Study Programme Business Analytics (MSc)

Module descriptions
Last updated: March 2016

This English translation is intended to allow international readers a better understanding. It is solely for information purposes and subject to change without notice. In case of discrepancies, only the German version applies and prevails.

List of Contents

Module number	Module 1
Module name	Controlling
Semester (or term, if applicable)	Semester 1
Duration	1 semester
Type of module (compulsory, elective etc.)	Core module
Courses (if applicable)	Controlling und Big Data
Number of offers	Once per academic year
Person responsible for the module	Study programme director
Lecturer(s)	Prof. Dr. Marcus Albrecht Adjunct lecturer
Language of instruction	German and English
ECTS credits	6
Workload	150 h in total: approx. 60 h attendance, 90 h self-study
SWS	4
Weighting for overall grade	Bachelor of 6 semesters: 5.00 % of the total ECTS Bachelor of 7 semesters: 6.67 % of the total ECTS
Learning outcome	The students have gained an overview of big data integration in common controlling concepts and controlling processes. They have learned about the requirements for and applicability of big data in a controlling context. They have expanded and intensified their knowledge acquired during the bachelor's programme. The students know and can apply relevant controlling instruments in the context of predictive and prescriptive controlling. They are familiar with the requirements for data-based decision and controlling parameters and can conclude information needs.
Contents	• Requirements for and impact on controlling processes using big data • Implementation and examples of application of selected functional controlling disciplines • Financial management and controlling • Data-based instruments and organisational implications
Forms of teaching and learning	Seminar-like course including exercises and practical cases

Literature (compulsory / recommended)	IJBAN – International Journal of Business Analytics (specialist journal) Baum/Coenenberg/Günther, Strategisches Controlling, 5th edn, 2013 Davenport, big data @ work, 2014 Fischer/Möller/Schultze, Controlling. Grundlagen, Instrumente und Entwicklungsperspektiven, 2nd edn, 2015 Gleich/Grönke/Kirchmann/Leyk, Controlling und Big Data, 2014 Provost/Fawcett, Data Science for Business. What You Need to Know About Data Mining and Data-Analytic Thinking, 2013 Reichmann, Controlling mit Kennzahlen, 8th edn, 2011 **All books to be read in their latest editions.** **See updated lists of recommended literature in the course documents.**
Type of examination / requirements for award of credit	Written examination (duration: 90 min.) (= 75 %), written assignment including presentation (= 25 %)
Prerequisites	No specific prerequisites
Allocation to syllabus	Basic module within the master's programme, basis for specialisation modules
Special features (e.g. online courses, field trips in the industry, guest lectures)	Guest lectures from practice

Module number	Module 2
Module name	IT in Business Analytics
Semester (or term, if applicable)	Semester 1
Duration	1 semester
Type of module (compulsory, elective etc.)	Core module
Courses (if applicable)	a) IT Support in Business Analytics b) IT Applications in Business Analytics
Number of offers	Once per academic year
Person responsible for the module	Study programme director
Lecturer(s)	Prof. Dr. Alber Adjunct lecturer
Language of instruction	German and English
ECTS credits	12
Workload	300 h in total: approx. 90 h attendance, 210 h self-study
SWS	6
Weighting for overall grade	Bachelor of 6 semesters: 10.00 % of the total ECTS Bachelor of 7 semesters: 13.33 % of the total ECTS
Learning outcome	a) IT Support in Business Analytics The students have a deep understanding of models, methods and techniques for IT support in business analytics. They are able to • configure suitable IT support for a given case and • take on the (organisational, technical, legal and ethical) challenges arising in the process. b) IT Applications in Business Analytics In case studies, the students have learned to apply IT tools from practice.
Contents	• Data science • Database models • Information retrieval • Data and text analysis • Semantic web, XML • Data warehouse, data mart, ETL • In-memory data management

	• Reporting, online analytical processing, data and text mining • Predictive analytics, simulation, machine learning • Data and decision modelling • Visualisation • Data quality • Data security • Industry- and function-specific applications, e.g. analytical CRM, web analytics and social mining, mobile system data analysis
Forms of teaching and learning	Seminar-like course including exercises, computer-aided individual and group work
Literature (compulsory / recommended)	BISE – Business & Information Systems Engineering (specialist journal) Decision Analytics (specialist journal) DuD – Datenschutz und Datensicherheit (specialist journal) HMD – Praxis der Wirtschaftsinformatik (specialist journal) IJBAN – International Journal of Business Analytics (specialist journal) IJBIR – International Journal of Business Intelligence Research (specialist journal) Konasani/Kadre, Practical Business Analytics Using SAS. A Hands-on Guide, 2015 Maisel/Cokins, Predictive Business Analytics. Forward Looking Capabilities to Improve Business Performance, 2013 Mohanty/Jagadeesh/Srivatsa, Big Data Imperatives. Enterprise Big Data Warehouse, BI Implementations and Analytics, 2013 Müller/Lenz, Business Intelligence, 2013 Saxena/Srinivasan, Business Analytics. A Practitioner's Guide, 2013 **All books to be read in their latest editions.** **See updated lists of recommended literature in the course documents.**
Type of examination / requirements for award of credit	Written examination (duration: 120 min.) (= 75 %) and presentation of the individual and/or group work (= 25 %)
Prerequisites	No specific prerequisites
Allocation to syllabus	Basic module within the master's programme, basis for specialisation modules
Special features (e.g. online courses, field trips in the industry, guest lectures)	Approx. 50 % of the module takes place in the IT laboratory

