Description of the degree program

Business Information Systems (Bachelor)
PO 6

Date: 01.10.2025

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Compulsory Discipline Business Information Systems	**37 ECTS**

Title	Methods and Models of Business Information Systems		
Number	2218230	**Module version**	V3
Shorttext	WW-WINFO-23	**Language**	german
Frequency of offer	only in the summer term	**Teaching unit**	Carl-Friedrich-Gauß-Fakultät
Module duration	1	**Institution**	Institut für Wirtschaftsinformatik - Lehrstuhl für Decision Support
Hours per Week / ECTS	3 / 5,0	**Module owner**	Prof. Dr. Dirk Mattfeld
Workload (h)	150		
Class attendance (h)	56	**Self studying (h)**	94
Compulsory requirements			
Expected performance/ Type of examination	1 written exam (60 min) or 1 take-at-home exam		
Course achievement			

Contents

- Systems and models
- Enterprise models
- Data modelling
- Databases
- Task modelling
- Operations research models
- Business process modelling
- Internal integration

Objective qualification

After completing this module, students have a basic understanding of the development of complex operational information systems.
In principle, they are able to grasp and model tasks and implement them in a functional, data and process design.
Students recognise the necessity of interdisciplinary perspectives as a key competence for their future professional environment.

Literature

u.a. Ferstl, O., Sinz, E.: Grundlagen der Wirtschaftsinformatik,6. Auflage, Oldenbourg Verlag (2008)

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Related courses			
Rules for the choice of courses			
Students must take either Business Information Systems Methods or Business Process Management.			
Compulsory attendance			
Name of the course	**SWS**	**Eventtype**	**Language**
Methods for Business Information Systems	3,0	Lecture	german
Literature			
u.a. Ferstl, O., Sinz, E.: Grundlagen der Wirtschaftsinformatik,6. Auflage, Oldenbourg Verlag (2008)			

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

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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	Project Work		
Number	2299230	**Module version**	V2
Shorttext	WW-STD-23	**Language**	english german
Frequency of offer	every term	**Teaching unit**	Carl-Friedrich-Gauß-Fakultät
Module duration	2	**Institution**	
Hours per Week / ECTS	6 / 10,0	**Module owner**	Studiendekan der Wirtschaftswissenschaften
Workload (h)	300		
Class attendance (h)	112	**Self studying (h)**	188
Compulsory requirements			
Expected performance/ Type of examination	For the seminar: 1 term paper and presentation; For the team project: 1 project work, 1 draft, 1 experimental work or 1 software development		
Course achievement			

Contents

The course content depends on the specific task.
The content is partly taken from the project environment of the lecturer offering the course and may vary from year to year.

Objective qualification

The team project and the seminar can serve as a preparation for the Bachelor's thesis. The seminar gives students the opportunity to work on individual topics from one subject area in detail. As part of the team project, students carry out a larger task together and thus learn key qualifications such as the independent planning, agreement and coordination of projects in a team, the allocation of roles and tasks and the definition and adherence to milestones.

Literature

Depending on the specific task

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Related courses

Rules for the choice of courses

1 team project and 1 seminar must be completed.

Compulsory attendance

Name of the course	SWS	Eventtype	Language

Bachelor-Seminar Data-Driven Enterprise	3,0	Seminar	english german
Literature			
Rüter, A., et al.: IT-Governance in der Praxis, Springer 2010			

Bachelor-Seminar Decision Support	3,0	Seminar	german
Literature			
Rüter, A., et al.: IT-Governance in der Praxis, Springer 2010			

Bachelor-Seminar Service Management	3,0	Seminar	english german
Literature			
Wird in der Veranstaltung bekannt gegeben.			

Bachelor-Seminar Finance	3,0	Seminar	german
Literature			
vergleiche Homepage des Lehrstuhls			

	2,0	Seminar	english

Bachelor-Seminar Service Management	3,0	Seminar	english german
Literature			
Wird in der Veranstaltung bekannt gegeben.			

Seminar Application Security (Bachelor)	3,0	Seminar	german
Literature			
Die Literaturquellen variieren - je nach gewähltem Seminarthema.			

Seminar Connected and Mobile Systems (Bachelor)	3,0	Seminar	english german

	3,0	Seminar	english

Seminar Robotics and Process Control (Bachelor)	3,0	Seminar	german
Literature			
Die Literaturquellen variieren - je nach gewähltem Seminarthema.			

Seminar Theoretical Computer Science (Bachelor)	3,0	Seminar	english
Literature			
Literature sources vary - depending on the chosen seminar topic.			

Seminar Reliable System Software (Bachelor)	3,0	Seminar	german

Seminar Algorithmics (Bachelor)	3,0	Seminar	german
Literature			
Die Literaturquellen variieren - je nach gewähltem Seminarthema.			

Seminar Computer Graphics (Bachelor)	3,0	Seminar	german
Literature			
Die Literaturquellen variieren - je nach gewähltem Seminarthema.			

Seminar Computer Vision (Bachelor)	3,0	Seminar	english german
Literature			
Die Literaturquellen variieren, je nach gewähltem Thema.			

Seminar Data Science in Biomedicine (Bachelor)	3,0	Seminar	english

Team Project Decision Support	4,0	Team Project	german
Literature			
abhängig von der konkreten Aufgabenstellung			

Team Project Service Information Systems	4,0	Team Project	german

Programming of Distributed Embedded Systems	6,0	Team Project	german
Literature			
Die Literaturquellen variieren je nach gewähltem Thema.			

Team Project Robotics	4,0	Team Project	german
Literature			
Die Literaturquellen variieren je nach gewähltem Thema.			

	4,0	Team Project	german

Algorithmics Team Project	4,0	Team Project	german
Literature			
Die Literaturquellen variieren je nach gewähltem Thema.			

Bachelor-Seminar Decision Support	3,0	Seminar	english german
Literature			
Rüter, A., et al.: IT-Governance in der Praxis, Springer 2010			

Seminar Connected and Mobile Systems (Bachelor & Master)	3,0	Seminar	english german

Seminar Algorithmics (Bachelor & Master)	3,0	Seminar	german
Literature			
Die Literaturquellen variieren - je nach gewähltem Seminarthema.			

Seminar Computer Graphics Bachelor&Master	3,0	Seminar	german
Literature			
Die Literaturquellen variieren - je nach gewähltem Seminarthema.			

Seminar Computer Vision (Bachelor & Master)	3,0	Seminar	english german
Literature			
Die Literaturquellen variieren, je nach gewähltem Thema.			

Seminar Information Systems (Bachelor)	3,0	Seminar	english german
Literature			
Die Literaturquellen variieren, je nach gewähltem Thema.			

Seminar Artificial Intelligence (Bachelor)	3,0	Seminar	english german
Literature			
Die Literaturquellen variieren, je nach gewähltem Thema.			

Title	Tactical Information Management		
Number	4217510	**Module version**	V2
Shorttext	INF-MI-37	**Language**	german
Frequency of offer	only in the summer term	**Teaching unit**	Carl-Friedrich-Gauß-Fakultät
Module duration	1	**Institution**	
Hours per Week / ECTS	3 / 5,0	**Module owner**	Prof. Dr. Thomas Deserno
Workload (h)	150		
Class attendance (h)	42	**Self studying (h)**	108
Compulsory requirements			
Expected performance/ Type of examination	1 graded work: Written exam (90 minutes) or oral exam (30 minutes) or term Paper or presentation or deveplopment and documentation of computer programs or experimental work or portfolio or Take-Home-Exam.		
Course achievement			

Contents

Objective qualification

Literature

- Ammenwerth, E.; Haux. R.et al.(2015): IT-Projektmanagement im Gesundheitswesen. Schattauer Verlag, Stuttgart. ISBN 978-3-7945-3071-7
- Schlegel, H. (Hrsg.)(2010):Steuerung der IT im Klinikmanagement. Vieweg + Teubner Verlag, Wiesbaden.
- Dugas, Martin (2017). Medizininformatik. Berlin: Springer Vieweg.
- weitere aktuelle Literatur wird im Rahmen der Vorlesung bekanntgegeben

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Related courses

Rules for the choice of courses

Compulsory attendance

Name of the course	SWS	Eventtype	Language

Health Information Systems A	2,0	Lecture	german
Literature			
- Ammenwerth, E.; Haux. R.et al.(2015): IT-Projektmanagement im Gesundheitswesen. Schattauer Verlag, Stuttgart. ISBN 978-3-7945-3071-7 - Schlegel, H. (Hrsg.)(2010):Steuerung der IT im Klinikmanagement. Vieweg + Teubner Verlag, Wiesbaden. - Dugas, Martin (2017): Medizininformatik. Berlin, Springer Vieweg.			

