CONSTRUCTOR UNIVERSITY

Study Program Handbook

International Business Administration

(online)

Bachelor of Arts

Subject-specific Examination Regulations for International Business Administration (online) (Fachspezifische Prüfungsordnung)

The subject-specific examination regulations for International Business Administration (online) are defined by this program handbook and are valid only in combination with the General Examination Regulations for Undergraduate degree programs (General Examination Regulations = Rahmenprüfungsordnung). This handbook also contains the program-specific Study and Examination Plan (Chapter 6).

Upon graduation, students in this program will receive a Bachelor of Arts (BA) degree with a scope of 180 ECTS (for specifics see Chapter 4 of this handbook).

Disclaimer: This version of the Handbook for International Business Administration (online) has been accepted by the Academic Senate of Constructor Univesrity on September 27th, 2023. Changes to the program may still occur as a function of practical and accreditation-related requirements.

Version	**Valid as of**	**Decision**	**Details**
Fall 2024 – V2		Jan 31, 2024	Module achievements changes approved by AS
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1 Program Overview

1.1 Concept

1.1.1 Constructor University Educational Concept

Constructor University aims to educate students for both an academic and a professional career by emphasizing three core objectives: academic excellence, personal development, and employability to succeed in the working world. Constructor University offers an excellent research driven education experience across disciplines to prepare students for graduate education as well as career success by combining disciplinary depth and interdisciplinary breadth with supplemental skills education and extra-curricular elements. Through a multi-disciplinary, holistic approach and exposure to cutting-edge technologies and challenges, Constructor University develops and enables the academic excellence, intellectual competences, societal engagement, professional and scientific skills of tomorrow's leaders for a sustainable and peaceful future.

In this context, it is Constructor University's aim to educate talented young people from all over the world, regardless of nationality, religion, and material circumstances, to become citizens of the world who can take responsible roles for the democratic, peaceful, and sustainable development of the societies in which they live. This is achieved through high-quality teaching, manageable study loads and supportive study conditions. Study programs convey academic knowledge as well as the ability to interact positively with other individuals and groups in culturally diverse environments. The ability to succeed in the working world is a core objective for all study programs at Constructor University, both in terms of actual disciplinary subject matter and social skills and intercultural competence. Study-program-specific modules and additional specializations provide the necessary depth, interdisciplinary offerings provide breadth while the university-wide general foundation and methods modules, optional German language and Humanities modules, and an extended internship period strengthen the employability of students. In addition, Constructor University offers professional advising and counseling.

Constructor University's educational concept is highly regarded both nationally and internationally. While the university has consistently achieved top marks over the last decade in Germany's most comprehensive and detailed university ranking by the Center for Higher Education (CHE), it has also been listed by the renowned Times Higher Education (THE) magazine as one of the top 300 universities worldwide (ranking group 251-300) in 2019 as well as in 2021. Since 2022 Constructor University is considered to be among the top 30 percent out of more than 1600 universities worldwide and is ranked the most international university in Germany. The THE ranking is considered as one of the most widely observed university rankings. It is based on five major indicators: research, teaching, research impact, international orientation, and the volume of research income from industry.

1.1.2 Program Concept

The International Business Administration (online) study program's mission is to prepare students for their professional occupations in internationally active organizations ranging from small, innovative start-ups to large multinational enterprises. Business are active agents of change, using cross-border transactions, such as trade and investments, to shape the future of our globalized world. To succeed in this environment, managers need to understand the nature of international business activities in order to handle the challenges of international companies. The International Business Administration

(online) study program, is designed for young scholars from all over the world who share an interest in business activities, management, or entrepreneurship in an international context.

The program covers all essential areas of international business and management, combining theoretical knowledge, practical application, and scientific methods. Half of the modules in the first-year focus on the foundations of international business administration, such as management concepts and theories of internationalization of firms, as well as the principles of finance and accounting. The other half of the first-year modules introduce micro- and macro-economic theories. The combination of business administration and economics in their first study year allows students to understand the interactions between the activities of individual firms and their economic environment. In the second year, the modules in the International Business Administration (online) study program are designed to allow students to deepen their own academic profile. The core topics of international business administration are conveyed through combinations of different perspectives, such as digitalization and global e-commerce, entrepreneurship and innovation, international strategic management, project management, marketing, and organizational and human resource management. The combination of these perspectives shapes the individual student's profile while simultaneously ensuring a multifaceted understanding of international business administration. The final year of the International Business Administration (online) study program allows students to sharpen their profiles by letting them choose three specialization modules each of which places more emphasizes on the perspectives offered in the second year of studies.

To expose students to international business administration theories, to their application and to the latest scientific methods in this field, the program applies a combination of lectures, tutorials, and case studies and fosters an informed, comparative, and critical understanding of common business practices, problems, and values in an international, diverse context. The program is designed in a way that fits for students with or without prior work experience.

1.2 Specific Advantages of International Business Administration (online) at Constructor University

Right from the start, the International Business Administration (online) study program exposes students to the challenges of international business. Challenging case studies of real companies require students to develop creative solutions in intercultural teams that are supported within the live tutorials. Tackling real-world challenges is an integral part of the study program. Throughout the study program, students are exposed to transnational and culturally diverse topics from a variety of industries. This intense exposure to real challenges of international companies combined with a carefully designed mixture of self-study and groupwork in international teams is a unique advantage of the International Business Administration (online) study program at Constructor University. Graduates will be prepared to take on managerial responsibilities in international companies as well as to join and undertake internationally prestigious master's programs in International Business or Management.

1.3 Program-specific Educational Aims

1.3.1 Qualification Aims

The International Business Administration (online) study program examines the key questions of international companies and seeks to explain how these companies operate and coordinate their activities in a globalized world. The scientific education provided by the program focuses on qualitative and quantitative techniques. The unique aspect of the IBA program lies in the international focus and the opportunity to gain a global perspective on areas such as entrepreneurship, management, economics, and finance and to help students learn about business practices in cultures around the globe.

Due to the aspects of independent, self-governed knowledge acquisition, the students are prepared for life-long learning, where additional knowledge and skills will be acquired or updated in a regular fashion, especially in international business administration.

By being part of an international online community, students can work with scholars and peers from a wide range of nationalities and cultural backgrounds, thus learning to work in multinational teams. This will also contribute to their personal development, by shaping their attitudes while they learn to engage with various types of people as they will do later in their academic and professional endeavors.

The main subject-specific qualification of the International Business Administration (online) program is to enable learners from all over the world to acquire knowledge and skills in the context of business activities, management and entrepreneurship. The program covers all essential areas of international business and management and combines theoretical knowledge, practical application and scientific methods. Graduates of the program will achieve the following competencies:

- Scientific proficiency
  Graduates are enriched with theoretical knowledge and practical skills in international business, management, entrepreneurship, e-business, accounting & finance, economics, project management, international strategic management, organizational theories, and human resource management.

- Competencies for qualified employment
  The online program of International Business Administration prepares the graduates with interpersonal skills, various research methods, leadership competencies, employability skills which are embedded in the internship / start-up offerings.

- Development of personality
  The program equips graduates with innovative thinking experience, critical analytical skills, independent learning skills, as well as experience in working with others in a team setting.

- Competencies for engagement in society
  The program offers learning opportunities in individual settings as well as learning in an online community. It enables students to acquire competencies in organizational skills, time management, taking on responsibility in a diverse and remote team, engaging with peers and scholars from various cultural backgrounds across the global.

- Communication competencies
  Graduates are able to communicate subject-specific topics convincingly in both spoken and written form to fellow IBA specialists in an online environment.

- Teamwork and project management competencies
  Graduates are able to work effectively in a (remote) team and they are able to organize workflows in complex development efforts.

- Learning competencies
  Enabled with online learning platforms and technologies, graduates have acquired a solid foundation which helps to assess their own knowledge and skills, learn effectively, and remain up-to-date with the latest developments in the rapidly evolving field of International Business Administration.

- Personal and professional competencies
  Graduates are able to develop a professional profile, justify professional decisions based on theoretical and methodical knowledge, and critically reflect on their behavior with respect to their consequences for society.

- Management competence
  Graduates have obtained advanced business and management knowledge allowing them to work in a corporate environment.

1.3.2 Intended Learning Outcomes

The main subject-specific qualification aim is to enable students to take up qualified employment in modern industries involving digitalization and information technology or to enter graduate programs related to International Business or Management.

By the end of the online program students will be able to:

1. critically discuss and apply modern theories of business and economics;
2. explain the organizational behavior of Multinational Enterprises (MNE), Small and Medium Sized Enterprises (SME) and other organizations in diverse cultural and economic environments;
3. discuss how the political, economic, social, and technological environment affects business functions in a globalized world;
4. apply principles of international strategy to evaluate and solve challenges of transnational business activities;
5. apply the principles of marketing, organization and human resource management to evaluate and solve challenges of cross-cultural stakeholders inside and outside a company;
6. utilize the principles of finance and accounting to describe and evaluate the financial performance of companies;
7. defend solutions in discussions with specialists and non-specialists;
8. utilize entrepreneurial thinking in a variety of situations such as the development of business models and startups;

9. consider the social responsibility and ethical behavior of individuals, organizations and governments;
10. use advanced statistical software and methods in research and business;
11. work as effective members of a remote team and manage projects effectively;
12. structure and communicate complex issues;
13. communicate professionally with a consideration of the content and audience;
14. engage ethically with academic, professional, and wider communities and actively contribute to a sustainable future, reflecting and respecting different views;
15. take responsibility for their own learning, personal and professional development, and role in society, evaluating critical feedback and performing self-analysis;
16. apply their knowledge and understanding to a professional context;
17. take on responsibility in a diverse and remote team;
18. adhere to and defend ethical, scientific, and professional standards.

1.3.3 Online teaching and learning

1.3.3.1 General Framework

Constructor University online study programs focus on the holistic learning success of students and offer a variety of synchronous and asynchronous formats that align with problem- and project-based learning.

The online bachelor program in International Business Administration applies proven and effective teaching and learning modalities that engage distance learners and support a vibrant learning community. This means that students participate in online courses with predominantly asynchronous lectures and learning activities that are complemented by synchronous tutorials and hands-on sessions.

Students are guided and supported by faculty as well as experienced tutors and lecturers to transfer acquired knowledge into practice. The hands-on elements include dedicated collaboration with other students through the use of tools and concepts that enable distributed work from different places and different time-zones.

Students enrolled in online study programs will find their course materials such as videos, case studies, scholarly articles, websites, podcasts, online games etc. on a Learning Management Software (LMS) platform provided by Constructor University.

1.3.3.2 Student Workload

Module sizes range from 2.5 to 7.5 CP, identical to the on-campus study programs, allowing students to switch from the online program to the on-campus one within the first year. Studying in an online program at Constructor University involves students actively participating in reading, preparing assignments, meeting with peers on task/group projects, synchronous tutor sessions, and watching the required videos.

The terms used in the module data sheets that refer to student workload are defined as follows:

- Asynchronous Self-study = time that that student uses in predefined study contents on digital platforms. Main goal is to acquire content and methods.
- Interactive Learning = time that students spend in a synchronous manner with tutors and in study groups or working on group projects.
- Independent Study = time that students use with recommended further study content and first application of acquired knowledge.
- Assessment preparation = Application of acquired knowledge to specific problems that serve as examples of typical exam questions or writing term papers, designing presentations, etc.

1.3.3.3 Academic Tutors

Academic tutors specifically support the instructor of records and students within the undergraduate program in their asynchronous teaching and learning. They hold tutorial sessions for online students (individually or in groups) and serve as a first point of contact for student concerns and questions regarding asynchronous learning material and their learning process. In this way, we guarantee that all students, regardless of the global time zone in which they live, can be fully supported by Constructor University.

1.3.3.4 Assessment and Grading

In Constructor University's online study programs, we particularly emphasize formative forms of assessment. Formative assessment is used to monitor and evaluate how students are learning as they work through a module or study program. It is designed to help students learn more effectively by giving them feedback on their performance and on how it can be improved and/or maintained. It may be marked pass-fail, complete-incomplete, or other rating scale as part of the requirement to qualify for or participate in the final assessment. There are also similar assessment formats, so-called summative assessment with a final grade at the end of the course as in the on-campus teaching, e.g. written exams, presentations, and lab reports.

Any type of assessment may be conducted electronically or complemented by electronic and online assessment and submission elements. This includes computerized testing in a test center, video interviews, online/electronic submission and other formats which use electronic systems and/or devices. For computerized assessments, students will be offered an introduction to the system used to familiarize themselves with it.

1.3.3.5 Learning Management Software

Constructor University's online classes are supported by technology that includes a learning management system (LMS) and additional education technology tools that may be integrated into the LMS or offered as an alternative environment for students to engage in or to apply their knowledge and skills and to participate in simulations. The LMS includes discussion forums, assignments and quizzes, a gradebook, calendars, instructor and student dashboards. Additional tools offered may include video or document annotations, virtual labs for a variety of technical skills, gamified experiences, and more. The LMS and some associated tools enable timely communication to the students that can support time management and motivation to engage in their course work. The students will have access to applications that enable group work and peer-to-peer communication.

1.4 Career Options

With its clear focus on the management of firms in international business activities, students acquire solid labor-market qualifications for careers in a broad range of businesses, especially international and internationalizing firms. The IBA (online) study program takes our graduates onto a rich diversity of career paths. The academic rigor of the program also prepares students for highly ranked graduate programs, such as University of St. Gallen, IE Madrid or University of Amsterdam.

Due to their experience working remotely with students from across the world, IBA online graduates are well prepared to take on responsibility in intercultural work environments.

The Career Service Center (CSC) helps students in their career development. It provides students with high-quality training and coaching in CV creation, cover letter formulation, interview preparation, effective presenting, business etiquette, and employer research as well as in many other aspects, thus helping students identify and follow up on rewarding careers after graduating from Constructor University. Furthermore, the Alumni Office helps students establish a long-lasting and global network which is useful when exploring job options in academia, industry, and elsewhere.

1.5 Admission Requirements

Admission to Constructor University is selective and based on a candidate's school and/or university achievements, recommendations, self-presentation, and performance on standardized tests. Students admitted to Constructor University demonstrate exceptional academic achievements, intellectual creativity, and the desire and motivation to make a difference in the world.

The following documents need to be submitted with the application:

- Recommendation Letter (optional)
- Official or certified copies of high school/university transcripts
- Educational History Form
- Standardized test results (SAT/ACT) if applicable
- Motivation statement
- ZeeMee electronic resume (optional)
- Language proficiency test results (TOEFL Score: 90, IELTS: Level 6.5 or equivalent)

Formal admission requirements are subject to higher education law and are outlined in the Admission and Enrollment Policy of Constructor University.

For more detailed information about the admission visit: https://constructor.university/admission-aid/application-information-undergraduate

1.6 More information and contacts

For more information, please contact the study program chair:

Dr. Meckel, Matthias

Distinguished Lecturer in Business

Email: mmeckel@constructor.university

or visit our website: International Business Administration | Constructor University

2 The Curricular Structure

2.1 General

The curricular structure provides multiple elements for enhancing employability, interdisciplinarity, and internationality. The unique CONSTRUCTOR Track, offered across all undergraduate study programs, provides comprehensive tailor-made modules designed to achieve and foster career competency. Additionally, a mandatory internship of at least two months after the second year of study give students opportunities to gain insight into the professional world, apply their intercultural competences and reflect on their roles and ambitions for employment and in a globalized society.

All undergraduate programs at Constructor University are based on a coherently modularized structure, which provides students with an extensive and flexible choice of study plans to meet the educational aims of their major and complete their studies within the regular period.

The framework policies and procedures regulating undergraduate study programs at Constructor University can be found on the website (https://constructor.university/student-life/student-services/university-policies)

2.2 The Constructor University 4C Model

Constructor University offers study programs that comply with the regulations of the European Higher Education Area. All study programs are structured according to the European Credit Transfer System (ECTS), which facilitates credit transfer between academic institutions. The three-year undergraduate programs involve six semesters of study with a total of 180 ECTS credit points (CP). The undergraduate curricular structure follows an innovative and student-centered modularization scheme, the 4C Model. It groups the disciplinary content of the study program in three overarching themes, CHOICE-CORE-CAREER according to the year of study, while the university-wide CONSTRUCTOR Track is dedicated to multidisciplinary content dedicated to methods as well as intellectual skills and is integrated across all three years of study. The default module size is 5 CP, with smaller 2.5 CP modules being possible as justified exceptions, e.g., if the learning goals are more suitable for 2.5 CP and the overall student workload is balanced.

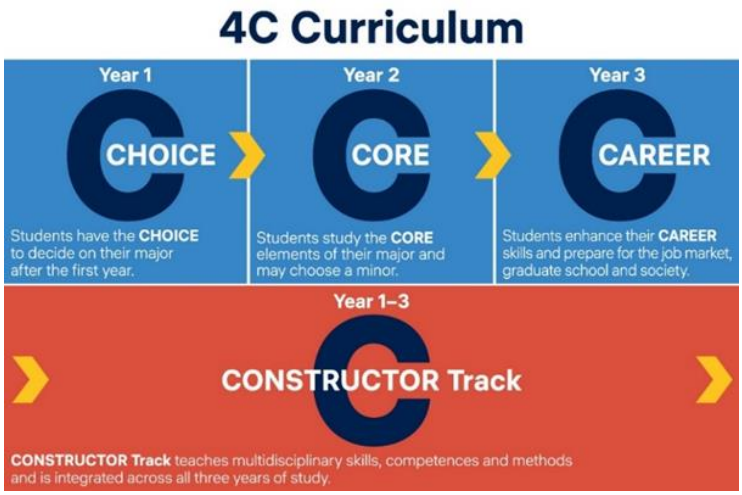

Figure 1: The Constructor University 4C-Model

2.3 The Curriculum

2.3.1 Year 1 – CHOICE

The first study year is characterized by a university-specific offering of disciplinary education that builds on and expands upon the students' entrance qualifications. Students select introductory modules for a total of 45 CP from the CHOICE area of a variety of study programs, of which 15-45 CP will belong to their intended major. A unique feature of our curriculum structure allows students to select their major (online) freely after admission to Constructor University. The team of Academic Advising Services offers curriculum counseling to all Bachelor students independently of their major, while Academic Advisors, in their capacity as contact persons from the faculty, support students individually in deciding on their major study program.

To pursue International Business Administration (online) as a major, students take the following mandatory (m) CHOICE modules (30 CP)

- CHOICE Module: Introduction to International Business (m, 7.5 CP)
- CHOICE Module: Microeconomics (m, 7.5 CP)
- CHOICE Module: Introduction to Finance and Accounting (m, 7.5 CP)
- CHOICE Module: Macroeconomics (m, 7.5 CP)

The combination of business administration and economics allows students to understand the interactions between the activities of individual firms and their economic environments. Thereby, the business administration related modules (Introduction to International Business, Introduction to Finance and Accounting) lay the foundation of all relevant business functions. Applied Calculus and Applied Statistics with R, likewise, introduce the quantitative elements of the study program on an introductory level.

In addition to these modules, students have to select another 15 CP as mandatory electives (me) either from:

Industrial Engineering and Management (IEM) (online)

- First semester: General Logistics (me, 7.5 CP)
- Second semester: General Industrial Engineering (me, 7.5 CP) or

Data Science (DS) online

- First semester: Introduction to Data Science (me, 7.5 CP),
- Second semester: Data Structures and Processing (me, 7.5 CP).

Both options allow students to broaden their studies with complementary knowledge that is highly relevant within the field of business administration. The students have the opportunity to choose further 15 CP in the second year in the above mentioned mandatory elective study programs and thus complete a minor (see 2.3.2 for more information).

Students can still change to another major at the beginning of their second year of studies, provided they have taken the corresponding mandatory CHOICE modules in their first year of studies. All students must participate in an entry advising session with their Academic Advisors to learn about their major change options and consult their Academic Advisor during the first year of studies prior to changing their major.

Students that would like to retain a further option are strongly recommended to additionally register for the CHOICE modules of Industrial Engineering and Management (IEM) in their first year.

The module descriptions can be found in the respective Study Program Handbook.

2.3.2 Year 2 – CORE

In their second year, students take a total of 45 CP from a selection of in-depth, discipline-specific CORE modules. Building on the introductory CHOICE modules and applying the methods and skills students have already acquired so far (see 2.3.1), these modules aim to expand the students' critical understanding of the key theories, principles, and methods in their major for the current state of knowledge and best practice.

To pursue International Business Administration (online) as a major, at least 30 CP of the following mandatory elective (me) CORE modules must be taken:

- CORE Module: Applied Project Management (me, 7.5 CP)
- CORE Module: International Strategic Management (me,7.5 CP)
- CORE Module: Digital Transformation and Information Economy (me, 5 CP)
- CORE Module: Entrepreneurial Challenges and Creative Solutions (me, 2.5 CP)
- CORE Module: Entrepreneurship and Innovation (me,7.5 CP)
- CORE Module: Marketing (me,7.5 CP)
- CORE Module: Organization and Human Resource Management (me,7.5 CP)

The remaining 15 CP can be selected according to interest and/or with the aim of pursuing a minor in a second field of studies, or students complement their studies by taking all of the above listed mandatory elective CORE modules.

IBA students can take CORE modules (or more advanced Specialization modules) from a second discipline, which allows them to incorporate a minor study track into their undergraduate education, within the 180 CP required for a bachelor's degree. The educational aims of a minor are to broaden the students' knowledge and skills, support the critical reflection of statements in complex contexts, foster an interdisciplinary approach to problem-solving, and to develop an individual academic and professional profile in line with students' strengths and interests. This extra qualification will be highlighted in the transcript.