Module number	Module 3
Module name	Economic Analysis 1
Semester (or term, if applicable)	Semester 1
Duration	1 semester
Type of module (compulsory, elective etc.)	Core module
Courses (if applicable)	Advanced Managerial Economics
Number of offers	Once per academic year
Person responsible for the module	Prof. Dr. Philipp Freitag
Lecturer(s)	Prof. Dr. Philipp Freitag
Language of instruction	German and English
ECTS credits	6
Workload	150 h in total: approx. 60 h attendance, 90 h self-study
SWS	4
Weighting for overall grade	Bachelor of 6 semesters: 5.00 % of the total ECTS Bachelor of 7 semesters: 6.67 % of the total ECTS
Learning outcome	Having successfully completed the module, the students have learned to describe and understand consumer behaviour and various market forms (e.g. monopoly, monopsony, standard competitive models). They can apply and extend them to realistic problem cases. They are also able to apply models to analyse economic behaviour and decide on alternative action (e.g. price discrimination, vertical partitioning, product differentiation). They are competent to analyse more complex microeconomic phenomena and conclude results relevant for specific business decisions (e.g. managers' remuneration). The students master fundamental game-theoretic concepts and can put real economic cases into context. The students are able to describe and explain • the determinants regarding corporate size and structure, • implications of a separation of ownership and control (principal-agent problems), • essential influencing factors for market structures and • key issues in competition policy and regulations.

Contents	• Production theory and cost analysis • Market forms and fundamental pricing strategies (competitive models, monopoly, monopolistic competition) • Advanced pricing strategies (price discrimination, bundling) • International transfer pricing • Strategic behaviour (oligopoly, game-theoretic approaches, auction mechanisms) • Decision-making under risks and uncertainty • Forms of remuneration considering principal-agent problems • Concepts of the 'new institutional economics'
Forms of teaching and learning	Seminar-like course including exercises
Literature (compulsory / recommended)	AEJ – American Economic Journal: Applied Economics (specialist journal) AEJ – American Economic Journal: Applied Economics (specialist journal) JITE – Journal of Institutional and Theoretical Economics (specialist journal) Allen/Weigelt/Doherty/Mansfield, Managerial Economics. Theory, Application and Cases, 8th edn, 2013 Berz, Spieltheoretische Verhandlungs- und Auktionsstrategien. Mit Praxisbeispielen von Internetauktionen bis Investmentbanking, 2014 Frank/Cartwright, Microeconomics and Behaviour, 2013 Goolsbee/Levitt/Syerson, Mikroökonomik, 2014 Hirschey/Bentzen, Managerial Economics, 13th edn, 2014 Richter, Neue Institutionenökonomik: Eine Einführung und kritische Würdigung, 4th edn, 2010 Riechmann, Spieltheorie, 4th edn, 2014 Varian, Intermediate Microeconomics, 9th edn, 2014 Waldman/Jensen, Industrial Organization: Theory and Practice, 4th edn, 2013 **All books to be read in their latest editions.** **See updated lists of recommended literature in the course documents.**
Type of examination / requirements for award of credit	Written examination (duration: 90 min.)
Prerequisites	No specific prerequisites
Allocation to syllabus	Basic module within the master's programme, basis for specialisation modules
Special features (e.g. online courses, field trips in the industry, guest lectures)	Case studies

Module number	Module 4
Module name	Compliance
Semester (or term, if applicable)	Semester 2
Duration	1 semester
Type of module (compulsory, elective etc.)	Core module
Courses (if applicable)	a) Conceptions and Compliance Management Systems b) Current Legal Issues, Especially Law Concerning Liability and Data Protection
Number of offers	Once per academic year
Person responsible for the module	Study programme director
Lecturer(s)	Prof. Dr. tba Adjunct lecturer
Language of instruction	German and English
ECTS credits	6
Workload	150 h in total: approx. 60 h attendance, 90 h self-study
SWS	4
Weighting for overall grade	Bachelor of 6 semesters: 5.00 % of the total ECTS Bachelor of 7 semesters: 6.67 % of the total ECTS
Learning outcome	In this module, the students have expanded their industry-specific, specialist and methodological expertise in business analytics topics relating to compliance. This includes questions of economic ethics regarding company standards and the application of business analytics instruments. They students are familiar with and can take into account data protection requirements. In this regard, they know country-specific aspects and possibilities of action. In addition, they are aware of the sociopolitical relevance of extensive business analytics application. The students have also looked at the relevant compliance questions regarding sustainable and responsive investment (SRI) – a subject of increasing importance for capital market-orientated enterprises.

Contents	• (National and international) legal frameworks for business analytics, especially data protection • Internal company standards • Compliance models and practical implementation • Principles for proper auditing of compliance management systems (auditing standards of the *Institut der Wirtschaftsprüfer* (institute of auditors, IDW) in Germany: IDW PS 980) • Technology assessment: corporate and societal change, social responsibility • Sustainable and responsible investment (SRI) • Development and implementation of compliance management systems
Forms of teaching and learning	Seminar-like course including exercises
Literature (compulsory / recommended)	DuD – Datenschutz und Datensicherheit (specialist journal) ZRFC – Zeitschrift Risk, Fraud & Compliance (specialist journal) BSI, Grundschutzkatalog, Baustein B 1.5 Datenschutz, 2013 BDSG – Bundesdatenschutzgesetz (German data protection act) Doppler/Lauterburg, Change Management: Den Unternehmenswandel gestalten, 2014 Heilmann/Liegl, Big Data und Datenschutz. Der Umgang der Deutschen mit persönlichen Daten und die Konsequenzen für den Einsatz von Big-Data-Analysen, 2013 Institut der Wirtschaftsprüfer (IDW), Grundsätze ordnungsmäßiger Prüfung von Compliance Management Systemen (IDW PS 980), 2011 ISO 19600, 2014 KPMG, Das wirksame Compliance-Management-System, 2014 Moosmayer/Beulke, Compliance-Risikoanalyse: Praxisleitfaden für Unternehmen, 2014 Morgenroth, Sie kennen dich! Sie haben dich! Sie steuern dich. Die wahre Macht der Datensammler, 2014 v.Werder, Corporate Governance, 2007. In: Handwörterbuch der Betriebswirtschaft, 6th edn, pp. 221–240 Wendt, Responsible Investment Banking, 2015 **All books to be read in their latest editions.** **See updated lists of recommended literature in the course documents.**
Type of examination / requirements for award of credit	Written examination (duration: 90 min.)
Prerequisites	No specific prerequisites
Allocation to syllabus	Basic module within the master's programme, basis for specialisation modules
Special features (e.g. online courses, field trips in the industry, guest lectures)	Guest lectures from practice and/or case studies