	1,0	Exercise	german
Literature			
- Ammenwerth, E.; Haux. R.et al.(2015): IT-Projektmanagement im Gesundheitswesen. Schattauer Verlag, Stuttgart. ISBN 978-3-7945-3071-7 - Schlegel, H. (Hrsg.)(2010):Steuerung der IT im Klinikmanagement. Vieweg + Teubner Verlag, Wiesbaden. - Dugas, Martin (2017): Medizininformatik. Berlin, Springer Vieweg.			

Title	Software Engineering 1		
Number	4220430	**Module version**	V3
Shorttext	INF-SSE-43	**Language**	german
Frequency of offer	only in the winter term	**Teaching unit**	Carl-Friedrich-Gauß-Fakultät
Module duration	1	**Institution**	Institut für Softwaretechnik und Fahrzeuginformatik
Hours per Week / ECTS	3 / 5,0	**Module owner**	Prof. Dr. Wolf-Tilo Balke
Workload (h)	150		
Class attendance (h)	42	**Self studying (h)**	108
Compulsory requirements			
Expected performance/ Type of examination	1 graded work: Written exam (90 minutes) or oral exam (30 minutes) or Take-Home-Exam.		
Course achievement	1 Coursework: 50% of homework assignments must be passed.		

Contents

- Overview of software techniques
- Procedures
- Design, implementation
- Object orientation
- Modelling, UML
- Software/system architectures
- Patterns in software development

Objective qualification

After completing this module, students will have a fundamental understanding of the development of complex software systems. They will be able to comprehend and model the task at hand and translate it into a design.

Literature

- Ian Sommerville: Software Engineering. 7. Aufl. Addison-Wesley, München 2004, ISBN 0-321-21026-3.

- Helmut Balzert: Lehrbuch der Software-Technik, Spektrum Akademischer Verlag, Heidelberg 1996, 1998, 2001, ISBN 3-8274-0480-0.

- J. Ludewig, H. Lichter: Software Engineering - Grundlagen, Menschen, Prozesse, Techniken. 1. Auflage. dpunkt-Verlag, Heidelberg 2006, ISBN 3-89864-268-2

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

Title	Software Engineering Lab		
Number	4220440	**Module version**	
Shorttext	INF-SSE-44	**Language**	german
Frequency of offer	only in the summer term	**Teaching unit**	Carl-Friedrich-Gauß-Fakultät
Module duration	1	**Institution**	
Hours per Week / ECTS	6 / 7,0	**Module owner**	Prof. Dr. Wolf-Tilo Balke
Workload (h)	210		
Class attendance (h)	70	**Self studying (h)**	140
Compulsory requirements	The requirement for attending the software development internship is the successful completion of the ‘Software Engineering’ module.		
Recommended requirements	Successful completion of the modules ‘Programming 1’ and ‘Programming 2’ is recommended. The corresponding content must be studied independently and is a requirement.		
Expected performance/ Type of examination			
Course achievement	1 Coursework: Experimental work (group work): Creation, documentation and presentation of software in an experimental environment with individual grading.		

Contents

- Overview of software techniques
- Design, implementation
- Object orientation
- Modelling, UML
- Knowledge in one of the areas of application

Objective qualification

After completing the module, students will be able to successfully work on a larger software development project as part of a team. They will be able to use systematic software engineering methods to determine the requirements for the system to be developed, translate these into a design, implement the software to be developed, and test it.

Literature

- Ian Sommerville: Software Engineering. 7. Aufl. Addison-Wesley, München 2004, ISBN 0-321-21026-3.
- Helmut Balzert: Lehrbuch der Software-Technik, Spektrum Akademischer Verlag, Heidelberg 1996, 1998, 2001, ISBN 3-8274-0480-0.
- J. Ludewig, H. Lichter: Software Engineering - Grundlagen, Menschen, Prozesse, Techniken. 1. Auflage. dpunkt-Verlag, Heidelberg 2006, ISBN 3-89864-268-2

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Related courses			
Rules for the choice of courses			
Compulsory attendance			
Name of the course	**SWS**	**Eventtype**	**Language**
	6,0	Internship	german

Compulsory Discipline Economic Sciences	**30 ECTS**

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
Macroeconomics for Repeaters	1,0	Tutorial	german
Literature			
wie in der Vorlesung Makroökonomik aus dem Sommersemester			

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)

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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	Basics of Law		
Number	2216250	**Module version**	V3
Shorttext	WW-RW-25	**Language**	german
Frequency of offer	only in the winter term	**Teaching unit**	Carl-Friedrich-Gauß-Fakultät
Module duration	2	**Institution**	
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			
Course achievement			

Contents

Objective qualification

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

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	Basics of Business Studies - Production & Logistics and Finance		
Number	2299530	**Module version**	V2
Shorttext	WW-STD-53	**Language**	german
Frequency of offer	only in the summer term	**Teaching unit**	Carl-Friedrich-Gauß-Fakultät
Module duration	1	**Institution**	
Hours per Week / ECTS	4 / 6,0	**Module owner**	Studiendekan der Wirtschaftswissenschaften
Workload (h)			
Class attendance (h)	56	**Self studying (h)**	124
Compulsory requirements			
Expected performance/ Type of examination			
Course achievement			
Contents			
Objective qualification			
Literature			

- Dyckhoff, H.; Spengler, T. S. (2010): Produktionswirtschaft – Eine Einführung, Springer, Berlin.
- 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.

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Related courses			
Rules for the choice of courses			
Compulsory attendance			
Name of the course	**SWS**	**Eventtype**	**Language**
Introduction to Finance	2,0	Lecture/Exercise	german
Literature			
Vergleiche Homepage des Lehrstuhls			

Principles of Production and Logistics	2,0	Lecture/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./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

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

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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

Compulsory Discipline Computer Science	**30 ECTS**

Title	Programming 1		
Number	4210430	**Module version**	V2
Shorttext	INF-PRS-43	**Language**	german
Frequency of offer	only in the winter term	**Teaching unit**	Carl-Friedrich-Gauß-Fakultät
Module duration	1	**Institution**	Institut für Betriebssysteme und Rechnerverbund
Hours per Week / ECTS	4 / 6,0	**Module owner**	Prof. Dr. Martin Johns
Workload (h)	180		
Class attendance (h)	56	**Self studying (h)**	124
Compulsory requirements			
Expected performance/ Type of examination	1 graded work: Written exam (120 minutes) or Take-Home-Exam.		
Course achievement	1 Coursework: Successful completion of homework assignments		

Contents

- Fundamentals of imperative and object-oriented programming using the Java language
- Recursive methods
- Reliability of programmes

Objective qualification

After completing this module, students will have a basic understanding of imperative and object-oriented programming as well as the Java language. They will be able to develop small programmes independently.