The Academic Advising Coordinator, Academic Advisor, and the Study Program Chair of the minor study program support students in the realization of their minor selection; the consultation with the Academic Advisor is mandatory when choosing a minor.

As a rule, this requires IBA students to:

1. select two CHOICE modules (15 CP) from the desired minor program in the first year and
2. substitute 15 CP of mandatory elective IBA CORE modules in the second year with the default minor CORE modules of the minor study program.

The requirements for each specific minor are described in the handbook of the study program offering the minor (Chapter 3.2) and are marked in the respective Study and Examination Plans. For an overview of accessible minors, please check the Major/Minor Combination Matrix which is published at the beginning of each academic year.

2.3.3 Year 3 – CAREER

During their third year, students prepare and make decisions for their career after graduation. To explore available choices fitting individual interests, and to gain professional experience, students take a mandatory summer internship (see 2.2.3.1). The third year of studies allows IBA (online) students to further sharpen their profile with a selection of discipline-specific, research-oriented specialization modules that can be combined to enhance their individual competences in business administration, strategy development for novel research approaches or managerial capabilities. Furthermore, the third year also focuses on the responsibility of students beyond their discipline (see CONSTRUCTOR Track).

2.3.3.1 Internship/Startup and Career Skills Module

As a core element of Constructor University's employability approach students are required to engage in a mandatory two-month internship of 15 CP that will usually be completed during the summer between the second and third years of study. This gives students the opportunity to gain first-hand practical experience in an external professional research environment, apply their knowledge and understanding in the context of an external institution, reflect on the relevance of their major to employment and society, reflect on their own personal role, and further develop their professional orientation. The internship can establish valuable contacts for the students' bachelor's thesis project, for the selection of a master program or graduate school, or for further employment after graduation. This module is complemented by career advising and several career skills workshops throughout all six semesters that prepare students for the transition from student life to professional life. As an alternative to the full-time internship, students interested in setting up their own company can apply for a start-up option to focus on developing their business plans.

For further information, please contact the Career Service Center (CSC) (https://constructor.university/student-life/career-services)

For organizational aspects consult with your Academic Advisor and the IBA (online) SPC for reasonable choices to conduct a prosperous internship.

2.3.3.2 Specialization Modules

In the third year of their studies, students take 15 CP from major-specific or major-related, advanced Specialization Modules to consolidate their knowledge and to be exposed to state-of-the-art research in the areas of their interest. This curricular component is offered as a portfolio of modules, from which students can make free selections during their fifth and sixth semester. The default Specialization Module size is 5 CP, with smaller 2.5 CP modules being possible as justified exceptions.

To pursue International Business Administration (online) as a major, at least 10 of the 15 CP from the following major-specific Specialization Modules need to be taken:

- IBA Specialization Module: Contemporary Topics in Marketing (me, 5 CP)
- IBA Specialization Module: Managerial Accounting (me, 5 CP)
- IBA Specialization Module: Lean Management (me, 5 CP)
- IBA Specialization Module: Advanced Econometrics (me, 5 CP)

In addition to the advancement of disciplinary skills within the International Business Administration (online) study program, these specialization modules are also meant to bring together different disciplinary threads developed in the CORE area in an interdisciplinary context, thus realizing the idea

of capstone modules in the third year of study. An updated list of all modules in the International Business Administration (online) Specialization area will be available in the online course catalogue at the start of the third academic year.

2.3.3.3 Bachelor Thesis

This Bachelor Thesis module (15 CP) is a mandatory graduation requirement for all undergraduate students. The title of the thesis will appear on the students' transcripts.

Within this module, students apply the knowledge skills, and methods they have acquired in their major discipline to become acquainted with actual research topics, ranging from the identification of suitable (short-term) research projects, preparatory literature searches, the realization of discipline-specific research, and the documentation, discussion, and interpretation of the results.

With their Bachelor Thesis students demonstrate mastery of the contents and methods of their major-specific research field. Furthermore, students show the ability to analyze and solve a well-defined problem with scientific approaches, a critical reflection of the status quo in scientific literature, and the original development of their own ideas. With the permission of a Constructor University Faculty Supervisor, the Bachelor Thesis can also have an interdisciplinary nature.

2.4 The CONSTRUCTOR Track

The CONSTRUCTOR Track is another important feature of Constructor University's educational model. The Constructor Track runs orthogonal to the disciplinary CHOICE, CORE, and CAREER modules across all study years and is an integral part of all undergraduate study programs. It provides an intellectual tool kit for lifelong learning and encourages the use of diverse methodologies to approach cross-disciplinary problems. The CONSTRUCTOR track contains Methods, New Skills and German Language and Humanities modules.

2.4.1 Methods Modules

Methods such as mathematics, statistics, programming, data handling, presentation skills, academic writing, and scientific and experimental skills are offered to all students as part of the Methods area in their curriculum. The modules that are specifically assigned to each study program to equip students with transferable academic skills. They convey and practice specific methods that are indispensable for each students' chosen study program. Students are required to take 20 CP in the Methods area. The size of all Methods modules is 5 CP.

To pursue IBA (online) as a major, the following Methods modules (20 CP) need to be taken as mandatory modules:

- Methods Module: Applied Calculus (m, 5 CP)
- Methods Module: Applied Statistics with R (m, 5 CP)
- Methods Module: Qualitative Research Methods (m, 5 CP)
- Methods Module: Econometrics (m, 5 CP)

2.4.2 New Skills Modules

This part of the curriculum constitutes an intellectual and conceptual tool kit that cultivates the capacity for a particular set of intellectual dispositions including curiosity, imagination, critical thought, and transferability. It nurtures a range of individual and societal capacities, such as self-reflection, argumentation and communication. Finally, it introduces students to the normative aspects of inquiry and research, including the norms governing sourcing, sharing, withholding materials and research results as well as others governing the responsibilities of expertise as well as the professional point of view.

All students are required to take the following modules in their second year:

- New Skills Module: Logic (m, 2.5 CP)
- New Skills Module: Causation and Correlation (m, 2.5 CP)

These modules will be offered with two different perspectives of which the students can choose. The module perspectives are independent modules which examine the topic from different point of views. Please see the module description for more details.

In the third year, students take three 5 CP modules that build upon previous modules in the track and are partially constituted by modules that are more closely linked to each student's disciplinary field of study. The following modules are mandatory for all students:

- New Skills Module: Argumentation, Data Visualization and Communication (m, 5 CP)

This module will also be offered with two different perspectives of which the students can choose.

- New Skills Module: Agency, Leadership and Accountability (m, 5 CP)

In their fifth semester, students may choose between:

- New Skills Module: Linear Model/Matrices (me, 5 CP) and
- New Skills Module: Complex Problem Solving (me, 5 CP).

2.4.3 German Language and Humanities Modules

German language abilities foster students' intercultural awareness and enhance their employability in their host country. They are also beneficial for securing mandatory internships (between the 2nd and 3rd year) in German companies and academic institutions. Constructor University supports its students in acquiring basic as well as advanced German skills in the first year of the CONSTRUCTOR Track. Non-native speakers of German are encouraged to take two German modules (me, 2.5 CP each), but are not obliged to do so. Native speakers and other students not taking advantage of this offering take alternative modules in Humanities in each of the first two semesters:

- Humanities Module: Introduction to Philosophical Ethics (me, 2.5 CP)
- Humanities Module: Introduction to the Philosophy of Science (me, 2.5 CP)
- Humanities Module: Introduction to Visual Culture (me, 2.5 CP)

3 International Business Administration (online) as a Minor in Entrepreneurship, Innovation and Management

A minor in Entrepreneurship, Innovation and Management (EIM) will meet the expectations of prospective students with a strong interest in entrepreneurship and the management of innovations in a globalized and international environment. EIM focuses on how firms and individuals make decisions regarding the identification and exploitation of business opportunities and how innovations and innovation processes can be managed within a firm.

3.1 Qualification Aims

The purpose of a minor in EIM is to enable graduates to complement their knowledge obtained in their major program with an entrepreneurial business perspective. The principles of entrepreneurship and innovation management are highly relevant in a world characterized by globalization, rapid technological change, and scarce resources. The basics of international business administration, covered in the first year's CHOICE modules, convey a business-driven approach to problem solving. The two second year CORE modules Entrepreneurship and Innovation, Entrepreneurial Challenges and Creative Solutions, and Digital Transformation and Information Economy develop these approaches further by expanding the perspective to the process of entrepreneurship and technology management.

3.1.1 Intended Learning Outcomes

With a minor in EIM, students will be able to:

1. critically discuss and apply modern theories in business and entrepreneurship;
2. explain the principles of idea creation and innovation management;
3. discuss how the political, economic, social, and technological environments affect business functions in a globalized world;
4. utilize the principles of finance and accounting to describe and evaluate the financial performance of companies and new business ventures;
5. defend their solutions in discussions with specialists and non-specialists.

3.2 Module Requirements

A minor in EIM requires 30 CP. The default option to obtain a minor in EIM is marked in the Study and Examination Plans in Section 6. It includes the following CHOICE and CORE modules:

- CHOICE Module: Introduction to International Business (m, 7.5 CP)
- CHOICE Module: Introduction to Finance and Accounting (m, 7.5 CP)
- CORE Module Component: Digital Transformation and Information Economy (m, 5 CP)
- CORE Module: Entrepreneurship and Innovation (m, 7.5 CP)
- CORE Module: Entrepreneurial Challenges and Creative Solutions (m, 2.5 CP)

3.3 Degree

After successful completion, the minor in Entrepreneurship, Innovation and Management will be listed on the final transcript under PROGRAM OF STUDY and BA/BSc – [name of the major] as "(Minor: Entrepreneurship, Innovation and Management)".

4 IBA (online) Undergraduate Program Regulations

4.1 Scope of these Regulations

The regulations in this handbook are valid for all students who entered the International Business Administration (online) undergraduate program at Constructor University in Fall 2024. In case of a conflict between the regulations in this handbook and the general Policies for Bachelor Studies, the latter apply (see https://constructor.university/student-life/student-services/university-policies)

In exceptional cases, certain necessary deviations from the regulations of this study handbook might occur during the course of study (e.g., change of the semester sequence, assessment type, or the teaching mode of courses).

4.2 Degree

Upon successful completion of this study program, students are awarded a Bachelor of Arts degree in International Business Administration.

4.3 Graduation Requirements

In order to graduate, students need to obtain 180 CP. In addition, the following graduation requirements apply:

Students need to complete all mandatory components of the program as indicated in the Study and Examination Plan in Chapter 6 of this handbook.

5 Schematic Study Plan for International Business Administration (online)

Figure 2 shows schematically the sequence and types of modules required for the study program. A more detailed description, including the assessment types, is given in the Study and Examination Plans in the following section.

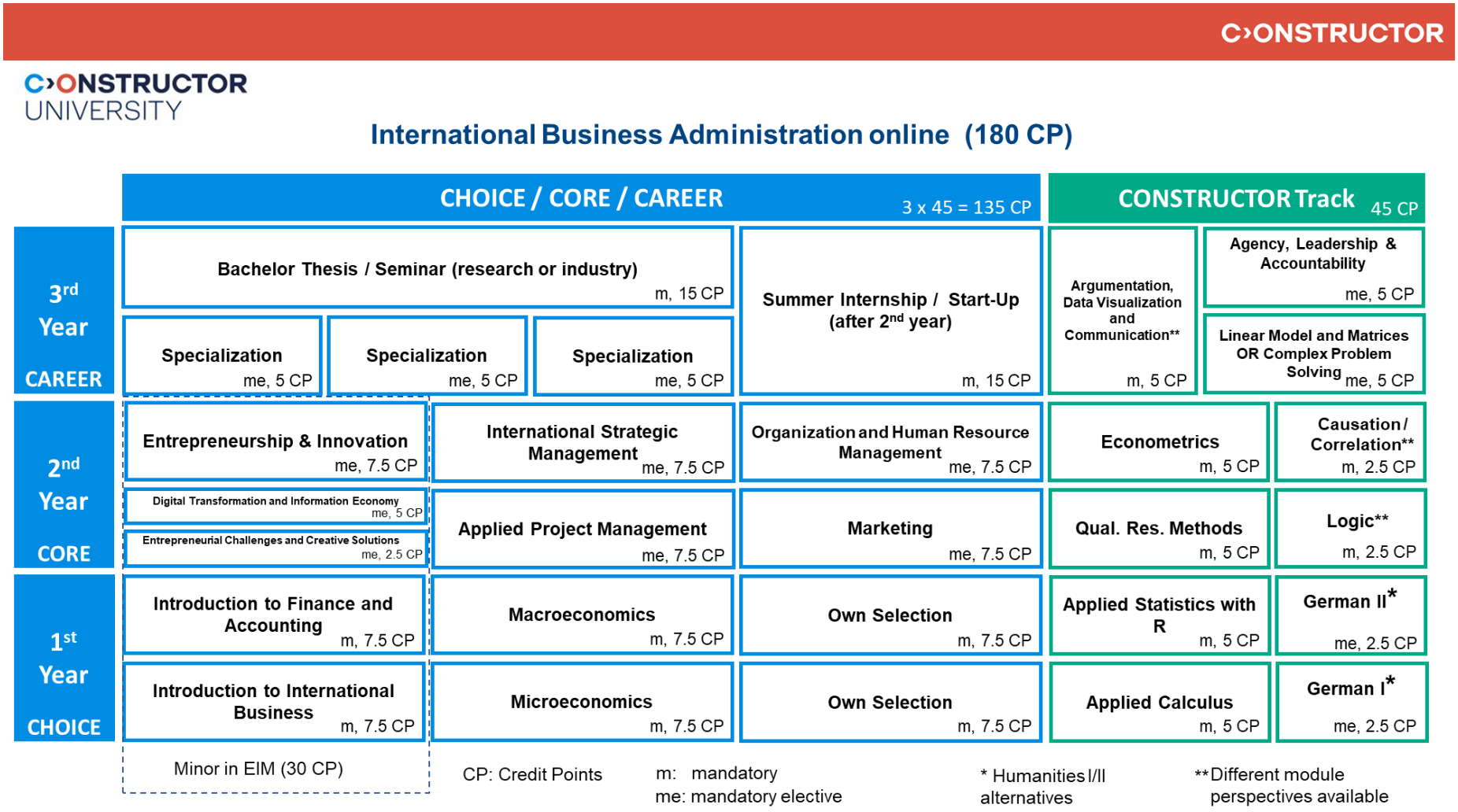

Figure 2: Schematic Study Plan for International Business Administration (online)

6 Study and Examination Plan

BA International Business Administration (online)

Matriculation Fall 2024

	Program-Specific Modules	Type	Assessment	Period	Status[1]	Sem.	ECTS
Year 1 - CHOICE							**45**
Take the mandatory CHOICE modules listed below, this is a requirement for IBA (online) program.							
	Unit: Business						**15**
IBA-101	**Module: Introduction to International Business***				**m**	**1**	**7.5**
IBA-101-A	Introduction to International Business	Lecture (online)	Written examination	Examination period			5
IBA-101-B	Introduction to International Business - Tutorial	Tutorial (online)					2.5
IBA-102	**Module: Introduction to Finance & Accounting***				**m**	**2**	**7.5**
IBA-102-A	Introduction to Finance & Accounting	Lecture (online)	Written examination	Examination period			5
IBA-102-B	Introduction to Finance & Accounting - Tutorial	Tutorial (online)					2.5
	Unit: Economics						**15**
IBA-103	**Module: Microeconomics**				**m**	**1**	**7.5**
IBA-103-A	Microeconomics Theory and Policy	Lecture (online)	Written examination	Examination period			5
IBA-103-B	Microeconomics - Turorial	Tutorial (online)					2.5
IBA-104	**Module: Macroeconomics**				**m**	**2**	**7.5**
IBA-104-A	Macroeconomics Theory and Policy	Lecture (online)	Written examination	Examination period			5
IBA-104-B	Macroeconomics - Tutorial	Tutorial (online)					2.5
	Unit: CHOICE (own selection)					**1/2**	**15**
Students take two further CHOICE units from those offered for all other study programs.[2]							
Year 2 - CORE							**45**
Take all CORE modules listed below or replace 15 ECTS with the CORE modules from the minor unit of another study program.							
	Unit:Management						**15**
IBA-201	**Module: Applied Project Management**				**me**	**3**	**7.5**
IBA-201-A	Applied Project Management	Lecture (online)	Written examination	Examination period	me		5
IBA-201-B	Applied Project Management - Tutorial	Tutorial (online)			me		2.5
IBA-202	**Module: International Strategic Management**				**me**	**4**	**7.5**
IBA-202-A	International Strategic Management	Lecture (online)	Term Paper	during the semester	me		5
IBA-202-B	International Strategic Management - Tutorial	Tutorial (online)			me		2.5
	Unit:Business Solutions						**15**
IBA-203	**Module: Digital Transformation & Information Economy***				**me**	**3**	**5**
IBA-203-A	Digital Transformation & Information Economy	Lecture (online)	Written examination	Examination period	me		5
IBA-204	**Module: Entrepreneurial Challenges and Creative Solutions***				**me**	**3**	**2.5**
IBA-204-A	Entrepreneurial Challenges and Creative Solutions	Lecture (online)	Presentation	during the semester	me		2.5
IBA-205	**Module: Entrepreneurship & Innovation***				**me**	**4**	**7.5**
IBA-205-A	Entrepreneurship & Innovation	Lecture (online)	Presentation	during the semester	me		7.5
	Unit: Managing Diversity						**15**
IBA-206	**Module: Marketing**				**me**	**3**	**7.5**
IBA-206-A	Marketing	Lecture (online)	Presentation	during the semester	me		5
IBA-206-B	Marketing - Tutorial	Tutorial (online)			me		2.5
IBA-207	**Module: Organization & Human Resource Management**				**me**	**4**	**7.5**
IBA-207-A	Organization & Human Resource Management	Lecture (online)	Presentation	during the semester	me		5
IBA-207-B	Organization & Human Resource Management - tutorial	Tutorial (online)			me		2.5

	Construtor Track Modules (General Education)	Type	Assessment	Period	Status[1]	Sem.	ECTS
							15
	Unit: Methods						**10**
CTMS-MAT-08	**Module: Applied Calculus**				**m**	**1**	**5**
CTMS-08	Applied Calculus	Lecture (online)	Written examination	Examination period			
CTMS-MET-03	**Module: Applied Statistics with R**				**m**	**2**	**5**
CTMS-03	Applied Statistics with R	Lecture & Lab (online)	Written examination	Examination period			
	Unit: German Language and Humanities (choose one module for each ememster)				**m**		**5**
German is default language and open to Non-German speakers (on campus and online).[3]							
CTLA-	**Module: German 1**				**me**	**1**	**2.5**
CTLA-	German 1	Seminar (online)	Various	Various	me		
CTLA-	**Module: German 2**				**me**	**2**	**2.5**
CTLA-	German 2	Seminar (online)	Various	Various	me		
CTHU-HUM-001	**Humanities Module: Introduction to Philosophical Ethics**				**me**	**1**	**2.5**
CTHU-001	Introduction to Philosophical Ethics	Lecture (online)	Written examination	Examination period	me		
CTHU-HUM-002	**Humanities Module: Introduction to the Philosophy of Science**				**me**	**2**	**2.5**
CTHU-002	Introduction to the Philosophy of Science	Lecture (online)	Written examination	Examination period	me		
CTHU-HUM-003	**Humanities Module: Introduction to Visual Culture**				**me**	**2**	**2.5**
CTHU-003	Introduction to Visual Culture	Lecture (online)	Written examination	Examination period	me		
							15
	Unit: Methods						**10**
CTMS-MET-04	**Module: Qualitative Research Methods**				**m**	**3**	**5**
CTMS-04	Qualitative Research Methods	Lecture (online)	Research Report	during the semester			
CTMS-MET-05	**Module: Econometrics**				**m**	**4**	**5**
CTMS-05	Econometrics	Seminar (online)	Written examination	Examination period			
	Unit: New Skills						**5**
CTNS-NSK-	**Module: Logic**				**m**	**3**	**2.5**
CTNS-01	Logic (perspective I)	Lecture (online)	Written examination	Examination period	me		2.5
CTNS-02	Logic (perspective II)	Lecture (online)	Written examination	Examination period	me		2.5
CTNS-NSK	**Module: Correlation and Causation**				**m**	**4**	**2.5**
CTNS-03	Correlation and Causation (perspective I)	Lecture (online)	Written examination	Examination period	me		2.5
CTNS-04	Correlation and Causation (perspective II)	Lecture (online)	Written examination	Examination period	me		2.5

Year 3 - CAREER							**45**
IBA-300	**Module: Summer Internship / Startup and Career Skills**				**m**	**4/5**	**15**
IBA-300-I	Summer Internship		Internship report	during the semester			15
IBA-400	**Module: Thesis IBA**				**m**	**6**	**15**
IBA-400-T	Thesis IBA	Lecture (online)	Thesis	during the semester	m		12
IBA-400-S	Thesis Seminar IBA	Seminar (online)			m		3
	Unit: Specialization IBA				**m**		**15**
	Total 15 ECTS of specialization modules				me	5/6	15
IBA-301	**Module: Managerial Accounting**				**me**	**5**	**5**
IBA-301-A	Managerial Accounting	Seminar (online)	Written examination	Examination period	me		5
IBA-302	**Module: Contemporary Topics in Marketing**				**me**	**6**	**5**
IBA-302-A	Contemporary Topics in Marketing	Seminar (online)	Term Paper	during the semester	me		5
IBA-303	**Module: Advanced Econometrics**				**me**	**5**	**5**
IBA-303-A	Advanced Econometrics	Seminar (online)	Term Paper	during the semester	me		5
IBA-304	**Module: Lean Management**				**me**	**5**	**5**
IBA-304-A	Lean Management	Lecture (online)	Presentation	during the semester	me		5

	Unit: New Skills						**10**
Choose one of the two modules							
CTNS-NSK-05	**Module: Linear Model and Matrices**				**me**	**5**	**5**
CTNS-05	Linear Model and Matrices	Seminar (online)	Written examination	Examination period			5
CTNS-NSK-06	**Module: Complex Problem Solving**				**me**	**5**	**5**
CTNS-06	Complex Problem Solving	Lecture (online)	Written examination	Examination period			5
Take this module either in semester 5 or 6							5
CTNS-NSK	**Module: Argumentation, Data Visualization and Communication**				**m**	**5/6**	**5**
CTNS-07	Argumentation, Data Visualization and Communication (perspective I)	Lecture (online)	Written examination	Examination period	me	**5**	5
CTNS-08	Argumentation, Data Visualization and Communication (perspective II)	Lecture (online)	Presentation	during the semester	me	**6**	5
Choose one of the two modules							
CTNS-NSK	**Module: Agency, Accountability & Leadership**				**me**	**6**	**5**
CTNS-09	Agency, Accountability & Leadership	Lecture (online)	Written examination	Examination period			5

Total ECTS	**180**

[1] Status (m = mandatory, me = mandatory elective)

[2] For a full listing of all CHOICE / CORE / CAREER / CONSTRUCTOR Track modules please consult the **CampusNet online catalogue** and /or the study program handbooks.