Module number	Module 5
Module name	Control Parameters in Corporate Governance
Semester (or term, if applicable)	Semester 2
Duration	1 semester
Type of module (compulsory, elective etc.)	Core module
Courses (if applicable)	a) Value-Orientated Corporate Governance b) Corporate Social Responsibility and Sustainability Reporting
Number of offers	Once per academic year
Person responsible for the module	Prof. Dr. Dirk Jödicke
Lecturer(s)	Prof. Dr. Dirk Jödicke Prof. Dr. Christian Kölle
Language of instruction	German and English
ECTS credits	12
Workload	300 h in total: approx. 90 h attendance, 210 h self-study
SWS	6
Weighting for overall grade	Bachelor of 6 semesters: 10.00 % of the total ECTS Bachelor of 7 semesters: 13.33 % of the total ECTS
Learning outcome	Having successfully completed the module, the students can apply and critically assess • traditional key figures and key figure systems, • various methods of business valuation. They are able to theoretically derive and practically apply value-orientated controlling key figures (residual profit concepts) – and also know their limitations. The students know the importance of non-financial performance indicators in corporate governance and can apply them using suitable instruments (balanced scorecard (BSC) and sustainable BSC). They know forms of integrated reporting and can reveal each form's potential issues. The students can illustrate and classify theoretical justifications for corporate social responsibility (CSR) and sustainability, including their fields of application. They have learned to assess and apply configuration principles and indicators of important CSR initiatives (e.g. UN Global Compact, ISO

	26000, EU Green Paper, OECD Guidelines, Global Reporting Initiative). The students have acquired knowledge of applied ethical problem cases in companies.
Contents	• Shareholder value as a possible target in corporate governance • Traditional key figures and key figure systems • Application of management tools • Business valuation methods • Value-orientated key figures • Opportunities and risks in value-orientated remuneration systems • Non-financial performance indicators in corporate governance • Trends in external reporting on non-financial performance indicators (Global Reporting Initiative (GRI) and integrated reporting) • Requirements for sustainable development • Implementation sustainability on national and international level • Corporate sustainability management and reporting
Forms of teaching and learning	Seminar-like course including exercises
Literature (compulsory / recommended)	ZfbF – Zeitschrift für betriebswirtschaftliche Forschung (specialist journal) Ballwieser, Unternehmensbewertung – Prozess, Methoden und Probleme, 4th edn, 2013 Coenenberg/Haller/Schultze, Jahresabschluss und Jahresabschlussanalyse, 25th edn, 2018 Crasselt/Pellens/Schremper, Konvergenz wertorientierter Erfolgskennzahlen, 2000. In: WISU, 29th issue, pp. 72–78 and pp. 205–208 Crasselt/Schremper, Economic Value Added, 2000. In: Die Betriebswirtschaft, 60th issue, pp. 813–816 Crasselt/Schremper, Cash Flow Return on Investment und Cash Value Added, 2001. In: Die Betriebswirtschaft, 61st issue, pp. 271–274 Drukarczyk/Schüler, Unternehmensbewertung, 7th edn, 2015 Freidank/Müller/Velte (ed), Handbuch Integrated Reporting, 2015 Kaplan/Norton/Horváth/Kuhn-Würfel/Vogelhuber, Balanced Scorecard: Strategien erfolgreich umsetzen, 1997 Kasperzak, Methoden der Unternehmensbewertung, 2004. In: Littkemann/Zündorf (ed), Beteiligungscontrolling, pp. 357–379 **All books to be read in their latest editions.** **See updated lists of recommended literature in the course documents.**
Type of examination / requirements for award of credit	Written examination (duration: 120 min.) (= 75 %) and presentation of case studies (= 25 %)
Prerequisites	No specific prerequisites
Allocation to syllabus	Basic module within the master's programme, basis for specialisation modules

Special features (e.g. online courses, field trips in the industry, guest lectures)	Case study analysis

Module number	Module 6
Module name	Economic Analysis 2
Semester (or term, if applicable)	Semester 2
Duration	1 semester
Type of module (compulsory, elective etc.)	Core module
Courses (if applicable)	a) Geographical Economics b) Competition Policy
Number of offers	Once per academic year
Person responsible for the module	Prof. Dr. Philipp Freitag
Lecturer(s)	Prof. Dr. Philipp Freitag
Language of instruction	German and English
ECTS credits	6
Workload	150 h in total: approx. 60 h attendance, 90 h self-study
SWS	4
Weighting for overall grade	Bachelor of 6 semesters: 5.00 % of the total ECTS Bachelor of 7 semesters: 6.67 % of the total ECTS
Learning outcome	Having successfully completed the module, the students know options and conditions of corporate location policy. They understand the phenomenon of spatial agglomeration in business activity in certain countries and regions – and can explain the underlying operating mechanisms. The students are able to show and assess options in economic policy to influence global location decisions in businesses. The students can interpret national and international macroeconomic situations and take into account relevant conclusions for business decisions. This includes the effect of monetary policy interventions on interest and exchange rates.

