



Description of the degree program

Industrial Engineering, Study Course Civil Engineering (Bachelor) PO 8

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Title	Quantitative Methods in Economic Sciences		
Number	2299830	Module version	V2
Shorttext	WW-STD-83	Language	german
Frequency of offer	only in the winter term	Teaching unit	Carl-Friedrich-Gauß-Fakultät
Module duration	1	Institution	Institut für Mathematische Stochastik
Hours per Week / ECTS	6 / 9,0	Module owner	Studiendekan der Wirtschaftswissenschaften
Workload (h)	270		
Class attendance (h)	84	Self studying (h)	186
Compulsory requirements			
Expected performance/ Type of examination	1 written exam (180 min) or 1 take-at-home exam - The examination is passed if, as a rule, at least 50% of the total points of the examination have been achieved and at least 25% of the points have been achieved in each individual examination part of the courses taken.		
Course achievement			
Contents			
• Linear programming • Graphs and networks • Integer linear optimisation • Heuristics • Nonlinear optimisation • Estimation and test theory • Confidence intervals • Independence and goodness of fit tests • Multivariate linear regression models • Categorical regression			
Objective qualification			
After completing this module, students have a basic overview of quantitative methods in economics and are able to apply them. They will be able to identify and model common quantitative decision-making and analysis problems and solve them by applying an appropriate method.			
Literature			
• Domschke, W.; Drexl, A.: Einführung in Operations Research. 7. Auflage. Springer, 2007. • Domschke, W. et al.: Übungen und Fallbeispiele zum Operations Research. 5. Auflage. Springer, 2004. • Fahrmeir, L. et al.: Statistik: Der Weg zur Datenanalyse. Springer, 2007. • Mosler, K.; Schmid, F.: Beschreibende Statistik und Wirtschaftsstatistik. Springer, 2006.			



Related courses			
Rules for the choice of courses			
Participation in the exercises is voluntary.			
Compulsory attendance			
Name of the course	SWS	Eventtype	Language
Operations Research	2,0	Lecture/Exercise	german
Literature			
W. Domschke, A. Drexl: Einführung in Operations Research, Springer, 7. Auflage			
	2,0	Lecture	german
	1,0	Exercise, small group	german
Fundamentals of Empirical Economics	2,0	Lecture/Exercise	german
Literature			
• Wooldridge, Jeffrey. Introductory Econometrics: A Modern Approach, 7e, Boston: Cengage Learning, 2019 • Stock, James, and Mark Watson. Introduction to econometrics, 3e, Boston: Pearson/Addison Wesley, 2014			

Title	Mathematics for Engineers A		
Number	1294250	Module version	V2
Shorttext	MAT-STD7-25	Language	english german
Frequency of offer	only in the winter term	Teaching unit	Carl-Friedrich-Gauß-Fakultät
Module duration	1	Institution	Institut für Partielle Differentialgleichungen
Hours per Week / ECTS	6 / 8,0	Module owner	Studiendekan der Mathematik
Workload (h)	240		
Class attendance (h)	112	Self studying (h)	128
Compulsory requirements			
Expected performance/ Type of examination	1 written exam (180 minutes) After approval by the examination board mathematics (Prüfungsausschuss Mathematik), the examiner can also choose the take-home exam as the form of examination.		
Course achievement			
Contents			
Mathematics for engineering students A (Calculus 1) 1 sequences and limit: definitions and concepts, e.g. monotony and bounds, convergence criteria of comparison and of monotony, typical limits, Euler's number e, accumulation point, limit superior, Bachmann-Landau notation, supremum, Cauchy sequence, basic properties of real numbers 2 series: convergence and absolute convergence, geometric, harmonic and exponential series, comparison test, ratio test, root test, alternating series test with proofs 3 functions: concepts, standard functions including hyperbolic and area functions, relation to trigonometric functions, inverse function, rational functions and partial fraction decomposition, graphical representation 4 limits of functions and continuity: definition, properties of continuous functions, classification of discontinuities, intermediate value theorem, extreme value theorem with proof 5 differentiation: difference and differential quotient, C^n-spaces and norms, product and chain rule, derivatives of standard functions, derivatives of inverse functions, mean value theorem, de l'Hospital's rule with proof, extreme values, curvature Taylor polynomials and series 6 integration: definit and indefinit integral (Riemann), fundamental theorem of calculus with proof, integration by parts, integration by substitution, integrals of standard functions, integrals of rational functions and power series, improper integrals, Gamma-unction Mathematics for engineering students A (Linear Algebra) 1 algebraic structures: number domains, group, field, modulo, complex numbers, cartesian and polar form, Euler's identity, roots of complex numbers, polynomial division, linear factor decomposition, fundamental theorem of algebra without proof 2 vectors and vector spaces: linear independence, sub-space, basis, dimension, norm, scalar product, projection, ortho-normal basis, Cauchy Schwarz inequality 3 linear maps and matrices: definition of general linear maps, kernel, image, rank, inverse matrix, transposition, determinant, matrix norm 4 Gaussian algorithm: trapezoid form, underdetermined systems and parameter-dependent solutions, inverse matrix 5 eigenvalues and eigenvectors: diagonalizable matrices, eigenvalues and -vectors of symmetric matrices, Jordan form, similarity 6 vectors in geometry: lines and planes, Hesse normal form, vector product, triple product, transformation of coordinates			

Objective qualification

The students combine the learnt mathematical methods of univariate calculus and linear algebra in the description and investigation of applied problems in the engineering sciences. They choose appropriate calculation techniques and appropriate methods of proof for the discussion of the mathematical fundamentals in the applied and engineering sciences, and they apply these techniques and methods. The students explain the formation of mathematical concepts and they derive the motivation of these concepts from applications and from the mathematical specification and delimitation of terms and definitions. The students reproduce and explain basic proofs and ideas of proofs in univariate calculus and linear algebra. They are able to identify and to test relations between the learnt concepts. The students are able to analyse mathematical problems occurring in applications and engineering lectures, to extract and to solve treatable sub-problems and to identify continuative difficulties. Finally, students use constructively modern tools for the treatment of computational problems.

Literature

Text books and lecture notes on calculus, linear algebra, mathematics for engineers, e.g.
 * Burg, Haf, Wille, Meister: Höhere Mathematik für Ingenieure, Band I & II, SpringerVieweg
 * Ansorge, Oberle, Rothe, Sonar: Mathematik in den Ingenieur- und Naturwissenschaften, Band I, Wiley
 * Langemann, Sommer: So einfach ist Mathematik, zwölf Herausforderungen im ersten Semester, SpringerSpektrum



Related courses

Rules for the choice of courses

You can attend lectures in German or English.
 Participation in the small exercises is voluntary.

Compulsory attendance

Name of the course	SWS	Eventtype	Language
Mathematics for Engineers A (Analysis 1)	1,0	Exercise	german
Mathematics for Engineers A (Analysis 1)	1,0	Exercise, small group	german
	2,0	Lecture/Exercise	german
	1,0	Exercise, small group	german
	2,0	Lecture/Exercise	english
	1,0	Exercise	english
	1,0	Exercise, small group	english
	2,0	Lecture/Exercise	english
	1,0	Exercise	english
	1,0	Exercise, small group	english

Mathematics for Engineers A (Linear Algebra)	1,0	Exercise	german
Mathematics for Engineers A (Linear Algebra)	2,0	Lecture/Exercise	german
Mathematics for Engineers	6,0	Lecture/Exercise	english german

Title	Mathematics for Engineers Building and Environment		
Number	1210440	Module version	V2
Shorttext	BAU-STD4-44	Language	english german
Frequency of offer	only in the summer term	Teaching unit	Carl-Friedrich-Gauß-Fakultät
Module duration	1	Institution	
Hours per Week / ECTS	4 / 4,0	Module owner	Prof. Dr. Dirk Lange-mann
Workload (h)	120		
Class attendance (h)	56	Self studying (h)	64
Compulsory requirements			
Expected performance/ Type of examination			
Course achievement			
Contents			
Objective qualification			
Literature			
Lehrbücher und Skripte über Ingenieurmathematik • Burg, Haf, Wille, Meister: Höhere Mathematik für Ingenieure, Band I & III, SpringerVieweg • Ansorge, Oberle, Rothe, Sonar, Mathematik in den Ingenieur- und Naturwissenschaften, Band II, Wiley • Langemann, Reisch: So einfach ist Mathematik, partielle Differentialgleichungen für Anwender, Springer-Spektrum			



Related courses			
Rules for the choice of courses			
Compulsory attendance			
Name of the course	SWS	Eventtype	Language
Mathematics for Engineers B (Differential Equations)	2,0	Lecture/Exercise	german
Mathematics for Engineers B (Differential Equations)	1,0	Exercise	german
Mathematics for Engineers B (Differential Equations)	1,0	Exercise, small group	german

	1,0	Tutorial	german
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Title	Building Construction 1		
Number	4306350	Module version	
Shorttext	BAU-STD3-35	Language	german
Frequency of offer	only in the winter term	Teaching unit	
Module duration	1	Institution	Institut für Baukonstruktion und Holzbau
Hours per Week / ECTS	4 / 6,0	Module owner	Prof. Dr. Mike Sieder
Workload (h)	180		
Class attendance (h)	56	Self studying (h)	124
Compulsory requirements			
Expected performance/ Type of examination			
Course achievement			
Contents			
Objective qualification			
Literature			
Skript mit den für die Vorlesungen und Übungen erforderlichen Angaben und umfangreichen Literaturhinweisen			



Related courses			
Rules for the choice of courses			
Compulsory attendance			
Name of the course	SWS	Eventtype	Language
	4,0	Lecture/Exercise	german

Title	Building Construction 2		
Number	4316080	Module version	
Shorttext	BAU-IBH-08	Language	german
Frequency of offer	only in the summer term	Teaching unit	
Module duration	1	Institution	Institut für Baukonstruktion und Holzbau
Hours per Week / ECTS	4 / 6,0	Module owner	Prof. Dr. Mike Sieder
Workload (h)	180		
Class attendance (h)	56	Self studying (h)	124
Compulsory requirements			
Expected performance/ Type of examination			
Course achievement			
Contents			
Objective qualification			
Literature			
Skript mit den für die Vorlesungen und Übungen erforderlichen Angaben und umfangreichen Literaturhinweisen			

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Related courses			
Rules for the choice of courses			
Compulsory attendance			
Name of the course	SWS	Eventtype	Language
	4,0	Lecture/Exercise	german

Title	Technical Mechanics 1		
Number	3315000000	Module version	
Shorttext		Language	german
Frequency of offer	only in the winter term	Teaching unit	
Module duration	1	Institution	Institut für Angewandte Mechanik
Hours per Week / ECTS	5 / 5,0	Module owner	Prof. Dr. Ralf Jänicke
Workload (h)	150		
Class attendance (h)	70	Self studying (h)	80
Compulsory requirements			
Expected performance/ Type of examination	3 written exams (45 min. each), during the semester		
Course achievement			
Module grade composition	The module grade is calculated from the average of the three written examinations; examinations graded as "non sufficient" can be compensated by better graded examinations.		
Contents			
This course deal with the statics of rigid structures: forces and torques, static equilibrium and determinacy, center of gravity, supports and joints, truss structures, internal forces in beams and frames, adhesion and friction.			
Objective qualification			
Completion of this course enables students to determine internal and external forces and torques in two- and three-dimensional, rigid, load-bearing structures, even in presence of Coulomb friction.			
Literature			
(1) Gross, Hauger, Schell, Schröder: Technische Mechanik 1: Statik, Springer (2) Hartmann: Technische Mechanik, Wiley (3) Hibbeler: Technische Mechanik 1: Statik, Pearson			



Related courses			
Rules for the choice of courses			
Compulsory attendance			
Name of the course	SWS	Eventtype	Language
	5,0	Lecture/Exercise	german