Literature

R. Sedgewick, K. Wayne: Einführung in die Programmierung mit Java. 1. Auflage. Pearson-Verlag, München 2011.

D. Ratz, J.Scheffler: Grundkurs Programmieren in Java. 6. aktualisierte und erweiterte Auflage. Hanser Verlag, München, Wien 2011.

R. Schiedermeier: Programmieren mit Java. 2. aktualisierte Auflage. Pearson Studium, München 2010.

W. Struckmann, D. Wätjen: Mathematik für Informatiker. Spektrum Akademischer Verlag, 2007.

↑

Related courses			
Rules for the choice of courses			
The lecture and the small exercise are compulsory. The exercise is optional.			
Compulsory attendance			
Name of the course	**SWS**	**Eventtype**	**Language**
Programming 1	2,0	Lecture	german
Literature			
R. Sedgewick, K. Wayne: Einführung in die Programmierung mit Java. 1. Auflage. Pearson-Verlag, München 2011. D. Ratz, J.Scheffler: Grundkurs Programmieren in Java. 6. aktualisierte und erweiterte Auflage. Hanser Verlag, München, Wien 2011. R. Schiedermeier: Programmieren mit Java. 2. aktualisierte Auflage. Pearson Studium, München 2010. W. Struckmann, D. Wätjen: Mathematik für Informatiker. Spektrum Akademischer Verlag, 2007.			
	2,0	Exercise	german
Programming 1	2,0	Exercise, small group	german
Literature			
R. Sedgewick, K. Wayne: Einführung in die Programmierung mit Java. 1. Auflage. Pearson-Verlag, München 2011. D. Ratz, J.Scheffler: Grundkurs Programmieren in Java. 6. aktualisierte und erweiterte Auflage. Hanser Verlag, München, Wien 2011. R. Schiedermeier: Programmieren mit Java. 2. aktualisierte Auflage. Pearson Studium, München 2010. W. Struckmann, D. Wätjen: Mathematik für Informatiker. Spektrum Akademischer Verlag, 2007.			

Title	Programming 2		
Number	4210440	**Module version**	V2
Shorttext	INF-PRS-44	**Language**	german
Frequency of offer	only in the summer term	**Teaching unit**	Carl-Friedrich-Gauß-Fakultät
Module duration	1	**Institution**	Institut für Anwendungssicherheit
Hours per Week / ECTS	4 / 6,0	**Module owner**	Dr. Martin Eisemann
Workload (h)	180		
Class attendance (h)	42	**Self studying (h)**	138
Compulsory requirements			
Recommended requirements	Students should have previously completed the modules ‘Algorithms and Data Structures’ and ‘Programming I’.		
Expected performance/ Type of examination	1 graded work: Written exam (90 minutes) or Take-Home-Exam.		
Course achievement	1 Coursework: Successful completion of homework assignments		

Contents

- Advanced object-oriented programming
- Dynamic and recursive data structures
- Fundamentals of parallel programming
- Fundamentals of graphics programming
- Fundamentals of functional programming
- Clean code

Objective qualification

After completing this module, students will have in-depth knowledge of imperative, functional and object-oriented programming. They will be able to develop medium-sized programmes independently, taking aspects of structured programming into account.

Literature

R. Sedgewick, K. Wayne: Einführung in die Programmierung mit Java. 1. Auflage. Pearson-Verlag, München 2011.

D. Ratz, J.Scheffler: Grundkurs Programmieren in Java. 6. aktualisierte und erweiterte Auflage. Hanser Verlag, München, Wien 2011.

R. Schiedermeier: Programmieren mit Java. 2. aktualisierte Auflage. Pearson Studium, München 2010.

↑

Related courses			
Rules for the choice of courses			
Compulsory attendance			
Name of the course	**SWS**	**Eventtype**	**Language**
Programming 2	2,0	Lecture	german
Literature			
- Stroustroup, B.: Tour of C++, A (C++ In Depth SERIES), Pearson International; 3. Edition (14. September 2022) - T. Will: C++: Das umfassende Handbuch zu Modern C++. Über 1.000 Seiten Profiwissen, aktuell zum Standard C++23, Rheinwerk Computing; 3. Edition (6. Juni 2024) - Martin, R.C.: Clean Code: A Handbook of Agile Software Craftsmanship (Robert C. Martin), Prentice Hall; 1. Edition (1. August 2008) - Grimm, R: C++ Core Guidelines Explained: Best Practices for Modern C++, Addison-Wesley Professional; 1. Edition (22. April 2022)			
	2,0	Exercise	german

Title	Computer Networks 1		
Number	4213160	**Module version**	V2
Shorttext	INF-KM-16	**Language**	
Frequency of offer	only in the summer term	**Teaching unit**	Carl-Friedrich-Gauß-Fakultät
Module duration	1	**Institution**	
Hours per Week / ECTS	3 / 5,0	**Module owner**	Prof. Dr. Lars Wolf
Workload (h)	150		
Class attendance (h)	56	**Self studying (h)**	94
Compulsory requirements			
Expected performance/ Type of examination	1 graded work: Written exam (90 minutes) or Take-Home-Exam.		
Course achievement			

Contents

- Historical classification
- Overview of networks and protocols
- Layer models and layers
- Protocol mechanisms
- Brief introduction to Internet protocols

Objective qualification

After completing this module, students will have a basic understanding of how computer networks work.
- They will be able to describe how processes in computer networks work.
- Furthermore, students will have gained a fundamental understanding of the effects of distribution and communication through networks and how to deal with them.

Literature

Andrew Tanenbaum, David Wetherall, Nick Feamster, Computer Networks, 6.Ed. 2021, Print-ISBN: 978-1-292-37406-2, E-ISBN: 978-1-292-37401-7
James Kurose, Keith Ross. Computer Networking. A Top-Down Approach, 2021, 8th edition, Print-ISBN: 978-1-292-40546-9, E-ISBN: 978-1-292-40551-3.

↑

Related courses

Rules for the choice of courses

Compulsory attendance

Name of the course	SWS	Eventtype	Language

Computer Networks	4,0	Lecture/Exercise	german
Literature			
- Andrew S. Tanenbaum; David J. Wetherall: Computer Networks. International Edition. 5th edition. Pearson, 2010. ISBN-10: 0132553171 / ISBN-13: 9780132553179 - James F. Kurose; Keith W. Ross: Computer Networking: A Top-Down Approach. International Edition. 6th edition. Pearson, 2012. ISBN-10: 0273768964 / ISBN-13: 9780273768968			

Title	Relational Database Systems 1		
Number	4214470	**Module version**	V2
Shorttext	INF-IS-47	**Language**	
Frequency of offer	only in the winter term	**Teaching unit**	Carl-Friedrich-Gauß-Fakultät
Module duration	1	**Institution**	
Hours per Week / ECTS	3 / 5,0	**Module owner**	Prof. Dr. Wolf-Tilo Balke
Workload (h)	150		
Class attendance (h)	42	**Self studying (h)**	108
Compulsory requirements			
Expected performance/ Type of examination	1 graded work: Written exam (120 minutes) or oral exam (30 minutes) or Take-Home-Exam.		
Course achievement	1 Coursework: 50% of homework assignments must be passed		

Contents

- The relational data model
- ER and UML modelling
- Relational calculus and algebra
- Structure and use of Structured Query Language (SQL)
- Fundamentals of database administration
- Triggers and active databases
- Normalisation of databases

Objective qualification

After completing this module, students will have acquired basic practical skills in designing and querying relational databases. They will also be familiar with the theoretical relationships between the relational model and real data and data structures, and will be able to apply this knowledge.

Literature

will be announced at the course

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Related courses

Rules for the choice of courses

The exercise is voluntary.