Contents	• Methods of empirical site analysis • Application of management tools • Exogenous and endogenous reasons for agglomeration and the business location • Foreign trade theory • Foreign trade policy • Exchange rates and macroeconomics of open economies • Taxation and investment policies • Government interventions in the market mechanism
Forms of teaching and learning	Seminar-like course including exercises
Literature (compulsory / recommended)	Journal of Economic Geography (specialist journal) CPI – Competition Policy International (specialist journal) Beugelsdijk et al., International Economics and Business, 2nd edn, 2013 Bröcker/Fritsch (ed), Ökonomische Geographie, 2012 Coe/Kelly/Yeung, Economic Geography. A Contemporary Introduction, 2nd edn, 2013 Feenstra/Taylor, International Economics, 3rd edn, 2014 Homburg, Allgemeine Steuerlehre, 7th edn, 2015 Krugman/Obstfeld/Melitz, International Economics. Theory and Practice, 10th edn, 2014 Mankiw, Macroeconomics, 8th edn, 2013 Rosen/Gayer, Public Finance, 10th edn, 2014 **All books to be read in their latest editions.** **See updated lists of recommended literature in the course documents.**
Type of examination / requirements for award of credit	Written examination (duration: 90 min.)
Prerequisites	No specific prerequisites
Allocation to syllabus	Basic module within the master's programme, basis for specialisation modules
Special features (e.g. online courses, field trips in the industry, guest lectures)	Case studies

Module number	Module 7
Module name	Quantitative Methods 1
Semester (or term, if applicable)	Semester 1
Duration	1 semester
Type of module (compulsory, elective etc.)	Compulsory elective (support module)
Courses (if applicable)	Financial Modelling
Number of offers	Once per academic year
Person responsible for the module	Prof. Dr. Horst Peters
Lecturer(s)	Prof. Dr. Horst Peters
Language of instruction	German and English
ECTS credits	6
Workload	150 h in total: approx. 60 h attendance, 90 h self-study
SWS	4
Weighting for overall grade	Bachelor of 6 semesters: 5.00 % of the total ECTS Bachelor of 7 semesters: 6.67 % of the total ECTS
Learning outcome	Having successfully completed the module, the students can design computer-aided financial models in a business context and interpret the results. This includes choosing, adapting and estimating models based on data. They have expanded and intensified their knowledge of mathematical and statistical procedures, which they can use to • quantitatively analyse and model decision situations and • conclude recommended action. The students know the applicability of different procedures as well as the limitations of their validity. They are able to assess and manage entrepreneurial and especially financial risks, based on the different modelling approaches.

Contents	• Theory of decision-making in business studies • Data-based financial models • Portfolio modelling and asset pricing models • Stochastic risk models • Estimation techniques • Parametric simulation models • Practical implementation and application of models in spreadsheet software, especially MS Excel
Forms of teaching and learning	Seminar-like course including exercises
Literature (compulsory / recommended)	JFQA – Journal of Financial and Quantitative Analysis (specialist journal) MMOR – Mathematical Methods of Operations Research (specialist journal) ORS – OR Spectrum (specialist journal) Quantitative Finance (specialist journal) Albrecht/Huggenberger, Finanzrisikomanagement. Methoden zur Messung, Analyse und Steuerung finanzieller Risiken, 2015 Bamberg/Coenenberg/Krapp, Betriebswirtschaftliche Entscheidungslehre, 15th edn, 2012 Bösch, Derivate verstehen, anwenden und bewerten, 3rd edn, 2014 Gleißner, Grundlagen des Risikomanagements im Unternehmen. Mit besseren Informationen zu fundierten Entscheidungen, 3rd edn, 2016 Hull, Optionen, Futures und andere Derivate, 8th edn, 2012 Hull, Risikomanagement. Banken, Versicherungen und andere Finanzinstitutionen, 3rd edn, 2014 **All books to be read in their latest editions.** **See updated lists of recommended literature in the course documents.**
Type of examination / requirements for award of credit	Written examination (duration: 90 min.)
Prerequisites	No specific prerequisites
Allocation to syllabus	Basic module within the master's programme, basis for specialisation modules
Special features (e.g. online courses, field trips in the industry, guest lectures)	Guest lectures from practice and/or case studies

Module number	Module 8
Module name	Quantitative Methods 2
Semester (or term, if applicable)	Semester 2
Duration	1 semester
Type of module (compulsory, elective etc.)	Compulsory elective (support module)
Courses (if applicable)	Econometrics and Empirical Research Methods
Number of offers	Once per academic year
Person responsible for the module	Prof. Dr. Horst Peters
Lecturer(s)	Prof. Dr. Horst Peters
Language of instruction	German and English
ECTS credits	6
Workload	150 h in total: approx. 60 h attendance, 90 h self-study
SWS	4
Weighting for overall grade	Bachelor of 6 semesters: 5.00 % of the total ECTS Bachelor of 7 semesters: 6.67 % of the total ECTS
Learning outcome	The students are able to • apply econometric methods with real data, using statistics software (e.g. Excel, SPSS and R), • interpret the results and • critically discuss empirical research work. They know applicability and application requirements of • multivariate procedures in explorative data analysis (e.g. factor analysis, cluster analysis) as well as • procedures in confirmatory data analysis (e.g. regression analysis, discriminant analysis). They can practically apply their knowledge using statistics software (e.g. Excel, SPSS and R) for research and management purposes and interpret the results.
Contents	• Multivariate linear regression (application requirements, calculation, interpretation) • How to deal with invalid basic assumptions in regression (e.g. heteroscedasticity, autocorrelation and multicollinearity) • Advanced methods (e.g. dynamic models) • Application of econometric methods