	2,0	Tutorial	german
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Title	Technical Mechanics 2		
Number	3315000010	Module version	
Shorttext		Language	german
Frequency of offer	only in the summer term	Teaching unit	
Module duration	1	Institution	Institut für Angewandte Mechanik
Hours per Week / ECTS	5 / 5,0	Module owner	Prof. Dr. Ralf Jänicke
Workload (h)	150		
Class attendance (h)	70	Self studying (h)	80
Compulsory requirements			
Expected performance/ Type of examination	3 written exams (45 min. each), during the semester		
Course achievement			
Module grade composition	The module grade is calculated from the average of the three written examinations; examinations graded as "non sufficient" can be compensated by better graded examinations.		
Contents			
This course extends the “engineering mechanics 1” course to the statics of deformable bodies: tension and compression of trusses, state of stress and strain, linear elasticity, bending of beams, torsion and buckling.			
Objective qualification			
Completion of this course enables students to determine internal and external forces and torques in two- and three-dimensional, elastic, load-bearing structures. They are familiar with the basics of strain, stress, and constitutive relations and can consequently predict deformation of trusses, bars and other simple structures under external loading. They can solve geometrically non-linear problems using the example of buckling.			
Literature			
(1) Gross, Hauger, Schröder, Wall: Technische Mechanik 2: Elastostatik, Springer (2) Hartmann: Technische Mechanik, Wiley (3) Hibbeler: Technische Mechanik 2: Festigkeitslehre, Pearson			



Related courses			
Rules for the choice of courses			
Compulsory attendance			
Name of the course	SWS	Eventtype	Language

	5,0	Lecture/Exercise	german
	2,0	Tutorial	german

Title	Structural Analysis 1		
Number	4398360	Module version	4398360-E-FK3-V1
Shorttext	Baustatik	Language	german
Frequency of offer	only in the winter term	Teaching unit	
Module duration	1	Institution	Institut für Statik und Dynamik
Hours per Week / ECTS	7 / 6,0	Module owner	Prof. Dr. Ursula Kowalsky
Workload (h)	180		
Class attendance (h)	98	Self studying (h)	82
Compulsory requirements			
Expected performance/ Type of examination	Written exam (90 Min.)		
Course achievement	Term paper		
Contents			
[Baustatik I (V+Ü+T)] Basics of design and modelling of beam structures and frameworks, basics of computational methods; idealization of constructions taking into account supports, hinges, materials as well as external actions, e.g. loads, displacements, cutting principle, governing equations for bars, beams, torsion bars, computation of statically-determined systems, kinematics of frameworks. Equations and principles of work, computation of displacement variables by means of principle of virtual forces. Computation of deflections, influence functions for displacement variables by means of Betti and Maxwell theorem.			
Objective qualification			
Students are able to determine and to evaluate distributions of state variables and influence functions for internal force and displacement variables for complex statically-determined constructions.			
Literature			
Es steht ein ausführliches Lehrbuch mit umfangreichen weiterführenden Literaturhinweisen zur Verfügung.			

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Related courses			
Rules for the choice of courses			
Compulsory attendance			
Name of the course	SWS	Eventtype	Language

	5,0	Lecture/Exercise	german
	2,0	Tutorial	german

Title	Geotechnical Engineering		
Number	4315010	Module version	
Shorttext	BAU-STD3-73	Language	german
Frequency of offer	only in the summer term	Teaching unit	
Module duration	2	Institution	Institut für Geomechanik und Geotechnik
Hours per Week / ECTS	6 / 6,0	Module owner	Prof. Dr. Marius Milatz
Workload (h)	180		
Class attendance (h)	84	Self studying (h)	96
Compulsory requirements			
Expected performance/ Type of examination	Written exam (120 Min.)		
Course achievement			
Contents			
Soil mechanics: Introduction to the classification of soils, soil investigation, stress calculations, settlement calculations, consolidation, mechanical effect of water in soil, earth pressure, stability analysis of foundations and embankments. Foundation engineering: Deep foundations, bearing capacity of piles and pile grids, design and calculation of piles, excavations, support structures for excavations, anchors, dewatering, hydraulic base failure, soil improvement and injections.			
Objective qualification			
Introduction to geotechnical engineering, understanding of mechanical principles in soil mechanics, classification of soils, stress-deformation behavior, soil investigation, mechanical effect of water in soil, seepage flow, stress calculations, settlement calculations, earth pressure, stability analysis of soil mechanics, stability analysis of foundations and embankments. Shallow and deep foundations, stability verifications, construction and bearing capacity of piles, excavation enclosures, support systems for excavations, anchors, dams, cuttings and slopes, groundwater and construction pit dewatering, subsoil improvement and injections.			
Literature			
Vorlesungsunterlagen			



Related courses			
Rules for the choice of courses			
Compulsory attendance			
Name of the course	SWS	Eventtype	Language
	4,0	Lecture/Exercise	german
	2,0	Lecture/Exercise	german

Title	Materials Science for Civil Engineering		
Number	4398400	Module version	
Shorttext		Language	german
Frequency of offer	every term	Teaching unit	
Module duration	2	Institution	Fachgebiet Baustoffe
Hours per Week / ECTS	8 / 8,0	Module owner	Dr. Thorsten Leusmann
Workload (h)	240		
Class attendance (h)	112	Self studying (h)	128
Compulsory requirements			
Expected performance/ Type of examination			
Course achievement			
Contents			
Objective qualification			
Literature			
-Übungsunterlagen -ausführliches Vorlesungsmanuskript			



Related courses			
Rules for the choice of courses			
Compulsory attendance			
Name of the course	SWS	Eventtype	Language
	4,0	Lecture/Exercise	german
	4,0	Lecture/Exercise	german

Title	Concrete Construction 1		
Number	4306760	Module version	
Shorttext	BAU-STD3-76	Language	german
Frequency of offer	only in the winter term	Teaching unit	
Module duration	1	Institution	Fachgebiet Massivbau
Hours per Week / ECTS	5 / 6,0	Module owner	Prof. Dr. Vincent Oettel
Workload (h)	180		
Class attendance (h)	70	Self studying (h)	110
Compulsory requirements			
Expected performance/ Type of examination	Written exam (90 Min.)		
Course achievement	Term paper		
Contents			
Areas of application of reinforced concrete construction and typical components; construction and building materials; reinforcement rules and basic design approaches; design methods for bending with and without normal force, shear force and torsion; limitations of crack width; practical design of beams, columns and uniaxial stressed plates			
Objective qualification			
The students will have an overview of typical applications of reinforced concrete and the structural design of simple components, such as beams, uniaxial span plates, columns etc. On that sense, basic knowledge on the structural design under normal, bending, shear and torsion stresses will be the main goal of the course.			
Literature			
A detailed script with all contents from the lectures is available.			



Related courses			
Rules for the choice of courses			
Compulsory attendance			
Name of the course	SWS	Eventtype	Language
	3,0	Lecture	german
	2,0	Exercise	german

Title	Concrete Construction 2		
Number	4334200	Module version	
Shorttext	BAU-iBMB-20	Language	german
Frequency of offer	only in the summer term	Teaching unit	
Module duration	1	Institution	Fachgebiet Massivbau
Hours per Week / ECTS	4 / 6,0	Module owner	Prof. Dr. Vincent Oettel
Workload (h)	180		
Class attendance (h)	56	Self studying (h)	124
Compulsory requirements			
Expected performance/ Type of examination	Written exam (90 Min.)		
Course achievement	Term paper		
Contents			
Design methods for standard reinforced concrete components; basic concepts of structural analysis; dimensioning of slabs (biaxially spanned slabs, multi-span slabs, slabs with openings); beams and T-beams; columns; walls; frames and foundations (slab and strip footings).			
Objective qualification			
By the end of this course, students will show advanced knowledge of standard reinforced concrete components design when considering general building construction. They will be able to design, dimension and detail the superstructure of a building, acquiring additional knowledge of the applicable standards/codes used in the construction sector.			
Literature			
A detailed script with all contents from the lectures is available			



Related courses			
Rules for the choice of courses			
Compulsory attendance			
Name of the course	SWS	Eventtype	Language
	2,0	Lecture	german
	2,0	Exercise	german

Title	Structural Analysis 2		
Number	4398370	Module version	4398370-E-FK3
Shorttext	Baustatik	Language	german
Frequency of offer	only in the summer term	Teaching unit	
Module duration	1	Institution	Institut für Statik und Dynamik
Hours per Week / ECTS	6 / 6,0	Module owner	Prof. Dr. Ursula Kowalsky
Workload (h)	180		
Class attendance (h)	84	Self studying (h)	96
Compulsory requirements			
Recommended requirements	Knowledge from the module "Structural Analysis 1" is assumed when taking this module.		
Expected performance/ Type of examination	Written exam (90 Min.)		
Course achievement	Term paper		
Contents			
Classification of indeterminate systems. Computation of state variables of statically indeterminate systems by flexibility or displacement method; generalization of flexibility method by principle of virtual work; theorem of reduction; generalization of displacement method by principle of virtual work; duality of flexibility and displacement method, influence functions concerning force and displacement variables, computation of frame-works considering theory of 2nd order, nonlinear load-bearing behaviour, imperfections, truss models.			
Objective qualification			
Students are able to compute and to evaluate state variables of complex statically indeterminate systems concerning either theory of 1st or 2nd order as well as influence functions.			
Literature			
Es steht ein ausführliches Lehrbuch mit umfangreichen weiterführenden Literaturhinweisen zur Verfügung.			



Related courses			
Rules for the choice of courses			
Compulsory attendance			
Name of the course	SWS	Eventtype	Language
	4,0	Lecture/Exercise	german
	2,0	Tutorial	german

Title	Timber Design		
Number	4316090	Module version	
Shorttext	BAU-IBH-09	Language	german
Frequency of offer	only in the winter term	Teaching unit	
Module duration	1	Institution	Institut für Baukonstruktion und Holzbau
Hours per Week / ECTS	4 / 6,0	Module owner	Prof. Dr. Mike Sieder
Workload (h)	180		
Class attendance (h)	56	Self studying (h)	124
Compulsory requirements			
Expected performance/ Type of examination			
Course achievement			
Contents			
Objective qualification			
Literature			
Skript mit den für die Vorlesungen und Übungen erforderlichen Angaben und umfangreichen Literaturhinweisen			

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Related courses			
Rules for the choice of courses			
Compulsory attendance			
Name of the course	SWS	Eventtype	Language

Title	Steel Constructions 1		
Number	4306740	Module version	
Shorttext	BAU-STD3-74	Language	german
Frequency of offer	only in the summer term	Teaching unit	
Module duration	1	Institution	Institut für Stahlbau
Hours per Week / ECTS	5 / 6,0	Module owner	Prof. Dr. Klaus Thiele
Workload (h)	180		
Class attendance (h)	70	Self studying (h)	110
Compulsory requirements			
Expected performance/ Type of examination	Written exam (120 Min.) or oral exam+ (20 Min.)		
Course achievement	Homework		
Contents			
Overview of steel construction, history of steel construction, steel products, fundamental material properties, profile section parameters, static proof using elastic-elastic and elastic-plastic analysis, static proof of bolts and welds, stability proof using equivalent member method, structural stability, design and proof of fundamental details, e.g. butt strap joint, column foot.			
Objective qualification			
Basic knowledge in steel construction Basic knowledge in modeling Basic knowledge in code regulations Ability to design steel constructions of basic level complexity			
Literature			
A detailed script is available			



Related courses			
Rules for the choice of courses			
Compulsory attendance			
Name of the course	SWS	Eventtype	Language
	5,0	Lecture/Exercise	german

Title	Steel Constructions 2		
Number	4313070	Module version	
Shorttext	BAU-IS-07	Language	english
Frequency of offer	only in the winter term	Teaching unit	
Module duration	1	Institution	Institut für Stahlbau
Hours per Week / ECTS	4 / 6,0	Module owner	Prof. Dr. Klaus Thiele
Workload (h)	180		
Class attendance (h)	56	Self studying (h)	124
Compulsory requirements			
Expected performance/ Type of examination	Written exam (120 Min.) or oral exam+ (20 Min.)		
Course achievement	Term paper		
Contents			
Design models, stability proof using second order effects, torsional flexural buckling; design and proof of details, e.g. butt strap joint Overview of steel construction, history of steel construction, steel products, fundamental material properties, profile section parameters, static proof using elastic-elastic and elastic-plastic analysis, static proof of bolts and welds, stability proof using equivalent member method, structural stability, design and proof of fundamental details, e.g. butt strap joint, column foot.			
Objective qualification			
Advanced knowledge in steel construction Basic knowledge in composite construction Advanced knowledge in code regulations Basic abilities in modeling Ability to design steel constructions of medium level complexity Ability to design composite constructions of basic level complexity			
Literature			
Es steht ein ausführliches Skript zur Verfügung.			