Compulsory attendance

Name of the course	SWS	Eventtype	Language

Relational database systems 1	2,0	Lecture	german
Literature			
wird in der Vorlesung bekanntgegeben			

	1,0	Exercise, small group	german
Literature			
wird in der Vorlesung bekanntgegeben			

	1,0	Exercise	german

Title	Algorithms and Data Structures		
Number	4227130	**Module version**	V2
Shorttext	INF-ALG-13	**Language**	german
Frequency of offer	only in the winter term	**Teaching unit**	Carl-Friedrich-Gauß-Fakultät
Module duration	1	**Institution**	Institut für Betriebssysteme und Rechnerverbund
Hours per Week / ECTS	6 / 8,0	**Module owner**	Prof. Dr. Sandor Fekete
Workload (h)	240		
Class attendance (h)	84	**Self studying (h)**	156
Compulsory requirements			
Expected performance/ Type of examination	1 graded work: Written exam (90 minutes) or oral exam (30 minutes) or Take-Home-Exam. The form of the examination depends on the number of participants.		
Course achievement	1 Coursework: 50% of the exercises must be passed		

Contents

- Algorithm concept
- Graphs
- Searching in graphs
- Correctness and complexity of algorithms
- Data structures
- Sorting
- Recursion
- Hashing

Objective qualification

Graduates of this module are familiar with the basic algorithms and data structures of computer science. They are able to formulate an algorithmic solution for a given problem and assess the performance of algorithmic solutions.

Literature

- Th. Cormen, Ch. Leiserson, R. Rivest, C. Stein: Introduction to Algorithms. 3rd edition. MIT Press, Cambridge 2009.

↑

Related courses

Rules for the choice of courses

Compulsory attendance

Name of the course	SWS	Eventtype	Language

Algorithms and Data Structures	5,0	Lecture/Exercise	german
Literature			
- Th. Cormen, Ch. Leiserson, R. Rivest, C. Stein: Introduction to Algorithms. 3rd edition. MIT Press, Cambridge 2009.			

Algorithms and Data Structures	1,0	Exercise, small group	german

Compulsory Discipline Basics	**23 ECTS**

Title	Analysis for Computer Scientists		
Number	1201110	**Module version**	V3
Shorttext	MAT-STD1-1	**Language**	
Frequency of offer	only in the summer term	**Teaching unit**	Carl-Friedrich-Gauß-Fakultät
Module duration	1	**Institution**	
Hours per Week / ECTS	6 / 10,0	**Module owner**	Dr. Marko Stautz
Workload (h)	300		
Class attendance (h)	84	**Self studying (h)**	216
Compulsory requirements			
Expected performance/ Type of examination			
Course achievement			
Contents			
Objective qualification			
Literature			
- Christian Blatter: Analysis 1, 2, Springer, 1991, 1993 - Otto Forster: Analysis 1, 2, 3, Vieweg, 2004, 1984, 1984 - Konrad Königsberger: Analysis 1, 2, Springer, 2004			

↑

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

	2,0	Exercise, small group	german

Title	Linear Algebra for Business Information Systems Specialists		
Number	2211150	**Module version**	V3
Shorttext	WW-----15	**Language**	english german
Frequency of offer	only in the winter term	**Teaching unit**	Carl-Friedrich-Gauß-Fakultät
Module duration	1	**Institution**	
Hours per Week / ECTS	3 / 5,0	**Module owner**	Studiendekan der Mathematik
Workload (h)	150		
Class attendance (h)	42	**Self studying (h)**	108
Compulsory requirements			
Expected performance/ Type of examination			
Course achievement			
Contents			
Objective qualification			
Literature			
• Gerd Fischer: Lineare Algebra, Vieweg 2003 • Gilbert W. Stewart: Matrix Algorithms, Volume I, Basic Decomposition, SIAM,1998			

↑

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

Title	Quantitative Methods in Economic Sciences		
Number	2299370	**Module version**	V2
Shorttext	WW-STD-37	**Language**	german
Frequency of offer	only in the winter term	**Teaching unit**	Carl-Friedrich-Gauß-Fakultät
Module duration	1	**Institution**	
Hours per Week / ECTS	6 / 8,0	**Module owner**	Studiendekan der Wirtschaftswissenschaften
Workload (h)	240		
Class attendance (h)	84	**Self studying (h)**	156
Compulsory requirements			
Expected performance/ Type of examination			
Course achievement			

Contents

Objective qualification

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

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

Compulsory Elective Discipline Business Information Systems	**18 ECTS**

Title	Specialisation - Decision Support		
Number	2218140	**Module version**	V3
Shorttext	WW-WINFO-14	**Language**	german
Frequency of offer	only in the winter term	**Teaching unit**	Carl-Friedrich-Gauß-Fakultät
Module duration	1	**Institution**	
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			
Expected performance/ Type of examination			
Course achievement			
Contents			
Objective qualification			
Literature			
Siehe Lehrveranstaltungen.			

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Related courses			
Rules for the choice of courses			
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 - Process and Project Management		
Number	2218240	**Module version**	V2
Shorttext	WW-Winfo-24	**Language**	german
Frequency of offer	every 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			
Expected performance/ Type of examination	1 written exam 120 (min) or 1 take-at-home exam		
Course achievement			

Contents

Business process management:
1. Process organization
2. Basics of process management
3. Strategic process management
4. Process design
5. Quality management
6. Process controlling
7. Process implementation
8. Process management in service companies

Project management:
1. Definition of projects
2. Portfolios
3. Project stakeholders
4. Project organization
5. Project initiation and selection
6. Work breakdown structure
7. Process and schedule planning
8. Resource and cost planning
9. Risk management
10. Project implementation
11. Schedule and progress control
12. Earned value method
13. Project reporting
14. Project completion
15. Configuration management
16. Contract management
17. Project management software
18. Project management standards

Objective qualification
Students have gained an in-depth understanding of the areas of organizational structure, analysis and optimization, both from a theoretical and practical perspective. Students will be able to map, implement and control processes. Students should acquire project management skills. They acquire specialist knowledge and methodological skills in the initiation, planning, implementation and completion of projects as well as in the application of time, resource and cost planning methods. They learn to evaluate different project management methods in different situations.
Literature
• Houy , Fettke, Loos, van der Aalst, Krogstie (2011): Geschäftsprozessmanagement im Großen, Business & Information Systems Engineering 3(6):385-388 • Jurisch, Palka, Wolf, Krcmar (2014): Which capabilities matter for successful business process change, Business Process Management Journal 20(1):7-67 • Kettinger, Teng (1997): Business process change_a study of methodologies, techniques, and tools • Trkman (2010): The critical success factors of business process management, International Journal of Information Management 30:128-134 • Vom Brocke, Schmiedel, Recker, Trkman, Mertens, Viaene (2014): Ten principles of good business process management, Business Process Management Journal, 20(4):530-548 • Zairi (1997): Business process management_A boundaryless approach to competitiveness, Business Process Management Journal 3(1):64-80 • Ika (2009): Project Success as a Topic in Project Management Journals, Project Management Journal 40(4):6–19 • Jonas (2010): Empowering project portfolio managers: How management involvement impacts project portfolio management performance, International Journal of Project Management 28:818–831 • Kwat, Anbari (2009): Analyzing project management research: Perspectives from top management journals, International Journal of Project Management 27:435–446 • Ratcheva (2009): Integrating diverse knowledge through boundary spanning processes – The case of multidisciplinary project teams, International Journal of Project Management 27:206–215 • Söderlund (2004): Building theories of project management: past research, questions for the future, International Journal of Project Management 22:183–191

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Related courses			
Rules for the choice of courses			
The examination refers to the lecture Business Application Systems. The academic achievement refers to the lecture Business Analytics.			
Compulsory attendance			
Name of the course	**SWS**	**Eventtype**	**Language**

Process and Project Management	4,0	Lecture	german

Literature

GPM:

