - Marking, explaining, and actively using a change in perspective <p>Personnel skills (communication skills)</p> <ul style="list-style-type: none"> - Consciously considering the perspectives of other departments - Communicating audience-specifically in the interdisciplinary context - Knowing, understanding, and applying binding standards of professional verbal and written communication - Transferring and applying scientific knowledge appropriately in project-related situations and contexts - Using technical and scientific terminology and weighing its use critically - Reflecting on their own problem resolution behavior and actions and regulating them
Contents

The academic program, together with the Examination Committee of the Academic Center for Sciences and Humanities, specifies in more detail the interdisciplinary compulsory elective modules at the end of the semester for the following semester.

From this compulsory elective module group, a project module must be selected based on the available selection and capacity limits of the course.

Literature	
Current lecture scripts of instructor (contain bibliography), textbooks, manuals, regulations in current edition	
Work forms and didactic tools	
2*2=4 SWH lecture / seminar / exercise / internships, self-study, project papers	
Prerequisites	
Possible follow-up modules	
Sensible combination:	
References / script	
Contact person	Respective instructor responsible for compulsory elective module
Application formalities	Application list; SPOB §3 (8)
Event location	HS Coburg, Campus Design
Schedule and map	www.hs-coburg.de/bi
Other comments	

Modules 88.1 and 88.2	Compulsory Elective Modules 2.1 and 2.2 / Electives 2.1 and 2.2		
Title of the course(s)	Compulsory Elective Modules 2.1 and 2.2		
Providing university	Coburg University		
Emphasis / program branch	Specialization infrastructure planning (Ap)		
Proof(s) of performance – admission prerequisites for examination	sR Separate regulation in program and examination plan SPOB §5 (2)		
Examination(s)	sR Separate regulation in program and examination plan		
Semester No.	6. Semester		
Type of course(s)	SL, Exc, L, Int, ExC		
Sem. / compulsory or elective / SS or	1	Compulsory	SS
Language	German		

Submodule	Type	SWH	Credits	Students	Work load
Module 88	SL, Exc, L, Int, ExC	2*2=4	4 ECTS	unlimited	120h (60h in-class, 60h self-dir. study)

Objectives / skills
<p>Methodological skills</p> <ul style="list-style-type: none"> - Know and understand factors for successful team work and implement methods and rules of successful team work in practice - Perform research related to project topics in data bases, the internet, and the library - Analyze complex texts critically, i.e. recognize structures and connections, uncover contradictions, and differentiate facts from interpretations - Use specific theories, models, and skills in defined practical contexts - Create and perform proper and target group-specific presentation of project contents - Document, segment, and prepare project results according to scientific criteria (project report / project manual, final report, final presentation) <p>Technical and interdisciplinary skills</p> <ul style="list-style-type: none"> - Knowing, classifying, interpreting, and applying phases, methods, and criteria of project management (e.g. planning steps and continually verifying, using resources sensibly...) - Reflecting value-related aspects in an interdisciplinary perspective (e.g. social justice, sustainability) - Expanding / deepening and applying disciplinary competences (knowledge and skills) in a project-specific manner (e.g. basic knowledge of particular target groups and/or special problems and/or fields of action of the academic program; knowing, understanding, classifying, and using social / legal conditions relevant to the academic program) - Singling out and verifying disciplinary theories, models, and concepts and comparing them with interdisciplinary solutions and verifying them - Marking, explaining, and actively using a change perspective <p>Personnel skills (communication skills)</p> <ul style="list-style-type: none"> - Consciously considering the perspectives of other departments - Communicating audience-specifically in the interdisciplinary context - Knowing, understanding, and applying binding standards of professional verbal and written communication - Transferring and applying scientific knowledge appropriately in project-related situations and contexts - Using technical and scientific terminology and weighing its use critically - Reflecting on their own problem resolution behavior and actions and regulating them
Contents

The academic program, together with the Examination Committee of the Academic Center for Sciences and Humanities, specifies in more detail the interdisciplinary compulsory elective modules at the end of the semester for the following semester.