	• Explorative procedures in data analysis (e.g. factor analysis, cluster analysis) • Confirmatory procedures in data analysis (e.g. regression models, discriminant analysis)
Forms of teaching and learning	Seminar-like course including exercises
Literature (compulsory / recommended)	Aaker/Kumar/Day/Leone, Marketing Research, 11th edn, 2012 Backhaus/Erichson/Plinke/Weiber, Multivariate Analyseverfahren, 13th edn, 2011 Backhaus/Erichson/Weiber, Fortgeschrittene Multivariate Analyseverfahren, 2nd edn, 2013 Berekoven/Eckert/Ellenrieder, Marktforschung, 10th edn, 2009 Briand/Hill, Using Excel for Principles of Econometrics, 4th edn, 2011 Groves et al., Survey Methodology, 2nd edn, 2009 Gujarati, Econometrics by example, 2nd edn, 2015 Gujarati/ Porter, Basic Econometrics, 5th edn, 2009 Härdle/Simar, Applied Multivariate Statistical Analysis, 2011 Hill/Griffiths/Lim, Principles of Econometrics, 4th edn, 2012 v. Auer, Ökonometrie. Eine Einführung, 6th edn, 2013 **All books to be read in their latest editions.** **See updated lists of recommended literature in the course documents.**
Type of examination / requirements for award of credit	Written examination (duration: 90 min.)
Prerequisites	No specific prerequisites
Allocation to syllabus	Basic module within the master's programme, basis for specialisation modules
Special features (e.g. online courses, field trips in the industry, guest lectures)	Guest lectures from practice and/or case studies

Module number	Module 9
Module name	Health Analytics
Semester (or term, if applicable)	Semester 3 or 4
Duration	1 semester
Type of module (compulsory, elective etc.)	Specialisation module
Courses (if applicable)	a) Health Economics and Healthcare Management b) Big Data in Healthcare
Number of offers	Generally once per academic year
Person responsible for the module	Prof. Dr. Philipp Freitag
Lecturer(s)	Prof. Dr. Philipp Freitag Adjunct lecturer
Language of instruction	German and English
ECTS credits	9
Workload	225 h in total: approx. 90 h attendance, 135 h self-study
SWS	6
Weighting for overall grade	Bachelor of 6 semesters: 7.50 % of the total ECTS Bachelor of 7 semesters: 10.00 % of the total ECTS
Learning outcome	Having successfully completed the module, the students know the essential internationally applied forms of organisation, financing and competition in healthcare systems. They are able to illustrate relevant incentive structures and challenges systemically and put them into an international context. The students know the fundamental methods of health economic evaluation and can apply them to practical cases. They master fundamental approaches and management instruments in healthcare. The students have gained an overview of available data sources, such as electronic patient records, social media, quantified self and data from the pharmaceutical industry. They master fundamental data-based analysis approaches and can apply them to practical cases. They understand the potential and limitations of data-based applications in healthcare. The students are able to fill management positions in healthcare organisations.
Contents	• Fundamental structures of financing and performance of healthcare systems in international comparison • Allocation and distribution issues in healthcare • Health economic evaluation • Management approaches and instruments in healthcare

	• Legal framework for the use of personal data • Data availability, quality and administration in healthcare • Development and application of health-related quality and performance indicators • Descriptive assessment and illustration methods • Predictive algorithms • Health analytics applications (in the IT laboratory)
Forms of teaching and learning	Seminar-like course including exercises
Literature (compulsory / recommended)	MMOR – Mathematical Methods of Operations Research (specialist journal) OR News (GOR magazine including specialist articles) ORS – OR Spectrum (specialist journal) ZEFQ – Zeitschrift für Evidenz, Fortbildung und Qualität im Gesundheitswesen (The Journal of Evidence and Quality in Health Care) (specialist journal) Bhattacharya/Hyde/Tu, Health Economics, 2014 Breyer/Zweifel/Kifmann, Gesundheitsökonomik, 6th edn, 2013 Burke, Health Analytics. Gaining the Insights to Transform Health Care, 2013 Busse/Blümel, Germany: Health system review. Health Systems in Transition, 16(2), pp. 1–296 Busse/Blümel/Ognyanova, Das deutsche Gesundheitssystem. Akteure, Daten, Analysen, 2013 Busse/Schreyögg/Stargardt, Management im Gesundheitswesen. Das Lehrbuch für Studium und Praxis. 3rd edn, 2013 Campbell/Brown, Cost-Benefit Analysis: Financial And Economic Appraisal Using Spreadsheets, 2015 Getzen, Health Economics and Financing, 5th edn, 2013 Langkafel (ed), Big Data in der Medizin und Gesundheitswirtschaft. Diagnose, Therapie, Nebenwirkungen, 2014 Rüping, Big Data in Medizin und Gesundheitswesen, 2015. In: Bundesgesundheitsblatt – Gesundheitsforschung – Gesundheitsschutz, August 2015, volume 58, issue 8, pp. 794–798 Strome, Healthcare Analytics for Quality and Performance Improvement, 2013 **All books to be read in their latest editions.** **See updated lists of recommended literature in the course documents.**
Type of examination / requirements for award of credit	Written examination (duration: 120 min.)
Prerequisites	No specific prerequisites
Allocation to syllabus	Builds on knowledge from the core and support modules, applies it in an industry-orientated manner Orientation for the master's thesis
Special features (e.g. online courses, field trips in the industry, guest lectures)	Guest lectures from practice

Module number	Module 10
Module name	Industry 4.0
Semester (or term, if applicable)	Semester 3
Duration	1 semester
Type of module (compulsory, elective etc.)	Specialisation module
Courses (if applicable)	Industry 4.0
Number of offers	Generally once per academic year
Person responsible for the module	Study programme director
Lecturer(s)	Prof. Dr. tba
Language of instruction	German and English
ECTS credits	9
Workload	225 h in total: approx. 90 h attendance, 135 h self-study
SWS	6
Weighting for overall grade	Bachelor of 6 semesters: 7.50 % of the total ECTS Bachelor of 7 semesters: 10.00 % of the total ECTS
Learning outcome	In the specialisation modules, the students have expanded their industry-specific, specialist and methodological expertise in business analytics topics. The specialisation modules teach relevant research methods and strategies. As a result, the students have improved specifically their research competences and required skills for doctoral studies. Working on application-based cases in the specialisation modules, the students have also refined their competences regarding • networking, • organisation and • their employability according to their individual strengths and interests In the specialisation module Industry 4.0, the participants have studied the potential and limitations of digitalisation in industrial production. This includes especially the possibilities of greatly individualised products in highly flexible series production. The students understand approaches to • include customers and business partners in business and value-added processes and