[3] German native speakers will have alternatives to the language modules (in the field of Humanities)

*students minoring in EIM take the indicated modules.

7 International Business Administration (online) Modules

7.1 Introduction to International Business

Module Name	**Module Code**	**Level (type)**	**CP**
Introduction to International Business	IBA-101	Year 1 (CHOICE)	7.5

Module Components

Number	Name	Type	CP
-IBA 101-A	Introduction to International Business	Lecture (online)	5.0
-IBA 101-B	Introduction to International Business - Tutorial	Tutorial (online)	2.5

Module Coordinator	**Program Affiliation**	**Mandatory Status**
Dr. Matthias Meckel	• International Business Administration (online) (IBA (online))	Mandatory for IBA (online), IEM (online) and minor in EIM

Entry Requirements			**Frequency**	**Duration**
Pre-requisites	Co-requisites	Knowledge, Abilities, or Skills	Annually (Fall)	1 semester
☒ None	☒ None			

Student Workload

Asynchronous Self Study	Interactive Learning	Exam Preparation	Independent Study	Hours Total
35 h	67.5 h	20 h	65 h	187.5 h

Recommendations for Preparation

None.

Content and Educational Aims

This module provides the basics needed for making informed and effective business decisions in today's global economy. It focuses on the domains of business such as international strategy and organizational structure, selecting and managing entry modes, developing and marketing products internationally and managing international operations. Issues of globalization, cross-cultural businesses, politics and law in business, economic systems and development, international trade, and international financial markets will also be covered. Upon completing the module, students will know how to use a number of international business analytical tools, and have experience with case study analysis: including, PEST, CAGE, International Market Selection and Modes of Entry. Global corporate social responsibility and sustainability issues will also be discussed.

Intended Learning Outcomes

By the end of this module, students will be able to

1. understand and describe the process of globalization and how it affects markets and production e.g. identify the two forces causing globalization to increase, identify the types of companies that participate in international business, describe the global business environment and identify its four main elements;
2. describe culture and explain the significance of both national culture and subcultures, identify the components of culture and the impact on business, describe the two main frameworks used to classify cultures and explain their practical use;
3. describe each main type of political system. Identify the origins of political risk and how managers can reduce its effects. List the main types of legal systems and explain how they differ. Describe the major legal and ethical issues facing international companies;
4. describe what is meant by a centrally planned economy and explain why its use is declining. Identify the main characteristics of a mixed economy and explain the emphasis on privatization. Describe the different ways to measure a nation's level of development;
5. discuss international trade and trade patterns. Explain absolute advantage and comparative advantage and identify their differences. Explain the factor proportions and international product life cycle theories as well as trade and national competitive advantage theories;
6. describe the political, economic, and cultural motives behind governmental intervention in trade. List and explain the methods governments use to promote and restrict international trade;
7. define regional economic integration and identify its five levels. Discuss the benefits and drawbacks associated with regional economic integration;
8. discuss international capital market, international bond, international equity, and Eurocurrency markets. Discuss the four primary functions of the foreign exchange market. Explain how currencies are quoted and the different rates given;
9. explain how exchange rates influence the activities of domestic and international companies. Identify the factors that help determine exchange rates and their impact on business;
10. identify international strategies and the corporate-level strategies that companies use;
11. discuss the important issues that influence the choice of organizational structure;
12. explain why and how companies use exporting, importing, and countertrade. Explain the various means of financing export and import activities. Describe the different contractual entry modes that are available to companies. Discuss the important strategic factors in selecting an entry mode;
13. explain the impact globalization is having on international marketing activities. Understand the various dimensions for developing international product, promotional, pricing and distribution strategies (4P's marketing mix);
14. use concepts, tools and frameworks and apply them in the international business context. Develop and improve your analytical and critical thinking skills by applying them to contemporary international business issues. Prepare and deliver oral presentations as well as written works either prepared individually or as a team. Improve your research skills by analyzing real business situations, identifying problems, evaluating and discussing options and prepare recommendations. These recommendations need to be fact-based, undertaken qualitative and quantitative analyses.

Indicative Literature

Peng, M. (2018). Global 4, Boston: Cengage.

Usability and Relationship to other Modules

Examination Type: Module Examination

Assessment Type: Written examination Duration: 120 minutes
Weight: 100%

Scope: all intended learning outcomes

Module Achievement: The short case studies and the presentation are intended to provide students with immediate feedback on their academic performance in order to familiarize them with university learning conditions, some of which

differ considerably from those the students known from school time.Completion: To pass this module, the examination has to be passed with at least 45%

7.2 Introduction to Finance and Accounting

Module Name	**Module Code**	**Level (type)**	**CP**
Introduction to Finance and Accounting	IBA-102	Year 1 (CHOICE)	7.5

Module Components

Number	Name	Type	CP
IBA-102-A	Introduction to Finance and Accounting	Lecture (online)	5.0
IBA-102-B	Finance and Accounting Tutorial	Tutorial (online)	2.5

Module Coordinator	**Program Affiliation**	**Mandatory Status**
Dr. Matthias Meckel	• International Business Administration (online) (IBA (online))	Mandatory for IBA (online), IEM (online) and EIM minor

Entry Requirements			**Frequency**	**Duration**
Pre-requisites	Co-requisites	Knowledge, Abilities, or Skills	Annually (Spring)	1 semester
☒ Introduction to International Business	☒ None	• None		

Student Workload

Asynchronous Self Study	Interactive Learning	Assessment Preparation	Independent Study	Hours Total
35 h	17.5 h	20 h	115 h	187.5h

Recommendations for Preparation
None

Content and Educational Aims

This module introduces students to the basics of finance and financial accounting.
The module is split into three sub-parts.
The first part focuses on finance and investment and will provide students with the basics of corporate finance and investments. It offers an overview of the different sources of finance from private and public sources, and it introduces several important analytical tools and techniques from corporate finance.
The second part focuses on financial accounting. It outlines the framework of accounting including its nature, purposes, and the context. In addition, it covers the basic concepts, conventions, and principles of accounting as well as the accounting equation. Moreover, the recognition and measurement principles are taught. Finally, the module covers the preparation and analysis of financial statements. This part uses the International Financial Reporting Standards as reference.

The third part of the module is designed as a tutorial. In this tutorial students repeat, apply, and practice the techniques from both finance and accounting lectures. Students work on exercises individually and in small groups.

Intended Learning Outcomes

Upon completion of this module, students will be able to

1. define the basic types of financial management decisions and the role of the financial manager
2. explain the goal of financial management
3. compute the external financing needed to fund a firm's growth and name the determinants of a firm's growth
4. determine the future value of an investment made today and the present value of cash to be received at a future date
5. define important bond features, types of bonds, and bond ratings
6. outline the impact of inflation on interest rates
7. apply the Present Value (PV), Net Present Value (NPV), Payback rule, Internal Rate of Return (IRR), and the Profitability Index (PI)
8. apply the concept of scenario and sensitivity analysis, calculate the tax shield, accounting break-even point and degree of operating leverage
9. identify and describe the major functions of financial accounting and financial reporting
10. explain the relationship between financial statement elements
11. describe the roles and desirable attributes of financial reporting standards
12. demonstrate knowledge and understanding of the elements of the balance sheet, income statement, cash flow statement, and statement of shareholders' equity
13. describe, explain, and classify cash flow items

Indicative Literature

Phillips, F., Libby,R., Libby P. (2015). Fundamentals of Financial Accounting, 5th Edition. New York: McGraw-Hill Education.

Ross, S.A., Westerfield, R. and Jordan, B.D., 2019. Fundamentals of corporate finance. Tata McGraw-Hill Education

Usability and Relationship to other Modules

- Builds on the module "Introduction to International Business"
- The module prepares students for the CORE modules in the second and third study year

Examination Type: Module Examination

Assessment Type: Written examination — Duration: 120 minutes

Weight: 100%

Scope: All intended learning outcomes of the module

Module Achievement: There is a multiple-choice online test at the end of each of the two parts of the module (one for the Accounting and one for the Finance part). Each of them encompasses 20 questions and must be passed with an overall grade of at least 50%. The number of attempts is not limited.

Completion: To pass this module, the examination has to be passed with at least 45%.

7.3 Microeconomics

Module Name Microeconomics		**Module Code** IBA-103	**Level (type)** Year 1 (CHOICE)	**CP** 7.5
Module Components				
Number	Name		Type	CP
IBA-103-A	Microeconomics Theory and Policy		Lecture (online)	5
IBA-103-B	Microeconomics - Tutorial		Tutorial (online)	2.5
Module Coordinator Dr. Matthias Meckel	**Program Affiliation** • International Business Administration (online) (IBA (online)) •		**Mandatory Status** Mandatory for IBA (online)	
Entry Requirements Pre-requisites ☒ None	Co-requisites ☒ None	Knowledge, Abilities, or Skills • Logical reasoning • High school mathematics	**Frequency** Annually (Fall)	**Duration** 1 semester

Student Workload				
Asynchronous Self Study	Interactive Learning	Exam Preparation	Independent Study	Hours Total
35 h	17.5 h	20 h	115 h	187.5h

Recommendations for Preparation

To prepare for this module, students are recommended to read the article "Research on teaching economics to undergraduates," published in the Journal of Economic Literature in 2015. The article will allow students to get a first-hand look at the challenges of teaching economics from the viewpoint of those who teach it.

Content and Educational Aims

The study of economics is concerned with the allocation of scarce resources and the associated implications for efficiency, equity, and human welfare. This module introduces the field of microeconomics, focusing on the role of markets in facilitating exchanges between different sectors of the economy such as workers, consumers, firms, and government institutions. Topics addressed include consumer theory, the cost structures and behavior of firms in various industries, competition, monopoly, and government regulation. The module applies theoretical concepts to contemporary policy questions, such as when government intervention is justified to correct market imperfections.

This module aims at transmitting fundamental knowledge of economics at the level of economic agents. A command of microeconomics constitutes the basis for undergraduate studies in the fields of economics and management and helps make sense of economic behaviors in many situations, including professional settings. With its focus on questions of welfare and the policy implications of microeconomic theories, this module also enables students to understand public affairs from an economic perspective at the micro level and promotes their capacity to differentiate among and explain the concepts taught in class. Textbook-based lectures ensure the transmission of the necessary knowledge. The accompanying, interactive tutorials further promote the students' capacity to describe and give examples of the concepts taught in class.

Intended Learning Outcomes

Upon completion of this module, students will be able to

1. explain how economic concepts such as opportunity costs and the gains from trade can be applied to a range of themes of relevance to human welfare;
2. use graphical depictions to derive insights into how markets function;
3. distinguish between equity and efficiency when evaluating the outcomes of economic policies;
4. explain and differentiate among fundamental microeconomic models, such as that demonstrating the gains from trade, using graphs as visual aids;
5. explain the policy implications of microeconomic theories.

Indicative Literature

Hayek, F. A. (1945). The use of knowledge in society. American Economic Review, 35(4): 519-530.

King, M. L., Jr. (1963). Letter from a Birmingham jail.

Thaler, R. H. (2016). Behavioral economics: Past, present, and future. American Economic Review, 106(7): 1577-1600.

Usability and Relationship to other Modules

- This module transmits fundamental knowledge of microeconomics that is necessary to the second-year modules “Development Economics”, “Environmental and Resource Economics”, “Comparing Economic Systems” and “International Economics”. This module further benefits from the contents taught in its accompanying “Macroeconomics” as the combination of the two offers a comprehensive view of economic questions from the interaction of economic agents to the aggregated level.

Examination Type: Module Examination

Assessment Type: Written examination Duration: 120 minutes
Weight: 100%

Scope: All intended learning outcomes of the module

Completion: To pass this module, the examination has to be passed with at least 45%.

7.4 Macroeconomics

Module Name Macroeconomics	**Module Code** IBA-104	**Level (type)** Year 1 (CHOICE)	**CP** 7.5

Module Components

Number	Name	Type	CP
IBA-104-A	Macroeconomics Theory and Policy	Lecture (online)	5
IBA-104-B	Macroeconomics Tutorial	Tutorial (online)	2.5

Module Coordinator Dr. Matthias Meckel	**Program Affiliation** • International Business Administration (online) (IBA (online))	**Mandatory Status** Mandatory for IBA (online)

Entry Requirements			**Frequency**	**Duration**
Pre-requisites	Co-requisites	Knowledge, Abilities, or Skills	Annually (Spring)	1 semester
☒ Microeconomics	☒ None	• Logical reasoning • High school mathematics		

Student Workload

Asynchronous Self Study	Interactive Learning	Exam Preparation	Independent Study	Hours Total
35 h	17.5 h	20 h	115 h	187.5h

Recommendations for Preparation

None

Content and Educational Aims

The study of economics is concerned with the allocation of scarce resources and the associated implications for efficiency, equity, and human welfare. The subdiscipline of macroeconomics investigates the workings of the overall economy, focusing on how shifts in aggregate demand and supply affect variables such as employment, gross domestic product, inflation, and the balance of trade. This module applies theoretical concepts from macroeconomics to contemporary policy questions, such as when, why and how governments intervene in the economy. The module will distinguish fiscal and monetary policies, and what these government interventions mean for various markets and economic actors. The lectures cover the material students need to know to take and pass the module examination. In the tutorials, the students further integrate the material taught in the lectures via discussions of related concepts, policy problems, scientific studies, and exercises.

A command of macroeconomics constitutes the basis for undergraduate studies in the fields of economics and management, further preparing students for graduate study in these fields. Beyond these academic qualifications, students will be equipped with analytical tools that and help make sense of the economic conditions that affect both their private and professional lives. With its coverage of market regulation and the policy implications of macroeconomic theories, this module also enables students to understand public affairs from the perspective of whole economies. Textbook-based lectures ensure the transmission of the necessary knowledge. The accompanying, interactive tutorials further promote the students' capacity to differentiate and explain the concepts taught in class.

Intended Learning Outcomes

Upon completion of this module, students will be able to:

1. express and discuss ways to analyze the performance of national economies through key indicators such as GDP growth, unemployment, inflation, government deficit and trade imbalances;
2. explain and differentiate the goals and effectiveness of government interventions to combat economic crises in the form of monetary and fiscal policies;
3. describe how supply side measures such as improvements in infrastructure, education, and research can improve long-term growth and the international competitiveness of national economies;
4. assess the distributional consequences of economic development and economic policy decisions;
5. explain the policy implications of macroeconomic theories.

Indicative Literature

Goodwin, N., Harris, J., Rajkarnikar, P. J., Roach, B. Torras, M. (2022). Macroeconomics in context. London: Routledge.

To give students historical perspective:

Snowdown, B., Vane, H. R. (2005). Modern macroeconomics. Its origins, development and current state. Cheltenham: Edward Elgar.

Usability and Relationship to other Modules

- This module transmits fundamental knowledge of macroeconomics that is necessary to the second-year modules "Development Economics", "Environmental and Resource Economics", "Comparing Economic Systems" and "International Economics". This module further benefits from the contents taught in its accompanying module "Microeconomics" as the combination of the two offers a comprehensive view of economic questions from the interaction of economic agents to the aggregated level.

Examination Type: Module Examination

Assessment Type: Written examination Duration: 120 minutes
Weight: 100%

Scope: All intended learning outcomes of the module

Completion: To pass this module, the examination has to be passed with at least 45%.

7.5 Applied Project Management

Module Name Applied Project Management	**Module Code** IBA-201	**Level (type)** Year 2 (Core)	CP 7.5

Module Components

Number	Name	Type	CP
IBA-201-A	Applied Project Management	Lecture (online)	5
IBA-201-B	Applied Project Management - Tutorial	Tutorial (online)	2.5

Module Coordinator Dr. Matthias Meckel	**Program Affiliation** • International Business Administration (online) (IBA (online))	**Mandatory Status** Mandatory elective for IBA (online) and IEM (online)

Entry Requirements Pre-requisites	Co-requisites	Knowledge, Abilities, or Skills	**Frequency** Annually (Fall)	**Duration** 1 semester
☒ Introduction to International Business and Introduction to Finance and Accounting	☒ None	• None		

Student Workload

Asynchronous Self Study	Interactive Learning	Exam Preparation	Independent Study	Hours Total
35 h	47.5 h	20 h	85 h	187.5h

Recommendations for Preparation

Content and Educational Aims

Well-run projects depend entirely on the foundation laid in the initial planning stages, the care and precision of project organization, and excellent teamwork. The module Applied Project Management (APM) offers a detailed look at the characteristics of projects and some hands-on team simulation of the project planning and management process.

The APM module explains various project phases, including major and detailed tasks. It will deal with task assignment and resource allocation, budgeting, tracking, and scheduling techniques as well as with project leadership and team processes.

The lecture component of this module covers the theoretical basics and offers practical examples. The tutorial component of this module serves as an exercise based on examples and case studies, which are also carried out over the course hours

Intended Learning Outcomes

Upon completion of this module, students will be able to

1. identify and memorize the key skills to manage projects, including internationally accepted standards and procedures for running and controling projects;
2. apply project management skills to set up, organize, manage and control (real) projects;
3. analyze project performance;
4. develop strong analytical skills.

Indicative Literature

Bittner, E., Gregorc, W. (ed.) (2010). Experiencing Project Management: Projects, Challenges and Lessons Learned. Hoboken: John Wiley & Sons.

Larson, E. W., Gray, C. F. (2015). A guide to the project management body of knowledge: PMBOK (®) guide. In: Project Management Institute.

Luecke, R (2004). Managing projects large and small: the fundamental skills for delivering on budget and on time. Harvard: Harvard Business Press.

Marks, T. (2012). 20:20 Project Management: How to deliver on time, on budget and on spec. London: Kogan Page Publishers.

Larson, E.W.; Gray, C. (2017). Project management: the managerial process, 7th edition. New York: McGraw-Hill Education.

Moriis, P.W.G., Pinto, J. K, Söderland, Jonas (Hg.) (2012). The Oxford handbook of project management. Oxford: Oxford University Press.

Pries, K. H.; Quigley, J.M (2010). Scrum project management. Boca Raton: CRC press.

Usability and Relationship to other Modules

Examination Type: Module Examination

Assessment Type: Written Examination Duration: 120 minutes

Weight: 100%

Scope: All intended learning outcomes

Completion: To pass this module, the examination has to be passed with at least 45%.

7.6 International Strategic Management

Module Name	**Module Code**	**Level (type)**	**CP**
International Strategic Management	IBA-202	Year 2 (CORE)	7.5

Module Components

Number	Name	Type	CP
IBA-202-A	International Strategic Management	Lecture (online)	5
IBA-202-B	International Strategic Management - Tutorial	Tutorial (online)	2.5

Module Coordinator	**Program Affiliation**	**Mandatory Status**
Dr. Matthias Meckel	• International Business Administration (online) (IBA (online))	Mandatory elective for IBA (online) and IEM (online)

Entry Requirements			**Frequency**	**Duration**
Pre-requisites	Co-requisites	Knowledge, Abilities, or Skills	Annually (Spring)	1 semester
☒ Introduction to International Business and Introduction to Finance and Accounting	☒ None	• Academic writing skills • Good understanding of the principles of international management		

Student Workload

Asynchronous Self Study	Interactive Learning	Exam Preparation	Independent Study	Hours Total
35 h	27.5 h	40 h	85 h	187.5 h

Recommendations for Preparation

Students should have developed a sound understanding of the principles of international management. In this advanced module, these principles are not repeated but are used as a basis. It is strongly recommended for all students to refresh their knowledge of the CHOICE module Introduction to International Business.