From this compulsory elective module group, a project module must be selected based on the available selection and capacity limits of the course.

Literature	
Current lecture scripts of instructor (contain bibliography), textbooks, manuals, regulations in current edition	
Work forms and didactic tools	
2*2=4 SWH lecture / seminar / exercise / internships, self-study, project papers	
Prerequisites	
Possible follow-up modules	
Sensible combination:	
References / script	
Contact person	Respective instructor responsible for compulsory elective module
Application formalities	Application list; SPOB §3 (8)
Event location	HS Coburg, Campus Design
Schedule and map	www.hs-coburg.de/bi
Other comments	

Module 91	Building Energy Design 2		
Title of the course(s)	Building Energy Design 2		
Providing university	Coburg University		
Emphasis / program branch	Energy-efficient building design (E)		
Proof(s) of performance – admission prerequisites for examination	PPs3: Solutions and presentation (if appl.) of exercises SPOB §5 (2)		
Examination(s)	Written examination		
Semester No.	6. Semester		
Type of course(s)	SL, Exc, Int, ExC		
Sem. / compulsory or elective / SS or	1	Compulsory (E)	SS
Language	German		

Submodule	Type	SWH	Credits	Students	Work load
Module 91	SL, Exc, Int,	4	5 ECTS	unlimited	150h (60h in-class, 90h self-dir.

Objectives / skills	
<p>Students learn and apply the basics of energetic balancing for non-residential buildings pursuant to DIN V 18599. The course covers new construction and existing buildings / renovations in consideration of the respective applicable legal regulations.</p> <p>Students discuss and practice in particular the creation of energy certificates as well as the identification of requirements and consumption.</p>	
Contents	
<ul style="list-style-type: none"> - Introduction to energetic building balancing pursuant to DIN L 18599 - Energetic particularities of non-residential buildings (interior loads, daylight, and cooling) - Zoning of non-residential buildings - Formation of lighting areas - Application of suitable software products - Particularities of EnEV in the area of non-residential buildings - Energetic building optimization in the area of non-residential buildings - Creation of energy certificates (identification of requirements and consumption) 	
Literature	
Current lecture scripts of instructor (contain bibliography), textbooks, standards, regulations in current edition	
Work forms and didactic tools	
4 SWH lecture / seminar / exercise	
Prerequisites	E: Module 42 (Building Energy Design 1)
Possible follow-up modules	Module 64 (Interdisciplinary Project)
Sensible combination:	
References / script	
Contact person	Prof. Friedemann Zeitler
Application formalities	No, compulsory module (E)
Event location	HS Coburg, Campus Design
Schedule and map	www.hs-coburg.de/bi
Other comments	

Module 92	Building Climatics		
Title of the course(s)	Building Climatics		
Providing university	Coburg University		
Emphasis / program branch	Energy-efficient building design (E)		
Proof(s) of performance – admission prerequisites for examination	PPs1: successful participation in experimental and exercise units related to subject PPs2: successful completion of one or several research papers and / or presentations PPs3: Solution and presentation (if appl.) of exercises SPOB §5 (2)		
Examination(s)	Written examination		
Semester No.	6. Semester		
Type of course(s)	SL, Exc, Int, ExC		
Sem. / compulsory or elective / SS or	1	Compulsory (E)	SS
Language	German		

Submodule	Type	SWH	Credits	Students	Work load
Module 92	SL, Exc, Int,	6	7 ECTS	unlimited	210h (90h in-class, 120h self-dir.)