	• incorporate high-quality services to production. They know suitable monitoring and decision processes and their developments which allow companies to control and optimise value-added networks – almost in real time.
Forms of teaching and learning	Seminar-like course including exercises
Contents	• Fundamentals of production economics and industrial enterprises • Traditional production planning and controlling systems • Integrated production management • Cyber-physical production systems (CPPS) • Suitable IT infrastructure and networks • IT integration in production processes • IT security in digitalised industrial production • Best practices and profitability analysis • Standardisation efforts and reference architectures for industry 4.0
Literature (compulsory / recommended)	Adam, Produktions-Management, 9th edn, 2013 Bauernhansl, Industrie 4.0 in Produktion, Automatisierung und Logistik, 2014 Deuse u.a., Gestaltung von Produktionssystemen im Kontext von Industrie 4.0, 2014 Fachausschuss Industrie 4.0 VDI/VDA GMA, Begrifflichkeiten um Industrie 4.0 – Ordnung im Sprachwirrwarr, 2014 Gutenberg, Grundlagen der Betriebswirtschaftslehre, 1. Band: Die Produktion, 24th edn, 1984 Härting u.a., Nutzenpotenziale von Industrie 4.0: Einblicke in aktuelle Studienergebnisse, 2015 Kagermann, Chancen von Industrie 4.0 nutzen, 2014 Kaufmann, Geschäftsmodelle in Industrie 4.0 und dem Internet der Dinge, 2015 Köhler-Schute, Industrie 4.0: Ein praxisorientierter Ansatz, 2015 Müller, Manufacturing Execution Systeme (MES): Status Quo und Ausblick in Richtung Industrie 4.0, 2015 Scheer, Industrie 4.0, 2013 **All books to be read in their latest editions.** **See updated lists of recommended literature in the course documents.**
Type of examination / requirements for award of credit	Written examination (duration: 120 min.)
Prerequisites	No specific prerequisites
Allocation to syllabus	Builds on knowledge from the core and support modules, applies it in an industry-orientated manner Orientation for the master's thesis
Special features (e.g. online courses, field trips in the industry, guest lectures)	Guest lectures from practice and, if possible, simulation

Module number	Module 11
Module name	Marketing Analytics
Semester (or term, if applicable)	Semester 3 or 4
Duration	1 semester
Type of module (compulsory, elective etc.)	Specialisation module
Courses (if applicable)	a) Digital Marketing b) Marketing Controlling
Number of offers	Generally once per academic year
Person responsible for the module	Prof. Dr. Olexiy Khabyuk (temporarily)
Lecturer(s)	Prof. Dr. Olexiy Khabyuk Adjunct lecturer
Language of instruction	German and English
ECTS credits	9
Workload	225 h in total: approx. 90 h attendance, 135 h self-study
SWS	6
Weighting for overall grade	Bachelor of 6 semesters: 7.50 % of the total ECTS Bachelor of 7 semesters: 10.00 % of the total ECTS
Learning outcome	The students have gained an overview of tasks and decision dimensions of strategic and operative marketing planning, marketing organisation and marketing control. They know the specifics of marketing in an international context and understand potential interdependency issues. They have learned the specifics of cross-country service marketing for market entry (Going International) and continuous operations (Being Global). They know approaches coordinating national markets, approaches of international differentiation and standardisation of marketing instruments. The students know and can apply tasks, instruments and methods in marketing controlling, which they understand as • subsystem of the management system 'marketing' and • subsystem of controlling. They are able to identify, classify and develop solution approaches for strategic and operative issues in marketing controlling. They can compare and assess the potential and limitations of the established and latest solution approaches in marketing controlling. The students have studied instruments and methods of marketing controlling to solve marketing issues purposefully in practice – in national and international contexts.

	In practical examples and case studies, they have learned to work on and assess concrete marketing issues regarding strategic and operative implications.
Contents	• Strategic marketing approaches • Fundamentals of operative marketing • Strategies for international market entry and operations • Standardisation vs differentiation of marketing instruments • Digital marketing • Introduction to marketing controlling • Information systems as basis for marketing controlling • Instruments of marketing controlling • Identification and analysis of customer profiles • Target group definition • Customer lifecycle analysis and controlling
Forms of teaching and learning	Participative, seminar-like course including typical examples and case studies, individual and group research, exercises as well as presentations
Literature (compulsory / recommended)	Absatzwirtschaft (specialist journal) JMR – Journal of Marketing Research (specialist journal) Journal of Marketing (specialist journal) Backhaus/Voeth, Internationales Marketing, 6th edn, 2010 Berndt/Fantapie-Altobelli/Sander, Internationales Marketing-Management, 4th edn, 2010 Bruhn, Marketing. Grundlagen für Studium und Praxis, 12th edn, 2014 Busch (ed), Realtime Advertising. Digitales Marketing in Echtzeit: Strategien, Konzepte und Perspektiven, 2014 Czinkota/Ronkainen, International Marketing, 10th edn, 2012 Homburg, Marketingmanagement: Strategie – Instrumente – Umsetzung – Unternehmensführung, 5th edn, 2015 Kotabe/Helsen, Global Marketing Management, 6th edn, 2015 Link/Weiser, Marketing-Controlling. Systeme und Methoden für mehr Markt und Unternehmenserfolg, 2014 Meffert/Burmann/Kirchgeorg, Marketing. Grundlagen marktorientierter Unternehmensführung. Konzepte – Instrumente – Praxisbeispiele, 12th edn, 2015 Scharf/Schubert/Hehn, Marketing. Einführung in Theorie und Praxis, 5th edn, 2012 Schwarz, Big Data im Marketing. Chancen und Möglichkeiten für eine effektive Kundenansprache, 2015 Zentes/Swoboda/Schramm-Klein, Internationales Marketing, 3rd edn, 2013 Ziegenbein, Controlling, 10th edn, 2010 Ziehe, Marketing-Controlling, 2013 **All books to be read in their latest editions.** **See updated lists of recommended literature in the course documents.**
Type of examination / requirements for award of credit	Written examination (duration: 90 min.) (= 75 %), written assignment including presentation (= 25 %)