Content and Educational Aims

This module will explore the nature of strategy, the forces of competition and strategic decision-making in a globalized world. The module covers the principles of both business-level and corporate-level strategies in international organizations. It is designed to introduce a wide variety of modern strategy frameworks and methodologies, including methods of assessing the attractiveness of foreign markets, and the strength of competition, for understanding relative bargaining power, for anticipating competitors' actions, and for analyzing cost and value structures in global supply chains. The lecture part of this module conveys the relevant concepts and theories of international strategic management in an interactive manner. In the tutorial part, students will apply this knowledge to real world challenges in international strategic management.

Intended Learning Outcomes

Upon completion of this module, students will be able to

1. identify and explain critical challenges in strategic management;
2. develop a sound understanding of the mechanisms behind international strategic assessments and planning processes;
3. evaluate and design strategies in international management, such as market selection or entry mode choices;
4. acquire and develop t additional knowledge and skills needed to support strategic decision making in international firms;
5. utilize analytical skills and apply relevant tools as required in the discipline

Indicative Literature

Peng, M. (2022): Global Strategy, 5th edition, cengage.

Usability and Relationship to other Modules

- This module prepares students for the Bachelor Thesis focusing on topics in international management

Examination Type: Module Examination

Type: Term Paper Length: 2.000 words
Weight: 100%

Scope: All intended learning outcomes of the module

Completion: To pass this module, the examination has to be passed with at least 45%.

7.7 Digital Transformation and Information Economy

Module Name	**Module Code**	**Level (type)**	**CP**
Digital Transformation and Information Economy	IBA-203	Year 2 (CORE)	5

Module Components

Number	Name	Type	CP
IBA-203-A	Digital Transformation and Information Economy	Lecture (online)	5

Module Coordinator	**Program Affiliation**	**Mandatory Status**
Dr. Matthias Meckel	• International Business Administration (online) (IBA (online))	Mandatory elective for IBA (online) Mandatory for Minor in EIM

Entry Requirements			**Frequency**	**Duration**
Pre-requisites	Co-requisites	Knowledge, Abilities, or Skills	Annually (Fall)	1 semester
☒ Introduction to International Business ☒ Introduction to Finance and Accounting	☒ None	• Basic knowledge of management concepts and economics		

Student Workload

Asynchronous Self Study	Interactive Learning	Exam Preparation	Independent Study	Hours Total
35 h	17.5 h	20 h	52.5 h	125h

Recommendations for Preparation

This module is based on the knowledge students acquired in the CHOICE modules during the first study year.

Content and Educational Aims

Information is a key resource in today's business operations and an important tool for decision-making. This module provides the basics for making informed and effective business decisions in today's information economy. The content of this module is located in the intersection of the Information Economy, Electronic Business, Electronic Commerce, and Electronic Services.
The overall goal of this module is to help students to learn, understand and practice entrepreneurial and innovation processes in the information age. The "Digital Transformation and Information Economy" module helps students to understand today's real-life challenges and problems and to explain complex problems coherently and concisely.

The module is strongly based on the paradigm of user-centeredness, the user centered design of services and the ideas of Service Dominant Logic. Service-dominant (S-D) logic is a meta-theoretical framework for explaining value creation, through exchange, among configurations of actors. One underlying idea of S-D logic is that goods are a distribution mechanism for co-created service provision.

In the information age, these co-created services can be supported and enhanced through information technologies (applications and devices). Hence, new technologies enable humans to apply their competences to benefit others and reciprocally benefit from others' applied competences through service-for-service exchange in a more advanced way.

Major challenges and concerns of the digital transformation and information economy will be reflected:

- the role of information in an information society
- globalization & strategic business
- information infrastructure
- new theories and concepts (such as service dominant logic, customer integration, gamification, P2P)
- new applications (e.g. Web 2.0 and Industry 4.0, Facebook, Twitter, Google, eBay, WeChat,…)
- new business models
- ethics and security.

Intended Learning Outcomes

Upon completion of this module, students will be able to

1. describe the role of information in the internet economy and in the digital transformation;
2. summarize and classify the new Web 2.0 and Industry 4.0 technologies;
3. Indicate the economic and business rules in the information age;
4. develop practical knowledge and management skills for digital transformation;
5. develop broad global and strategic perspectives;
6. develop sensitivity to international social responsibility and public interest issues from various perspectives;
7. explain the "service dominant logic" (SDL) for business/entrepreneurial activities and the power of new technologies (e.g. IoT) for customer relationship management;
8. outline how business ethics are also applicable in the field of Information Systems and Management;
9. adapt to a new working culture based on a user-centricity, empathy, and playful testing.

Indicative Literature

Brynjolfsson, E., McAfee, A. (2016). The Second Machine Age: Work, Progress, and Prosperity in a Time of Brilliant Technologies. New York: Norton & Company, ISBN-13: 978-0393350647, ISBN-10: 0393350649.
Laudon, K. C., Traver, C.G., (2011). Management Information Systems – Managing the Digital Firm (12th Edition). Upper Sadle River: Pearson; ISBN-10: 0-27-375453-X; ISBN-13: 978-0-27-375453-X.

Usability and Relationship to other Modules

- This module prepares students who are interested in the consequences of digitization and creative problem solving for their independent studies in the Bachelor Thesis module

Examination Type: Module Examination

Assessment Type: Written Examination

Duration: 120 minutes
Weight: 100%

Scope: All intended learning outcomes of the module

Completion: To pass this module, the examination has to be passed with at least 45%.

7.8 Entrepreneurial Challenges and Creative Solutions

Module Name	**Module Code**	**Level (type)**	**CP**
Entrepreneurial Challenges and Creative Solutions	IBA-204	Year 2 (CORE)	2.5

Module Components

Number	Name	Type	CP
IBA-204-A	Entrepreneurial Challenges and Creative Solutions	Lecture (online)	2.5

Module Coordinator	**Program Affiliation**	**Mandatory Status**
Dr. Matthias Meckel	• International Business Administration (online) (IBA (online))	Mandatory elective for IBA (online) Mandatory for Minor in EIM

Entry Requirements			**Frequency**	**Duration**
Pre-requisites	Co-requisites	Knowledge, Abilities, or Skills	Annually (Fall)	1 semester
☒ none	☒ None	•		

Student Workload

Asynchronous Self Study	Interactive Learning	Exam Preparation	Independent Study	Hours Total
17.5 h	17.5 h	10 h	17.5 h	62.5 h

Recommendations for Preparation

N.A.

Content and Educational Aims

Many challenges of the ever-growing digitalization require creative approaches to complex solutions. In this course, these challenges will be regarded as entrepreneurial opportunities which can be assessed and potentially solved with an entrepreneurial approach. Due to the complex nature of many challenges, students will apply selective creative techniques, such as brainstorming, 6-3-5 or Walt-Disney, to dismantle problems, question potential solutions and finally develop entrepreneurial answers to these questions.

By applying principles from entrepreneurship and critical decision making, students shall be enabled to discover alternative and transdisciplinary options to address challenges in various settings.

Intended Learning Outcomes

Upon completion of this module, students will be able to

1. Understand the essence of entrepreneurship
2. Understand the principles of creativity in management
3. Learn and apply different creativity techniques
4. Assess various challenges through the lens of entrepreneurial principles
5. Analyse and identify opportunities and solutions in a creative and systematic way

Indicative Literature
Usability and Relationship to other Modules
Examination Type: Module Examination Assessment Type: Presentation Duration: 20 minutes Weight: 100% Scope: All intended learning outcomes of the module Completion: To pass this module, the examination has to be passed with at least 45%.

7.9 Marketing

<table>
<tr><td colspan="3">Module Name
Marketing</td><td>Module Code
IBA-206</td><td>Level (type)
Year 2 (CORE)</td><td>CP
7.5</td></tr>
<tr><td colspan="6">Module Components

Number | Name | Type | CP
IBA-206-A | Marketing | Lecture (online) | 5
IBA-206-B | Marketing – Tutorial | Tutorial (online) | 2.5</td></tr>
<tr><td colspan="2">Module Coordinator

Dr. Matthias Meckel</td><td colspan="2">Program Affiliation

• International Business Administration (online) (IBA (online))
•</td><td colspan="2">Mandatory Status

Mandatory elective for IBA (online)</td></tr>
<tr><td colspan="3">Entry Requirements

Pre-requisites: ☒ Introduction to International Business; ☒Introduction to Finance and Accounting; ☒Microeconomics; ☒Macroeconomics
Co-requisites: ☒ None
Knowledge, Abilities, or Skills: • Academic writing skills • Interest in creative thinking</td><td>Frequency

Annually (Fall)</td><td colspan="2">Duration

1 semester</td></tr>
<tr><td colspan="6">Student Workload
Asynchronous Self Study | Interactive Learning | Exam Preparation | Independent Study | Hours Total
35 h | 47.5 h | 35 h | 70 h | 187.5 h</td></tr>
<tr><td colspan="6">Recommendations for Preparation

None</td></tr>
<tr><td colspan="6">Content and Educational Aims

The marketing concept is one of the most vital yet one of the most often misunderstood concepts in business management. Identifying target customers and their needs and developing products, services and brands designed to fulfill these needs is the major prerequisite for a successful business endeavor. Without being able to create relevant value for a well-defined group of target customers, a company will not operate successfully in the long run.
This is an integrative and applications-oriented module in marketing planning and strategy. With a strong focus on customer-orientated marketing, the module spans across to main topics. Topic A covers the marketing environment, consumer behavior, market segmentation and positioning. In topic B the focus is shifted to the operational decision-making processes in marketing such as product, pricing, and distribution decisions.
The main objective of this course is to provide students with a sound understanding of the basic marketing concepts and how they are applied in practice. Students will be able to analyze markets, competitors and customers and to define relevant markets and market segments. The lecture part of this module conveys the relevant concepts and theories on marketing management in an interactive manner. In the tutorial part, students will apply this knowledge to real world challenges in marketing.</td></tr>
</table>

Intended Learning Outcomes

Upon completion of this module, students will be able to

1. identify, explain, and solve critical marketing challenges such as the impact of demographic change on consumer segments or the changing influence of market participants in social media;
2. develop a sound understanding of the mechanisms behind the marketing of branded goods and services;
3. connect theoretical knowledge and practical tools (e.g. online surveys) to explain and evaluate marketing strategies;
4. combine entrepreneurial spirit with marketing knowledge when creating and testing their marketing concepts;
5. utilize analytical skills and apply relevant tools as required in the discipline.

Indicative Literature

Kotler, P. & Keller, K.L. (2015). Marketing Management, Global Edition – 15th edition. London: Pearson.

Keegan, W.J. & Green, M. C. (2011). Global Marketing – 6th edition. London: Pearson.

Usability and Relationship to other Modules

- This module prepares students for the Bachelor Thesis focusing on topics in marketing

Examination Type: Module Examination

Assessment Type: Oral Presentation + Presentation script submitted in a report format.

Length: 30 minutes
Weight: 100%

Scope: All intended learning outcomes of the module

Completion: To pass this module, the examination has to be passed with at least 45%.

7.10 Entrepreneurship and Innovation

Module Name	**Module Code**	**Level (type)**	**CP**
Entrepreneurship and Innovation	IBA-205	Year 2 (CORE)	7.5

Module Components

Number	*Name*	*Type*	*CP*
IBA-205-A	Entrepreneurship and Innovation	Lecture (online)	7.5

Module Coordinator	**Program Affiliation**	**Mandatory Status**
Dr. Matthias Meckel	• International Business Administration (online) (IBA (online))	Mandatory elective for IBA (online) Mandatory for Minor in EIM

Entry Requirements			***Frequency***	***Duration***
Pre-requisites ☒ Introduction to International Business ☒ Introduction to Finance and Accounting ☒ Microeconomics ☒ Macroeconomics	Co-requisites ☒ None	Knowledge, Abilities, or Skills	Annually (Spring)	1 semester

Student Workload

Asynchronous Self Study	Interactive Learning	Assessment Preparation	Independent Study	Hours Total
35 h	47.5 h	20 h	85 h	187.5 h

Recommendations for Preparation

This module is based on the knowledge students acquired in the CHOICE modules during the first study year. For preparation, students should recall the topics related to innovation and financial planning.

Content and Educational Aims

Innovation is the principal source of sustainable competitive advantage for firms around the world. However, building an organization that can successfully and repeatedly bring innovations to market is a daunting managerial challenge. This module will focus on the practices and processes managers use to manage innovation effectively. Over the semester, several aspects will be examined with regard to innovation: such as exploring, executing, leveraging and renewing innovation. The focus will be on entrepreneurial organizations. The module is designed to provide a deep grounding in the field of innovation for managers and entrepreneurs whose goal is to play a leading role in innovation-driven firms. The material moves between strategic issues (what should you do?) and organizational and managerial issues (how should you get it done?). The focus of the module is on exemplifying and experiencing the innovation process and implementation. Students have to develop business ideas and business plans. They will also be trained to present their business ideas in a pitch.

Intended Learning Outcomes

Upon completion of this module, students will be able to

1 identify organizational, managerial and financial opportunities and challenges within businesses;
2 create value in terms of products and services while forming a business idea;
3 sell their ideas to investors using excellent oral and visual presentation skills;
4 transform theoretical knowledge into creative approaches while solving real-world problems;
5 evaluate the needs of innovation and initiate creative processes to expand businesses;
6 analyze markets and identify the best opportunities for the company formation;

Indicative Literature

Phillips, F., Libby,R., Libby P. (2015). Fundamentals of Financial Accounting, 5th Edition. New York: McGraw-Hill Education.

Fraser, L.M., Ormiston, A. (2015). Understanding Financial Statements, 11th Edition, London: Pearson.

Hisrich, R., Peters, M., Shepherd D (2017). Entrepreneurship & Innovation, 10th Edition, New York: McGraw-Hill.

Usability and Relationship to other Modules

- This module prepares students who are interested in founding their own business or StartUp. As such the module can support students who would like to choose the StartUp – Option in the "Internship/ StartUp and Career Skills" module

Examination Type: Module Examination

Assessment Type: Presentation Duration: 10 minutes

Weight: 100%

Scope: All intended learning outcomes

Completion: To pass this module, the examination has to be passed with at least 45%.

7.11 Organization and Human Resource Management

Module Name	**Module Code**	**Level (type)**	**CP**
Organization and Human Resource Management	IBA-207	Year 2 (CORE)	7.5

Module Components

Number	*Name*	*Type*	*CP*
IBA-207-A	Organization and Human Resource Management	Lecture(online)	5
IBA-207-B	Organization and Human Resource Management - Tutorial	Tutorial (online)	2.5

Module Coordinator	**Program Affiliation**	**Mandatory Status**
Dr. Matthias Meckel	• International Business Administration (online) (IBA (online)) •	Mandatory elective for IBA (online)

Entry Requirements			***Frequency***	***Duration***
Pre-requisites	Co-requisites	Knowledge, Abilities, or Skills	Annually (Spring)	1 semester
☒ None	☒ None			

Student Workload

Asynchronous Self Study	Interactive Learning	Assessment Preparation	Independent Study	Hours Total
35 h	17.5 h	20 h	115 h	187.5 h

Recommendations for Preparation

Before the first session, students should read the short article by John Beeson “Five questions every leader should ask about organizational design”, published in the Harvard Business Review, January 2014.

Content and Educational Aims

This module introduces students to fundamental concepts in organization theory, organizational behavior and human resource (HR) management, such as scientific management, the human relations school, learning, motivation, or turnover. It transmits an overview of organization theories and the history of managerial thought, as well as central concepts for diagnosing and shaping organizations, and the basic functions of human resource (HR) management. The module relies on project-based instruction and trains the students’ capacity to communicate their organizational analysis and recommendations. The seminar introduces the concepts students need to know and work with in order to present a successful work at the end of the term. In the tutorials, students train their research and presentation skills and further integrate the material taught in the seminar via group discussions of concepts, case study problems, and guest lectures by practitioners in order to reflect upon their own work.

This module transmits fundamental knowledge of organizations applied to a diversity of fields and sectors. Knowledge of organization theories and organizational behavior are fundaments of undergraduate studies in the field of management. With its didactic focus on communication skills as conveyors of knowledge in organizational analysis, this module provides our students with a solid preparation to their future professional responsibilities. Finally, understanding organizational dynamics and behavior in organizations further enables students to become responsible managers with an eye for the consequences of their decisions for the people they work with.

Intended Learning Outcomes

Upon completion of this module, students will be able to

1. label fundamental dimensions of organizational analysis and HRM;
2. deduce organizational problems based on complementary dimensions;
3. infer solutions to organizational problems through a team effort;
4. predict and discuss the influence of organizational decisions on people;
5. practice research and presenting as ways to plan for and communicate organizational development issues.

Indicative Literature

Grey, C. (2017). A very short, fairly interesting and reasonably cheap book about studying organizations - 4th edition. Thousand Oaks: Sage.

Morgan, G. (2006). Images of organization. Thousand Oaks: Sage.

Usability and Relationship to other Modules

This module builds on the knowledge acquired in the first-year modules “Introduction to International Business” and expands students’ understanding of how businesses are run by focusing on the design of organizations, work and the management of human resource. This module benefits from the contents taught in its accompanying module “Marketing” as the combination of the two modules places the management of organizational structures into the perspective of the firm’s market positioning. This module provides knowledge that is required for the third-year GEM modules “Information Economics” and “Managing Public and Nonprofit Organizations”.

Examination Type: Module Examination

Assessment Type: Presentation

Duration: 45 minutes

Weight: 100%

Scope: All intended learning outcomes of the module

Completion: To pass this module, the examination has to be passed with at least 45%.

7.12 Managerial Accounting

Module Name	**Module Code**	**Level (type)**	**CP**
Managerial Accounting	IBA-301	Year 3 (Specialization)	5

Module Components

Number	Name	Type	CP
IBA-301-A	Managerial Accounting	Seminar (online)	5

Module Coordinator	**Program Affiliation**	**Mandatory Status**
Dr. Matthias Meckel	• International Business Administration (online) (IBA (online))	Mandatory elective for IBA (online)

Entry Requirements			**Frequency**	**Duration**
Pre-requisites	Co-requisites	Knowledge, Abilities, or Skills	Annually (Fall)	1 semester
☒ Introduction to Finance and Accounting	☒ None			

Student Workload

Asynchronous Self Study	Interactive Learning	Exam Preparation	Independent Study	Hours Total
35 h	17.5 h	20 h	52.5 h	125 h

Recommendations for Preparation

Students are expected to refresh their knowledge obtained from the module “Introduction to Finance and Accounting”.

Content and Educational Aims

This module aims to provide an overview and understanding of managerial accounting basics. It introduces the core concepts of managerial accounting. Further, it enables students to perform and evaluate managerial accounting tools and concepts available to managers for financial decision making and considers how these may be used in practice.

The module focuses on the concepts, models, and systems that provide managers with the information necessary to achieve both the financial and the non-financial (ESG) goals. The overall goal is to familiarize students with the terminology and basic concepts of managerial accounting.

Intended Learning Outcomes

Upon completion of this module, students will be able to

1. understand cost classifications used for assigning costs to cost objects and preparing financial statements
2. prepare income statements using the traditional and contribution formats
3. apply overhead cost to jobs using a predetermined overhead rate
4. compute the total cost and the unit product cost of a job
5. understand the flow of costs in a job-order costing system and prepare appropriate journal entries and T-accounts to record costs
6. understand the basic approach in activity-based costing and how it differs from conventional costing
7. assign costs to units and prepare a cost reconciliation report using the weighted-average method

8. explain how changes in activity affect contribution margin and net operating income
9. determine the break-even point, the level of sales needed to achieve a desired target profit, and the margin
10. of safety and explain their significance
11. prepare different types of budgets
12. compute different performance measures

Indicative Literature

Garrison, R., Noreen E. and Brewer P. (2020). Managerial Accounting, 17th Ed. New York: MacGraw-Hill.

Usability and Relationship to other Modules

Examination Type: Module Examination

Assessment Type: Written examination

Duration: 120 minutes
Weight:100%

Scope: All intended learning outcomes of the module

Completion: To pass this module, the examination has to be passed with at least 45%.

7.13 Contemporary Topics in Marketing

Module Name	**Module Code**	**Level (type)**	**CP**
Contemporary Topics in Marketing	IBA-302	Year 3 (Specialization)	5

Module Components

Number	Name	Type	CP
IBA-302-A	Contemporary Topics in Marketing	Seminar (online)	5

Module Coordinator	**Program Affiliation**	**Mandatory Status**
Dr. Matthias Meckel	• International Business Administration (online) (IBA (online))	Mandatory elective for IBA (online)

Entry Requirements			**Frequency**	**Duration**
Pre-requisites	Co-requisites	Knowledge, Abilities, or Skills	Annually (Spring)	1 semester
☒ Introduction to International Business ☒ Introduction to Finance & Accounting	☒ None	• Basic Concepts of Marketing		

Student Workload

Asynchronous Self Study	Interactive Learning	Exam Preparation	Independent Study	Hours Total
35 h	17.5 h	30 h	42.5 h	125 h

Recommendations for Preparation

It is recommended that students chose the "Marketing" module in their second year to gain in-depth knowledge of basic marketing concepts prior to this specialization. Students should at least familiarize themselves with basic marketing concepts as outlined in the syllabus of the "Marketing" module.

Content and Educational Aims

The module aims to provide an overview and understanding of frontline topics in marketing. The purpose is also to stimulate interest in a further exploration of these topics, for continued research and thesis work. The overall objective is to provide students with an explicit marketing-based mindset and a set of conceptual, analytical, and practical tools with which to come to terms with contemporary marketing issues, thus enabling them to challenge and improve existing practices and theories.
The module covers a set of marketing topics that (a) are important in contemporary marketing, from both a theoretical and practical point of view, and (b) have not received extensive coverage in previous marketing-related modules.