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Related courses			
Rules for the choice of courses			
Compulsory attendance			
Name of the course	SWS	Eventtype	Language
	4,0	Lecture/Exercise	german

Title	Geodesy and Geographical Information		
Number	4306660	Module version	
Shorttext	BAU-STD3-66	Language	german
Frequency of offer	only in the summer term	Teaching unit	
Module duration	1	Institution	Institut für Geodäsie und Photogrammetrie
Hours per Week / ECTS	6 / 6,0	Module owner	Prof. Dr. Markus Gerke
Workload (h)	180		
Class attendance (h)	84	Self studying (h)	96
Compulsory requirements			
Expected performance/ Type of examination	Written exam (90 Min.)		
Course achievement	Term paper		
Contents			
[Geodesy (LE)] Large-scale coordinate systems, basic knowledge of geodetic measurement and evaluation methods, satellite positioning, remote sensing, laser scanning, photogrammetry, solution approaches for typical surveying tasks, solution competence for simple surveying tasks, basics of statistics and error theory. [Geographic Information Systems (LE)] Fundamentals of spatial data modeling and processing, working with ESRI's ArcGIS, presentation techniques.			
Objective qualification			
The students learn the essential basics from geodesy and geoinformation. This includes coordinate systems, measurement systems for three-dimensional and continuous data acquisition, as well as the practical use of sensors and the associated evaluation algorithms (Geodesy). In the course Geoinformation knowledge is imparted on the theory, practical structure and use of Geographic Information Systems (GIS). The students will be able to apply the essential methods and algorithms from geodesy and Geoinformation to problems in civil and environmental engineering.			
Literature			
Witte, Schmidt (2005): Vermessungskunde und Grundl. Statistik für das Bauwesen, Resnik, Bill (2003): Vermessungskunde für den Planungs-, Bau- und Umweltbereich, Kahmen (1997): Vermessungskunde; b) Selbstentwickelte multimediale GIS-Lernmodule, Lange, N. de (2002): Geoinformatik in Theorie und Praxis.			



Related courses			
Rules for the choice of courses			
Compulsory attendance			
Name of the course	SWS	Eventtype	Language
	2,0	Lecture/Exercise	german
	1,0	Exercise	german
	2,0	Lecture	german
	1,0	Practical exercise	german

Title	Hydraulic Engineering - Application		
Number	4306790	Module version	
Shorttext	BAU-STD3-79	Language	german
Frequency of offer	only in the summer term	Teaching unit	
Module duration	1	Institution	Abteilung Wasserbau und Gewässermorphologie
Hours per Week / ECTS	4 / 6,0	Module owner	Prof. Dr. Jochen Aberle
Workload (h)	180		
Class attendance (h)	56	Self studying (h)	124
Compulsory requirements			
Expected performance/ Type of examination	Written exam (60 Min.)		
Course achievement	Term paper		
Contents			
Lecture: Methods and procedures for flood risk assessment an integrated flood risk management; area-detailed and GIS-based precipitation-runoff modelling; statistical analysis of time-series data and methods of extreme value statistics, approaches for the design of flood protection measures and risk based assessment. Fields of application of 1-D programs, theoretical basics of 1-D water level calculation, practical use of a program: model setup by input of geometry and roughness, calibration of the model, variation of input parameters, installation of hydraulic structures such as bridges and weirs, interpretation of results. Seminar: A wide range of topics from the fields of hydraulic engineering, hydrology, water management and water protection as well as hydromechanics and coastal engineering are addressed every semester. Interdisciplinary connections with natural sciences, economics and social sciences and structural engineering are also highlighted.			
Objective qualification			
The students gain insights into the principles of flood risk assessment and management and are able to explain the driving factors of flood risk. They gain the capability to select and evaluate different flood risk prevention options including natural and technical flood protection measures. They acquire the ability to conduct statistical extreme value analysis and to use these information for the design of flood protection measures and the assessment of flood risk. The students acquire the ability to carry out and interpret computer-aided 1-D water level calculations. They will acquire the theoretical basics for the calculations so that the results can be correctly interpreted and the strengths and weaknesses of the software can be recognized. The hydraulic engineering seminar gives students an insight into professional practice and the different fields of activity in hydraulic engineering, water management and coastal engineering through lectures by guest speakers working in administrative institutions, engineering offices, water associations or construction companies. The students acquire the ability to professionally process a hydraulic engineering as well as water management issue using specific literature to deepen the basic knowledge they have learned.			

Literature
Ausgabe von Vorlesungsunterlagen, Übungsaufgaben und Lernhilfen

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Related courses			
Rules for the choice of courses			
Compulsory attendance			
Compulsory attendance in Wasserbauseminar			
Name of the course	SWS	Eventtype	Language
	2,0	Seminar	german
	2,0	Lecture	german

Title	Hydromechanics		
Number	4320010	Module version	
Shorttext	BAU-STD3-46	Language	german
Frequency of offer	only in the summer term	Teaching unit	
Module duration	1	Institution	Abteilung Hydromechanik, Küsteningenieurwesen und Seebau
Hours per Week / ECTS	5 / 6,0	Module owner	Prof. Dr. Nils Goseberg
Workload (h)	180		
Class attendance (h)	70	Self studying (h)	110
Compulsory requirements			
Expected performance/ Type of examination	Written exam (120 Min.)		
Course achievement			
Contents			
[Hydromechanics (V+Ü)] Tasks of hydromechanics and mechanical properties of water, hydrostatics, introduction to hydrodynamics, continuity equation, introduction to potential flow, energy and momentum theorems, combined applications of conservation laws, theory of critical water depth, surge and sunk waves, Borda's shock loss and hydraulic jump. Introduction to real fluids, fluid friction law of NEWTON, laminar and turbulent flows, boundary layer concept of PRANDTL, laminar flow in circular pipe and in the ground, turbulent flow in circular pipe and in open channel flow.			
Objective qualification			
Upon completion of the module, students will be able to solve the conventional problems in practice with the help of the acquired basics of hydromechanics and quickly acquire the complementary knowledge for solving special flow problems. At the beginning, students are given an understanding of the basic laws/concepts of hydrostatics and fluid mechanics and their practical implications in civil and environmental engineering. The basic law of hydrostatics essentially addresses the determination of level surfaces and of hydrostatic forces on adjacent surfaces of any shape under the action of the earth's and other accelerations, as well as the demonstration of the buoyancy and stability of bodies. Idealized fluid mechanics involves the application of the conservation laws of mass, energy, and momentum and their various combinations to solve complex flow problems analytically. Furthermore, students learn how an ideal flow is changed by introducing viscosity and how this results in real flows considering viscosity. Using the examples of laminar pressure flows in circular pipes and in the ground, and turbulent pressure pipe and free-flow flows, students will learn about the complexity of real, frictional flows compared to ideal, frictionless flows. The limitations of the theoretical approaches derived will be demonstrated using practical examples			
Literature			
Detailed Hydromechanics script of approximately 297 pages, PowerPoint lecture presentations with educational videos about hydromechanics.			

Related courses			
Rules for the choice of courses			
Compulsory attendance			
Name of the course	SWS	Eventtype	Language
	5,0	Lecture/Exercise	german

Title	Hydraulic Engineering and Water Resources Management		
Number	4320140	Module version	
Shorttext	BAU-STD3-78	Language	german
Frequency of offer	only in the winter term	Teaching unit	
Module duration	1	Institution	Abteilung Wasserbau und Gewässermorphologie
Hours per Week / ECTS	4 / 6,0	Module owner	Prof. Dr. Jochen Aberle
Workload (h)	180		
Class attendance (h)	56	Self studying (h)	124
Compulsory requirements			
Expected performance/ Type of examination	Written exam (120 Min.)		
Course achievement			
Contents			
[Water Management (VÜ)] Tasks of hydrology and water management; water cycle and water balance of catchment areas; measurement and processing of hydrometeorological data; physical-mathematical models for rainfall-runoff processes; hydrological design of dams; reservoir management; exercises [Hydraulic Engineering (VÜ)] Introduction to river science; water level and water surface profile calculation; river training measures; hydraulic structures (weirs, dams; stilling basins); environmental hydraulics; sediment transport; river revitalization; ecological connectivity of rivers; hydropower structures			
Objective qualification			
The students acquire a basic knowledge of engineering hydrology principles and water management in connection with hydraulic engineering principles and environmentally relevant natural sciences (meteorology, biology, geology, etc.). From a hydrological point of view, the basics of physical-mathematical models are presented so that the students will be able to evaluate hydro-meteorological measurement series of river catchment areas and to establish water balances. Moreover, the students will learn the design principles for water storage structures considering flooding and reservoir management. From a hydraulic engineering point of view, the students will learn the basic principles for the design and dimensioning of hydraulic structures including dams, weirs, and nature-based solutions. They will be able to calculate open-channel water surface profiles, the conveyance capacity of hydraulic structures, and will acquire the basic knowledge to assess the morphological development of rivers and streams so that they will have the basic understanding to plan and implement hydraulic engineering measures and hydraulic structures.			
Literature			
Es stehen ein Skript und PC-Arbeitshilfen (Programme, Spreadsheets) zur Verfügung.			



Related courses			
Rules for the choice of courses			
Compulsory attendance			
Name of the course	SWS	Eventtype	Language
	2,0	Lecture/Exercise	german
	2,0	Lecture/Exercise	german

Title	Water Supply and Wastewater and Waste Management		
Number	4335010	Module version	
Shorttext	BAU-STD3-77	Language	german
Frequency of offer	only in the summer term	Teaching unit	
Module duration	1	Institution	Institut für Siedlungs- wasserwirtschaft
Hours per Week / ECTS	4 / 6,0	Module owner	Prof. Dr. Thomas Dock- horn
Workload (h)	180		
Class attendance (h)	56	Self studying (h)	124
Compulsory requirements			
Expected performance/ Type of examina- tion	Written exam (120 Min.)		
Course achievement			
Contents			
[Recycling and Waste Management (VÜ)] Collection of wastes, transport systems, biological, chemical and physical treatment processes for solid wastes, waste collection route planning, planning and dimensioning of waste treatment plants, aspects of hygiene, quantity and quality of wastewater and exhaust air from various treatment plants and for various treatment technologies, methods for ecological evaluation of waste treatment technologies, introduction of models for quality control of secondary raw materials [Water Supply and Wastewater Management (V)] Basics of drinking water supply, treatment and distribution, basics of wastewater discharge, separate and combined sewer systems, dimensioning and construction of sewer systems, basics of wastewater treat- ment, mechanical, chemical and biological treatment steps, nutrient removal, sewage sludge treatment and disposal			
Objective qualification			
Students will gain essential knowledge and skills for understanding and solving problems in the field of municipal and industrial waste and wastewater management, water supply and closed loop recycling. They will be able to use their acquired engineering skills to solve environmental problems for municipal and indu- strial employers in the fields of water supply, wastewater management, waste management und recycling. They will be able to critically discuss various process options and find adequate solutions taking into consi- deration social, scientific and ethical concerns.			
Literature			
Comprehensive lecture notes are available for download			



Related courses			
Rules for the choice of courses			
Compulsory attendance			
Name of the course	SWS	Eventtype	Language
	2,0	Lecture/Exercise	german
Water Supply and Wastewater Management	2,0	Lecture/Exercise	german