- Houy , Fettke, Loos, van der Aalst, Krogstie (2011): Geschäftsprozessmanagement im Großen, Business & Information Systems Engineering 3(6):385-388
- Jurisch, Palka, Wolf, Krcmar (2014): Which capabilities matter for successful business process change, Business Process Management Journal 20(1):7-67
- Kettinger, Teng (1997): Business process change_a study of methodologies, techniques, and tools
- Trkman (2010): The critical success factors of business process management, International Journal of Information Management 30:128-134
- Vom Brocke, Schmiedel, Recker, Trkman, Mertens, Viaene (2014): Ten principles of good business process management, Business Process Management Journal, 20(4):530-548
- Zairi (1997): Business process management_A boundaryless approach to competitiveness, Business Process Management Journal 3(1):64-80

PM:

- Ika (2009): Project Success as a Topic in Project Management Journals, Project Management Journal 40(4):6–19
- Jonas (2010): Empowering project portfolio managers: How management involvement impacts project portfolio management performance, International Journal of Project Management 28:818–831
- Kwat, Anbari (2009): Analyzing project management research: Perspectives from top management journals, International Journal of Project Management 27:435–446
- Ratcheva (2009): Integrating diverse knowledge through boundary spanning processes – The case of multidisciplinary project teams, International Journal of Project Management 27:206–215
- Söderlund (2004): Building theories of project management: past research, questions for the future, International Journal of Project Management 22:183–191

Title	Specialisation - Information Management		
Number	2222140	**Module version**	V2
Shorttext	WW-WII-14	**Language**	german
Frequency of offer	only in the summer term	**Teaching unit**	Carl-Friedrich-Gauß-Fakultät
Module duration	1	**Institution**	
Hours per Week / ECTS	4 / 6,0	**Module owner**	Prof. Dr. Susanne Robra-Bissantz
Workload (h)			
Class attendance (h)	56	**Self studying (h)**	124
Compulsory requirements			
Expected performance/ Type of examination			
Course achievement			

Contents

Objective qualification

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, Wiesbaden 2008

↑

Related courses

Rules for the choice of courses

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.			

Compulsory Elective Discipline Economic Sciences	**18 ECTS**

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 Woisetschläger
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 - Economics		
Number	2212110	**Module version**	V2
Shorttext	WW-VWL-11	**Language**	german
Frequency of offer	every term	**Teaching unit**	Carl-Friedrich-Gauß-Fakultät
Module duration	2	**Institution**	
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			
Course achievement			

Contents

Objective qualification

Literature

- Wellisch, D. (2000): Finanzwissenschaft I, München: Vahlen.
- Blanchard, O und G. Illing (2014): Makroökonomie, Halbergmoss. Pearson.
- Ray, D (1998): Development Economics, Princeton: Princeton University Press.

↑

Related courses

Rules for the choice of courses

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 - Management Accounting		
Number	2214090	**Module version**	V2
Shorttext	WW-ACuU-09	**Language**	german
Frequency of offer	only in the summer term	**Teaching unit**	Carl-Friedrich-Gauß-Fakultät
Module duration	1	**Institution**	
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			
Course achievement			

Contents

Objective qualification

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

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	Colloquium	german
	1,0	Colloquium	german
	1,0	Lecture	german
	1,0	Lecture	german
Audit Insights	2,0	Lecture	german

Title	Specialisation - Finance		
Number	2215050	**Module version**	V2
Shorttext	WW-FIWI-05	**Language**	german
Frequency of offer	only in the winter term	**Teaching unit**	Carl-Friedrich-Gauß-Fakultät
Module duration	1	**Institution**	
Hours per Week / ECTS	4 / 6,0	**Module owner**	Prof. Dr. Marc Gürtler
Workload (h)			
Class attendance (h)	56	**Self studying (h)**	124
Compulsory requirements			
Expected performance/ Type of examination			
Course achievement			
Contents			
Objective qualification			
Literature			

- Breuer (2000): Investitionstheorie I
- Breuer (2001): Investitionstheorie II
- Breuer (1998): Finanzierungstheorie

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Related courses			
Rules for the choice of courses			
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, 51 Jg., S. 213-232. • Busse von Colbe, Walther/Witte, Frank (2018): Investitionstheorie und Investitionsrechnung, 5. Auflage, Berlin. • Kruschwitz, 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 - Law		
Number	2216200	**Module version**	V3
Shorttext	WW-RW-20	**Language**	german
Frequency of offer	only in the winter term	**Teaching unit**	Carl-Friedrich-Gauß-Fakultät
Module duration	1	**Institution**	
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			
Course achievement			
Contents			
Objective qualification			
Literature			

↑

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

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

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

↑

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 - Organization and Leadership		
Number	2223040	**Module version**	V2
Shorttext	WW-ORGF-04	**Language**	german
Frequency of offer	only in the summer term	**Teaching unit**	Carl-Friedrich-Gauß-Fakultät
Module duration	1	**Institution**	
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 Wttbewerbsvorteile, 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 Wttbewerbsvorteile, in: Zeitschrift für Betriebswirtschaft, 58. Jg., Nr.4, S. 461-480.			
	2,0	Seminar	german
	1,0	Colloquium	german

Compulsory Elective Discipline Computer Science	**5 ECTS**

Title	Theoretical Computer Science 1		
Number	4212350	**Module version**	V2
Shorttext	INF-THI-35	**Language**	german
Frequency of offer	only in the winter term	**Teaching unit**	Carl-Friedrich-Gauß-Fakultät
Module duration	1	**Institution**	Institut für Theoretische Informatik
Hours per Week / ECTS	4 / 5,0	**Module owner**	Prof. Dr. Roland Meyer
Workload (h)	150		
Class attendance (h)	56	**Self studying (h)**	94
Compulsory requirements			
Expected performance/ Type of examination	1 graded work: Written exam (120 minutes) or oral exam (30 minutes) or Take-Home-Exam.		
Course achievement	1 Coursework: 50% of completed homework assignments		

Contents

- Finite automata
- Regular languages
- Pigeonhole automata
- Context-free grammars and languages

Objective qualification

- After completing this module, students will have a basic understanding of automata, context-free languages and their grammars.
- They will be prepared to recognise these concepts in other areas of computer science and apply them there.
- The models discussed are intended to teach students the ability to create models independently. This skill is of great importance in all branches of computer science and in their future professional lives.

Literature

- John E. Hopcroft, Jeffrey D. Ullman, Rajeev Motwani. Einführung in die Automatentheorie, Formale Sprachen und Komplexitätstheorie. Pearson Studium 2002

- Alexander Asteroth, Christel Baier: Theoretische Informatik Pearson 2002

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Related courses			
Rules for the choice of courses			
The exercise is voluntary.			
Compulsory attendance			
Name of the course	**SWS**	**Eventtype**	**Language**
Theoretical Computer Science 1	2,0	Lecture	german
Literature			
- John E. Hopcroft, Jeffrey D. Ullman, Rajeev Motwani. Einführung in die Automatentheorie, Formale Sprachen und Komplexitätstheorie. Pearson Studium 2002 - Alexander Asteroth, Christel Baier: Theoretische Informatik Pearson 2002			
Theoretical Computer Science 1	2,0	Exercise, small group	german
Literature			
- John E. Hopcroft, Jeffrey D. Ullman, Rajeev Motwani. Einführung in die Automatentheorie, Formale Sprachen und Komplexitätstheorie. Pearson Studium 2002 - Alexander Asteroth, Christel Baier: Theoretische Informatik Pearson 2002			
	2,0	Exercise	german

Title	Introduction to Logic		
Number	4212520	**Module version**	V2
Shorttext	INF-THI-52	**Language**	german
Frequency of offer	only in the summer term	**Teaching unit**	Carl-Friedrich-Gauß-Fakultät
Module duration	1	**Institution**	Institut für Theoretische Informatik
Hours per Week / ECTS	4 / 5,0	**Module owner**	Prof. Dr. Roland Meyer
Workload (h)	150		
Class attendance (h)	56	**Self studying (h)**	94
Compulsory requirements			
Expected performance/ Type of examination	1 graded work: Written exam (90 minutes) or oral exam (30 minutes) or Take-Home-Exam.		
Course achievement	1 Coursework: 50% of homework assignments must be passed		

Contents

- Propositional logic
- Normal forms
- Boolean algebras
- Predicate logic

Objective qualification

- After completing this module, students will have gained an insight into the methods of formal logic and their relevance in computer science.
- They can formulate facts in a formal, logical manner and apply formal, logical methods.