Intended Learning Outcomes

Upon completion of this module, students will be able to

- illustrate an understanding of contemporary topics in marketing relating to theories, models, research methods and empirical phenomena;
- analyze and assess published journal articles in the field of marketing;
- discuss contemporary marketing phenomena and practices;
- design an adequate empirical research approach for an analysis of a contemporary topic in marketing.

Indicative Literature

Hanlon, A. (2019). Digital Marketing - Strategic Planning & Integration. Thousand Oakes: Sage.

Usability and Relationship to other Modules

Examination Type: Module Examination

Assessment Type: Term paper Length: 1.500 words
Weight: 100%

Scope: All intended learning outcomes of the module

Completion: To pass this module, the examination has to be passed with at least 45%.

7.14 Advanced Econometrics

Module Name	**Module Code**	**Level (type)**	**CP**
Advanced Econometrics	IBA-303	Year 3 (Specialization)	5

Module Components

Number	Name	Type	CP
IBA-303-A	Advanced Econometrics	Seminar (online)	5

Module Coordinator	**Program Affiliation**	**Mandatory Status**
Dr. Matthias Meckel	• International Business Administration (online) (IBA (online))	Mandatory elective for IBA (online)

Entry Requirements			**Frequency**	**Duration**
Pre-requisites	Co-requisites	Knowledge, Abilities, or Skills	Annually (Fall)	1 semester
☒ Econometrics	☒ None	• Notions of substantive versus statistical significance • Basic knowledge of econometrics • Academic writing skills		

Student Workload

Asynchronous Self Study	Interactive Learning	Exam Preparation	Independent Study	Hours Total
35 h	17.5 h	30 h	42.5 h	125 h

Recommendations for Preparation

Students prepare best for this module by reading Edward Leamer's seminal article "Let's take the con out of Econometrics," published in the American Economic Review in 1983. The article covers many of the key issues that econometricians still grapple with today, such as whether randomization is essential.

Content and Educational Aims

The goal of this module is to build on the knowledge acquired in the "Econometrics" module, covering select advanced concepts of regression analysis as it applies to empirical social science research. The prime learning objective is to understand different approaches of secondary data analysis, where and how to apply particular econometric estimators, and their limitations. Particular emphasis will be placed on identifying exogenous sources of variation and methods for identifying causal relationships between variables. The class will also cover some of the opportunities and pitfalls associated with the analysis of "big data", drawing on current examples and available data. Textbook-based lectures ensure the transmission of the necessary knowledge. Exercises in class further promote the students' capacity to differentiate and debate the merits of alternative econometric techniques for testing particular hypotheses.

This module aims at consolidating students' command of econometrics and related statistical techniques. A command of econometrics constitutes an important fundament for undergraduate studies in the fields of economics and helps students to critically appraise scientific statements about causality in many situations, including professional settings. This module helps students to assess and criticize econometric findings in academic papers and promotes their capacity to differentiate between bias and statistical precision in interpreting their own econometric results

Intended Learning Outcomes

Upon completion of this module, students will be able to

1. identify the econometric method appropriate to specific data types;
2. implement the method using R-software and interpret the results;
3. design a research project that applies an econometric model to secondary data;
4. write a term paper that develops a thesis, derives a testable hypothesis, presents results, and draws conclusions;
5. articulate model results in terms that a lay person can understand;
6. discriminate between the notions of “economic significance” and “statistical significance”.

Indicative Literature

Angrist, J. D., Pischke, J. S. (2014). Mastering metrics: The path from cause to effect. Princeton University Press.

Antonakis, J., Bendahan, S., Jacquart, P. Lalive, R. (2010). On making causal claims: A review and recommendations. The Leadership Quarterly, 21(6): 1086-1120.

Usability and Relationship to other Modules

- This module builds on the second-year methods module “Econometrics”, as well as on models and topics from the first-year modules “Microeconomics” and “Macroeconomics” and from the second-year modules “Environmental and Resource Economics” and “Development Economics”. The module expands students’ understandings of econometrics beyond the introductiory level towards advanced techniques and applications

Examination Type: Module Examination

Assessment Type: Term Paper — Length: 1.500 words
Weight: 100%

Scope: All intended learning outcomes of the module

Completion: To pass this module, the examination has to be passed with at least 45%

7.15 Lean Management

Module Name	Module Code	Level (type)	CP
Lean Management	IBA-304	Year 3 (Specialization)	5

Module Components

Number	Name	Type	CP
IBA-304-A	Lean Management	Lecture (online)	5

Module Coordinator	Program Affiliation	Mandatory Status
Dr. Matthias Meckel	• International Business Administration (online) (IBA (online))	Mandatory elective for IBA (online)

Entry Requirements			Frequency	Duration
Pre-requisites	Co-requisites	Knowledge, Abilities, or Skills	Annually Fall	1 semester
☒ Introduction to International Business ☒ Introduction to Finance & Accounting	☒ None			

Student Workload

Asynchronous Self Study	Interactive Learning	Exam Preparation	Independent Study	Hours Total
35 h	17.5 h	20 h	52.5 h	125 h

Recommendations for Preparation

Before the first session, students should familiarize themselves with Sanjay Bhasin (2015), Lean Management Beyond Manufacturing, A Holistic Approach. Springer; McAfee, A. & Brynjolfsson, E. (2012), "Big Data: The Management Revolution," Harvard Business Review, 1-9; Ustundag, A. & Cevikcan, E. (2017) Industry 4.0: Managing The Digital Transformation. Springer; Winkelhake, U.(2018) The Digital Transformation of the Automotive Industry. Springer.

Content and Educational Aims

The module engages with lean production and lean management. Articles are used to highlight issues scientists and managers are confronted with in practice and theory. Special emphasis is given to developing an understanding of how companies, especially production companies, are formed and shaped by ideas and concepts.

Furthermore, this module examines the nature of organizations in a changing context and applies theories and strategies for managing change in a business environment. The module also engages in key issues affecting business life, focusing on production analysis. Topics include change management and time management. The target is to develop an understanding of the phenomenon of change and the factors that facilitate and hinder it.

The lecture should familiarize students with the "lean philosophy." Students learn the success factors of lean management, lean organization, and lean office culture. They should be able to understand and apply the underlying methods. In addition, they deal critically with the application limits of lean management.

The course also stimulates students' interest in exploring these topics further, for continued research and thesis work. The overall objective is to provide students with an explicit lean management-based mindset and a set of conceptual, analytical, and practical tools with which to come to terms with related contemporary topics such as industry 4.0, so that students should be able to challenge and improve existing practices and theories.

Intended Learning Outcomes

Upon completion of this module, students will be able to

1. illustrate an understanding of contemporary topics in lean management relating to theories, models, research methods and industrial applications;
2. analyze published journal articles in the field of lean management and apply these theories to real-world cases;
3. use the basics of production management and lean office culture;
4. choose and use the right lean principles;
5. develop a sensibility for the phenomenon of change and the factors that facilitate or hinder it;
6. discuss strategies for managing change in an industrial environment;
7. explain tips and tricks for application and implementation.

Indicative Literature

Bhasin, S. (2015). Lean management beyond manufacturing. New York: Springer.

Charron, R. et al. (2014). The lean management systems handbook. New York: Productivity Press.

Jones, E. (2014). Quality management for organizations using lean six sigma techniques. Boca Raton: CRC press.

Nicholas, J. (2018). Lean production for competitive advantage: a comprehensive guide to lean methodologies and management practices. New York: Productivity Press.

Paksoy, T., Weber, G.-H., Huber, S. (2019). Lean and Green Supply Chain Management. Berlin: Springer.

Yasuhiro, M., Yoshiteru, M. (ed.) (2015). Lean management of global supply chain. Singapore: World Scientific.

Usability and Relationship to other Modules

Examination Type: Module Examination

Assessment Type: Presentation (recorded) Duration: 40 minutes
Weight: 100%

Scope: All intended learning outcomes of the module

Completion: To pass this module, the examination has to be passed with at least 45%

7.17 Summer Internship / Startup and Career Skills

Module Name	**Module Code**	**Level (type)**	**CP**
Summer Internship / Startup and Career Skills	IBA-300	Year 3 (CAREER)	15

Module Components

Number	Name	Type	CP
IBA-300-I	Summer Internship	Internship	15

Module Coordinator	**Program Affiliation**	**Mandatory Status**
Sinah Vogel & Dr. Tanja Woebs (CSC Organization); SPC / Faculty Startup Coordinator (Academic responsibility)	• CAREER module for undergraduate study programs	Mandatory IBA

Entry Requirements			**Frequency**	**Duration**
Pre-requisites	Co-requisites	Knowledge, Abilities, or Skills	Annually (Spring/Fall)	1 semester
☒ at least 15 CP from CORE modules in the major	☒ None	• Information provided on CSC pages (see below) • Major specific knowledge and skills		

Student Workload

Internship	Interactive Learning	Internship Event	Independent Study	Hours Total
308 h	33 h	2 h	32 h	375 h

Forms of Learning and Teaching

- Internship/Start-up
- Internship event
- Seminars, info-sessions, workshops and career events
- Self-study, readings, online tutorials

Recommendations for Preparation

- Please see the section "Knowledge Center" at JobTeaser Career Center for information on Career Skills seminar and workshop offers and for online tutorials on the job market preparation and the application process. For more information, please see https://www.jacobs-university.de/employability/career-services
- Participating in the internship events of earlier classes

Content and Educational Aims

The aims of the internship module are reflection, application, orientation, and development: for students to reflect on their interests, knowledge, skills, their role in society, the relevance of their major subject to society, to apply these skills and this knowledge in real life whilst getting practical experience, to find a professional orientation, and to develop their personality and

in their career. This module supports the programs' aims of preparing students for gainful, qualified employment and the development of their personality.

The full-time internship must be related to the students' major area of study and extends lasts a minimum of two consecutive months, normally scheduled just before the 5th semester, with the internship event and submission of the internship report in the 5th semester. Upon approval by the SPC and CSC, the internship may take place at other times, such as before teaching starts in the 3rd semester or after teaching finishes in the 6th semester. The Study Program Coordinator or their faculty delegate approves the intended internship a priori by reviewing the tasks in either the Internship Contract or Internship Confirmation from the respective internship institution or company. Further regulations as set out in the Policies for Bachelor Studies apply.

Students will be gradually prepared for the internship in semesters 1 to 4 through a series of mandatory information sessions, seminars, and career events.
The purpose of the Career Services Information Sessions is to provide all students with basic facts about the job market in general, and especially in Germany and the EU, and services provided by the Career Services Center.
In the Career Skills Seminars, students will learn how to engage in the internship/job search, how to create a competitive application (CV, Cover Letter, etc.), and how to successfully conduct themselves at job interviews and/or assessment centers. In addition to these mandatory sections, students can customize their skill set regarding application challenges and their intended career path in elective seminars.
Finally, during the Career Events organized by the Career Services Center (e.g. the annual Constructor Career Fair and single employer events on and off campus), students will have the opportunity to apply their acquired job market skills in an actual internship/job search situation and to gain their desired internship in a high-quality environment and with excellent employers.

As an alternative to the full-time internship, students can apply for the StartUp Option. Following the same schedule as the full-time internship, the StartUp Option allows students who are particularly interested in founding their own company to focus on the development of their business plan over a period of two consecutive months. Participation in the StartUp Option depends on a successful presentation of the student's initial StartUp idea. This presentation will be held at the beginning of the 4th semester. A jury of faculty members will judge the student's potential to realize their idea and approve the participation of the students. The StartUp Option is supervised by the Faculty StartUp Coordinator. At the end of StartUp Option, students submit their business plan. Further regulations as outlined in the Policies for Bachelor Studies apply.

The concluding Internship Event will be conducted within each study program (or a cluster of related study programs) and will formally conclude the module by providing students the opportunity to present on their internships and reflect on the lessons learned within their major area of study. The purpose of this event is not only to self-reflect on the whole internship process, but also to create a professional network within the academic community, especially by entering the Alumni Network after graduation. It is recommended that all three classes (years) of the same major are present at this event to enable networking between older and younger students and to create an educational environment for younger students to observe the "lessons learned" from the diverse internships of their elder fellow students.

Intended Learning Outcomes

Upon completion of this module, students will be able to

1. describe the scope and the functions of the employment market and personal career development;
2. apply professional, personal, and career-related skills for the modern labor market, including self-organization, initiative and responsibility, communication, intercultural sensitivity, team and leadership skills, etc.;
3. independently manage their own career orientation processes by identifying personal interests, selecting appropriate internship locations or start-up opportunities, conducting interviews, succeeding at pitches or assessment centers, negotiating related employment, managing their funding or support conditions (such as salary, contract, funding, supplies, work space, etc.);
4. apply specialist skills and knowledge acquired during their studies to solve problems in a professional environment and reflect on their relevance in employment and society;
5. justify professional decisions based on theoretical knowledge and academic methods;
6. reflect on their professional conduct in the context of the expectations of and consequences for employers and their society;
7. reflect on and set their own targets for the further development of their knowledge, skills, interests, and values;
8. establish and expand their contacts with potential employers or business partners, and possibly other students and alumni, to build their own professional network to create employment opportunities in the future;
9. discuss observations and reflections in a professional network.

Indicative Literature

Not specified

Usability and Relationship to other Modules

- This module applies skills and knowledge acquired in previous modules to a professional environment and provides an opportunity to reflect on their relevance in employment and society. It may lead to thesis topics.

Examination Type: Module Examination

Assessment Type: Internship Report or Business Plan and Reflection — Length: approx. 3.500 words

Scope: All intended learning outcomes — Weight: 100%

7.18 Bachelor Thesis and Seminar

Module Name Bachelor Thesis			**Module Code** IBA-400	**Level (type)** Year 3 (CAREER)	**CP** 15
Module Components					
Number	Name			Type	CP
IBA-400-T	Thesis IBA			Lecture (online)	12
IBA-400-S	Thesis Seminar IBA			Seminar (online)	3
Module Coordinator Study Program Chair	**Program Affiliation** • all Bachelor Programs			**Mandatory Status** Mandatory for all Bachelor Programs	
Entry Requirements			**Frequency**	**Duration**	
Pre-requisites	Co-requisites	Knowledge, Abilities, or Skills	Every semester (Fall/Spring)	1 semester	
☒ Students must be in their third year and have taken at least 30 CP from Year 2 modules. None	☒ None	• Comprehensive knowledge of the subject and deeper insight into the chosen topic; • ability to plan and undertake work independently; skills to identify and critically review literature.			

Student Workload				
Asynchronous Self Study	Interactive Learning	Exam Preparation	Independent Study & Lab work	Hours Total
5h	20 h	0 h	350 h	375 h

Recommendations for Preparation

- Identify an area or a topic of interest and discuss this with your prospective supervisor in good time.
- Create a research proposal including a research plan to ensure timely submission.
- Ensure you possess all required technical research skills or are able to acquire them on time.

Review again the University's Code of Academic Integrity and Guidelines to Ensure Good Academic Practice.

Content and Educational Aims

This module is a mandatory graduation requirement for all undergraduate students to demonstrate their ability to deal with a problem from their respective major subject independently by means of academic/scientific methods within a set period. Although supervised, the module requires the student to be able to work independently and regularly and set their own goals in exchange for the opportunity to explore a topic that excites and interests them personally and which a faculty member is interested to supervise. Within this module, students apply their acquired knowledge about the major discipline, skills, and methods to conduct research, ranging from the identification of suitable (short-term) research projects, preparatory literature searches, the realization of discipline-specific research, and the documentation, discussion, interpretation and communication of the results.

This module consists of two components, an independent thesis and an accompanying seminar. The thesis component must be supervised by a Constructor University faculty member and requires short-term research work, the results of which must be documented in a comprehensive written thesis including an introduction, a justification of the methods,

results, a discussion of the results, and conclusions. The seminar provides students with the opportunity to present, discuss and justify their and other students' approaches, methods and results at various stages of their research to practice these skills to improve their academic writing, receive and reflect on formative feedback, thereby growing personally and professionally.

Intended Learning Outcomes

Upon completion of this module, students will be able to

1. independently plan and organize advanced learning processes;
2. design and implement appropriate research methods taking full account of the range of alternative techniques and approaches;
3. collect, assess and interpret relevant information;
4. draw scientifically founded conclusions that consider social, scientific and ethical insights;
5. apply their knowledge and understanding to a context of their choice;
6. develop, formulate and advance solutions to problems and arguments in their subject area, and defend these through argument;
7. discuss information, ideas, problems and solutions with specialists and non-specialists;

Usability and Relationship to other Modules

This module builds on all previous modules of the program. Students apply the knowledge, skills and competencies they acquired and practiced during their studies, including research methods and the ability to acquire additional skills independently as and if required.

Examination Type: Module Examination

Assessment type: Thesis

Length: 1.500 words
Weight: 100%

Scope: All intended learning outcomes of the module

Completion: To pass this module, the examination has to be passed with at least 45%

8 CONSTRUCTOR Track Modules

8.1 Methods

8.1.1 Applied Calculus

<table>
<tr><td colspan="3">Module Name
Applied Calculus</td><td>Module Code
CTMS-MAT-08</td><td>Level (type)
Year 1 (Methods)</td><td>CP
5</td></tr>
<tr><td colspan="6">Module Components

Number | Name | Type | CP
CTMS-08 | Applied Calculus | Lecture (online) | 5</td></tr>
<tr><td>Module Coordinator

NN</td><td colspan="3">Program Affiliation

• CONSTRUCTOR Track Area</td><td colspan="2">Mandatory Status

Mandatory for IBA (online) and IEM (online)</td></tr>
<tr><td colspan="3">Entry Requirements

Pre-requisites: ☒ None
Co-requisites: ☒ None
Knowledge, Abilities, or Skills:
• Knowledge of Mathematics at high school level (Functions, graphs of functions, linear and polynomial functions, logarithms and exponential function, basic trigonometric functions, elementary methods for solving systems of linear and nonlinear equations).
• Some familiarity with elementary calculus (limits, derivatives) is helpful, but not required</td><td>Frequency

Annually (Fall)</td><td colspan="2">Duration

1 semester</td></tr>
<tr><td colspan="6">Student Workload
Asynchronous Self Study | Interactive Learning | Assessment Preparation | Independent Study | Hours Total
35 h | 20 h | 20 h | 50 h | 125 h</td></tr>
<tr><td colspan="6">Recommendations for Preparation</td></tr>
</table>

Content and Educational Aims

This module gives a broad overview of the methods of Calculus, putting more emphasis on applications, rather than on mathematical rigor. Most of the concepts and methods are backed up by examples from chemistry, biology, economics and/or other sciences. In this module students enhance both their quantitative problem-solving skills as well as their conceptual understanding of mathematical methods.

The lecture comprises the following topics:

- Brief review of elementary functions and their graphs
  Intuitive understanding of limits; horizontal and vertical asymptotes
- Derivatives and their computation
- Applications of derivatives (interpretation of derivatives, their units, local linear approximation, error propagation, optimization problems)
- Brief introduction to functions of several variables, partial derivatives, local minima and maxima
- Integrals and their computation
- Applications of integrals (accumulated change, average value, applications in probability: density functions and cumulative distribution functions).
- Brief introduction to differential equations.

Intended Learning Outcomes

Upon completion of this module, students will be able to

1. apply the fundamental concepts of Calculus in structured situations;
2. command the methods described in the content section of this module description to the extent that they can solve standard text-book problems reliably and with confidence;
3. explain importance of the methods of Calculus in problems arising from applications;
4. understand the methods of Calculus, used in other modules, as well as in scientific literature.

Indicative Literature

D. Hughes-Hallett, A. Gleason, P. Lock, D. Flath, et al. (2010/2013). Applied Calculus, 4th or 5th edition. Hoboken: Wiley.

Usability and Relationship to other Modules

- The module serves as preparation for the 2nd year IEM CORE module Operations Research.
- This serves as preparation for the 1st year GEM and IBA modules Microeconomics, Macroeconomics and Introduction to Finance and Accounting
- A mathematically rigorous treatment of Calculus is provided in the module “Analysis I”.
- The first year modules Calculus and Elements of Linear Algebra I+II can be used in place of the modules Applied Calculus and Finite Mathematics, respectively, to satisfy the graduation requirements in majors in which they are mandatory.

Examination Type: Module Examination

Module Achievement: Submission of at least 8 out of 12 homework assignments.

Assessment type: Written examination

Duration: 120 min
Weight: 100%

Scope: All intended learning outcomes of this module

Module Achievement: The assignments should give students direct feedback and better preparation opportunities for the final written examination.

Completion: To pass this module, the examination has to be passed with at least 45%

8.1.2 Applied Statistics with R

Module Name			**Module Code**	**Level (type)**	**CP**
Applied Statistics with R			CTMS-MET-03	Year 1 (Methods)	5
Module Components					
Number	Name			Type	CP
CTMS-03	Applied Statistics with R			Lecture & Lab (online)	5
Module Coordinator NN	**Program Affiliation** • CONSTRUCTOR Track Area			**Mandatory Status** Mandatory for IBA (online) and IEM (online)	
Entry Requirements Pre-requisites ☒ None	Co-requisites ☒ None	Knowledge, Abilities, or Skills	**Frequency** Annually (Spring)	**Duration** 1 semester	

Student Workload				
Asynchronous Self Study	Interactive Learning	Assessment Preparation	Independent Study	Hours Total
17.5 h	17.5 h	10 h	80 h	125 h

Recommendations for Preparation

Get acquainted to statistical thinking by watching online videos for introductory probability and statistics as well as paying attention whenever arguments are backed up by empirical data.