Title	Basics of track-guided traffic and public transport		
Number	4310920	Module version	
Shorttext	Schienenve	Language	german
Frequency of offer	only in the winter term	Teaching unit	
Module duration	1	Institution	Institut für Planung des öffentlichen Verkehrs
Hours per Week / ECTS	4 / 6,0	Module owner	Prof. Dr. Thomas Siefer
Workload (h)	180		
Class attendance (h)	56	Self studying (h)	124
Compulsory requirements			
Expected performance/ Type of examination	Written exam (90 Min.)		
Course achievement			
Contents			
[Fundamentals of track-bound traffic and public transport (V)] - Principles of operational, tactical and strategic planning in public transport - system-technical basics of rail traffic - organisational and legal fundamentals of railways according to EBO and public transport according to BOStrab - Technology and building materials for traffic route construction- Drainage and dimensioning basics for traffic route construction - Legal and financial basics of track-guided transport - Operational and technological basics of track plan design - Basics of passenger and freight transport strategies - Basics of environmental aspects of rail transport - Basics of train haulage (locomotives, multiple units, braking technology) - Basics of safety systems (interlocking technology and train control systems)			

Objective qualification			
The students acquire a basic understanding of planning processes in public transport systems, including strategic, tactical and operational planning practice. Then, the students analyse the system interrelationships in track-guided transport systems both of the railways according to the Railway Construction and Operation Regulations (EBO) and according to the Tram Construction and Operation Regulations (BOStrab). This includes the technological, construction material, drainage and dimensioning principles of traffic route construction in the inner-city area according to BOStrab as well as for railways according to EBO. Furthermore, the legal and financial principles of service planning of track-guided traffic as well as the operational and technological basics of the cycle-rail system are presented. The students also learn the basics of track plan design, safety systems in the road and railway sector, driving dynamics as well as environmental aspects of rail transport.			
Literature			
Vorlesungsskript, Präsentation			



Related courses			
Rules for the choice of courses			
Compulsory attendance			
Name of the course	SWS	Eventtype	Language
	4,0	Lecture/Exercise	german

Title	Traffic and Urban Planning		
Number	4302330	Module version	
Shorttext	BAU-STD-33	Language	german
Frequency of offer	only in the winter term	Teaching unit	
Module duration	1	Institution	Institut für Verkehr und Stadtbauwesen
Hours per Week / ECTS	4 / 6,0	Module owner	Prof. Dr. Bernhard Friedrich
Workload (h)	180		
Class attendance (h)	56	Self studying (h)	124
Compulsory requirements			
Expected performance/ Type of examination	Written Exam (120min) (in the Master's programme in Social Sciences as a course achievement)		
Course achievement			
Contents			
Objective qualification			
Literature			
Wird in der Lehrveranstaltung bekannt gegeben			

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Related courses			
Rules for the choice of courses			
Compulsory attendance			
Name of the course	SWS	Eventtype	Language
	4,0	Lecture/Exercise	german

Title	Fundamentals in Road Pavement Engineering		
Number	4306060	Module version	
Shorttext	BAU-STD3-06	Language	german
Frequency of offer	only in the summer term	Teaching unit	
Module duration	1	Institution	Institut für Straßenwesen
Hours per Week / ECTS	6 / 6,0	Module owner	
Workload (h)	180		
Class attendance (h)	84	Self studying (h)	96
Compulsory requirements			
Expected performance/ Type of examination	Written exam (120 Min.) or oral exam (approx. 30 Min.)		
Course achievement			
Contents			
[Straßenwesen (VÜ)] The road engineering course first introduces the students to the legal, technical and ecological framework conditions of traffic route construction. Based on this, the basics for planning, drafting and constructive implementation of road pavements in asphalt, concrete and paving construction methods are taught. In particular, the topics of route planning, formulation of road building materials, dimensioning of the road structure as well as execution and quality assurance when installing road building materials are dealt with. [Management der Straßeninfrastruktur (VÜ)] The course deals with the structural and operational maintenance of road infrastructure within the framework of systematic maintenance planning (Pavement Management System).			
Objective qualification			
Through the course, the students get to know the basic conditions for finding traffic corridors and find their way around the technical regulations and standards for road engineering. You will be able to evaluate variant studies for road construction projects, to design a road pavement as a preliminary site / grading plan and to independently determine the road cross-section and structure. In addition, you will gain an overview of the Building materials, construction methods and installation principles available for road construction.			
Literature			
Script			

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Related courses			
Rules for the choice of courses			
Compulsory attendance			
Name of the course	SWS	Eventtype	Language
	4,0	Lecture/Exercise	german
	2,0	Lecture/Exercise	german

Title	Basics of Economics		
Number	2212140	Module version	V2
Shorttext	WW-VWL-14	Language	german
Frequency of offer	every term	Teaching unit	Carl-Friedrich-Gauß-Fakultät
Module duration	2	Institution	Institut für Volkswirtschaftslehre
Hours per Week / ECTS	4 / 6,0	Module owner	Prof. Dr. Markus Ludwig
Workload (h)	180		
Class attendance (h)	56	Self studying (h)	124
Compulsory requirements			
Expected performance/ Type of examination	1 written exam 120 (min) or 1 take-at-home exam		
Course achievement	only for Bachelor Social Sciences instead of the exam: 1 written exam 120 (min) or 1 take-at-home exam		
Contents			
• Supply and demand • Competition and market efficiency • Macroeconomic variables (gross domestic product, inflation, unemployment) • Business cycle and growth			
Objective qualification			
Students have a basic understanding of how markets work. They know the empirical-statistical background of macroeconomic variables such as GDP, inflation, unemployment and balance of payments and can describe and evaluate economic policy in Germany against the background of economic theories.			
Literature			
• Blanchard, Oliver, Illing, Gerhard: Makroökonomie, Pearson Studium, aktuelle Auflage • Mankiw, N. Gregory, Taylor, Mark P.: Grundzüge der Volkswirtschaftslehre, Schäffer-Poeschel, aktuelle Auflage • Pindyck, Robert S., Rubinfeld, Daniel L.: Mikroökonomie, Pearson Studium, aktuelle Auflage			

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Related courses			
Rules for the choice of courses			
Exercises and tutorials are voluntary.			
Compulsory attendance			
Name of the course	SWS	Eventtype	Language
Microeconomics	3,0	Lecture/Exercise	german
Literature			
• Blanchard, Oliver, Illing, Gerhard: Makroökonomie, Pearson Studium, aktuelle Auflage • Mankiw, N. Gregory, Taylor, Mark P.: Grundzüge der Volkswirtschaftslehre, Schäffer-Poeschel, aktuelle Auflage • Pindyck, Robert S., Rubinfeld, Daniel L.: Mikroökonomie, Pearson Studium, aktuelle Auflage			
Macroeconomics	3,0	Lecture/Exercise	german
Literature			
• Blanchard, Oliver, Illing, Gerhard: Makroökonomie, Pearson Studium, aktuelle Auflage. • Mankiw, N. Gregory, Taylor, Mark P.: Grundzüge der Volkswirtschaftslehre, Schäffer-Poeschel, aktuelle Auflage. • Pindyck, Robert S., Rubinfeld, Daniel L.: Mikroökonomie, Pearson Studium, aktuelle Auflage.			
	1,0	Tutorial	german
Microeconomics for Repeaters	1,0	Tutorial	german
Literature			
• Blanchard, Oliver, Illing, Gerhard: Makroökonomie, Pearson Studium, aktuelle Auflage • Mankiw, N. Gregory, Taylor, Mark P.: Grundzüge der Volkswirtschaftslehre, Schäffer-Poeschel, aktuelle Auflage • Pindyck, Robert S., Rubinfeld, Daniel L.: Mikroökonomie, Pearson Studium, aktuelle Auflage			
Macroeconomics for Repeaters	1,0	Tutorial	german
Literature			
• Blanchard, Oliver, Illing, Gerhard: Makroökonomie, Pearson Studium, aktuelle Auflage. • Mankiw, N. Gregory, Taylor, Mark P.: Grundzüge der Volkswirtschaftslehre, Schäffer-Poeschel, aktuelle Auflage. • Pindyck, Robert S., Rubinfeld, Daniel L.: Mikroökonomie, Pearson Studium, aktuelle Auflage.			

Title	Basics of Business Studies - Production & Logistics and Finance		
Number	2299850	Module version	V2
Shorttext	WW-STD-85	Language	english german
Frequency of offer	only in the summer term	Teaching unit	Carl-Friedrich-Gauß-Fakultät
Module duration	1	Institution	Institut für Automobilwirtschaft und Industrielle Produktion - Lehrstuhl für Produktion und Logistik
Hours per Week / ECTS	4 / 6,0	Module owner	Studiendekan der Wirtschaftswissenschaften
Workload (h)	180		
Class attendance (h)	56	Self studying (h)	124
Compulsory requirements			
Expected performance/ Type of examination	1 written exam (120 min) or 1 take-at-home exam		
Course achievement			
Contents			
Introduction to production and logistics: Global production in the context of sustainable development Fundamentals of modelling production systems Modelling of production processes and systems Assessment of production systems based on dominance relationships Economic evaluation of production systems Sustainability assessment of production systems and supply chains From production systems to value chains Life cycle-orientated sustainability assessment Economic life cycle assessment Ecological life cycle assessment Social life cycle assessment Integrated assessment Fundamentals of decision theory Multi-criteria decision methods (e.g. scoring methods) Introduction to financial economics: Static and dynamic favourable decisions under certainty Fisher separation and net present value criterion Determination of project cash flows Application and assessment of static methods Parameter rules Fundamentals of corporate financing Financing instruments and their classification Transformation function of financing measures Market value maximisation and capital cost minimisation Modigliani/Miller (1958) and the irrelevance of financing decisions			

Simultaneous investment and financing decisions by means of complete financial planning
Objective qualification
Introduction to production & logistics Students... ...are able to explain the challenges of global production and sustainable development ...are able to describe production processes and systems with the help of mathematical models ...have a basic understanding of economic evaluation concepts and methods ...understand the importance of analysing production systems in the context of supply chains ...know the relevant approaches to life cycle-oriented sustainability assessment ...can apply life cycle-oriented assessment methods to analyse simple production systems and supply chains ... are able to transfer the individual assessment methods into an integrated assessment approach ...are familiar with the central concepts of decision theory and can apply simple multi-criteria decision models Introduction to finance: Students... ...understand the importance of capital value in the context of an entrepreneurial decision-making situation. ...are able to make capital value maximising investment decisions on the basis of given secure payment structures. ...are able to apply both "static" and "dynamic" benefit comparisons and are able to categorise them critically. ...know the most important parameter rules and can classify and critically assess them in the context of capital value maximisation. ...know the most important financing instruments and can categorise them according to the basic forms of financing. ...understand the transformation function of entrepreneurial financing measures and are familiar with the concept of market value maximisation and capital cost minimisation. ...understand the irrelevance of financing in a perfect market environment as well as the "leverage effect" and know their consequences for entrepreneurial cost of capital rates. ...are able to assess investment programmes and financing programmes on the basis of a complete financial plan, even in an imperfect market environment.
Literature
Einführung in die Produktion & Logistik: • Dyckhoff, H.; Spengler, T. S. (2010): Produktionswirtschaft – Eine Einführung, Springer, Berlin. Einführung in die Finanzwirtschaft: • Breuer, W. (2013): Finanzierung, 3. Auflage, Wiesbaden. • Breuer, W. (2012): Investition I, 4. Auflage, Wiesbaden. • Hirth, H. (2017): Grundzüge der Finanzierung und Investition, 4. Auflage, München. • Kruschwitz, L.; Lorenz, D. (2019): Investitionsrechnung, 15. Auflage, Berlin.