Objectives / skills	
<ul style="list-style-type: none"> - Knowledge of standard heat balance procedure - Calculation of non-stationary building climatics processes and application of building simulation procedure - Ability to assess building climatics concepts 	
Contents	
Energy-saving heat protection <ul style="list-style-type: none"> - Heat balancing procedure pursuant to DIN 4108-6 / DIN L 18599 - Representation of non-stationary processes in monthly balance procedure - Efficiency of internal heat sources Building climate control principles <ul style="list-style-type: none"> - Interaction of different heat transport mechanisms and heat storage - Analytical and numerical calculation of non-stationary processes - Aerophysics: Calculation of natural ventilation processes in buildings - Calculation of sun irradiation onto and into buildings Dynamic building simulation <ul style="list-style-type: none"> - Algorithms of dynamic building simulation programs - Framework conditions depending on exterior climate, construction, building technology, and users - Introduction to dynamic building simulation Building climate control in building design <ul style="list-style-type: none"> - Overheating and heat protection of rooms in the summer pursuant to DIN 4108-2 - Climate concepts and building design - Assessment of facade systems - Energy optimization of buildings Internship <ul style="list-style-type: none"> - Application of building simulation procedure 	
Literature	
Current lecture scripts of instructor (contain bibliography), textbooks, standards, regulations in current edition	
Work forms and didactic tools	
4 SWH seminar classes and exercises, 2 SWS internship	
Prerequisites	Module 5 (Building Physics)
Possible follow-up modules	
Sensible combination:	

References / script	
Contact person	Dr. Peter Pfrommer
Application formalities	No, compulsory module (E)
Event location	HS Coburg, Campus Design
Schedule and map	www.hs-coburg.de/bi
Other comments	Subject also for students of other technical programs (prerequisites: Engineering Mathematics, Principles of Physics)

Module 93	Lighting Engineering
Title of the course(s)	Lighting Engineering
Providing university	Coburg University
Emphasis / program branch	Energy-efficient building design (E)
Proof(s) of performance – admission prerequisites for examination	Lne1: successful participation in experimental and exercise units related to subject (participation in internship) SPOB §5 (2)
Examination(s)	Written examination
Semester No.	6. Semester
Type of course(s)	SL, Exc, Int (1 SWH), ExC
Sem. / compulsory or elective / SS or	1 Compulsory (E) SS
Language	German

Submodule	Type	SWH	Credits	Students	Work load
Module 93	SL, Exc, Int,	3	4 ECTS	unlimited	120h (45h in-class, 75h self-dir.

Objectives / skills	
Students are familiarized with the properties artificial daylight and daylight important that are important to the human environment and learn how to perform lighting calculations and measurements and to assess and plan corresponding lighting systems	
Contents	
<ul style="list-style-type: none"> - Principles of lighting engineering <ul style="list-style-type: none"> - Basic concepts in lighting engineering - Physiology of the eye - Light climate, lighting requirements - Light protection - Light sources - Lamps - Emergency lighting - Energy efficiency - Control, regulation, light management - Daylight engineering - Calculation procedure, simulation - System solutions 	
Internship	
<ul style="list-style-type: none"> - Fundamental attempts to characterize light sources and photometry of internal spaces, day light quotient, light simulation, new lighting systems 	
Literature	
Current lecture scripts of instructor (contain bibliography), textbooks, standards, regulations in current edition	
Work forms and didactic tools	
2 SWH lecture / seminar / exercise; 1 SWH internship	
Prerequisites	
Possible follow-up modules	
Sensible combination:	
References / script	
Contact person	Dr. Manfred Casties
Application formalities	No, compulsory module (E)
Event location	HS Coburg, Campus Design
Schedule and map	www.hs-coburg.de/bi
Other comments	Other academic programs may take this course as an elective and/or it may be taken as a compulsory subject (Laser and Light Technology)

Module 94	Building Automation		
Title of the course(s)	Building Automation		
Providing university	Coburg University		
Emphasis / program branch	Energy-efficient building design (E)		
Proof(s) of performance – admission prerequisites for examination	SPOB §5 (2)		
Examination(s)	Written examination		
Semester No.	6. Semester		
Type of course(s)	SL, Exc, Int, ExC		
Sem. / compulsory or elective / SS or	1	Compulsory (E)	SS
Language	German		

Submodule	Type	SWH	Credits	Students	Work load
Module 94	SL, Exc, Int,	2	3 ECTS	unlimited	90h (30h in-class, 60h self-dir.)