Content and Educational Aims

We live in a world full of data and more and more decisions are taken based on a comprehensive analysis of data. A central method of data analysis is the use of models describing the relationship between a set of predictor variables and a response. This module provides a thorough introduction to quantitative data analysis covering graphical representations, numerical summary statistics, correlation, and regression models. The module also introduces the fundamental concepts of statistical inference. Students learn about the different data types, how to best visualize them and how to draw conclusions from the graphical representations. Students will learn in this module the ideas and techniques of regression models within the generalized linear model framework involving multiple predictors and co-variates. Students will learn how to become an intelligent user of statistical techniques from a prosumers perspective to assess the quality of presented statistical results and to produce high-quality analyses by themselves. By using illustrative examples from economics, engineering, and the natural and social sciences students will gain the relevant background knowledge for their specific major as well as an interdisciplinary glimpse of other research fields. The general objective of the module is to enable students to become skilled statistical modelers who are well versed in the various assumptions, limitations, and controversies of statistical models and their application. Regular exercises and practical sessions will corroborate the students' proficiency with the statistical software R.

Intended Learning Outcomes

Upon completion of this module, students will be able to

1. apply basic techniques in statistical modeling and quantitative research methods
2. describe fundamental statistical concepts, procedures, their assumptions and statistical fallacies
3. explain the potential of using quantitative methods in all fields of applications;
4. express informed skepticism of the limitations of statistical reasoning;
5. interpret statistical modeling results in scientific publications;
6. perform basic and intermediate-level statistical analyses of data, using R.

Indicative Literature

Michael J. Crawley (2013). The R Book, Second Edition. Hoboken: John Wiley & Sons.

Peter Daalgard (2008). Introductory Statistics with R. Berlin: Springer.

John Maindonald, W. John Braun (2010). Data Analysis and Graphics Using R – an Example-Based Approach, Third Edition, Cambridge Series. In Statistical and Probabilistic Mathematics. Cambridge: Cambridge University Press.

Christopher Gandrud (2015). Reproducible Research with R and RStudio, Second Edition. The R Series, Chapman & Hall/CRC Press.

Randall E. Schumacker (2014). Learning Statistics Using R. Thousand Oaks: Sage.

Charles Wheelan (2013). Naked Statistics: Stripping the Dread from The Data. New York: W.W. Norton & Company.

Usability and Relationship to other Modules

- Quantitative analytical skills are used and needed in many modules of all study programs.
- Pre-requisite for Econometrics.
- This module introduces students to R in preparation for the 2nd year mandatory method module on econometrics and 3rd year module on advanced econometrics.

Examination Type: Module Examination

Assessment Type: Written examination — Duration: 120 min
Weight: 100%

During the examination students use the software R as an auxiliary resource approved by the Instructor of Record.

Scope: All intended learning outcomes of the module.

Completion: This module is passed with an assessment-component weighted average grade of 45% or higher.

8.1.3 Qualitative Research Methods

Module Name	**Module Code**	**Level (type)**	**CP**
Qualitative Research Methods	CTMS-MET-04	Year 2 (Methods)	5

Module Components

Number	Name	Type	CP
CTMS-04	Qualitative Research Methods	Lecture (online)	5

Module Coordinator	**Program Affiliation**	**Mandatory Status**
N.N	• CONSTRUCTOR Track Area	Mandatory for IBA (online)

Entry Requirements			**Frequency**	**Duration**
Pre-requisites	Co-requisites	Knowledge, Abilities, or Skills	Annually (Fall)	1 semester
☒ None	☒ None			

Student Workload

Asynchronous Self Study	Interactive Learning	Assessment Preparation	Independent Study	Hours Total
35 h	20 h	20 h	50 h	125 h

Recommendations for Preparation

Patton, Michael Quinn (2015). Qualitative evaluation and research methods (4th ed.). Thousand Oaks etc.: Sage, chapter 2

Content and Educational Aims

Qualitative researchers explore the structure of everyday life and the meaning that events, other persons and their actions hold for us. To do so, they take an in-depth look at a few selected cases, such as organizations, campaigns, or people. We will look at the rationale and constructivist and interpretivist principles underlying qualitative research and from there move on to specific designs (such as grounded theory or ethnography), design principles (such as purposive strategies for selecting cases), and research methods. The focus of the module will be on learning about and trying out methods for collecting and analyzing qualitative data. Among methods for collecting qualitative data, relevant topics include semi-structured and narrative interviews, focus groups, observation, working with documents and with visual elements. Methods for analyzing qualitative data include, for example, coding, qualitative content analysis, discourse analysis, visual analysis, semiotics or iconography.
The module has a strong hands-on component. It is held in part as a seminar and in part as a lab where students apply the methods to data from their own fields of study. During the lab sessions, students are required to participate in and report on activities involving the application and testing of selected methods. For assessment and grading, students will carry out their own small research project, in which they bring to bear different methods to a topic of their choice.

Intended Learning Outcomes

Upon completion of this module, students will be able to

1. explain the principles underlying qualitative research;
2. apply basic qualitative approaches and designs;
3. identify and address ethical issues arising in qualitative research;
4. apply strategies for purposefully selecting participants and cases;
5. apply methods for collecting qualitative data;
6. apply methods for analyzing qualitative data;
7. know what to look for in evaluating qualitative research.

Indicative Literature

Dresing, T., Pehl, T., & Schmieder, C. (2015). Manual (on) transcription. Transcription conventions, software guides, and practical hints for qualitative researchers. 3rd English edition. Marburg. Available under: http://www.audiotranskription.de/english/transcription-practicalguide.htm

Flick, U. (2018) (ed.). The SAGE handbook of qualitative data collection. Los Angeles, CA: Sage.

Flick, U. (2019). Introduction to qualitative research. 6th edition. London etc.: Sage.

Patton, M.Q. (2015). Qualitative evaluation and research methods. 4th edition. Thousand Oaks etc.: Sage.

Rose, G. (2016). Visual methodologies. 4th edition. London: Sage.

Usability and Relationship to other Modules

- Complements Method and Skills module Data Collection and Empirical Research Methodologies.
- This module prepares students for the GEM and IBA 2nd year module on organization and HRM as well as Marketing, the GEM 3rd year module on public and nonprofit management, the IBA 3rd year module on Contemporary Topics in Marketing, and the thesis.

Examination Type: Module Examination

Assessment type: Research project (including abstract, ethics statement, and lab report on methods implementation, findings, and evaluation)

Length: 5.000 words (for groups of three students)
Weight: 100%

Scope: All intended learning outcomes of the module.

Completion: To pass this module, the research project has to be passed with at least 45%.

8.1.4 Econometrics

Module Name			**Module Code**	**Level (type)**	**CP**
Econometrics			CTMS-MET-05	Year 2 (Methods)	5
Module Components					
Number	Name			Type	CP
CTMS-05	Econometrics			Seminar (online)	5
Module Coordinator	**Program Affiliation**			**Mandatory Status**	
N.N.	• CONSTRUCTOR Track Area			Mandatory for IBA (online)	
Entry Requirements			**Frequency**	**Duration**	
Pre-requisites	Co-requisites	Knowledge, Abilities, or Skills	Annually (Spring)	1 semester	
☒ Applied statistics with R	☒ None	• Knowledge of the ordinary least-squares regression model. • Ability to estimate regression models using R software. • Skills in conducting statistical inference tests.			

Student Workload

Asynchronous Self Study	Interactive Learning	Assessment Preparation	Independent Study	Hours Total
35 h	20 h	20 h	50 h	125 h

Recommendations for Preparation

An accessible overview of regression analysis can be found in Sykes, A.O. (1993). An Introduction to Regression Analysis. Coase-Sandor Institute for Law & Economics, Univ. of Chicago Working Paper No. 20. https://chicagounbound.uchicago.edu/law_and_economics/51/. Students are also encouraged to read: Ziliak, Stephen T. (2008). Retrospectives: Guinnessometrics: The Economic Foundation of "Student's" t. Journal of Economic Perspectives 22(4): 199-216.

Content and Educational Aims

This module focuses on the application of econometric methods to the analysis of secondary data. Specifically, the goal is to expose students to some of the issues and challenges typically confronted by econometricians when analyzing empirical data in the realms of social science research, business and finance. Emphasis will be placed on the intuition underlying various commonly applied econometric techniques and on the steps needed to implement them. The module expands on the knowledge acquired in statistics and intensifies discussions of multiple regression analysis. The general objective is to become familiar with contemporary methods that are used in econometric and business analyses and to become a critical reader of case studies. In this regard, a clear distinction will be drawn along two dimensions: between questions of statistical significance versus those of economic or social significance; and between correlation and causation. The module

takes a practical approach that covers how to estimate econometric models using R software. Sessions will often include computer applications to foster understanding of the discussed topics.

Intended Learning Outcomes

Upon completion of this module, students will be able to

1 explain the mechanics and assumptions underpinning the Ordinary Least Squares (OLS) regression model;
2 estimate an OLS model on secondary data using R-software;
3 interpret the coefficient estimates from an OLS model with respect to their sign and magnitude;
4 conduct one- and two-sided tests of the statistical significance of coefficients.

Indicative Literature

Abadie, A. & Cattaneo, M.D. (2018). Econometric methods for program evaluation. Annual Review of Economics, 10, 465-503.

Angrist, J.D. & Pischke, J.S. (2014). Mastering' metrics: The path from cause to effect. Princeton University Press.

Kabacoff, R. (2015). R in action: Data analysis and graphics with R. Chapter 8. Manning Publications Co.

Wooldridge, J. M. (2015). Introductory econometrics: A modern approach. 6th edition. Cambridge Learning.

Ziliak, Stephen T. (2008). Guinnessometrics: The economic foundation of "student's". Journal of Economic Perspectives 22(4), 199-216.

Usability and Relationship to other Modules

- This module builds on models and topics from the first-year modules "Microeconomics" and "Macroeconomics" and from the second-year modules "Environmental and Resource Economics" and "Development Economics"
- This module introduces students to R in preparation for the 2nd year mandatory method module on econometrics and 3rd year GEM module on advanced econometrics; the statistics skills prepare students for all 2nd and 3rd year GEM modules and the thesis
- This module prepares students in IBA for the analysis of data in the 2nd year modules International Strategic Management and Marketing and the 3rd year module Contemporary Topics in Marketing and the thesis

Examination Type: Module Examination

Assessment Type: Written examination Duration: 120 min
Weight: 100%

Scope: All intended learning outcomes of the module.

Completion: To pass this module, the examination has to be passed with at least 45%

8.2 New Skills

8.2.1 Logic (perspective I)

<table>
<tr><td colspan="3">Module Name
Logic (perspective I)</td><td>Module Code
CTNS-NSK-01</td><td>Level (type)
Year 2 (New Skills)</td><td>CP
2.5</td></tr>
<tr><td colspan="6">Module Components</td></tr>
<tr><td>Number</td><td colspan="3">Name</td><td>Type</td><td>CP</td></tr>
<tr><td>CTNS-01</td><td colspan="3">Logic (perspective I)</td><td>Lecture (online)</td><td>2.5</td></tr>
<tr><td colspan="2">Module Coordinator

Prof. Dr. Jules Coleman</td><td colspan="2">Program Affiliation

• CONSTRUCTOR Track Area</td><td colspan="2">Mandatory Status
Mandatory elective for all UG students (one perspective must be chosen)</td></tr>
<tr><td colspan="3">Entry Requirements

Pre-requisites

☒ none</td><td>Co-requisites

☒ none</td><td>Frequency

Annually (Fall or Spring)</td><td>Duration

1 semester</td></tr>
<tr><td colspan="6">Student Workload</td></tr>
<tr><td>Asynchronous Self Study</td><td>Interactive Learning</td><td>Assessment Preparation</td><td>Independent Study</td><td colspan="2">Hours Total</td></tr>
<tr><td>17.5h</td><td>10h</td><td>10h</td><td>25 h</td><td colspan="2">62.5h</td></tr>
<tr><td colspan="6"></td></tr>
<tr><td colspan="6">Recommendations for Preparation
none</td></tr>
<tr><td colspan="6">Content and Educational Aims
Suppose a friend asks you to help solve a complicated problem? Where do you begin? Arguably, the first and most difficult task you face is to figure out what the heart of the problem actually is. In doing that you will look for structural similarities between the problem posed and other problems that arise in different fields that others may have addressed successfully. Those similarities may point you to a pathway for resolving the problem you have been asked to solve. But it is not enough to look for structural similarities. Sometimes relying on similarities may even be misleading. Once you've settled tentatively on what you take to be the heart of the matter, you will naturally look for materials, whether evidence or arguments, that you believe is relevant to its potential solution. But the evidence you investigate of course depends on your formulation of the problem, and your formulation of the problem likely depends on the tools you have available – including potential sources of evidence and argumentation. You cannot ignore this interactivity, but you can't allow yourself to be hamstrung entirely by it. But there is more. The problem itself may be too big to be manageable all at once, so you will have to explore whether it can be broken into manageable parts and if the information you have bears on all or only some of those parts. And later you will face the problem of whether the solutions to the particular sub problems can be put together coherently to solve the entire problem taken as a whole.
What you are doing is what we call engaging in computational thinking. There are several elements of computational thinking illustrated above. These include: Decomposition (breaking the larger problem down into smaller ones); Pattern recognition (identifying structural similarities); Abstraction (ignoring irrelevant particulars of the problem): and Creating Algorithms), problem-solving formulas.
But even more basic to what you are doing is the process of drawing inferences from the material you have. After all, how else are you going to create a problem-solving formula, if you draw incorrect inferences about what information has shown and what, if anything follows logically from it. What you must do is apply the rules of logic to the information to draw inferences that are warranted.</td></tr>
</table>

We distinguish between informal and formal systems of logic, both of which are designed to indicate fallacies as well as warranted inferences. If I argue for a conclusion by appealing to my physical ability to coerce you, I prove nothing about the truth of what I claim. If anything, by doing so I display my lack of confidence in my argument. Or if the best I can do is berate you for your skepticism, I have done little more than offer an ad hominem instead of an argument. Our focus will be on formal systems of logic, since they are at the heart of both scientific argumentation and computer developed algorithms. There are in fact many different kinds of logic and all figure to varying degrees in scientific inquiry. There are inductive types of logic, which purport to formalize the relationship between premises that if true offer evidence on behalf of a conclusion and the conclusion and are represented as claims about the extent to which the conclusion is confirmed by the premises. There are deductive types of logic, which introduce a different relationship between premise and conclusion. These variations of logic consist in rules that if followed entail that if the premises are true then the conclusion too must be true.

There are also modal types of logic which are applied specifically to the concepts of necessity and possibility, and thus to the relationship among sentences that include either or both those terms. And there is also what are called deontic logic, a modification of logic that purport to show that there are rules of inference that allow us to infer what we ought to do from facts about the circumstances in which we find ourselves. In the natural and social sciences most of the emphasis has been placed on inductive logic, whereas in math it is placed on deductive logic, and in modern physics there is an increasing interest in the concepts of possibility and necessity and thus in modal logic. The humanities, especially normative discussions in philosophy and literature are the province of deontic logic.

This module will also take students through the central aspects of computational thinking, as it is related to logic; it will introduce the central concepts in each, their relationship to one another and begin to provide the conceptual apparatus and practical skills for scientific inquiry and research.

Intended Learning Outcomes

Students acquire transferable and key skills in this module.

Upon completion of this module, students will be able to

1. apply the various principles of logic and expand them to computational thinking.
2. understand the way in which logical processes in humans and in computers are similar and different at the same time.
3. apply the basic rules of first-order deductive logic and employ them rules in the context of creating a scientific or social scientific study and argument.
4. employ those rules in the context of creating a scientific or social scientific study and argument.

Indicative Literature

Frege, Gottlob (1879), Begriffsschrift, eine der arithmetischen nachgebildete Formelsprache des reinen Denkens [Translation: A Formal Language for Pure Thought Modeled on that of Arithmetic],Halle an der Salle: Verlag von Louis Nebert.

Gödel, Kurt (1986), Russels mathematische Logik. In: Alfred North Whitehead, Bertrand Russell: Principia Mathematica. Vorwort, S. V–XXXIV. Suhrkamp.

Leeds, Stephen. "George Boolos and Richard Jeffrey. Computability and logic. Cambridge University Press, New York and London1974, x+ 262 pp." The Journal of Symbolic Logic 42.4 (1977): 585-586.

Kubica, Jeremy. Computational fairy tales. Jeremy Kubica, 2012.

McCarthy, Timothy. "Richard Jeffrey. Formal logic: Its scope and limits. of XXXVIII 646. McGraw-Hill Book Company, New York etc. 1981, xvi+ 198 pp." The Journal of Symbolic Logic 49.4 (1984): 1408-1409.

Usability and Relationship to other Modules

Examination Type: Module Examination

Assessment Type: Written Examination — Duration/Length: 60 min
Weight: 100%

Scope: All intended learning outcomes of the module.
Completion: To pass this module, the examination has to be passed with at least 45%

8.2.2 Logic (perspective II)

Module Name	**Module Code**	**Level (type)**	**CP**
Logic (perspective II)	CTNS-NSK-02	Year 2 (New Skills)	2.5

Module Components

Number	Name	Type	CP
CTNS-02	Logic (perspective II)	Lecture (online)	2.5

Module Coordinator	**Program Affiliation**	**Mandatory Status**
N.N.	• CONSTRUCTOR Track Area	Mandatory elective for all UG students (one perspective must be chosen)

Entry Requirements			**Frequency**	**Duration**
Pre-requisites	Co-requisites	Knowledge, Abilities, or Skills	Annually (Fall)	1 semester
☒ none	☒ none			

Student Workload

Asynchronous Self Study	Interactive Learning	Assessment Preparation	Independent Study	Hours Total
17.5 h	10 h	10 h	25 h	62.5 hours h

Recommendations for Preparation

Content and Educational Aims

The focus of this module is on formal systems of logic, since they are at the heart of both scientific argumentation and computer developed algorithms. There are in fact many kinds of logic and all figure to varying degrees in scientific inquiry. There are inductive types of logic, which purport to formalize the relationship between premises that if true offer evidence on behalf of a conclusion and the conclusion and are represented as claims about the extent to which the conclusion is confirmed by the premises. There are deductive types of logic, which introduce a different relationship between premise and conclusion. These variations of logic consist in rules that if followed entail that if the premises are true then the conclusion too must be true.

This module introduces logics that go beyond traditional deductive propositional logic and predicate logic and as such it is aimed at students who are already familiar with basics of traditional formal logic. The aim of the module is to provide an overview of alternative logics and to develop a sensitivity that there are many different logics that can provide effective tools for solving problems in specific application domains.
The module first reviews the principles of a traditional logic and then introduces many-valued logics that distinguish more than two truth values, for example true, false, and unknown. Fuzzy logic extends traditional logic by replacing truth values with real numbers in the range 0 to 1 that are expressing how strong the believe into a proposition is. Modal logics introduce modal operators expressing whether a proposition is necessary or possible. Temporal logics deal with propositions that are qualified by time. Once can view temporal logics as a form of modal logics where propositions are qualified by time constraints. Interval temporal logic provides a way to reason about time intervals in which propositions are true.

The module will also investigate the application of logic frameworks to specific classes of problems. For example, a special subset of predicate logic, based on so-called Horn clauses, forms the basis of logic programming languages such as Prolog.

Description logics, which are usually decidable logics, are used to model relationships and they have applications in the semantic web, which enables search engines to reason about resources present on the Internet.

Intended Learning Outcomes

Students acquire transferable and key skills in this module.

By the end of this module, the students will be able to

1. apply the various principles of logic
2. explain practical relevance of non-standard logic
3. describe how many-valued logic extends basic predicate logic
4. apply basic rules of fuzzy logic to calculate partial truth values
5. sketch basic rules of temporal logic
6. implement predicates in a logic programming language
7. prove some simple non-standard logic theorems

Indicative Literature

Bergmann, Merry. “An Introduction to Many-Valued and Fuzzy Logic: Semantics, Algebras, and Derivation Systems”, Cambridge University Press, April 2008.

Sterling, Leon S., Ehud Y. Shapiro, Ehud Y. "The Art of Prolog", 2nd edition, MIT Press, March 1994.

Fisher, Michael. “An Introduction to Practical Formal Methods Using Temporal Logic”, Wiley, Juli 2011.

Baader, Franz. "The Description Logic Handbook: Theory Implementation and Applications", Cambridge University Press, 2nd edition, May 2010.

Usability and Relationship to other Modules

Examination Type: Module Examination

Assessment Type: Written Examination — Duration/Length: 60 min, Weight: 100%

Scope: All intended learning outcomes of the module.