Related courses			
Rules for the choice of courses			
Lectures compulsory. Tutorials, exercises voluntary			
Compulsory attendance			
Name of the course	SWS	Eventtype	Language
Principles of Production and Logistics	2,0	Lecture/Exercise	german
Literature			
• Dyckhoff/Spengler: Produktionswirtschaft (Springer, 2010, 3. Auflage) • Hahn, R.: Sustainability Management (2022)			
Introduction to Finance	2,0	Lecture/Exercise	german
Literature			
• Breuer, W. (2013): Finanzierung, 3. Auflage, Wiesbaden. • Breuer, W. (2012): Investition I, 4. Auflage, Wiesbaden. • Hirth, H. (2017): Grundzüge der Finanzierung und Investition, 4. Auflage, München. • Kruschwitz, L.; Lorenz, D. (2019): Investitionsrechnung, 15. Auflage, Berlin.			
Exam Preparation for Principles of Production and Logistics	1,0	Exercise	german
Literature			
• Dyckhoff/Spengler: Produktionswirtschaft (Springer, 2010, 3. Auflage) • Hahn, R.: Sustainability Management (2022)			

Title	Basics of Business Studies - Management and Marketing		
Number	2299540	Module version	V2
Shorttext	WW-STD-54	Language	german
Frequency of offer	only in the winter term	Teaching unit	Carl-Friedrich-Gauß-Fakultät
Module duration	1	Institution	Institut für Marketing und Innovation
Hours per Week / ECTS	4 / 6,0	Module owner	Studiendekan der Wirtschaftswissenschaften
Workload (h)	180		
Class attendance (h)	56	Self studying (h)	124
Compulsory requirements			
Expected performance/ Type of examination	1 exam (120 min) or 1 take-at-home exam		
Course achievement			
Contents			
• Fundamentals of corporate management; • Fundamentals of procurement management; • Fundamentals of operational decision-making; • Basics of marketing; • Marketing research; • Objectives and basic strategies of marketing; • Marketing implementation and control			
Objective qualification			
Students have a basic understanding of general business administration and marketing. They will be able to differentiate between and describe the various business functions, in particular the three main functions of planning, decision-making and control. Students will also have acquired the ability to view business reality from a marketing perspective.			
Literature			
Einführung in das Marketing: • Fritz, W. /von der Oelsnitz, D./Seegebarth, B.: Marketing. Elemente marktorientierter Unternehmensführung, 5. Aufl., Stuttgart 2019. • Meffert, H./Burmans, C./Kirchgeorg, M.: Marketing : Grundlagen marktorientierter Unternehmensführung, Konzepte - Instrumente - Praxisbeispiele, 12. Aufl., Wiesbaden 2014. • Kotler, P./Keller, K./Opresnik, M. O.: Marketing-Management, 15. Aufl., München 2017. • Homburg, C.: Grundlagen des Marketingmanagements: Einführung in Strategie, Instrumente, Umsetzung und Unternehmensführung, 5. Aufl., Wiesbaden 2017. • Folienskript Einführung in die Unternehmensführung: • von der Oelsnitz, D. (2009): Management. Geschichte, Aufgaben, Beruf, München. • Staehle, W.H. (1999): Management, 8. Aufl., München. • Steinmann, H./Schreyögg, G. (2005): Management, 6. Aufl., Wiesbaden			



Related courses			
Rules for the choice of courses			
Lectures compulsory. Exercises and tutorials are voluntary.			
Compulsory attendance			
Name of the course	SWS	Eventtype	Language
Introduction to Management	2,0	Lecture	german
Literature			
• von der Oelsnitz, D. (2009): Management. Geschichte, Aufgaben, Beruf, München • Staehle, W.H. (1999): Management, 8. Aufl., München • Steinmann, H./Schreyögg, G. (2005): Management, 6. Aufl., Wiesbaden			
Introduction to Marketing	2,0	Lecture	german
Literature			
• Fritz, W. /von der Oelsnitz, D./Seegebarth, B.: Marketing. Elemente marktorientierter Unternehmensführung, 5. Aufl., Stuttgart 2019 • Meffert, H./Burmann, C./Kirchgeorg, M.: Marketing : Grundlagen marktorientierter Unternehmensführung, Konzepte - Instrumente - Praxisbeispiele, 12. Aufl., Wiesbaden 2014 • Kotler, P./Keller, K./Opresnik, M. O.: Marketing-Management, 15. Aufl., München 2017 • Homburg, C.: Grundlagen des Marketingmanagements: Einführung in Strategie, Instrumente, Umsetzung und Unternehmensführung, 5. Aufl., Wiesbaden 2017 • Folienskript			
	2,0	Colloquium	german
	2,0	Tutorial	german
Literature			
• Macharzina, K./Wolf, J. (2005): Unternehmensführung, 4. Aufl., Wiesbaden. • Staehle, W.H. (1999): Management, 8. Aufl., München. • Steinmann, H./Schreyögg, G. (2005): Management, 6. Aufl., Wiesbaden.			
	1,0	Colloquium	german

Title	Introduction to Business Information Systems		
Number	2222150	Module version	V2
Shorttext	WW-WII-15	Language	german
Frequency of offer	only in the winter term	Teaching unit	Carl-Friedrich-Gauß-Fakultät
Module duration	1	Institution	Institut für Wirtschafts-informatik - Abteilung Service-Informationssy- steme
Hours per Week / ECTS	3 / 5,0	Module owner	Prof. Dr. Susanne Robra-Bissantz
Workload (h)	150		
Class attendance (h)	42	Self studying (h)	108
Compulsory requirements			
Expected performance/ Type of examina- tion	1 exam (90 min) or 1 take-at-home exam		
Course achievement			
Contents			
• Overview of business informatics • Hardware, software and networking • Enterprise models: data, function and process modelling • Application development and project management • Integrated application systems in industry and services • Inter-company information systems: e-commerce, electronic markets • IT and corporate strategy: e-business management, customer relationship management, supply chain management, digital products • Management of information processing (information management, process management, knowledge management)			
Objective qualification			
The "Introduction to Business Information Systems" module provides students with an overview of business information systems: as an interdisciplinary subject between business administration, computer science and technology and as an independent subject that considers the relationships between people, (business) tasks and technology. Participants are familiar with the operational and inter-company areas of application of business informatics and know how business management tasks are supported with integrated application systems. They know and master the essential approaches to the design and introduction of application systems and their significance in the management of the company's information system. In addition, they have an idea of new developments in business informatics, e.g. in inter-company relationships of the company with customers and partners or in electronic markets.			
Literature			
• Mertens et al.: Grundzüge der Wirtschaftsinformatik, 9. Auflage, Berlin et al. 2005. • Lehner, F., Wildner, S., Scholz, M.: Wirtschaftsinformatik. Eine Einführung, München, Wien 2008. • Laudon, K. et al.: Wirtschaftsinformatik: Eine Einführung, München 2006 • Stahlknecht, P., Hasenkamp, U.: Einführung in die Wirtschaftsinformatik, 11. Auflage, Berlin et al. 2005 • Vorlesungsunterlagen zum Download			



Related courses			
Rules for the choice of courses			
Compulsory attendance			
Name of the course	SWS	Eventtype	Language
Introduction to Business Information Systems	3,0	Lecture/Exercise	german
Literature			
• Mertens et al.: Grundzüge der Wirtschaftsinformatik, 9. Auflage, Berlin et al. 2005 • Lehner, F., Wildner, S., Scholz, M.: Wirtschaftsinformatik. Eine Einführung, München, Wien 2008 • Laudon, K. et al.: Wirtschaftsinformatik: Eine Einführung, München 2006 • Stahlknecht, P., Hasenkamp, U.: Einführung in die Wirtschaftsinformatik, 11. Auflage, Berlin et al. 2005 • Vorlesungsunterlagen zum Download			

Title	Basics of Law		
Number	2216320	Module version	V2
Shorttext	WW-RW-32	Language	german
Frequency of offer	every term	Teaching unit	Carl-Friedrich-Gauß-Fakultät
Module duration	2	Institution	Institut für Rechtswissenschaften
Hours per Week / ECTS	4 / 6,0	Module owner	Prof. Dr. Anne Paschke
Workload (h)	180		
Class attendance (h)	56	Self studying (h)	124
Compulsory requirements			
Expected performance/ Type of examination	1 written exam (180 min) or 1 take-at-home exam		
Course achievement			
Contents			
Fundamentals of law 1: Introduction to law, legal methodology of case and dispute resolution, constitutional law, in particular state organisation and fundamental rights, administrative law, in particular official action through administrative acts, legal remedies, basic principles of European law. Fundamentals of law 2: Fundamentals of civil law, in particular legal capacity, declarations of intent, conclusion of contracts, representation and avoidance, law of obligations - general part - and fundamentals of criminal law			
Objective qualification			
Students understand the basic principles of law, in particular constitutional law, administrative law and European law (Fundamentals of Law 1). Furthermore, they deal with the contents of the Civil Code - General Section and the Law of Obligations - General Section - and gain an initial insight into criminal law (Fundamentals of Law 2). They solve simple legal cases independently.			
Literature			
• Haug, Öffentliches Recht im Überblick, 3. Auflage 2021, • Leipold, BGB I Einführung und Allgemeiner Teil, 10. Auflage, 2019, Mohr Siebeck Verlag, • Brox/Walker, Allgemeines Schuldrecht, 46. Auflage, 2022, Verlag C.H. Beck			

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Related courses			
Rules for the choice of courses			
The lecture "Fundamentals of Law 1" should be attended before the lecture "Fundamentals of Law 2". The exercises are voluntary.			
Compulsory attendance			
Name of the course	SWS	Eventtype	Language
Basics of German Law 1	2,0	Lecture	german
Literature			
Hinweise werden in der Veranstaltung gegeben			
Basics of German Law 2	2,0	Lecture	
Literature			
Hinweise werden in der Veranstaltung gegeben			
	2,0	Exercise	german

Title	Accounting		
Number	2214120	Module version	V2
Shorttext	WW-ACuU-12	Language	german
Frequency of offer	only in the winter term	Teaching unit	Carl-Friedrich-Gauß-Fakultät
Module duration	1	Institution	Institut für Controlling und Unternehmensrechnung
Hours per Week / ECTS	4 / 6,0	Module owner	Prof. Dr. Heinz Ahn
Workload (h)	180		
Class attendance (h)	56	Self studying (h)	124
Compulsory requirements			
Expected performance/ Type of examination	1 written exam (120 min) or 1 take-at-home exam		
Course achievement			
Contents			
• Overview of capital market-oriented accounting in accordance with IFRS • The technique of posting business transactions • General recognition and measurement rules • Presentation of the financial position • Presentation of the earnings position • Presentation of the financial position • Basic concepts of cost and revenue accounting • Cost and revenue type accounting • Cost centre accounting • Cost and revenue element accounting • Cost and activity accounting systems based on partial costs			
Objective qualification			
After completing this module, students will have a basic understanding of the tasks and methods of industrial accounting. This applies to external and internal accounting.			
Literature			
• Zimmermann, J./Werner, J.R.: Buchführung und Bilanzierung nach IFRS, Pearson Studium, München 2008 (bzw. ggf. aktuellere Auflage) • Deimel, K./Isemann, R./Müller, S.: Kosten und Erlösrechnung - Grundlagen, • Managementaspekte und Integrationsmöglichkeiten der IFRS, Pearson Studium, München 2006 (bzw. ggf. aktuellere Auflage)			



Related courses			
Rules for the choice of courses			
Compulsory attendance			
Name of the course	SWS	Eventtype	Language
Accounting and Financial Reporting	2,0	Lecture	german
Tutorial - Accounting and Financial Reporting	2,0	Exercise	german
Literature			
• Zimmermann, J./Werner, J. R./Hitz, J.-M. (2020): Buchführung und Bilanzierung nach IFRS und HGB, 4. Aufl., Pearson • Deimel, K./Erdmann, G./Isemann, R./Müller, S. (2017): Kostenrechnung: Das Lehrbuch für Bachelor, Master und Praktiker, Pearson, Kapitel 1–6			