Literature

- J. Adamek: Einfuehrung in die Logik, Skript 2011 (Webseite des Instituts fuer Theoretische Informatik)
- Uwe Schoening: Logik fuer Informatiker, Spektrum Verlag, Berlin 2005
- H. Ehrich et al: Grundlagen der Informatik, Springer Verlag 1999
- M. Huth und M.Ryan: Logic in computer science, Cambridge University Press 2004.

↑

Related courses

Rules for the choice of courses

Compulsory attendance

Name of the course	SWS	Eventtype	Language

Introduction to Logic	2,0	Lecture	german
Literature			
- J. Adamek: Einfuehrung in die Logik, Skript 2011 (Webseite des Instituts fuer Theoretische Informatik) - Uwe Schoening: Logik fuer Informatiker, Spektrum Verlag, Berlin 2005 - H. Ehrich et al: Grundlagen der Informatik, Springer Verlag 1999 - M. Huth und M.Ryan: Logic in computer science, Cambridge University Press 2004.			

Introduction to Logic (exercise)	2,0	Exercise, small group	german

Title	Introduction to Medical Informatics		
Number	4217610	**Module version**	V2
Shorttext	INF-MI-61	**Language**	german
Frequency of offer	only in the winter term	**Teaching unit**	Carl-Friedrich-Gauß-Fakultät
Module duration	1	**Institution**	Peter L. Reichertz Institut für Medizinische Informatik
Hours per Week / ECTS	4 / 5,0	**Module owner**	Prof. Dr. Thomas Deserno
Workload (h)	150		
Class attendance (h)	56	**Self studying (h)**	94
Compulsory requirements			
Expected performance/ Type of examination	1 graded work: Written exam (90 minutes) or oral exam (30 minutes) or term Paper or presentation or creation and documentation of computer programs or experimental work or portfolio or Take-Home-Exam.		
Course achievement			

Contents

Medical informatics:
- for individual healthcare
- for gaining knowledge in medicine
- for organising healthcare

Methods, examples, excursions into practice

Objective qualification

Students gain insight into the objectives and subfields of medical informatics. They are familiar with the problems and can develop solutions for them. In addition, students are familiar with the structure of healthcare systems and are able to develop methods for decision-making and for accessing and processing knowledge.

Literature

- Dugas, Martin (2017): Medizininformatik. Springer Vieweg, Berlin.

- IMIA Yearbook of Medical Informatics [published annually]

- Further current literature will be announced during the lecture.

↑

Related courses			
Rules for the choice of courses			
Compulsory attendance			
Name of the course	**SWS**	**Eventtype**	**Language**
	3,0	Lecture	german
Literature			
- Dugas, Martin (2017): Medizininformatik. Springer Vieweg, Berlin. - IMIA Yearbook of Medical Informatics [erscheint jährlich] - weitere aktuelle Literatur wird im Rahmen der Vorlesung bekanntgegeben			
	1,0	Exercise	german

Title	Distributed Systems		
Number	4223340	**Module version**	V2
Shorttext	INF-VS-34	**Language**	german
Frequency of offer	irregular	**Teaching unit**	Carl-Friedrich-Gauß-Fakultät
Module duration	1	**Institution**	
Hours per Week / ECTS	3 / 5,0	**Module owner**	Prof. Dr. Christian Mengert-Dietrich
Workload (h)	150		
Class attendance (h)	42	**Self studying (h)**	108
Compulsory requirements			
Expected performance/ Type of examination	1 graded work: Written exam (90 minutes) or oral exam (30 minutes) or Take-Home-Exam.		
Course achievement			

Contents

Objective qualification

Literature

- A. Tanenbaum, Marten van Stehen: Verteilte Systeme, Pearson Studium, 2007, ISBN: 978-3-8273-7293-2
- weitere Literatur: siehe Lehrveranstaltung

↑

Related courses

Rules for the choice of courses

Compulsory attendance

Name of the course	SWS	Eventtype	Language
Distributed Systems	2,0	Lecture	german

Literature

- A. Tanenbaum, Marten van Stehen: Verteilte Systeme, 2. Auflage, Pearson, 2007
- G. Coulouris, J. Dollimore, T. Kindberg: Verteilte Systeme - Konzepte und Design, 3. Auflage, Pearson, 2002
- C. Cachin, R. Guerraoui, L. Rodrigues: Introduction to Reliable and Secure Distributed Programming, 2nd edition, 2011

	1,0	Exercise	german

Title	Operating Systems		
Number	4225040	**Module version**	V3
Shorttext	INF-IBR-04	**Language**	german
Frequency of offer	only in the winter term	**Teaching unit**	Carl-Friedrich-Gauß-Fakultät
Module duration	1	**Institution**	Institut für Betriebssysteme und Rechnerverbund
Hours per Week / ECTS	4 / 5,0	**Module owner**	Rüdiger Kapitza
Workload (h)	150		
Class attendance (h)	56	**Self studying (h)**	94
Compulsory requirements			
Expected performance/ Type of examination	1 graded work: Written exam (90 minutes) or oral exam (30 minutes) or Take-Home-Exam.		
Course achievement	1 Coursework: 50% of homework assignments must be passed		

Contents

- History of operating systems
- Process management
- Interprocess communication
- Memory management
- Input and output
- File systems

Objective qualification

- At the end of the course, students will have a good overview of the basic concepts of operating systems.
- In particular, they will have gained an in-depth understanding of processes and memory management.
- They will be able to identify the principles they have learned in real operating systems and assess the quality of their implementation.

Literature

- A. Tanenbaum:Modern Operating Systems, 2nd., Prentice-Hall,2001.
- W. Stallings: Operating Systems: International Version: Internals and Design Principles, 7th revised edition,Prentice Hall International, 2011.
- Silberschatz, Galvin, Gane:Operating System Concepts, 8th edition, John Wiley & Sons, 2011

↑

Related courses			
Rules for the choice of courses			
Compulsory attendance			
Name of the course	**SWS**	**Eventtype**	**Language**
	4,0	Lecture/Exercise	german
	1,0	Exercise	german
	1,0	Exercise, small group	german

Title	Algorithms Laboratory		
Number	4227100	**Module version**	
Shorttext	INF-ALG-10	**Language**	german
Frequency of offer	irregular	**Teaching unit**	Carl-Friedrich-Gauß-Fakultät
Module duration	1	**Institution**	Institut für Betriebssysteme und Rechnerverbund
Hours per Week / ECTS	3 / 5,0	**Module owner**	Prof. Dr. Sandor Fekete
Workload (h)	150		
Class attendance (h)	42	**Self studying (h)**	108
Compulsory requirements			
Expected performance/ Type of examination			
Course achievement	1 Coursework: Colloquium on the internship. Detailed modalities will be announced at the beginning of the lecture.		

Contents
Design and implementation of algorithms for person recognition in the ‘sensor corridor’.
Objective qualification
Upon completion of the module, students will be able to design, construct and implement algorithms relating to geometric and graph theory issues.
Literature
The literature sources vary depending on the topic.

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Related courses
Rules for the choice of courses
Compulsory attendance

Name of the course	**SWS**	**Eventtype**	**Language**
Algorithms Laboratory	3,0	Internship	german
Literature			
Die Literaturquellen variieren je nach Thema.			