Completion: To pass this module, the examination has to be passed with at least 45%

8.2.3 Causation and Correlation (perspective I)

Module Name	**Module Code**	**Level (type)**	**CP**
Causation and Correlation (perspective I)	CTNS-NSK-03	Year 2 (New Skills)	2.5

Module Components

Number	Name	Type	CP
CTNS-03	Causation and Correlation	Lecture (online)	2.5

Module Coordinator	**Program Affiliation**	**Mandatory Status**
Prof. Dr. Jules Coleman	• CONSTRUCTOR Track Area	Mandatory elective for all UG students (one perspective must be chosen)

Entry Requirements			**Frequency**	**Duration**
Pre-requisites	Co-requisites	Knowledge, Abilities, or Skills	Annually (Spring)	1 semester
☒ none	☒ none			

Student Workload

Asynchronous Self Study	Interactive Learning	Assessment Preparation	Independent Study	Hours Total
17.5h	10 h	10 h	25 h	62.5h

Recommendations for Preparation

Content and Educational Aims

In many ways, life is a journey. And also, as in other journeys, our success or failure depends not only on our personal traits and character, our physical and mental health, but also on the accuracy of our map. We need to know what the world we are navigating is actually like, the how, why and the what of what makes it work the way it does. The natural sciences provide the most important tool we have developed to learn how the world works and why it works the way it does. The social sciences provide the most advanced tools we have to learn how we and other human beings, similar in most ways, different in many others, act and react and what makes them do what they do. In order for our maps to be useful, they must be accurate and correctly reflect the way the natural and social worlds work and why they work as they do.

The natural sciences and social sciences are blessed with enormous amounts of data. In this way, history and the present are gifts to us. To understand how and why the world works the way it does requires that we are able to offer an explanation of it. The data supports a number of possible explanations of it. How are we to choose among potential explanations? Explanations, if sound, will enable us to make reliable predictions about what the future will be like, and also to identify many possibilities that may unfold in the future. But there are differences not just in the degree of confidence we have in our predictions, but in whether some of them are necessary future states or whether all of them are merely possibilities? Thus, there are three related activities at the core of scientific inquiry: understanding where we are now and how we got here (historical); knowing what to expect going forward (prediction); and exploring how we can change the paths we are on (creativity).

At the heart of these activities are certain fundamental concepts, all of which are related to the scientific quest to uncover immutable and unchanging laws of nature. Laws of nature are thought to reflect a causal nexus between a previous event

and a future one. There are also true statements that reflect universal or nearly universal connections between events past and present that are not laws of nature because the relationship they express is that of a correlation between events. A working thermostat accurately allows us to determine or even to predict the temperature in the room in which it is located, but it does not explain why the room has the temperature it has. What then is the core difference between causal relationships and correlations? At the same time, we all recognize that given where we are now there are many possible futures for each of us, and even had our lives gone just the slightest bit differently than they have, our present state could well have been very different than it is. The relationship between possible pathways between events that have not materialized but could have is expressed through the idea of counterfactual.

Creating accurate roadmaps, forming expectations we can rely on, making the world a more verdant and attractive place requires us to understand the concepts of causation, correlation, counterfactual explanation, prediction, necessity, possibility, law of nature and universal generalization. This course is designed precisely to provide the conceptual tools and intellectual skills to implement those concepts in our future readings and research and ultimately in our experimental investigations, and to employ those tools in various disciplines.

Intended Learning Outcomes

Students acquire transferable and key skills in this module.

By the end of this module, the students will be able to

1. formulate testable hypotheses that are designed to reveal causal connections and those designed to reveal interesting, important and useful correlations.
2. distinguish scientifically interesting correlations from unimportant ones.
3. apply critical thinking skills to evaluate information.
4. understand when and why inquiry into unrealized possibility is important and relevant.

Indicative Literature

Thomas S. Kuhn: The Structure of Scientific Revolutions, Nelson, fourth edition 2012;

Goodman, Nelson. Fact, fiction, and forecast. Harvard University Press, 1983;

Quine, Willard Van Orman, and Joseph Silbert Ullian. The web of belief. Vol. 2. New York: Random house, 1978.

Usability and Relationship to other Modules

Examination Type: Module Examination

Assessment Type: Written Examination

Duration/Length: 60 min
Weight: 100%

Scope: All intended learning outcomes of the module

Completion: To pass this module, the examination has to be passed with at least 45%

8.2.4 Causation and Correlation (perspective II)

Module Name	**Module Code**	**Level (type)**	**CP**
Causation and Correlation (perspective II)	CTNS-NSK-04	Year 2 (New Skills)	2.5

Module Components

Number	Name	Type	CP
CTNS-04	Causation and Correlation (perspective II)	Lecture (online)	2.5

Module Coordinator	**Program Affiliation**	**Mandatory Status**
Dr. Keivan Mallahi-Karai Dr. Eoin Ryan Dr. Irina Chiaburu	• CONSTRUCTOR Track Area	Mandatory elective for all UG students (one perspective must be chosen)

Entry Requirements			**Frequency**	**Duration**
Pre-requisites	Co-requisites	Knowledge, Abilities, or Skills	Annually (Spring)	1 semester
☒ none	☒ none	• Basic probability theory		

Student Workload

Asynchronous Self Study	Interactive Learning	Assessment Preparation	Independent Study	Hours Total
17.5 h	10h	10h	25 h	62.5h

Recommendations for Preparation

Content and Educational Aims

Causality or causation is a surprisingly difficult concept to understand. David Hume famously noted that causality is a concept that our science and philosophy cannot do without, but it is equally a concept that our science and philosophy cannot describe. Since Hume, the problem of cause has not gone away, and sometimes seems to get even worse (e.g., quantum mechanics confusing previous notions of causality). Yet, ways of doing science that lessen our need to explicitly use causality have become very effective (e.g., huge developments in statistics). Nevertheless, it still seems that the concept of causality is at the core of explaining how the world works, across fields as diverse as physics, medicine, logistics, the law, sociology, and history – and ordinary daily life – through all of which, explanations and predictions in terms of cause and effect remain intuitively central.

Causality remains a thorny problem but, in recent decades, significant progress has occurred, particularly in work by or inspired by Judea Pearl. This work incorporates many 20th century developments, including statistical methods – but with a reemphasis on finding the why, or the cause, behind statistical correlations –, progress in understanding the logic, semantics and metaphysics of conditionals and counterfactuals, developments based on insights from the likes of philosopher Hans Reichenbach or biological statistician Sewall Wright into causal precedence and path analysis, and much more. The result is a new toolkit to identify causes and build causal explanations. Yet even as we get better at identifying causes, this raises new (or old) questions about causality, including metaphysical questions about the nature of causes (and effects, events, objects, etc), but also questions about what we really use causality for (understanding the world as it is or just to glean predictive control of specific outcomes), about how causality is used differently in different fields and

activities (is cause in physics the same as that in history?), and about how other crucial concepts relate to our concept of cause (space and time seem to be related to causality, but so do concepts of legal and moral responsibility).
This course will introduce students to the mathematical formalism derived from Pearl's work, based on directed acyclic graphs and probability theory. Building upon previous work by Reichenbach and Wright, Pearl defines a "a calculus of interventions" of "do-calculus" for talking about interventions and their relation to causation and counterfactuals. This model has been applied in various areas ranging from econometrics to statistics, where acquiring knowledge about causality is of great importance.

At the same time, the course will not forget some of the metaphysical and epistemological issues around cause, so that students can better critically evaluate putative causal explanations in their full context. Abstractly, such issues involve some of the same philosophical questions Hume already asked, but more practically, it is important to see how metaphysical and epistemological debates surrounding the notion of cause affect scientific practice, and equally if not more importantly, how scientific practice pushes the limits of theory. This course will look at various ways in which empirical data can be transformed into explanations and theories, including the variance approach to causality (characteristic of the positivistic quantitative paradigm), and the process theory of causality (associated with qualitative methodology). Examples and case studies will be relevant for students of the social sciences but also students of the natural/physical world as well.

Intended Learning Outcomes

Students acquire transferable and key skills in this module.

Upon completion of this module, students will be able to

1. have a clear understanding of the history of causal thinking.
2. form a critical understanding of the key debates and controversies surrounding the idea of causality.
3. recognize and apply probabilistic causal models.
4. explain how understanding of causality differs among different disciplines.
5. demonstrate how theoretical thinking about causality has shaped scientific practices.

Indicative Literature

Paul, L. A. and Ned Hall. Causation: A User's Guide. Oxford University Press 2013.

Pearl, Judea. Causality: Models, Reasoning and Inference. Cambridge University Press 2009

Pearl, Judea, Glymour Madelyn and Jewell, Nicolas. Causal Inference in Statistics: A Primer. Wiley 2016

llari, Phyllis McKay and Federica Russo. Causality: Philosophical Theory Meets Scientific Practice. Oxford University Press 2014.

Usability and Relationship to other Modules

Examination Type: Module Examination

Assessment: Written examination

Duration/Length: 60 min
Weight: 100 %

Scope: All intended learning outcomes of the module

Completion: To pass this module, the examination has to be passed with at least 45%

8.2.5 Linear Model and Matrices

Module Name	**Module Code**	**Level (type)**	**CP**
Linear Model and Matrices	CTNS-NSK-05	Year 3 (New Skills)	5

Module Components

Number	Name	Type	CP
CTNS-05	Linear models and matrix	Seminar (online)	5

Module Coordinator	**Program Affiliation**	**Mandatory Status**
Prof. Dr. Marc-Thorsten Hütt	• CONSTRUCTOR Track Area	Mandatory elective

Entry Requirements			**Frequency**	**Duration**
Pre-requisites ☒ Logic ☒ Causation & Correlation	Co-requisites ☒ none	Knowledge, Abilities, or Skills	Annually (Fall)	1 semester

Student Workload

Asynchronous Self Study	Interactive Learning	Assessment Preparation	Independent Study	Hours Total
35 h	20 h	20 h	50 h	125 h

Recommendations for Preparation

Content and Educational Aims

There are no universal 'right skills'. But the notion of linear models and the avenue to matrices and their properties can be useful in diverse disciplines to implement a quantitative, computational approach. Some of the most popular data and systems analysis strategies are built upon this framework. Examples include principal component analysis (PCA), the optimization techniques used in Operations Research (OR), the assessment of stable and unstable states in nonlinear dynamical systems, as well as aspects of machine learning.

Here we introduce the toolbox of linear models and matrix-based methods embedded in a wide range of transdisciplinary applications (part 1). We describe its foundation in linear algebra (part 2) and the range of tools and methods derived from this conceptual framework (part 3). At the end of the course, we outline applications to graph theory and machine learning (part 4). Matrices can be useful representations of networks and of system of linear equations. They are also the

core object of linear stability analysis, an approach used in nonlinear dynamics. Throughout the course, examples from neuroscience, social sciences, medicine, biology, physics, chemistry, and other fields are used to illustrate these methods.

A strong emphasis of the course is on the sensible usage of linear approaches in a nonlinear world. We will critically reflect the advantages as well as the disadvantages and limitations of this method. Guiding questions are: How appropriate is a linear approximation of a nonlinear system? What do you really learn from PCA? How reliable are the optimal states obtained via linear programming (LP) techniques?

This debate is embedded in a broader context: How does the choice of a mathematical technique confine your view on the system at hand? How, on the other hand, does it increase your capabilities of analyzing the system (due to software available for this technique, the ability to compare with findings from other fields built upon the same technique and the volume of knowledge about this technique)?

- In the end, students will have a clearer understanding of linear models and matrix approaches in their own discipline, but they will also see the full transdisciplinarity of this topic. They will make better decisions in their choice of data analysis methods and become mindful of the challenges when going from linear to nonlinear thinking.

Intended Learning Outcomes

Upon completion of this module, students will be able to

1. apply the concept of linear modeling in their own discipline
2. distinguish between linear and nonlinear interpretation strategies and understand the range of applicability of linear models
3. make use of data analysis / data interpretation strategies from other disciplines, which are derived from linear algebra
4. be aware of the ties that linear models have to machine learning and network theory

Note that these four ILOs can be loosely associated with the four parts of the course indicated above

Indicative Literature

Part 1: material from Linear Algebra for Everyone, Gilbert Strang, Wellesley-Cambridge Press, 2020

Part 2: material from Introduction to Linear Algebra (5th Edition), Gilbert Strang, Cambridge University Press, 2021

Part 3: material from Mathematics of Big Data: Spreadsheets, Databases, Matrices, and Graphs, Jeremy Kepner, Hayden Jananthan, The MIT Press, 2018

Mainzer, Klaus. "Introduction: from linear to nonlinear thinking." Thinking in Complexity: The Computational Dynamics of Matter, Mind and Mankind (2007): 1-16.

Part 4: material from Introduction to Linear Algebra (5th Edition), Gilbert Strang, Cambridge University Press, 2021

Part 5: material from Linear Algebra and Learning from Data, Gilbert Strang, Wellesley-Cambridge Press, 2019

Usability and Relationship to other Modules

Examination Type: Module Examination

Assessment: Written examination

Duration/Length: 120 min

Weight: 100 %

Scope: All intended learning outcomes of the module

Completion: To pass this module, the examination has to be passed with at least 45%.

8.2.6 Complex Problem Solving

<table>
<tr><td colspan="3">Module Name
Complex Problem Solving</td><td>Module Code
CTNS-NSK-06</td><td>Level (type)
Year 3
(New Skills)</td><td>CP
5</td></tr>
<tr><td colspan="6">Module Components

Number | Name | Type | CP
CTNS-06 | Complex Problem Solving | Lecture (online) | 5</td></tr>
<tr><td colspan="2">Module Coordinator
Prof. Dr. Marco Verweij</td><td colspan="2">Program Affiliation
• CONSTRUCTOR Track Area</td><td colspan="2">Mandatory Status
Mandatory elective</td></tr>
<tr><td colspan="3">Entry Requirements
Pre-requisites
☒ Logic
☒ Causation and Correlation
Co-requisites
☒ none
Knowledge, Abilities, or Skills
• Project Management
• Complex Problem Solving</td><td>Frequency
Annually
(Fall)</td><td colspan="2">Duration
1 semester</td></tr>
<tr><td colspan="6">Student Workload</td></tr>
<tr><td>Asynchronous Self Study</td><td>Interactive Learning</td><td>Assessment Preparation</td><td>Independent Study</td><td colspan="2">Hours Total</td></tr>
<tr><td>35 h</td><td>20 h</td><td>20 h</td><td>50 h</td><td colspan="2">125 h</td></tr>
<tr><td colspan="6"></td></tr>
<tr><td colspan="6">Recommendations for Preparation
Wherever possible intuition will be emphasized over technical detail. Technical readings will be made available and discussed with students in class.</td></tr>
<tr><td colspan="6">Content and Educational Aims
Complex problems are, by definition, non-linear and/or emergent. Some fifty years ago, scholars such as Herbert Simon began to argue that societies around the world had developed an impressive array of tools with which to solve simple and even complicated problems, but still needed to develop methods with which to address the rapidly increasing number of</td></tr>
</table>

complex issues. Since then, a variety of such methods has emerged. These include 'serious games' developed in computer science, 'multisector systems analysis' applied in civil and environmental engineering, 'robust decision-making' proposed by the RAND Corporation, 'design thinking' developed in engineering and business studies, 'structured problem solving' used by McKinsey & Co., 'real-time technology assessment' advocated in science and technology studies, and 'deliberative decision-making' emanating from political science.

- In this course, students first learn to distinguish between simple, complicated and complex problems. They also become familiar with the ways in which a particular issue can sometimes shift from one category into another. In addition, the participants learn to apply several tools for resolving complex problems. Finally, the students are introduced to the various ways in which natural and social scientists can help stakeholders resolve complex problems. Throughout the course examples and applications will be used. When possible, guest lectures will be offered by experts on a particular tool for tackling complex issues. For the written, take-home exam, students will have to select a specific complex problem, analyse it and come up with a recommendation – in addition to answering several questions about the material learned.

Intended Learning Outcomes

Upon completion of this module, students will be able to

1. identify a complex problem;
2. develop an acceptable recommendation for resolving complex problems.
3. understand the roles that natural and social scientists can play in helping stakeholders resolve complex problems

Indicative Literature

Camillus, J. (2008). Strategy as a wicked problem. Harvard Business Review 86: 99-106.
Chia, A. (2019). Distilling the essence of the McKinsey way: The problem-solving cycle. Management Teaching Review 4(4): 350-377.
Den Haan, J., van der Voort, M.C., Baart, F., Berends, K.D., van den Berg, M.C., Straatsma, M.W., Geenen, A.J.P., & Hulscher, S.J.M.H. (2020). The virtual river game: Gaming using models to collaboratively explore river management complexity, Environmental Modelling & Software 134, 104855,
Folke, C., Carpenter, S., Elmqvist, T., Gunderson, L., Holling, C.S., & Walker, B. (2002). Resilience and sustainable development: Building adaptive capacity in a world of transformations. AMBIO: A Journal of the Human Environment 31(5): 437-440.
Ostrom, E. (2010). Beyond markets and states: Polycentric governance of complex economic systems. American Economic Review 100(3): 641-72.
Pielke, R. Jr. (2007). The honest broker: Making sense of science in policy and politics. Cambridge: Cambridge University Press.
Project Management Institute (2021). A guide to the project management body of knowledge (PMBOK® guide).
Schon, D. A., & Rein, M. (1994). Frame reflection: Toward the resolution of intractable policy controversies. New York: Basic Books.
Simon, H. A. (1973). The structure of ill structured problems. Artificial Intelligence 4(3-4): 181-201.
Verweij, M. & Thompson, M. (Eds.) (2006). Clumsy solutions for a complex world. London: Palgrave Macmillan.

Usability and Relationship to other Modules

Examination Type: Module Examination

Assessment Type: Written examination

Duration: 120 min

Weight: 100%

Scope: All intended learning outcomes of the module.

Completion: To pass this module, the examination has to be passed with at least 45%

8.2.7 Argumentation, Data Visualization and Communication (perspective I)

<table>
<tr><td colspan="3">Module Name
Argumentation, Data Visualization and Communication (perspective I)</td><td>Module Code
CTNS-NSK-07</td><td>Level (type)
Year 3
(New Skills)</td><td>CP
5</td></tr>
<tr><td colspan="6">Module Components</td></tr>
<tr><td>Number</td><td colspan="3">Name</td><td>Type</td><td>CP</td></tr>
<tr><td>CTNS-07</td><td colspan="3">Argumentation, Data Visualization and Communication (perspective I)</td><td>Lecture (online)</td><td>5</td></tr>
<tr><td>Module Coordinator

Prof. Dr. Jules Coleman,
Prof. Dr. Arvid Kappas</td><td colspan="3">Program Affiliation

• CONSTRUCTOR Track Area</td><td colspan="2">Mandatory Status

Mandatory elective for all UG students (one perspective must be chosen)</td></tr>
<tr><td colspan="3">Entry Requirements

Pre-requisites
☒ Logic
☒ Causation & Correlation

Co-requisites
☒ none

Knowledge, Abilities, or Skills</td><td>Frequency

Annually (Fall)</td><td colspan="2">Duration

1 semester</td></tr>
<tr><td colspan="6">Student Workload</td></tr>
<tr><td>Asynchronous Self Study</td><td>Interactive Learning</td><td>Exam Preparation</td><td>Independent Study</td><td colspan="2">Hours Total</td></tr>
<tr><td>35 h</td><td>20 h</td><td>20 h</td><td>50 h</td><td colspan="2">125 h</td></tr>
<tr><td colspan="6">Recommendations for Preparation

none</td></tr>
<tr><td colspan="6">Content and Educational Aims
One must be careful not to confuse argumentation with being argumentative. The latter is an unattractive personal attribute, whereas the former is a requirement of publicly holding a belief, asserting the truth of a proposition, the plausibility of a hypothesis, or a judgment of the value of a person or an asset. It is an essential component of public discourse. Public discourse is governed by norms and one of those norms is that those who assert the truth of a proposition or the validity of an argument or the responsibility of another for wrongdoing open themselves up to good faith requests to defend their claims. In its most general meaning, argumentation is the requirement that one offer evidence in support of the claims they make, as well as in defense of the judgments and assessments they reach. There are different modalities of argumentation associated with different contexts and disciplines. Legal arguments have a structure of their own as do assessments of medical conditions and moral character. In each case, there are differences in the kind of evidence that is thought relevant and, more importantly, in the standards of assessment for whether a case has been successfully made. Different modalities of argumentation require can call for different modes of reasoning. We not only offer reasons in defense of or in support of beliefs we have, judgments we make and hypotheses we offer, but we reason from evidence we collect to conclusions that are warranted by them.
Reasoning can be informal and sometimes even appear unstructured. When we recognize some reasoning as unstructured yet appropriate what we usually have in mind is that it is not linear. Most reasoning we are familiar with is</td></tr>
</table>

linear in character. From A we infer B, and from A and B we infer C, which all together support our commitment to D. The same form of reasoning applies whether the evidence for A, B or C is direct or circumstantial. What changes in these cases is perhaps the weight we give to the evidence and thus the confidence we have in drawing inferences from it.
Especially in cases where reasoning can be supported by quantitative data, wherever quantitative data can be obtained either directly or by linear or nonlinear models, the visualization of the corresponding data can become key in both, reasoning and argumentation. A graphical representation can reduce the complexity of argumentation and is considered a must in effective scientific communication. Consequently, the course will also focus on smart and compelling ways for data visualization - in ways that go beyond what is typically taught in statistics or mathematics lectures. These tools are constantly developing, as a reflection of new software and changes in state of the presentation art. Which graph or bar chart to use best for which data, the use of colors to underline messages and arguments, but also the pitfalls when presenting data in a poor or even misleading manner. This will also help in readily identifying intentional mis-representation of data by others, the simplest to recognize being truncating the ordinate of a graph in order to exaggerate trends. This frequently leads to false arguments, which can then be readily countered.
There are other modalities of reasoning that are not linear however. Instead they are coherentist. We argue for the plausibility of a claim sometimes by showing that it fits in with a set of other claims for which we have independent support. The fit is itself the reason that is supposed to provide confidence or grounds for believing the contested claim.
Other times, the nature of reasoning involves establishing not just the fit but the mutual support individual items in the evidentiary set provide for one another. This is the familiar idea of a web of interconnected, mutually supportive beliefs. In some cases, the support is in all instances strong; in others it is uniformly weak, but the set is very large; in other cases, the support provided each bit of evidence for the other is mixed: sometimes strong, sometimes weak, and so on.
There are three fundamental ideas that we want to extract from this segment of the course. These are (1) that argumentation is itself a requirement of being a researcher who claims to have made findings of one sort or another; (2) that there are different forms of appropriate argumentation for different domains and circumstances; and (3) that there are different forms of reasoning on behalf of various claims or from various bits of evidence to conclusions: whether those conclusions are value judgments, political beliefs, or scientific conclusions. Our goal is to familiarize you with all three of these deep ideas and to help you gain facility with each.