Title	Economic methodology (Major)		
Number	2299840	Module version	V2
Shorttext	WW-STD-84	Language	german
Frequency of offer	only in the summer term	Teaching unit	Carl-Friedrich-Gauß-Fakultät
Module duration	1	Institution	Department Wirtschafts-wissenschaften
Hours per Week / ECTS	4 / 5,0	Module owner	Studiendekan der Wirt-schaftswissenschaften
Workload (h)	150		
Class attendance (h)	56	Self studying (h)	94
Compulsory requirements			
Expected performance/ Type of examination	1st examination: 1 written examination (60 min) or 1 term paper or 1 portfolio or 1 oral examination or 1 presentation or 1 take-at-home exam 2nd examination: 1 term paper or 1 portfolio or 1 oral examination or 1 presentation or 1 written examination (60 min) or 1 take-at-home exam		
Course achievement			
Contents			
Multivariate data analysis: The introductory course in multivariate data analysis provides students with a basic understanding of the analysis of quantitative data, which is used as a basis for economic decisions. The course covers the methods of regression, variance, discriminant, factor and cluster analysis as well as conjoint analysis. In exercises, students acquire application skills in analysing the data sets provided. Qualitative methods 1 and 2: Qualitative research methods complement quantitative analysis by, for example, working with smaller subject groups, more exploratory, more interpretative or also accompanied by the design of artefacts. In this course, students are familiarised with an overview of qualitative methods and their special features and are able to discuss, reflect on and decide on their use. In a total of 6 individual methods for collecting, processing and analysing findings, students acquire theoretical knowledge as well as basic skills in their use and apply them in small research scenarios. The six methods covered in particular include structured literature analyses, expert interviews, experiments and approaches from grounded theory, action research, case study research and design thinking. Software-based applications of operations research: Knowledge of relevant standard software in the field of data analytics and operations research Application of the software to selected questions on the optimisation of production and logistics systems Knowledge transfer through Teaching the basics of modelling and application Software presentation as well as supervised and independent use of the software Topics: Fundamentals of OR-supported planning and decision-making using mathematical optimisation Fundamentals of data analysis using the CRISP-DM process model			

Data acquisition, analysis and evaluation using the KNIME software
Mathematical formulation of optimisation models (standard OR models)
Implementation, solution finding and evaluation using AIMMS
Independent use of the software as part of a case study
Comparative analysis of alternative optimisation models

Machine Learning Applications in Business Decision-Making

Methods of accounting consulting

Objective qualification

After completing this module, students have an overview of methods in economics and are able to apply them. They will be able to identify and model common quantitative and qualitative decision-making and analysis problems and solve them by applying an appropriate method.

Literature

Qualitative Verfahren:

- Mayring, Philipp: Einführung in die Qualitative Sozialforschung, 2016

Softwarebasierte Anwendungen des OR:

- Domschke, W.; Drexl, A. (2015): Einführung in Operations Research, 9. Auflage, Springer
- Roelofs, M.; Bisshop, J. (2020): AIMMS The User's Guide, Paragon Decision Technology (Hrsg.); URL: https://download.aimms.com/aimms/download/manual/AIMMS3_UG.pdf
- Cleve, J.; Lämmel, U. (2016): Data Mining; 2. Auflage, DeGruyter
- KNIME Analytics Platform; URL: <https://www.knime.com/sites/default/file/KNIME%20Analytics%20Platform%20Course%20for%20Beginners.pdf>

Multivariate Datenanalyse:

- Backhaus, K., Erichson, B., Plinke, W., & Weiber, R. (2018). Multivariate Analysemethoden – Eine anwendungsorientierte Einführung, 15. Auflage: Springer.
- Hair, J. F., Black, W. C., Babin, B. J., & Anderson, R. E. (2018). Multivariate data analysis, 8. Auflage: Cengage.

Machine Learning Applications in Business Decision-Making

- Afsharian, M. (2024). Data science essentials in business administration: A multidisciplinary perspective. Decision Analytics Journal, 11, 100442.
- Evans, J.R. (2017): Business Analytics. 2nd edition. Pearson, London.
- Evans, J.R., Olson, D.L. (2002): Introduction to Simulation and Risk Analysis. 2nd edition. Pearson, New Jersey.
- Hodeghatta, U.R., Nayak, U. (2016): Business Analytics Using R - A Practical Approach. Apress.
- Jank, W. (2011): Business Analytics for Managers (Use R!). Springer, New York.
- Provost, F., Fawcett, T. (2013): Data Science for Business: What You Need to Know About Data Mining and Data-Analytic Thinking. O'Reilly and Associates
- Runkler, T.A. (2016): Data Analytics – Models and Algorithms for Intelligent Data Analysis. 2nd edition. Springer, Wiesbaden.
- Kubat, M. (2015): An Introduction to Machine Learning. Springer, New York.

Methoden der Accounting-Beratung

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Meyer / Theile (2025, 34. Auflage)

Bilanzierung nach Handels- und Steuerrecht

unter Einschluss der Konzernrechnungslegung und der internationalen Rechnungslegung



Related courses			
Rules for the choice of courses			
2 events of your choice. Students are expected to attend the following courses if they intend to write a thesis and/or seminar in the following subjects. Multivariate data analysis: service management, marketing Qualitative methods: Information Management, Corporate Management & Organisation Software-based applications of OR: Decision Support, Production & Logistics Machine Learning Applications in Business Decision-Making: Finance, Economics Accounting consulting methods: corporate accounting			
Compulsory attendance			
Name of the course	SWS	Eventtype	Language
Machine Learning and Econometrics	2,0	Lecture/Exercise	german
Literature			
- James, G.; Witten, D.; Hastie, T; Tibshirani, R.: An Introduction to Statistical Learning with Applications in R (stets die neueste Auflage) - Wooldridge, J. M.: Introductory Econometrics: A Modern Approach (stets die neueste Auflage)			
Multivariate Data Analysis	2,0	Lecture/Exercise	german
Literature			
- Backhaus, K., Erichson, B., Plinke, W., & Weiber, R. (2018). Multivariate Analysemethoden – Eine anwendungsorientierte Einführung, 15. Auflage: Springer - Hair, J. F., Black, W. C., Babin, B. J., & Anderson, R. E. (2018). Multivariate data analysis, 8. Auflage: Cengage			
Qualitativ Methods 1	2,0	Lecture/Exercise	german
Literature			
Mayring, Philipp: Einführung in die Qualitative Sozialforschung, 2016			
Software-based Applications of Operations Research	2,0	Lecture/Exercise	german
Literature			
- Domschke, W.; Drexl, A. (2015): Einführung in Operations Research, 9. Auflage, Springer - Roelofs, M.; Bisshop, J. (2020): AIMMS The User's Guide, Paragon Decision Technology (Hrsg.); URL: https://download.aimms.com/aimms/download/manuals/AIMMS3_UG.pdf - Cleve, J.; Lämmel, U. (2016): Data Mining; 2. Auflage, DeGruyter - KNIME Analytics Platform; URL: https://www.knime.com/sites/default/files/KNIME%20Analytics%20Platform%20Course%20for%20Beginners.pdf			

	2,0	Lecture	german
Literature			
Meyer / Theile (2025, 34. Auflage) Bilanzierung nach Handels- und Steuerrecht unter Einschluss der Konzernrechnungslegung und der internationalen Rechnungslegung			
Methods of Data Science for Business	1,0	Lecture	english
	1,0	Colloquium	english
Machine Learning Applications in Business Decision-Making	2,0	Lecture/Exercise	german
Literature			
Meyer / Theile (2025, 34. Auflage) Bilanzierung nach Handels- und Steuerrecht unter Einschluss der Konzernrechnungslegung und der internationalen Rechnungslegung			
Machine Learning Applications in Business Decision-Making	1,0	Colloquium	german
Literature			
Meyer / Theile (2025, 34. Auflage) Bilanzierung nach Handels- und Steuerrecht unter Einschluss der Konzernrechnungslegung und der internationalen Rechnungslegung			
Qualitativ Methods 2	2,0	Lecture/Exercise	german
Literature			
Mayring, Philipp: Einführung in die Qualitative Sozialforschung, 2016			

Title	Specialisation - Economics		
Number	2212250	Module version	V3
Shorttext	WW-VWL-25	Language	german
Frequency of offer	every term	Teaching unit	Carl-Friedrich-Gauß-Fakultät
Module duration	2	Institution	Institut für Volkswirtschaftslehre
Hours per Week / ECTS	4 / 6,0	Module owner	Prof. Dr. Markus Ludwig
Workload (h)	180		
Class attendance (h)	56	Self studying (h)	124
Compulsory requirements			
Recommended requirements	Knowledge from the module Fundamentals of Economics		
Expected performance/ Type of examination	1 written exam (120 min) or 1 take-at-home exam		
Course achievement			
Contents			
• Market and state failure • Equity and justice • Growth and development • Trade			
Objective qualification			
The module deepens and expands the content of the module Fundamentals of Economics. Students are able to use complex economic models to analyze the actions of private and state actors and assess economic effects.			
Literature			
• Krugman, Paul R., Obstfeld, Maurice, Melitz, Marc: Internationale Wirtschaft, Pearson Studium, aktuelle Auflage. • Pindyck, Robert S., Rubinfeld, Daniel L.: Mikroökonomie, Pearson Studium, aktuelle Auflage.			



Related courses			
Rules for the choice of courses			
Lectures compulsory, tutorials voluntary.			
Compulsory attendance			
Name of the course	SWS	Eventtype	Language

Development Economics	4,0	Lecture/Exercise	german
Literature			
• Todaro, Michael P., Smith, Stephen C.: Economic Development, Pearson, aktuelle Auflage • Weil, David: Economic Growth, Routledge, aktuelle Auflage			
Economics of the State	2,0	Lecture/Exercise	german
Literature			
• Krugman, Paul R., Obstfeld, Maurice, Melitz, Marc: Internationale Wirtschaft, Pearson Studium, aktuelle Auflage • Pindyck, Robert S., Rubinfeld, Daniel L.: Mikroökonomie, Pearson Studium, aktuelle Auflage			
	2,0	Colloquium	german

Title	Specialisation - Services Management		
Number	2201010	Module version	V2
Shorttext	WW-DLM-01	Language	german
Frequency of offer	only in the summer term	Teaching unit	Carl-Friedrich-Gauß-Fakultät
Module duration	1	Institution	Institut für Automobilwirtschaft und Industrielle Produktion - Lehrstuhl für Dienstleistungsmanagement
Hours per Week / ECTS	4 / 6,0	Module owner	Prof. Dr. David Woitschläger
Workload (h)	180		
Class attendance (h)	56	Self studying (h)	124
Compulsory requirements			
Expected performance/ Type of examination	1 written exam (120 min) or 1 oral exam (30 min) or 1 take-at-home exam		
Course achievement			
Contents			
• Characteristics and typologies of services • Customer behaviour in the service process • Quality management • Customer relationship management • Marketing of services			
Objective qualification			
In this module, students acquire a basic understanding of issues relating to the management of service companies and the marketing of services. Students learn a broad spectrum of methods for analysing business management issues in various service fields.			
Literature			
• Zeithaml/Bitner/Gremler (2006): Services Marketing			



Related courses			
Rules for the choice of courses			
Compulsory attendance			
Name of the course	SWS	Eventtype	Language

Services Management	4,0	Lecture/Exercise	german
Literature			
• Zeithaml/Bitner/Gremler (2006): Service Marketing • Ergänzende Literatur (PDF-Dokumente, Vorlesungsunterlagen zum Download)			
	2,0	Colloquium	german
Bachelor-/Master-Colloquium Services Management	2,0	Colloquium	german