Prerequisites	No specific prerequisites
Allocation to syllabus	Builds on knowledge from the core and support modules, applies it in an industry-orientated manner Orientation for the master's thesis
Special features (e.g. online courses, field trips in the industry, guest lectures)	Guest lectures from practice Simulation

Module number	Module 12
Module name	Supply Chain Analytics
Semester (or term, if applicable)	Semester 3 or 4
Duration	1 semester
Type of module (compulsory, elective etc.)	Specialisation module
Courses (if applicable)	a) Introduction to Supply Chain Management b) Supply Chain Planning and Controlling
Number of offers	Generally once per academic year
Person responsible for the module	Prof. Dr. Peter Scheideler
Lecturer(s)	Prof. Dr. Peter Scheideler
Language of instruction	German and English
ECTS credits	9
Workload	225 h in total: approx. 90 h attendance, 135 h self-study
SWS	6
Weighting for overall grade	Bachelor of 6 semesters: 7.50 % of the total ECTS Bachelor of 7 semesters: 10.00 % of the total ECTS
Learning outcome	Having successfully completed the module, the students understand supply chain management as a concept which integrates different intra- and inter-institutional areas. They have gained an overview of supply chain management as process-orientated approach and its coordination function. The students are able to form supply chain networks, develop and apply planning models and optimise the supply chain. In this context, the module focusses especially on collaboration concepts (interlinked thinking, cooperation) for the supply chain participants (suppliers, original equipment manufacturers (OEM), logistics provider, traders etc.). The students understand and can apply different collaboration concepts, such as collaborative planning, forecasting and replenishment (CPFR), efficient consumer response (ECR), just-in-time (JIT) or vendor managed inventory. They have also looked at how the supply chain can contribute to sustainable economy and reducing CO2 emissions.

Contents	• Supply chain operations reference (SCOR) model • Transport systems, types and processes • Logistics cooperation and logistics networks • Network design • Product range optimisation • Advanced planning and scheduling (APS) systems • Performance key figures and drivers • Demand and stock management • Warehouse management • Sustainability in the supply chain
Forms of teaching and learning	Seminar-like course including exercises
Literature (compulsory / recommended)	IJBAN – International Journal of Business Analytics (specialist journal) ORS – OR Spectrum (specialist journal) Arndt, Supply Chain Management, Optimierung logistischer Prozesse, 2013 Chopra/Meindl, Supply Chain Management – Strategy, Planning, and Operation, 6th edn, 2015 Feigin, Supply Chain Planning and Analytics, 2011 Jacobs/Chase, Operations and Supply Chain Management, 2013 Watson/Lewis/Cacioppi/Jayaraman, Supply Chain Network Design: Applying Optimization and Analytics to the Global Supply Chain, 2012 **All books to be read in their latest editions.** **See updated lists of recommended literature in the course documents.**
Type of examination / requirements for award of credit	Written examination (duration: 120 min.)
Prerequisites	No specific prerequisites
Allocation to syllabus	Builds on knowledge from the core and support modules, applies it in an industry-orientated manner Orientation for the master's thesis
Special features (e.g. online courses, field trips in the industry, guest lectures)	Practical examples (business cases) for the students to apply their acquired knowledge to practice

Module number	Module 13
Module name	Auditing and Risk Management
Semester (or term, if applicable)	Semester 3
Duration	1 semester
Type of module (compulsory, elective etc.)	Specialisation module
Courses (if applicable)	a) Auditing b) Risk Management
Number of offers	Generally once per academic year
Person responsible for the module	Prof. Dr. Christoph Voos
Lecturer(s)	Prof. Dr. Christoph Voos Prof. Dr. Marcus Albrecht
Language of instruction	German
ECTS credits	9
Workload	225 h in total: approx. 90 h attendance, 135 h self-study
Type of examination / requirements for award of credit	Written assignment and presentation
SWS	6
Weighting for overall grade	Bachelor of 6 semesters: 7.50 % of the total ECTS Bachelor of 7 semesters: 10.00 % of the total ECTS
Learning outcome	In this specialisation module, the students have studied academic and practice-orientated aspects of information-based corporate governance – from the practical areas of auditing and internal revision, fraud and risk management. Thus, they have expanded their industry-specific, specialist and methodological expertise. The students know the (legal) frameworks of risk management, fraud management and compliance (in different industries). Based on this knowledge, they can assess and improve risk management and compliance systems. The students can apply process models and suitable analysis instruments to properly analyse and influence the economic and forensic corporate risk situation. In addition, They have learned about relevant research methods and strategies. As a result, the students have improved specifically their research competences and required skills for doctoral studies.