Objectives / skills	
Students learn to understand and assess the principles of measurement, control, regulations, and data processing technology in building technology from the field level to the higher-level building and energy management	
Contents	
<ul style="list-style-type: none"> - Principles of measurement, control, regulation, and data processing technology in building technology - Structure, behavior, use, and layout of control equipment and actuators in building technology (e.g. valves, hydraulic compensation, pumps) - Digital control technology - Building automation systems, building control technology - Communication and bus systems - Data network technology - Building management / energy management (monitoring) / facility management 	
Literature	
Current lecture scripts of instructor (contain bibliography), textbooks, standards, regulations in current edition	
Work forms and didactic tools	
2 SWH lecture / seminar / exercise / internship	
Prerequisites	Module 45 (Measurement and Control Technology)
Possible follow-up modules	
Sensible combination:	
References / script	
Contact person	Dr. Manfred Casties
Application formalities	No, compulsory module (E)
Event location	HS Coburg, Campus Design
Schedule and map	www.hs-coburg.de/bi
Other comments	

Module 95	Noise Protection and Room Acoustics		
Title of the course(s)	Noise Protection and Room Acoustics		
Providing university	Coburg University		
Emphasis / program branch	Energy-efficient building design (E)		
Proof(s) of performance – admission prerequisites for examination	PPs1: successful participation in experimental and exercise units related to subject PPs3: Solution and presentation (if appl.) of exercises; SPOB §5 (2)		
Examination(s)	Written examination		
Semester No.	7. Semester		
Type of course(s)	SL, Exc, Int, ExC		
Sem. / compulsory or elective / SS or	1	Compulsory (E)	WS
Language	German		

Submodule	Type	SWH	Credits	Students	Work load
Module 95	SL, Exc, Int,	9	9 ECTS	unlimited	270h (135h in-class, 135h self-dir.)

Objectives / skills					
<ul style="list-style-type: none"> - Secure knowledge of engineering principles - Specialization in sound calculation and assessment procedures - Independent creation of legal certification procedures and knowledge of constructive consequences - Ability to solve practical sound problems independently - Application of important sound measurement procedures 					
Contents					
Building acoustics					
<ul style="list-style-type: none"> - Principles of acoustics, vibrations, and waves - Noise protection in structural concrete, certification pursuant to DIN 4109 - Sound insulation of flexible and inflexible, single-layer and multi-layer components, coincidence and resonance - Sound transfer via flanking components (DIN EN 12354) - Footfall noise protection of ceilings and stairs - Noise protection of components with elements (doors etc.) - Noise protection in timber structures and shell construction - Noise protection of timber beam ceilings - Noise protection against outside noise - Noise protection against sounds from building technology and operations - Vibration insulation of machines - Calculation and measurement procedures - Regulations and sample applications 					
Room acoustics					
<ul style="list-style-type: none"> - Parameters of room acoustics - Sound absorption and absorbing materials - Sound propagation and sound reduction in rooms - Audibility in small to medium-sized rooms - Larger rooms for speech and music - Room acoustic planning and sample implementations 					
Internship					
<ul style="list-style-type: none"> - Fundamental experiments in measurement of sound field parameters - Measurement of effect of different noise protection measures 					
Literature					
Current lecture scripts of instructor (contain bibliography), textbooks, standards, regulations in current edition					
Work forms and didactic tools					
8 SWH seminar classes and exercises, 1 SWS internship					
Prerequisites					
Module 5 (Building Physics)					

Possible follow-up modules	
Sensible combination:	
References / script	
Contact person	Dr. Peter Pfrommer
Application formalities	No, compulsory module (E)
Event location	HS Coburg, Campus Design
Schedule and map	www.hs-coburg.de/bi
Other comments	Subject also for students of other technical programs (prerequisites: Engineering Mathematics, Principles of Physics)

Module 96	History of Buildings and Architecture History of Buildings and Architecture		
Title of the course(s)	History of Buildings and Architecture		
Providing university	Coburg University		
Emphasis / program branch	Energy-efficient building design (E)		
Proof(s) of performance – admission prerequisites for examination			
Examination(s)	Examination research paper		
Semester No.	6. Semester		
Type of course(s)	SL, Exc, L, ExC		
Sem. / compulsory or elective / SS or	1	Compulsory (E)	SS
Language	German		