Title	Specialisation - Finance		
Number	2215000020	Module version	V2
Shorttext		Language	german
Frequency of offer	only in the winter term	Teaching unit	Carl-Friedrich-Gauß-Fakultät
Module duration	1	Institution	Institut für Finanzwirtschaft
Hours per Week / ECTS	4 / 6,0	Module owner	Prof. Dr. Marc Gürtler
Workload (h)	180		
Class attendance (h)	56	Self studying (h)	124
Compulsory requirements			
Expected performance/ Type of examination	2 examinations for the two courses: 1 written exam (60 min) or 1 oral exam (30 min) or 1 take-at-home exam and 1 written exam (60 min) or 1 oral exam (30 min) or 1 term paper or 1 presentation or 1 portfolio or 1 take-at-home exam		
Course achievement			
Contents			
• Procedures for assessing investment decisions under uncertainty • Evaluation of sequential investment decisions and real options • Optimal financing decisions under consideration of taxes and insolvency costs • Incentive problems of debt and equity financing and countermeasures • Loan collateral and its incentivising effect • Mezzanine financing and its optimal structure • Basic methods and techniques of machine and statistical learning (e.g. linear regression, variable selection methods, tree-based methods and neural networks) • Application of the methods to forecasting and estimation problems in finance • Implementation of the methods in the context of software-based case studies			
Objective qualification			
Students have a sound understanding of the assessment of financing and investment decisions. They have the ability to evaluate investment projects and assess financing programmes. Students master basic methods of machine and statistical learning and can use these to deal with forecasting and estimation problems in finance.			
Literature			
• Breuer (2000): Investitionstheorie I • Breuer (2001): Investitionstheorie II • Breuer (1998): Finanzierungstheorie			

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Related courses			
Rules for the choice of courses			
Two lectures must be attended. The two courses mentioned can also be replaced by other courses from the catalogue of courses offered by the Institute of Finance, provided that these correspond to the qualification objectives and do not change the scope of the module. Colloquium voluntary.			
Compulsory attendance			
Name of the course	SWS	Eventtype	Language
Capital Budgeting and Corporate Finance	2,0	Lecture	german
Literature			
• Breuer, Wolfgang (2012): Investition I, 4. Auflage, Wiesbaden. • Breuer, Wolfgang (2001): Investition II, Wiesbaden. • Breuer, Wolfgang/Gürtler, Marc/Schuhmacher, Joachim (1999): Die Bewertung betrieblicher Realoptionen, in: Betriebswirtschaftliche Forschung und Praxis, 5. Jg., S. 215-232. • Kuschwicz, Lutz/Lorenz, Daniela (2019): Investitionsrechnung, 15. Auflage, Berlin.			
Machine and Statistical Learning in Finance	2,0	Lecture	german
Literature			
• James, Gareth/Witten, Daniela/Hastie, Trevor/Tibshirani, Robert (2023): An Introduction to Statistical Learning with Applications in R, 2. Auflage, korrigierte Fassung, Springer. • Heesen, B. (2023): Künstliche Intelligenz und Machine Learning mit R, Springer Fachmedien Wiesbaden.			
	2,0	Colloquium	german

Title	Specialisation - Marketing		
Number	2221060	Module version	V3
Shorttext	WW-MK-06	Language	german
Frequency of offer	only in the summer term	Teaching unit	Carl-Friedrich-Gauß-Fakultät
Module duration	1	Institution	Institut für Marketing und Innovation
Hours per Week / ECTS	4 / 6,0	Module owner	Prof. Dr. Wolfgang Fritz
Workload (h)	180		
Class attendance (h)	56	Self studying (h)	124
Compulsory requirements			
Expected performance/ Type of examination	1 written exam (120 min) or 1 take-at-home exam		
Course achievement			
Contents			
• Basic concepts and special features of capital goods marketing; • The marketing management of a capital goods manufacturer; • Business type-specific special problems of capital goods marketing; • Basic concepts and framework conditions of Internet marketing and e-commerce; • The Internet as an instrument of marketing management and e-commerce			
Objective qualification			
In this module, students acquire the ability to apply and expand their basic marketing knowledge to the special problems of capital goods marketing, internet marketing and market-oriented electronic commerce. After completing the module, they will be able to analyse the marketing situation of a capital goods manufacturer and develop a marketing concept. In addition, students will be able to recognise the special features of marketing in e-commerce and outline a concept for internet marketing.			
Literature			
• Backhaus, K. (2003): Industriegütermarketing, 7. Aufl., München 2003. • Backhaus, K./ Voeth, M. (2007): Industriegütermarketing, 8. Aufl., München 2008. • Fritz, W. (2009): Internet-Marketing und Electronic Commerce, 4.Aufl., Wiesbaden 2009. • Folienskripte			

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Related courses			
Rules for the choice of courses			
Lectures compulsory. Exercises voluntary.			
Compulsory attendance			
Name of the course	SWS	Eventtype	Language
B2B Marketing	2,0	Lecture	german
Digital Marketing	2,0	Lecture	german

Title	Specialisation - Production and Logistics		
Number	2220060	Module version	V2
Shorttext	WW-AIP-06	Language	german
Frequency of offer	only in the winter term	Teaching unit	Carl-Friedrich-Gauß-Fakultät
Module duration	1	Institution	Institut für Automobilwirtschaft und Industrielle Produktion - Lehrstuhl für Produktion und Logistik
Hours per Week / ECTS	4 / 6,0	Module owner	Prof. Dr. Thomas Spengler
Workload (h)	180		
Class attendance (h)	56	Self studying (h)	124
Compulsory requirements			
Expected performance/ Type of examination	1 written exam (120 min) or 1 take-at-home exam		
Course achievement			
Contents			
• Advanced Planning Systems • Forecasting methods • Production programme planning • Materials management • Production control • Process planning • Procurement logistics • distribution logistics • Spare parts logistics • Transport systems and traffic • Reverse logistics			
Objective qualification			
Students have a basic understanding of production management and logistics issues. With the help of the quantitative and qualitative methods they have learned, they are able to model and solve industrial problems. Students also have a basic understanding of the most important tools such as simulation, optimisation and operational planning systems (APS, ERP).			
Literature			
• Günther/Tempelmeier (2009): Produktion und Logistik • Dyckhoff/Spengler (2010): Produktionswirtschaft • Pfohl (2010): Logistiksysteme • Thonemann (2010): Operations Management • eigene Foliensätze/Übungsaufgaben			



Related courses			
Rules for the choice of courses			
Lecture compulsory. Tutorials and colloquium voluntary.			
Compulsory attendance			
Name of the course	SWS	Eventtype	Language
Operations Management	4,0	Lecture	german
Literature			
• Günther/Tempelmeier (2020): Produktion und Logistik • Dyckhoff/Spengler (2010): Produktionswirtschaft • Pfohl (2018): Logistiksysteme • Thonemann (2018): Operations Management • eigene Foliensätze/Übungsaufgaben			
Bachelor-Colloquium - Production and Logistics	2,0	Colloquium	german
Exercise Operations Management	2,0	Exercise	german
Literature			
• Günther/Tempelmeier (2020): Produktion und Logistik • Dyckhoff/Spengler (2010): Produktionswirtschaft • Pfohl (2018): Logistiksysteme • Thonemann (2018): Operations Management • eigene Foliensätze/Übungsaufgaben			

Title	Specialisation - Management and Organisation Science		
Number	2223120	Module version	V2
Shorttext	WW-ORGF-12	Language	german
Frequency of offer	only in the summer term	Teaching unit	Carl-Friedrich-Gauß-Fakultät
Module duration	1	Institution	Institut für Unternehmensführung und Organisation
Hours per Week / ECTS	4 / 6,0	Module owner	Prof. Dr. Dietrich von der Oelsnitz
Workload (h)	180		
Class attendance (h)	56	Self studying (h)	124
Compulsory requirements			
Recommended requirements	Basic knowledge of management studies, in particular the main functions of planning, decision-making and control.		
Expected performance/ Type of examination	1 written exam (120 min) or 1 take-at-home exam		
Course achievement			
Contents			
Personnel management • Tasks and the function of supervisors and • Presentation of the behavioral science principles of personnel management, in particular motivation theory • Basic approaches to personnel management • Practice-dominated management models such as the Harzburg model or "management by" concepts Strategic corporate management • Selected approaches to strategic analysis (e.g. experience curve concept, portfolio models and life cycle concepts) • Basic strategies of corporate management • The concept of hypercompetition			
Objective qualification			
After completing this module, students will be able to understand methods of strategic analysis and the basic strategies of sales-oriented corporate management. Furthermore, students will be introduced to the broad spectrum of possible management styles and models, including their behavioral theory background. After successfully completing the module, students will be able to recognize which leadership behavior is promising in which context.			
Literature			
Human resources management: • Oelsnitz, D. von der (2011): Einführung in die systemische Personalführung, Heidelberg. • Neuberger, O. (2002): Führen und führen lassen, 6. Auflage, Stuttgart. • Wunderer, R. (2003): Führung und Zusammenarbeit, 5. Auflage, München/Neuwied.			

Strategic corporate management:

- Hungenberg, H. (2008): Strategisches Management in Unternehmen, 5. Auflage, Wiesbaden.

2. Welge, M. K. / Al-Laham, A. (2008): Strategisches Management, 5. Auflage, Wiesbaden.

3. Simon, H. (1988): Management strategischer Wettbewerbsvorteile, in: Zeitschrift für Betriebswirtschaft, 58. Jg., Nr.4, S. 461-480.



Related courses			
Rules for the choice of courses			
Colloquia voluntary			
Compulsory attendance			
Name of the course	SWS	Eventtype	Language
Leadership	2,0	Lecture	german
Literature			
• Oelsnitz, D. von der (2011): Einführung in die systemische Personalführung, Heidelberg. • Neuberger, O. (2002): Führen und führen lassen, 6. Auflage, Stuttgart. • Wunderer, R. (2003): Führung und Zusammenarbeit, 5. Auflage, München/Neuwied.			
Strategic Management	2,0	Lecture	german
Literature			
• Hungenberg, H. (2008): Strategisches Management in Unternehmen, 5. Auflage, Wiesbaden. • Welge, M. K. / Al-Laham, A. (2008): Strategisches Management, 5. Auflage, Wiesbaden. • Simon, H. (1988): Management strategischer Wettbewerbsvorteile, in: Zeitschrift für Betriebswirtschaft, 58. Jg., Nr.4, S. 461-480.			
	2,0	Seminar	german
	1,0	Colloquium	german

Title	Specialisation - Decision Support		
Number	2218270	Module version	V2
Shorttext	WW-WINFO-27	Language	german
Frequency of offer	only in the winter term	Teaching unit	Carl-Friedrich-Gauß-Fakultät
Module duration	1	Institution	Institut für Wirtschaftsinformatik - Lehrstuhl für Decision Support
Hours per Week / ECTS	4 / 6,0	Module owner	Prof. Dr. Dirk Mattfeld
Workload (h)	180		
Class attendance (h)	56	Self studying (h)	124
Compulsory requirements			
Recommended requirements	Methods of business information systems		
Expected performance/ Type of examination	1 written exam (120 min) or 1 term paper or 1 oral exam or 1 take-at-home exam		
Course achievement			
Contents			
• Enterprise Resource Planning Systems • Data structures for information integration • Information integration in production planning • EDI and Enterprise Application Integration • OLAP • Data warehouse modelling • ETL processes • Metadata in the data warehouse • Data warehouse use			
Objective qualification			
Students gain a fundamental understanding of two complementary paradigms of operational information processing. They familiarise themselves with transaction-oriented information processing in ERP systems and are introduced to its significance for operational and inter-company task integration. Students understand the role of information integration for coordination, co-operation and communication tasks in the company. Students become familiar with analysis-oriented information processing and are introduced to its importance in management support. They gain a comprehensive understanding of the structure, conception and application of analytical databases.			
Literature			
See courses.			