	Especially working on practical problems and case studies, they have expanded and practised their leadership, analysis, communication and presentation skills – according to their individual strengths and interests.
Contents	• Analytical auditing methods • Fraud protection, fraud triangle, fraud diamond • Preventive measures (organisation, internal control system (ICS), communication etc.) • Detective measures (forensic auditing, mass data analysis, whistle-blowing, compliance audits) • Reactive measures (emergency plan, special audits, e-discovery and computer forensics, asset tracing) • Forensic data backup and analyses • Overview of objectives, tasks and instruments in risk management • Types and effects of risks • Risk controlling and management as controlling tasks • Organisation of risk management systems • Methods and techniques for risk identification • Methods and techniques for risk assessment (especially value at risk (VaR)) • Strategies, instruments and techniques for risk mitigation • Development and implementation of early warning systems • Other topical subjects according to current developments in science and practice
Forms of teaching and learning	• Seminar-like course including exercises • Work on case studies and topical issues • Presentations
Literature (compulsory / recommended)	Basic literature: • Deggendorfer Forum zur digitalen Datenanalyse e. V. (ed): Digitale Datenanalyse, Interne Revision und Wirtschaftsprüfung • Eller/Heinrich et al. (ed), Kompaktwissen Risikomanagement, Wiesbaden 2010 • Freidank/Müller et al. (ed), Controlling und Rechnungslegung. Aktuelle Entwicklungen in Wissenschaft und Praxis • Hannemann/Schneider/Weigl, Mindestanforderungen an das Risikomanagement, 4th edn, Stuttgart 2013 • Hlavica/Hülsberg et al. (ed), Tax Fraud & Forensic Accounting: Umgang mit Wirtschaftskriminalität • Hofmann, Handbuch Anti-Fraud-Management: Bilanzbetrug erkennen – vorbeugen – bekämpfen • Hull, Risikomanagement, 3rd edn, Munich 2014 • Krommes, Handbuch Jahresabschlussprüfung: Ziele – Technik – Nachweise • Löhr/Burkatzki (ed): Wirtschaftskriminalität und Ethik • Meyer, Forensische Datenanalyse: Dolose Handlungen im Unternehmen erkennen und aufdecken

	• Oehler/Unser, Finanzwirtschaftliches Risikomanagement, Berlin et al. 2001 • Romeike/Hager, Erfolgsfaktor Risiko- Management 3.0: Methoden, Beispiele, Checklisten – Praxishandbuch für Industrie und Handel, Wiesbaden 2013 • Schierenbeck/Lister/Kirmße, Ertragsorientiertes Bankmanagement, volume 2: Risikocontrolling und integrierte Rendite-Risiko-Steuerung, Wiesbaden 2008 • Wiedmann/Heckemüller, Ganzheitliches Corporate Finance Management **More literature according to announcements in the course.** **All books to be read in their latest editions.** **See updated lists of recommended literature in the course documents.**

Module number	Module 14
Module name	Project Module
Semester (or term, if applicable)	Semester 3
Duration	1 semester
Type of module (compulsory, elective etc.)	Transferable skills module
Courses (if applicable)	Project Module Seminar
Number of offers	Once per semester
Person responsible for the module	Study programme director
Lecturer(s)	tba (Faculty of Business Studies) tba (project partner)
Language of instruction	Generally German
ECTS credits	21
Workload	525 h in total: approx. 90 h attendance, 435 h self-study
SWS	6
Weighting for overall grade	Bachelor of 6 semesters: 17.50 % of the total ECTS
Learning outcome	The independent work on a specific assignment in the area of business analytics has enabled the students to perform academically based work independently. They have learned to place their projects within the current research environment. They have gained new insight applying academic methodology, derived and presented results applicable to practice. The students have acquired in-depth knowledge of the specialist subject they worked on. Due to the complexity and duration of the project work, they have practised their project and time management skills.
Forms of teaching and learning	Seminar and project work
Contents	• Academic methodology • Project management and time management • Independent work on a specific subject and a project-based, academic assignment within the area of business analytics • Preparing and presenting project results

Literature (compulsory / recommended)	Oehlrich, Wissenschaftliches Arbeiten und Schreiben. Schritt für Schritt zur Bachelor- und Master-Thesis in den Wirtschaftswissenschaften, 2015 Stöger, Wirksames Projektmanagement. Mit Projekten zu Ergebnissen, 3rd edn, 2011 Theisen, Wissenschaftliches Arbeiten. Erfolgreich bei Bachelor- und Masterarbeit, 16th edn, 2013 Timinger, Wiley-Schnellkurs Projektmanagement, 2015 Additional recommended literature depending on the project's topic **All books to be read in their latest editions.** **See updated lists of recommended literature in the course documents.**
Type of examination / requirements for award of credit	Written assignment and presentation of the research results
Prerequisites	No specific prerequisites
Allocation to syllabus	Builds on knowledge from the core and support modules, applies it in a practice- and industry-orientated manner Orientation for the master's thesis
Special features (e.g. online courses, field trips in the industry, guest lectures)	If possible, cooperation with companies and research institutions

Module number	Module 15 and 16
Module name	Master's Thesis including Colloquium
Semester (or term, if applicable)	Semester 3 or 4
Duration	1 semester
Type of module (compulsory, elective etc.)	Transferable skills module
Courses (if applicable)	-
Number of offers	Once per semester
Person responsible for the module	Study programme director
Lecturer(s)	Supervisor
Language of instruction	German and English
ECTS credits	21
Workload	525 h in total
SWS	-
Weighting for overall grade	Bachelor of 6 semesters: 17.50 % of the total ECTS Bachelor of 7 semesters: 23.33 % of the total ECTS
Learning outcome	Having successfully completed the module, the students can independently work on a problem case in business analytics, e.g. in a business context. Applying academic methods, they are able to achieve new results. They have expanded and refined their specialist skills and academic methodology acquired during the bachelor's and master's programmes. The students are able to assess, document and present their own work results. Working on practical cases, they have acquired specialist skills in the respective topic, which provided orientation for career options.
Forms of teaching and learning	-
Contents	• Choosing an assignment within the field of study and compiling a written academic report on it • Presenting the content and results, justifying the master's thesis in a colloquium

Literature (compulsory / recommended)	Oehlrich, Wissenschaftliches Arbeiten und Schreiben. Schritt für Schritt zur Bachelor- und Master-Thesis in den Wirtschaftswissenschaften, 2015 Theisen, Wissenschaftliches Arbeiten. Erfolgreich bei Bachelor- und Masterarbeit, 16th edn, 2013 Additional literature depending on the chosen subject
Type of examination / requirements for award of credit	Written assignment and oral examination
Prerequisites	No specific prerequisites
Allocation to syllabus	Builds on knowledge from the core and support modules, applies it in a practice- and industry-orientated manner
Special features (e.g. online courses, field trips in the industry, guest lectures)	If possible, cooperation with companies and research institutions