Title	Network Algorithms		
Number	4227120	**Module version**	V2
Shorttext	INF-ALG-12	**Language**	german
Frequency of offer	only in the summer term	**Teaching unit**	Carl-Friedrich-Gauß-Fakultät
Module duration	1	**Institution**	Institut für Betriebssysteme und Rechnerverbund
Hours per Week / ECTS	4 / 5,0	**Module owner**	Prof. Dr. Sandor Fekete
Workload (h)	150		
Class attendance (h)	56	**Self studying (h)**	94
Compulsory requirements			
Expected performance/ Type of examination	1 graded work: Written exam (120 minutes) or oral exam (30 minutes) or Take-Home-Exam.		
Course achievement	1 Coursework: 50% of the exercises must be passed		

Contents

- Graphs and discrete structures
- Overview of important discrete optimisation problems
- Algorithms for calculating optimal trees
- Algorithms for calculating optimal paths
- Algorithms for calculating optimal flows
- Algorithms for calculating optimal matchings

Objective qualification

Students will acquire the ability to model discrete optimisation problems, learn about algorithmic approaches to solving them, acquire the ability to implement and apply the problems covered, and be able to assess the applicability and complexity of models and algorithms.

Literature

- B. Korte, J. Vygen: Combinatorial Optimization.5th edition. Springer-Verlag, Berlin Heidelberg 2012.
bzw.
- B. Korte, J. Vygen: Kombinatorische Optimierung: Theorie und Algorithmen. 2. deutsche Auflage. Springer-Verlag, Berlin Heidelberg 2012.

- Cook, Cunningham, Pulleyblank, Schrijver: Combinatorial Optimization. 1st edition. John Wiley & Sons, 1997.

- C. Papdimitriou, K. Steiglitz: Combinatorial Optimization: Algorithms and Complexity. 1st edition. Dover Publication Inc., New York 1998.

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Related courses			
Rules for the choice of courses			
Compulsory attendance			
Name of the course	**SWS**	**Eventtype**	**Language**
Network Algorithms	2,0	Lecture	german
Literature			
- B. Korte, J. Vygen: Combinatorial Optimization.5th edition. Springer-Verlag, Berlin Heidelberg 2012. bzw. - B. Korte, J. Vygen: Kombinatorische Optimierung: Theorie und Algorithmen. 2. deutsche Auflage. Springer-Verlag, Berlin Heidelberg 2012. - Cook, Cunningham, Pulleyblank, Schrijver: Combinatorial Optimization. 1st edition. John Wiley & Sons, 1997. - C. Papdimitriou, K. Steiglitz: Combinatorial Optimization: Algorithms and Complexity. 1st edition. Dover Publication Inc., New York 1998.			
	1,0	Exercise	german
	1,0	Exercise, small group	german
Literature			
- B. Korte, J. Vygen: Combinatorial Optimization.5th edition. Springer-Verlag, Berlin Heidelberg 2012. bzw. - B. Korte, J. Vygen: Kombinatorische Optimierung: Theorie und Algorithmen. 2. deutsche Auflage. Springer-Verlag, Berlin Heidelberg 2012. - Cook, Cunningham, Pulleyblank, Schrijver: Combinatorial Optimization. 1st edition. John Wiley & Sons, 1997. - C. Papdimitriou, K. Steiglitz: Combinatorial Optimization: Algorithms and Complexity. 1st edition. Dover Publication Inc., New York 1998.			

Title	Algorithms and Data Structures 2		
Number	4227230	**Module version**	V2
Shorttext	INF-ALG-23	**Language**	german
Frequency of offer	only in the summer term	**Teaching unit**	Carl-Friedrich-Gauß-Fakultät
Module duration	1	**Institution**	Institut für Betriebssysteme und Rechnerverbund
Hours per Week / ECTS	4 / 5,0	**Module owner**	Prof. Dr. Sandor Fekete
Workload (h)	150		
Class attendance (h)	56	**Self studying (h)**	94
Compulsory requirements			
Expected performance/ Type of examination	1 graded work: Written exam (90 minutes) or oral exam (30 minutes) or Take-Home-Exam.		
Course achievement	1 Coursework: 50% of the exercises must be passed		

Contents

- Further aspects of complexity
- Elementary aspects of heuristics, exact methods and approximation algorithms
- Enumeration methods
- Probabilistic approaches
- Advanced data structures

Objective qualification

Graduates of this module are familiar with advanced algorithms and data structures in computer science. They are able to formulate algorithmic solutions even for complex problems and to evaluate the performance of algorithmic solutions.

Literature

- Th. Cormen, Ch. Leiserson, R. Rivest, C. Stein: Introduction to Algorithms. 3rd edition. MIT Press, Cambridge 2009.

↑

Related courses

Rules for the choice of courses

Compulsory attendance

Name of the course	SWS	Eventtype	Language

Algorithms and Data Structures 2	2,0	Lecture	german
Literature			
- Th. Cormen, Ch. Leiserson, R. Rivest, C. Stein: Introduction to Algorithms. 3rd edition. MIT Press, Cambridge 2009.			

	1,0	Exercise	german

Algorithms and Data Structures 2	1,0	Exercise, small group	german
Literature			
- Th. Cormen, Ch. Leiserson, R. Rivest, C. Stein: Introduction to Algorithms. 3rd edition. MIT Press, Cambridge 2009.			

Title	Introduction to Algorithm Engineering		
Number	4227240	**Module version**	V2
Shorttext	INF-ALG-24	**Language**	english
Frequency of offer	irregular	**Teaching unit**	Carl-Friedrich-Gauß-Fakultät
Module duration	1	**Institution**	Institut für Betriebssysteme und Rechnerverbund
Hours per Week / ECTS	4 / 5,0	**Module owner**	Prof. Dr. Sandor Fekete
Workload (h)	150		
Class attendance (h)	56	**Self studying (h)**	94
Compulsory requirements			
Expected performance/ Type of examination	1 graded work: Written exam (90 minutes) or oral exam (30 minutes) or portfolio or Take-Home-Exam.		
Course achievement			

Contents

Traditional algorithm design is limited to purely theoretical analyses, which in turn are based on simple and established computer models
(such as RAM and Turing). However, the computer systems commonly used today deviate from these models in some respects. Input data often has extreme
properties, such as large data volumes or small data variance, for which standard algorithms and data structures are not designed.
Algorithm engineering is based on realistic assumptions about computers and inputs. Analyses include both asymptotic (big O) and
experimental techniques.

The individual topics of the module include
- Data structures (e.g. ordered sequences, sets, relations, graphs)
- Algorithms (e.g. sorting, searching, traversing)
- Computer models (e.g. external memory, parallel/multicore, distributed)
- Theoretical analysis techniques (e.g. asymptotic, worst-case vs. average-case, smoothed complexity)
- Practical analysis techniques (e.g. hypothesis design and validation, experiment planning and evaluation)

Objective qualification

Graduates of this module will be able to distil correct algorithmic formulations for given practical problems, make and verify assumptions about the expected data characteristics, and select and adapt algorithms that are suitable for the problem at hand, taking into account their application context. They can determine the correct alternative analysis techniques and implement them to validate hypotheses about their decisions.

Literature

- Kurt Mehlhorn und Peter Sanders: "Algorithms and Data Structures: The Basic Toolbox". Springer Verlag.
- Ulrich Meyer, Peter Sanders und Jop Sibeyn: "Algorithms for Memory Hierarchies: Advanced Lectures". Springer Verlag.