Intended Learning Outcomes

Students acquire transferable and key skills in this module. By the end of this module, the students will be able to

1. distinguish among different modalities of argument, e.g. legal arguments, vs. scientific ones.
2. construct arguments using tools of data visualization.
3. communicate conclusions and arguments concisely, clearly and convincingly.

Indicative Literature

- Tufte, E.R. (1985). The visual display of quantitative information. The Journal for Healthcare Quality (JHQ), 7(3), 15.
- Cairo, A (2012). The Functional Art: An introduction to information graphics and visualization. New Ridders.
- Knaflic, C.N. (2015). Storytelling with data: A data visualization guide for business professionals. John Wiley & Sons.

Usability and Relationship to other Modules

Examination Type: Module Examination

Assessment Type: Written Examination

Duration/Length: 120 (min)
Weight: 100%

Scope: All intended learning outcomes of the module

Completion: To pass this module, the examination has to be passed with at least 45%.

8.2.8 Argumentation, Data Visualization and Communication (perspective II)

Module Name	**Module Code**	**Level (type)**	**CP**
Argumentation, Data Visualization and Communication (perspective II)	CTNS-NSK-08	Year 3 New Skills	5

Module Components

Number	Name	Type	CP
CTNS-08	Argumentation, Data Visualization and Communication (perspective II)	Lecture (online)	5

Module Coordinator	**Program Affiliation**	**Mandatory Status**
Prof. Dr. Jules Coleman, Prof. Dr. Arvid Kappas	• CONSTRUCTOR Track Area	Mandatory elective for all UG students (one perspective must be chosen)

Entry Requirements			**Frequency**	**Duration**
Pre-requisites	Co-requisites	Knowledge, Abilities, or Skills	Annually (Spring)	1 semester
☒ Logic ☒ Causation & Correlation	☒ none	• ability and openness to engage in interactions • media literacy, critical thinking and a proficient handling of data sources • own research in academic literature		

Student Workload

Asynchronous Self Study	Interactive Learning	Assessment Preparation	Independent Study	Hours Total
35 h	20 h	20 h	50 h	125 h

Recommendations for Preparation

Content and Educational Aims

Humans are a social species and interaction is crucial throughout the entire life span. While much of human communication involves language, there is a complex multichannel system of nonverbal communication that enriches linguistic content, provides context, and is also involved in structuring dynamic interaction. Interactants achieve goals by encoding information that is interpreted in the light of current context in transactions with others. This complexity implies also that there are frequent misunderstandings as a sender's intention is not fulfilled. Students in this course will learn to understand the structure of communication processes in a variety of formal and informal contexts. They will learn what constitutes challenges to achieving successful communication and to how to communicate effectively, taking the context and specific requirements for a target audience into consideration. These aspects will be discussed also in the scientific context, as well as business, and special cases, such as legal context – particularly with view to argumentation theory.

Communication is a truly transdisciplinary concept that involves knowledge from diverse fields such as biology, psychology, neuroscience, linguistics, sociology, philosophy, communication and information science. Students will learn what these different disciplines contribute to an understanding of communication and how theories from these fields can be applied in the real world. In the context of scientific communication, there will also be a focus on visual communication of data in different disciplines. Good practice examples will be contrasted with typical errors to facilitate successful communication also with view to the bachelor's thesis.

Intended Learning Outcomes

Upon completion of this module, students will be able to

1. analyze communication processes in formal and informal contexts.
2. identify challenges and failures in communication.
3. design communications to achieve specified goals to specific target groups.
4. understand the principles of argumentation theory.
5. use data visualization in scientific communications.

Indicative Literature

Joseph A. DeVito: The Interpersonal Communication Book (Global edition, 16th edition), 2022

Steven L. Franconeri, Lace M. Padilla, Priti Shah, Jeffrey M. Zacks, and Jessica Hullman: The Science of Visual Data Communication: What Works Psychological Science in the Public Interest, 22(3), 110–161, 2022

Douglas Walton: Argumentation Theory – A Very Short Introduction. In: Simari, G., Rahwan, I. (eds) Argumentation in Artificial Intelligence. Springer, Boston, MA, 2009

Examination Type: Module Examination

Assessment Type: Digital submission of asynchronous presentation, including reflection

Duration/Length: Asynchronous/Digital submission

Weight: 100%Scope: All intended learning outcomes of the module

Completion: To pass this module, the examination has to be passed with at least 45%

8.2.9 Agency, Leadership, and Accountability

Module Name	**Module Code**	**Level (type)**	**CP**
Agency, Leadership, and Accountability	CTNS-NSK-09	Year 3 New Skills	5

Module Components			
Number	Name	Type	CP
CTNS-09	Agency, Leadership, and Accountability	Lecture (online)	5

Module Coordinator	**Program Affiliation**	**Mandatory Status**
Prof. Dr. Jules Coleman	• CONSTRUCTOR Track Area	Mandatory for ACS and IBA (online) Mandatory elective for all other UG study programs

Entry Requirements			**Frequency**	**Duration**
Pre-requisites ☒ none	Co-requisites ☒ none	Knowledge, Abilities, or Skills	Annually (Spring)	1 semester

Student Workload

Asynchronous Self Study	Interactive Learning	Assessment Preparation	Independent Study	Hours Total
35 h	20 h	20 h	50 h	125 h

Recommendations for Preparation

none

Content and Educational Aims

Each of us is judged by the actions we undertake and held to account for the consequences of them. Sometimes we may be lucky and our bad acts don't have harmful effects on others. Other times we may be unlucky and reasonable decisions can lead to unexpected or unforeseen adverse consequences for others. We are therefore held accountable both for choices and for outcomes. In either case, accountability expresses the judgment that we bear responsibility for what we do and what happens as a result. But our responsibility and our accountability in these cases is closely connected to the idea that we have agency.

Agency presumes that we are the source of the choices we make and the actions that result from those choices. For some, this may entail the idea that we have free will. But there is scientific world view that holds that all actions are determined by the causes that explain them, which is the idea that if we knew the causes of your decisions in advance, we would know the decision you would make even before you made it. If that is so, how can your choice be free? And if it is not free, how can you be responsible for it? And if you cannot be responsible, how can we justifiably hold you to account for it?

These questions express the centuries old questions about the relationship between free will and a determinist world view: for some, the conflict between a scientific world view and a moral world view.

But we do not always act as individuals. In society we organize ourselves into groups: e.g. tightly organized social groups, loosely organized market economies, political societies, companies, and more. These groups have structure. Some

individuals are given the responsibility of leading the group and of exercising authority. But one can exercise authority over others in a group merely by giving orders and threatening punishment for non-compliance.

Exercising authority is not the same thing as being a leader? For one can lead by example or by encouraging others to exercise personal judgment and authority. What then is the essence of leadership?

The module has several educational goals. The first is for students to understand the difference between actions that we undertake for which we can reasonably held accountable and things that we do but which we are not responsible for. For example, a twitch is an example of the latter, but so too may be a car accident we cause as a result of a heart attack we had no way of anticipating or controlling. This suggests the importance of control to responsibility. At the heart of personal agency is the idea of control. The second goal is for students to understand what having control means. Some think that the scientific view is that the world is deterministic, and if it is then we cannot have any personal control over what happens, including what we do. Others think that the quantum scientific view entails a degree of indeterminacy and that free will and control are possible, but only in the sense of being unpredictable or random. But then random outcomes are not ones we control either. So, we will devote most attention to trying to understand the relationships between control, causation and predictability.

But we do not only exercise agency in isolation. Sometimes we act as part of groups and organizations. The law often recognizes ways in which groups and organizations can have rights, but is there a way in which we can understand how groups have responsibility for outcomes that they should be accountable for. We need to figure out then whether there is a notion of group agency that does not simply boil down to the sum of individual actions. We will explore the ways in which individual actions lead to collective agency.

Finally we will explore the ways in which occupying a leadership role can make one accountable for the actions of others over which one has authority.

Intended Learning Outcomes

Students acquire transferable and key skills in this module. By the end of this module, the students will be able to

1. understand and reflect how the social and moral world views that rely on agency and responsibility are compatible, if they are, with current scientific world views.
2. understand how science is an economic sector, populated by large powerful organizations that set norms, fund research agendas.
3. identify the difference between being a leader of others or of a group – whether a research group or a lab or a company – and being in charge of the group.
4. learn to be a leader of others and groups. Understand that when one graduates one will enter not just a field of work but a heavily structured set of institutions and that one's agency and responsibility for what happens, what work gets done, its quality and value, will be affected accordingly.

Indicative Literature

Hull, David L. "Science as a Process." Science as a Process. University of Chicago Press, 2010;

Feinberg, Joel. "Doing & deserving; essays in the theory of responsibility." (1970).

Usability and Relationship to other Modules

Examination Type: Module Examination

Assessment Type: Written examination

Duration/Length: 120 min

Weight: 100%

Scope: All intended learning outcomes of the module

Completion: To pass this module, the examination has to be passed with at least 45%

8.3 Language and Humanities Modules

8.3.1 Languages

The descriptions of the language modules are provided in a separate document, the "Language Module Handbook" that can be accessed from the Constructor University's Language & Community Center internet sites (https://constructor.university/student-life/language-community-center/learning-languages).

8.3.2 Humanities

8.3.2.1 Introduction to Philosophical Ethics

Module Name Introduction to Philosophical Ethics			**Module Code** CTHU-HUM-001	**Level (type)** Year 1	**CP** 2.5
Module Components					
Number	Name			Type	CP
CTHU-001	Introduction to Philosophical Ethics			Lecture (online)	
Module Coordinator Dr. Eoin Ryan	**Program Affiliation** • CONSTRUCTOR Track Area			**Mandatory Status** Mandatory elective	
Entry Requirements			**Frequency**	**Duration**	
Pre-requisites ☒ none	Co-requisites ☒ none	Knowledge, Abilities, or Skills	Annually (Spring/Fall)	1 semester	
Student Workload					
Asynchronous Self Study	Interactive Learning	Assessment Preparation	Independent Study	Hours Total	
17.5h	10 h	10 h	25 h	62.5h	
Recommendations for Preparation					
Content and Educational Aims The nature of morality – how to lead a life that is good for yourself, and how to be good towards others – has been a central debate in philosophy since the time of Socrates, and it is a topic that continues to be vigorously discussed. This course will introduce students to some of the key aspects of philosophical ethics, including leading normative theories of ethics (e.g. consequentialism or utilitarianism, deontology, virtue ethics, natural law ethics, egoism) as well as some important questions from metaethics (are useful and generalizable ethical claims even possible; what do ethical speech and ethical judgements actually do or explain) and moral psychology (how do abstract ethical principles do when realized by human psychologies). The course will describe ideas that are key factors in ethics (free will, happiness, responsibility,					

good, evil, religion, rights) and indicate various routes to progress in understanding ethics, as well as some of their difficulties.

Intended Learning Outcomes

Upon completion of this module, students will be able to

1. describe normative ethical theories such as consequentialism, deontology and virtue ethics.
2. discuss some metaethical concerns.
3. analyze ethical language.
4. highlight complexities and contradictions in typical ethical commitments.
5. indicate common parameters for ethical discussions at individual and social levels.
6. analyze notions such as objectivity, subjectivity, universality, pluralism, value.

Indicative Literature

Simon Blackburn, Being Good (2009)

Russ Shafer-Landay, A Concise Introduction to Ethics (2019)

Mark van Roojen, Metaethicas: A Contemporary Introduction (2015)

Usability and Relationship to other Modules

Examination Type: Module Examination

Assessment Type: Written Examination — Duration/Length: 60 min
Weight: 100%

Scope: All intended learning outcomes of the module.

Completion: To pass this module, the examination has to be passed with at least 45%

8.3.2.2 Introduction to the Philosophy of Science

Module Name	**Module Code**	**Level (type)**	**CP**
Introduction to the Philosophy of Science	CTHU-HUM-002	Year 1	2.5

Module Components

Number	**Name**	**Type**	**CP**
CTHU-002	Introduction to the Philosophy of Science	Lecture (online)	2.5

Module Coordinator	**Program Affiliation**	**Mandatory Status**
Dr. Eoin Ryan	• CONSTRUCTOR Track Area	Mandatory elective

Entry Requirements			**Frequency**	**Duration**
Pre-requisites	Co-requisites	Knowledge, Abilities, or Skills	Annually (Spring/Fall))	1 semester
☒ None	☒ None			

Student Workload

Asynchronous Self Study	Interactive Learning	Assessment Preparation	Independent Study	Hours Total
17.5 h	10 h	10 h	25 h	62.5h

Recommendations for Preparation

Content and Educational Aims

This humanities module will introduce students to some of the central ideas in philosophy of science. Topics will include distinguishing science from pseudo-science, types of inference and the problem of induction, the pros and cons of realism and anti-realism, the role of explanation, the nature of scientific change, the difference between natural and social sciences, scientism and the values of science, as well as some examples from philosophy of the special sciences (e.g., physics, biology).

The course aims to give students an understanding of how science produces knowledge, and some of the various contexts and issues which mean this process is never entirely transparent, neutral, or unproblematic. Students will gain a critical understanding of science as a human practice and technology; this will enable them both to better understand the importance and success of science, but also how to properly critique science when appropriate.

Intended Learning Outcomes

Upon completion of this module, students will be able to

1. understand key ideas from the philosophy of science.
2. discuss different types of inference and rational processes.
3. describe differences between how the natural sciences, social sciences and humanities discover knowledge.
4. identify ways in which science can be more and less value-laden.
5. illustrate some important conceptual leaps in the history of science

Indicative Literature

Peter Godfrey-Smith, Theory and Reality (2021)

James Ladyman, Understanding Philosophy of Science (2002)

Paul Song, Philosophy of Science: Perspectives from Scientists (2022)

Usability and Relationship to other Modules

Examination Type: Module Examination

Assessment Type: Written Examination — Duration/Length: 60 min
Weight: 100%

Scope: All intended learning outcomes of the module

Completion: To pass this module, the examination must be passed with at least 45%.

8.3.2.3 Introduction to Visual Culture

Module Name			**Module Code**	**Level (type)**	**CP**
Introduction to Visual Culture			CTHU-HUM-003	Year 1	2.5
Module Components					
Number	Name			Type	CP
CTHU-003	Introduction to Visual Culture			Lecture (online)	2.5
Module Coordinator Dr. Irina Chiaburu	**Program Affiliation** • CONSTRUCTOR Track Area			**Mandatory Status** Mandatory elective	
Entry Requirements			**Frequency**	**Duration**	
Pre-requisites ☒ none	Co-requisites ☒ None	Knowledge, Abilities, or Skills	Annually (Spring)	1 semester	

Student Workload

Asynchronous Self Study	Interactive Learning	Assessment Preparation	Independent Study	Hours Total
14h	14h	10h	24.5h	62.5h

Recommendations for Preparation

Content and Educational Aims

Of the five senses, the sense of sight has for a long time occupied the central position in human cultures. As John Berger has suggested this could be because we can see and recognize the world around us before we learn how to speak. Images have been with us since the earliest days of the human history. In fact, the earliest records of human history are images found on cave walls across the world. We use images to capture abstract ideas, to catalogue and organize the world, to represent the world, to capture specific moments, to trace time and change, to tell stories, to express feelings, to better understand, to provide evidence and more. At the same time, images exert their power on us, seducing us into believing in their 'innocence', that is into forgetting that as representations they are also interpretations, i.e., a particular version of the world.

The purpose of this course is to explore multiple ways in which images and the visual in general mediate and structure human experiences and practices from more specialized discourses, e.g., scientific discourses, to more informal and personal day-to-day practices, such as self-fashioning in cyberspace. We will look at how social and historical contexts affect how we see, as well as what is visible and what is not. We will explore the centrality of the visual to the intellectual activity, from early genres of scientific drawing to visualizations of big data. We will examine whether one can speak of visual culture of protest, look at the relationship between looking and subjectivity and, most importantly, ponder the relationship between the visual and the real.

Intended Learning Outcomes

Upon completion of this module, students will be able to

- understand a range of key concepts pertaining to visual culture, art theory and cultural analysis
- understand the role visuality plays in development and maintenance of political, social, and intellectual discourses
- think critically about images and their contexts.
- reflect critically on the connection between seeing and knowing

Indicative Literature

Berger, J., Blomberg, S., Fox, C., Dibb, M., & Hollis, R. (1973). Ways of seeing.

Foucault, M. (2002). The order of things: an archaeology of the human sciences (Ser. Routledge classics). Routledge.

Hunt, L. (2004). Politics, culture, and class in the French revolution: twentieth anniversary edition, with a new preface (Ser. Studies on the history of society and culture, 1). University of California Press.

Miller, V. (2020). Understanding digital culture (Second). SAGE.

Thomas, N. (1994). Colonialism's culture: anthropology, travel and government. Polity Press.

Usability and Relationship to other Modules

Examination Type: Module Examination

Assessment: Written examination

Duration/Length: 60 min.
Weight: 100%

Scope: all intended learning outcomes

Completion: To pass this module, the examination has to be passed with at least 45%

7 Appendix

7.1 Intended Learning Outcomes Assessment Matrix

International Business Administration BA (online)					Microeconomics	Macroeconomics	Introduction to International Business	Introduction to Finance and Accounting	Elective CHOICE	Applied Project Management	International Strategic Management	Digital Transformation and Information Economy	Entrepreneurial Challenges and Creative Solutions	Entrepreneurship and Innovation	Marketing	Organization and Human Resources Management	Lean Management	Managerial Accounting	Contemporary Topics in Marketing	Advanced Econometrics	Internship / Startup and Career Skills	Bachelor Thesis	CT Methods	CT German Language and Humanities Module	CT New Skills
Semester					1	2	1	2	1/2	3	4	3	3	4	3	4	5-6	5-6	5-6	5-6	4-5	6	1-4	1-2	3-6
Mandatory/ optional					m	m	m	m	me	me	me	me	me	me	me	me	me	me	me	me	m	m	m	m	m
ECTS Credits					7.5	7.5	7.5	7.5	15	7.5	7.5	5.0	2.5	7.5	7.5	7.5	5.0	5.0	5.0	5.0	15.0	15.0	20.0	5.0	20.0
	Competencies*																								
Program Learning Outcomes	**A**	**E**	**P**	**S**																					
critically discuss and apply modern theories of business and economics	x	x			x	x	x	x		x	x	x	x	x	x	x	x	x	x	x	x	x			
explain the organizational behavior of Multinational Enterprises (MNE), Small and Medium Sized Enterprises (SME) and other organizations in various cultural and economic environments	x	x		x			x				x	x	x	x	x				x	x	x	x			
discuss how the political, economic, social, and technological environments affect business functions in a globalized world	x	x		x	x	x	x				x	x	x	x	x				x	x					
apply principles of international strategy to evaluate and solve challenges of transnational business activities;	x	x					x				x	x	x												
apply principles of marketing, organization and human resource management to evaluate and solve challenges of cross-cultural stakeholders insight and outside a company	x	x		x			x					x	x	x	x				x						
utilize principles of finance and accounting to describe and evaluate the financial performance of companies	x	x						x						x				x							
defend solutions in discussions with specialists and non-specialists	x	x	x	x	x	x	x	x		x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
utilize entrepreneurial thinking in a variety of situations such as the development of business models and StartUps		x	x	x								x	x	x	x				x		x				
consider the social responsibility and ethical behavior of individuals, organizations and governments;		x	x	x		x	x			x	x	x		x	x	x			x	x					x
use advanced statistical software and methods in research and business	x	x									x				x			x							
work as effective members of a remote team and manage projects effectively		x	x	x						x			x	x		x	x								
structure and communicate complex issues	x	x	x	x					x			x	x	x		x		x	x	x	x	x	x		x
communicate professionally with a consideration of the content and audience	x	x	x	x			x			x	x	x	x	x	x	x			x	x	x	x			
engage ethically with academic, professional and wider communities and actively contribute to a sustainable future, reflecting and respecting different views	x	x	x	x					x			x	x	x	x	x			x	x	x	x			x
take responsibility for their own learning, personal and professional development and role in society, evaluating critical feedback and performing self-analysis			x	x						x		x	x	x		x				x	x	x	x		x
apply knowledge and understanding to a professional context	x	x	x				x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x			
take on responsibility in a diverse and remote team		x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x				x	x
adhere to and defend ethical, scientific and professional standards	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
Assessment Type																									
Oral examination																									
Written examination					x	x	x	x		x		x						x							
Project																									
Term paper											x								x	x					
Lab report																									
Poster presentation																									
Presentation													x	x	x	x	x								
Variable									x												x		x	x	x
Module achievements					x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x		x	x	x	x

*Competencies: A-scientific/academic proficiency; E-competence for qualified employment; P-development of personality; S-competence for engagement in society

Figure 3: ILO Assessment Matrix