(Sub)module	Type	SWH	Credits	Students	Work load
Module 96	SL, Exc, L, ExC	2	2 ECTS	unlimited	60 h (30h in-class, 30h self-study)

Objectives / skills	
<ul style="list-style-type: none"> - Students learn to classify buildings and cityscapes in term of typology and time period. - They develop their own attitude towards the cultural responsibility of everyday engineering work by analyzing examples. 	
Contents	
<ul style="list-style-type: none"> - Principles of architecture and urban development - Significance and context of buildings and cityscapes in social perception - Construction art and construction culture 	
Literature	
Subject-related	
Work forms and didactic tools	
2 SWH lecture / exercise	
Prerequisites	
Possible follow-up modules	
Sensible combination:	
References / script	
Contact person	Dr. Jochen Driller
Application formalities	No, compulsory module (E)
Event location	HS Coburg, Campus Design
Schedule and map	www.hs-coburg.de/bi
Other comments	

Module 97	Electives		
Title of the course(s)	Compulsory Elective Module		
Providing university	Coburg University		
Emphasis / program branch	Energy-efficient building design (E)		
Proof(s) of performance – admission prerequisites for examination	sR Separate regulation in program and examination plan SPOB §5 (2)		
Examination(s)	sR Separate regulation in program and examination plan		
Semester No.	6. Semester		
Type of course(s)	SL, Exc, L, Int, ExC		
Sem. / compulsory or elective / SS or	1	Elective (E)	SS
Language	German		

Submodule	Type	SWH	Credits	Students	Work load
Module 97	SL, Exc, L, Int, ExC	2	2 ECTS	unlimited	60h (30h in-class, 30h self-dir. study)

Objectives / skills
<p>Methodological skills</p> <ul style="list-style-type: none"> - Know and understand factors for successful team work and implement methods and rules of successful team work in practice - Perform research related to project topics in data bases, the internet, and the library - Analyze complex texts critically, i.e. Recognize structures and connections, uncover contradictions, and differentiate facts from interpretations - Use specific theories, models, and skills in defined practical contexts - Create and perform proper and target group-specific presentation of project contents - Document, segment, and prepare project results according to scientific criteria (project report / project manual, final report, final presentation) <p>Technical and interdisciplinary skills</p> <ul style="list-style-type: none"> - Knowing, classifying, interpreting, and applying phases, methods, and criteria of project management (e.g. planning steps and continually verifying, using resources sensibly...) - Reflecting value-related aspects in an interdisciplinary perspective (e.g. social justice, sustainability) - Expanding / deepening and applying disciplinary competences (knowledge and skills) in a project-specific manner (e.g. basic knowledge of particular target groups and/or special problems and/or fields of action of the academic program; knowing, understanding, classifying, and using social / legal conditions relevant to the academic program) - Singling out and verifying disciplinary theories, models, and concepts and comparing them with interdisciplinary solutions and verifying them - Marking, explaining, and actively using a change perspective <p>Personnel skills (communication skills)</p> <ul style="list-style-type: none"> - Consciously considering the perspectives of other departments - Communicating audience-specifically in the interdisciplinary context - Knowing, understanding, and applying binding standards of professional verbal and written communication - Transferring and applying scientific knowledge appropriately in project-related situations and contexts - Using technical and scientific terminology and weighing its use critically - Reflecting on own problem resolution behavior and actions and regulating them
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The academic program, together with the Examination Committee of the Academic Center for Sciences and Humanities, specifies in more detail the interdisciplinary compulsory elective modules at the end of the semester for the following semester.

From this compulsory elective module group, a project module must be selected based on the available selection and capacity limits of the course.