↑

Related courses
Rules for the choice of courses
Compulsory attendance

Name of the course	SWS	Eventtype	Language
	2,0	Lecture	english
Literature			
- Kurt Mehlhorn und Peter Sanders: "Algorithms and Data Structures: The Basic Toolbox". Springer Verlag. - Ulrich Meyer, Peter Sanders und Jop Sibeyn: "Algorithms for Memory Hierarchies: Advanced Lectures". Springer Verlag.			
	1,0	Exercise	english
Literature			
- Kurt Mehlhorn und Peter Sanders: "Algorithms and Data Structures: The Basic Toolbox". Springer Verlag. - Ulrich Meyer, Peter Sanders und Jop Sibeyn: "Algorithms for Memory Hierarchies: Advanced Lectures". Springer Verlag.			
	1,0	Exercise, small group	english
Literature			
- Kurt Mehlhorn und Peter Sanders: "Algorithms and Data Structures: The Basic Toolbox". Springer Verlag. - Ulrich Meyer, Peter Sanders und Jop Sibeyn: "Algorithms for Memory Hierarchies: Advanced Lectures". Springer Verlag.			

Title	Computer Security 1		
Number	4229030	**Module version**	V2
Shorttext	INF-ISS-03	**Language**	
Frequency of offer		**Teaching unit**	Carl-Friedrich-Gauß-Fakultät
Module duration	1	**Institution**	
Hours per Week / ECTS	4 / 5,0	**Module owner**	
Workload (h)	150		
Class attendance (h)	56	**Self studying (h)**	94
Compulsory requirements			
Expected performance/ Type of examination	1 graded work: Written exam (90 minutes) or oral exam (30 minutes) or Take-Home-Exam.		
Course achievement			

Contents

Objective qualification

Literature

- M. Bishop. Computer Security - Art and Science. Macmillian Publishing, 2002
- D. Gollmann. Computer Security. Wiley & Sons, 2011
- C. Eckert. IT-Sicherheit: Konzepte - Verfahren - Protokolle. Oldenbourg, 2006
- B. Schneier. Applied Cryptography. Wiley & Sons, 1995
- P. Szor. The Art of Computer Virus Research and Defense. Addison-Wesley, 2005

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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	Exercise	german

Professionalisation	**8 ECTS**

Title	Interdisciplinary Qualifications		
Number	2299760	**Module version**	
Shorttext	WW-STD-76	**Language**	german
Frequency of offer	every term	**Teaching unit**	Carl-Friedrich-Gauß-Fakultät
Module duration	1	**Institution**	
Hours per Week / ECTS	5 / 7,0	**Module owner**	
Workload (h)	240		
Class attendance (h)	70	**Self studying (h)**	170
Compulsory requirements			
Expected performance/ Type of examination			
Course achievement	1. IT practice (2 CP) 2. One Impact Learning (3 to 5 CP; old: service learning) or one social science course (3 CP each) or scout project (4 CP) 3. courses from the pool model The examination modalities depend on the selected courses and can be found in the information on the respective courses.		

Contents

IT practice: Excursions to regional IT-related companies in the area of Braunschweig. Presentation and learning about the professional fields of business IT specialists and their tasks and requirements.

Impact Learning (old: Service learning): Project with a social focus (civic participation)
Scout: Learning (old: Service learning) in the form of a project
Social science courses: Topics on international foreign policy or sociology
Various in the elective courses of the modified overall program

Objective qualification

Area I:
Overarching reference/ embedding of the degree program
Students are enabled to place their degree program in a social, historical, legal or career-oriented context (depending on the focus of the course). They are able to recognize, analyze and evaluate superordinate, subject-specific connections and their significance. Students gain an insight into the networking possibilities of the degree program and application references of their degree program in their professional life.

Area II: Cultures of knowledge
The students
- become familiar with theories and methods of other, non-subject-related cultures of knowledge,
- learn to engage and work in an interdisciplinary manner with students from other fields of study,

- are able to discuss and evaluate current controversies from different disciplines,
- are familiar with gender-related perspectives on various subject areas and the effects of gender differences,
- can deal intensively with application examples from other disciplines

Area III: Practice-oriented offers
Students are enabled to use theoretical knowledge in an practical way. They acquire procedural knowledge (knowledge of procedures and courses of action) and metacognitive knowledge (including knowledge of your own strengths and weaknesses).
Depending on the focus of the course, students acquire the ability to:

- Convey knowledge or apply communication techniques
- conduct discussions and negotiations effectively, reflect on themselves and evaluate themselves appropriately,
- work cooperatively in a team, manage conflicts,
- use information and communication media or
- express themselves in another language

Due to the action-oriented courses, students are able to use knowledge acquired in other areas more effectively, to work more easily and constructively with other people and thus to facilitate the acquisition and development of new knowledge. You will acquire key qualifications that simplify your entry into the professional field and contribute to success in all professional situations.

Literature

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Related courses
Rules for the choice of courses
IT practice is compulsory and should be attended in the 4th or 5th semester. Either service learning or a course in the social sciences or the scout project must be chosen. Further courses must be selected from the modified overall program of interdisciplinary courses at TU Braunschweig (pool model). The list of permitted courses can be found on the following page: https://www.tu-braunschweig.de/wirtschaftsinformatik-bachelor/aufbau#c542991
Compulsory attendance

Name of the course	**SWS**	**Eventtype**	**Language**
IT Career Service	1,0	Excursion	german
Service Learning	3,0	Project	german
Introduction to International Relations	2,0	Lecture	german

Introduction to Comparative Politics	2,0	Lecture	german
Literature			
Suitable preparation for the course: • Caramani, Daniele (2020): Comparative Politics. Oxford: Oxford University Press. • Dickovick, J. T./Eastwood, J. (2019): Comparative Politics: Integrating Theories, Methods, and Cases. 3. Ed. Oxford: Oxford University Press. • Ismayr, Wolfgang, 2009: Die politischen Systeme Westeuropas. Wiesbaden: VS Verlag für Sozialwissenschaften. • Lehner, Franz/Widmaier, Ulrich, 2005: Vergleichende Regierungslehre. Wiesbaden: VS Verlag für Sozialwissenschaften. • Powell, G. Bingham/Dalton, Russell J./Strøm, Kaare W. (2014): Comparative Politics Today. A World-view. Essex: Pearson Education Limited. Further reading will be announced during the course.			

Foundations of the Analysis of Social Structures	2,0	Lecture	german
Literature			
Literature will be announced at the beginning of the course.			

Political System of the Federal Republic of Germany	2,0	Lecture	german
Literature			
Schmidt, Manfred G. 2021: Das politische System Deutschlands. München: C.H. Beck Verlag. Marschall, Stefan 2018: Das politische System Deutschlands. Stuttgart: UTB Verlag. Rudzio, Wolfgang 2018: Das politische System der Bundesrepublik Deutschland. Wiesbaden: VS Verlag für Sozialwissenschaften. Further literature references will be announced in the course for the individual sessions.			

Introduction to the Sociology of Work	2,0	Lecture	german
Literature			
Will be announced at the beginning of the course.			

Changing World of Work	2,0	Lecture	german
Literature			
Will be announced at the beginning of the lecture.			

Bachelor Thesis	**12 ECTS**

Title	Bachelor Thesis		
Number	2299040	**Module version**	V2
Shorttext	WW-STD-04	**Language**	english german
Frequency of offer	every term	**Teaching unit**	Carl-Friedrich-Gauß-Fakultät
Module duration	1	**Institution**	
Hours per Week / ECTS	0 / 12,0	**Module owner**	
Workload (h)	360		
Class attendance (h)	20	**Self studying (h)**	340
Compulsory requirements			
Recommended requirements	It is recommended that the subject area underlying the bachelor's thesis be studied in depth beforehand.		
Expected performance/ Type of examination	1 written paper		
Course achievement			

Contents
Development of a topic from the chosen elective or specialization in computer science, business information systems or economics.
Objective qualification
Students are enabled to work independently on a topic and deal with it methodically.
Literature
Depending on the specific task

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