Related courses			
Rules for the choice of courses			
The examination is divided equally between the lecture Business Application Systems and the lecture Business Analytics.			
Compulsory attendance			
Name of the course	SWS	Eventtype	Language
Corporate Application Systems	2,0	Lecture	german
Literature			
• Karl Kurbel, Enterprise Resource Planning und Supply Chain Management in der Industrie, De Gruyter Oldenbourg Verlag, München 2016. • Roland M. Müller, Business Intelligence, Springer, 2013. • Weitere Literatur wird in der Lehrveranstaltung angegeben			
Business Analytics	2,0	Lecture	german
Literature			
• David Hand, Heikki Mannila and Padhraic Smyth, Principles of Data. The MIT Press © 2001 • Berthold, M. R., Borgelt, C., Höppner, F., & Klawonn, F., Guide to intelligent data analysis: How to intelligently make sense of real data. Springer • Weitere Literatur wird in der Lehrveranstaltung angegeben			

Title	Specialisation - Information Management		
Number	2222240	Module version	
Shorttext	WW-WII-24	Language	german
Frequency of offer	only in the summer term	Teaching unit	Carl-Friedrich-Gauß-Fakultät
Module duration	1	Institution	Institut für Wirtschafts-informatik - Abteilung Service-Informationssys-teme
Hours per Week / ECTS	4 / 6,0	Module owner	Prof. Dr. Susanne Robra-Bissantz
Workload (h)	180		
Class attendance (h)	56	Self studying (h)	124
Compulsory requirements			
Expected performance/ Type of examination	1 written exam+ (60 min) (3 CP) or 1 take-at-home exam (3 CP)		
Course achievement	1 project work (3 CP) The coursework must be completed before the examination.		
Module grade composition	Upon request, the coursework can be included in the module grade. The coursework then accounts for 50% of the module grade. The request must be submitted before the coursework is completed and also applies to repeat examinations.		
Contents			
Fundamentals of operational information management Concepts, technologies and application systems for operational tasks Operational area: Process management Knowledge management Information management, etc. Inter-company area: E-commerce e-procurement Market Engineering			
Objective qualification			
Students understand the role of information in the context of operational tasks, people and technology. They are familiar with key concepts and application systems for communication and coordination, focussing either on the internal (e.g. in process and knowledge management) or external area (e.g. in e-commerce and elec-tronic markets). Here they acquire specialised and methodological knowledge and skills that enable them to expand their knowledge independently and apply existing knowledge to solve limited practical problems in a team in a project environment.			
Literature			
• Bodendorf, F., Robra-Bissantz, S.: E-Business-Management, Berlin 2009 • Laudon, K. et al.: Wirtschaftsinformatik: Eine Einführung, München 2006 • Kollmann, T.: E-Business: Grundlagen elektronischer Geschäftsprozesse in der Net Economy, Wiesba-den 2008			



Related courses			
Rules for the choice of courses			
One lecture and one project, to be completed in the same semester; colloquium voluntary			
Compulsory attendance			
Name of the course	SWS	Eventtype	Language
	2,0	Colloquium	german
Digital Markets	2,0	Lecture	german
Literature			
Vorlesungsunterlagen zum Download, weitere Literatur wird in der Veranstaltung bekannt gegeben.			
Design Digital Markets	2,0	Project	german
Literature			
Benötigte Literatur wird in der ersten Veranstaltung, je nach Themenbereich, bekannt gegeben.			

Title	Specialisation - Management Accounting		
Number	2214000010	Module version	
Shorttext		Language	german
Frequency of offer	only in the summer term	Teaching unit	Carl-Friedrich-Gauß-Fakultät
Module duration	1	Institution	Institut für Controlling und Unternehmensrechnung
Hours per Week / ECTS	4 / 6,0	Module owner	Prof. Dr. Heinz Ahn
Workload (h)	180		
Class attendance (h)	56	Self studying (h)	124
Compulsory requirements			
Recommended requirements	The module 'Specialisation - Management Accounting' builds on the module 'Operational Accounting'.		
Expected performance/ Type of examination	1 written exam+ (120 min) or 1 oral exam+ (30 min) or 1 term paper or 1 take-at-home exam		
Course achievement	1 presentation or 1 term paper or 1 exercise assignment or 1 portfolio or 1 presentation		
Module grade composition	Upon request, the coursework may be included in the overall assessment of the module. Depending on the scope of the coursework, it may then account for up to 10% of the overall module assessment. The request must be submitted before the coursework is completed and is also binding for repeat examinations.		
Contents			
• Cost and revenue accounting as decision accounting • Selected cost and revenue accounting systems • Basics of cost management • Central instruments of cost management			
Objective qualification			
Students have an in-depth understanding of issues and methods of industrial accounting, in particular cost and revenue accounting and strategic cost management. On this basis, they are able to analyze relevant problems and make appropriate decisions.			
Literature			
einführende Literatur: • Baden: Strategische Kostenrechnung, Wiesbaden 1997 • Ewert/Wagenhofer: Interne Unternehmensrechnung, Berlin et al., 6. Auflage, 2005 • Kremin-Buch: Strategisches Kostenmanagement, jeweils aktuelle Auflage			



Related courses			
Rules for the choice of courses			
The courses "Cost Accounting Systems" and "Strategic Cost Management", which form the core of the module, can be replaced by other courses if necessary.			
Colloquia, tutorial voluntary.			
Compulsory attendance			
Name of the course	SWS	Eventtype	Language
Cost Accounting Systems	2,0	Lecture	german
Literature			
Ewert, R./Wagenhofer, (2014): Interne Unternehmensrechnung, 8. Aufl., Berlin et al.			
Strategic Cost Management	2,0	Lecture	german
Literature			
Baden, A. (1997): Strategische Kostenrechnung, Wiesbaden			
	1,0	Lecture	german
	1,0	Lecture	german
	1,0	Colloquium	german
Audit Insights	2,0	Lecture	german
	1,0	Colloquium	german

Title	Specialisation - Law		
Number	2216340	Module version	V2
Shorttext	WW-RW-34	Language	german
Frequency of offer	only in the winter term	Teaching unit	Carl-Friedrich-Gauß-Fakultät
Module duration	1	Institution	Institut für Rechtswissenschaften
Hours per Week / ECTS	4 / 6,0	Module owner	Prof. Dr. Anne Paschke
Workload (h)	180		
Class attendance (h)	56	Self studying (h)	124
Compulsory requirements			
Recommended requirements	The course builds on the lectures 'Fundamentals of Law 1' and 'Fundamentals of Law 2'.		
Expected performance/ Type of examination	1 written exam (120 min) or 1 oral exam (30 min) or 1 take-at-home exam		
Course achievement			
Contents			
Specialization in Law VL: This course provides students with in-depth knowledge of civil law, in particular the special part of the law of obligations, basic principles of labor law and tort law. Exercise in Advanced Law: The course provides students with practical application strategies for solving legal cases from the law of obligations - special part, tort law, i.e. tortious acts (§§ 823 ff. BGB) and basic principles of labor law.			
Objective qualification			
Students are able to understand and assess specific issues of civil law - law of obligations, individual employment law and tort law - and to apply them to practical cases and come to a conclusion independently.			
Literature			
• Löhnig, Martin; Fischinger, Philipp S.: Einführung in das Zivilrecht, aktuelle Auflage, C. F. Müller • Musielak, Hans-Joachim; Hau, Wolfgang: Grundkurs BGB, aktuelle Auflage, C. H. BECK • Medicus, Dieter; Petersen, Jens: Grundwissen zum Bürgerlichen Recht, aktuelle Auflage, Vahlen • Junker, Abbo: Grundkurs Arbeitsrecht, aktuelle Auflage, C. H. BECK • Krause, Rüdiger: Arbeitsrecht, aktuelle Auflage, Nomos			



Related courses			
Rules for the choice of courses			
Compulsory attendance			
Name of the course	SWS	Eventtype	Language
Spezialisatation Law	4,0	Lecture/Exercise	
Literature			
Löhnig, Martin; Fischinger, Philipp S.: Einführung in das Zivilrecht, aktuelle Auflage, C. F. Müller Musielak, Hans-Joachim; Hau, Wolfgang: Grundkurs BGB, aktuelle Auflage, C. H. BECK Medicus, Dieter; Petersen, Jens: Grundwissen zum Bürgerlichen Recht, aktuelle Auflage, Vahlen Junker, Abbo: Grundkurs Arbeitsrecht, aktuelle Auflage, C. H. BECK Krause, Rüdiger: Arbeitsrecht, aktuelle Auflage, Nomos			

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Title	Basics of Building, Real Estate and Infrastructure Industry		
Number	4310180	Module version	
Shorttext	BAU-STD-75	Language	german
Frequency of offer	only in the winter term	Teaching unit	
Module duration	1	Institution	
Hours per Week / ECTS	4 / 6,0	Module owner	Prof. Dr. Tanja Kessel
Workload (h)	180		
Class attendance (h)	56	Self studying (h)	124
Compulsory requirements			
Expected performance/ Type of examination			
Course achievement			
Contents			
Objective qualification			
Literature			
Vorlesungsskript			

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Related courses			
Rules for the choice of courses			
Compulsory attendance			
Name of the course	SWS	Eventtype	Language
	4,0	Lecture/Exercise	german

Title	Key Qualifications		
Number	4310560	Module version	
Shorttext	BAU-STD4-5	Language	german
Frequency of offer		Teaching unit	Fakultät Architektur, Bauingenieurwesen und Umweltwissenschaften
Module duration		Institution	
Hours per Week / ECTS	0 / 11,0	Module owner	
Workload (h)			
Class attendance (h)		Self studying (h)	
Compulsory requirements			
Expected performance/ Type of examination			
Course achievement			
Contents			
Objective qualification			
Literature			



Related courses			
Rules for the choice of courses			
Compulsory attendance			
Name of the course	SWS	Eventtype	Language
	3,0	Lecture/Exercise	english
	1,0	Seminar	german
	2,0	Lecture/Exercise	german
	1,0	Exercise	german
	2,0	Lecture	german

	2,0	Lecture	german
	0,5	Lecture	german
	0,5	Exercise	german
	1,0	Internship	german
	2,0	Lecture/Exercise	german
	1,0	Tutorial	german
	2,0	Lecture/Exercise	german

Title	Construction Industry and Operation		
Number	4321010	Module version	
Shorttext	BAU-STD-64	Language	german
Frequency of offer	only in the summer term	Teaching unit	
Module duration	1	Institution	Institut für Bauwirtschaft und Baubetrieb
Hours per Week / ECTS	5 / 6,0	Module owner	Prof. Dr. Patrick Schwerdtner
Workload (h)	180		
Class attendance (h)	70	Self studying (h)	110
Compulsory requirements			
Expected performance/ Type of examination	Written exam (120 Min.)		
Course achievement			
Contents			
Lean Construction; production planning; introduction to construction methods and processes; general site facilities; performance estimation of construction machinery; introduction to construction machinery; introduction to occupational health and safety measures; machinery and methods of soil engineering; lifting devices; formwork; Logistics of concrete and masonry work; characteristics of construction; introduction to sustainable planning and construction; organizational and operational structure; tendering and contracting; wages and salary; Work time values; methods of cost estimation; building contract; introduction to quality management; application of Building Information Modeling (BIM)			
Objective qualification			
After completing the module, students will be able to apply basic knowledge of production planning, scheduling and construction process engineering to the execution of construction works. They will be able to determine the general facilities as well as machinery and equipment required for a construction project as well as determine their performance. Furthermore, the students acquire the ability to apply the principles of cost and performance accounting to simple projects. In this context, the students are able to take into account selected aspects of construction contract law and quality management for the project preparation and implementation.			
Literature			
Lehrmaterial: Skript zur Vorlesung "Grundlagen der Bauverfahrenstechnik"			
Lehrmaterial: Übungsskript zur Vorlesung "Grundlagen der Bauverfahrenstechnik"			
Lehrmaterial: Skript zur Vorlesung "Grundlagen der Bauwirtschaft"			
Lehrmaterial: Übungsskript zur Vorlesung "Grundlagen der Bauwirtschaft"			



Related courses			
Rules for the choice of courses			
Compulsory attendance			
Name of the course	SWS	Eventtype	Language
	3,0	Lecture	german
	2,0	Exercise	german

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Title	Bachelor's Thesis		
Number	4399150	Module version	
Shorttext	BAU-STD-15	Language	german
Frequency of offer		Teaching unit	Fakultät Architektur, Bauingenieurwesen und Umweltwissenschaften
Module duration		Institution	
Hours per Week / ECTS	0 / 12,0	Module owner	
Workload (h)	360		
Class attendance (h)		Self studying (h)	360
Compulsory requirements			
Expected performance/ Type of examination			
Course achievement			
Contents			
Objective qualification			
Literature			



Related courses			
Rules for the choice of courses			
Compulsory attendance			
Name of the course	SWS	Eventtype	Language