Literature	
Current lecture scripts of instructor (contain bibliography), textbooks, manuals, regulations in current edition	
Work forms and didactic tools	
2 SWH lecture / seminar / exercise / internships, self-study, project papers	
Prerequisites	
Possible follow-up modules	
Sensible combination:	
References / script	
Contact person	Respective instructor responsible for compulsory elective
Application formalities	Application list; SPOB §3 (8)
Event location	HS Coburg, Campus Design
Schedule and map	www.hs-coburg.de/bi
Other comments	

4 Notes on risk potentials

The civil engineering program involves potential general risks. There may be increased potential risks in particular during internships, lab internships, excursions, or comparable activities.

All students should ask their instructors about possible risks before the start of classes; in some cases there may be restrictions as a result.

In terms of maternity leave, the individual modules were classified centrally. The following classification overview only serves as a rough guide for the risk assessment; even a "green" classification requires an individual preliminary examination. Students are asked to contact the Family Office of Coburg University at the beginning of a pregnancy.

Classification for a risk assessment without specific occasion pursuant to §§ 10 et seqq.

MuSchG: Red: cannot be studied by students as defined in *MuSchG*

Yellow: Electable with restrictions; individual arrangement necessary

Green: Electable without restrictions

Module	Subject	Classificati
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1 Study of foundations		
1	Mathematics	Green
2	Structural Mechanics	Green
3.1	Structural Analysis 1 (Part 1)	Green
4	Construction Materials and Material	Yellow
5.1	Building Physics (Part 1)	Yellow
6.1	Structural Design 1	Green
6.2	Freehand Drawing	Green
6.3	Construction Drawing	Green
7	Descriptive Geometry	Green
8	CAD	Green
9	Computer Science	Green
10	Load-bearing Structures	Green
11	Urban Water Supply and Sanitation	Yellow
12.1	Principles of Sustainable Building	Green
12.2	Circular Economy	Green
13	Construction Operations	Green
14	General Law	Green
15	Scientific Work	Green

2 Specialized program		
5.2	Building Physics (Part 2)	Yellow
21	Structural Design 2	Green
22	Building Technology 1	Green
3.2	Structural Analysis 1 (Part 2)	Green
23	Non-material-specific surveying and construction	Green
24	Structural Concrete 1	Green
25.1	Soil Mechanics	Yellow
26	Road Design	Green
27	Building Information Modeling	Green

2.1 Program branch A

31	Structural Analysis 2	Green
25.2	Foundation Engineering	Green
32	Waterway Engineering 1	Yellow
33	Road Construction	Yellow
34	Surveying	Yellow
35	History of Buildings and Architecture	Green

2.2 Program branch E

41	Heat and Moisture Protection	Green
42	Building Energy Design 1	Green
43	Building Technology 2	Green
44	Thermodynamics and Fluid Dynamics	Green

45	Measurement and Control Technology	Green
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4 Specialization program

4.1 Joint program

61.1	Construction law	Green
61.2	Environmental & Guideline Planning	Green
62	Calculation and Project Management	Green
63	Fire Protection	Green
64	Interdisciplinary Project	Green
65.1	Bachelor Seminar	Green
65.2	Bachelor's Thesis	Green

4.2 Program branch A

4.2.1 Specialization construction engineering (Ak)

71	Special Civil Engineering	Green
72	Num. Structural Analysis & Analysis of	Green
73	Structural Concrete 2	Green
74	Steel Construction	Green
75.1	Timber Structures	Green
75.2	Composite Structures	Green
77.1&2	WPM 1a+1b	Yellow
78.1&2	WPM 2a+2b	Yellow

4.2.2 Specialization infrastructure planning (Ap)

81	Urban Water Supply and Sanitation	Yellow
82	Waterway Engineering 2	Yellow
83	Embankment and Landfill Construction	Yellow
84	Traffic System	Green
85	Preservation of Road Structure	Green
86	Construction Material Recycling	Green
87.1&2	WPM 1a+1b	Yellow
88.1&2	WPM 2a+2b	Yellow

4.3 Program branch E

91	Building Energy Design 2	Green
92	Building Climate Control	Green
93	Lighting Engineering	Green
94	Building Automation	Green
95	Noise Protection and Room Acoustics	Green
96	History of Buildings and Architecture	Green
97	WPM	Yellow