



**Study
Program
Handbook**

Integrated Social and Cognitive Psychology

Bachelor of Science

Subject-specific Examination Regulations for Integrated Social and Cognitive Psychology (Fachspezifische Prüfungsordnung)

The subject-specific examination regulations for Integrated Social and Cognitive Psychology 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 Science (BSc) degree with a scope of 180 ECTS (for specifics see Chapter 4 of this handbook).

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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 tomorrows 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 and related study abroad 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 and the minor option 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. The concept of living and learning together on an international campus with many cultural and social activities supplements students' education. 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 one of the most widely observed university rankings, the Times Higher Education (THE) ranking. More details on the current ranking positions can be found at <https://constructor.university/more/about-us>.

1.1.2 Program Concept

The Constructor University BSc in Integrated Social and Cognitive Psychology (ISCP) is built on a multi-level approach. Studying human behavior at the level of the individual, group and the society and culture reflects the insight that individual behavior is constrained and shaped by factors that range from biological and psychological variables to socio-cultural contexts, such as, for instance, interpersonal, intergroup, and even intercultural relationships. These factors interact intricately to affect behavior. Our program focuses on equipping you with the skills to analyze, model, and eventually influence those multi-level interactions in ways that help individuals and groups attain positive outcomes, both performance-related (e.g., academic or job performance) and personal (e.g.,

subjective well-being, health behavior). Consistent with the multi-level approach, our teaching explicitly addresses diversity as a defining feature of behaviors and interactions. It is therefore geared toward taking general explanations to the next level that apply across people and contexts. In addition to familiarizing you with a comprehensive range of theoretical perspectives on human behavior, the multi-level approach enables you to fruitfully combine those perspectives. This maximizes the explanatory and predictive power of any research approach or practice strategy. Also, it is aimed at analyzing and explaining human behavior in the complex contexts in which it unfolds, and to eventually enable and support behavior change in people and organizations alike.

The Constructor University BSc program in Integrated Social and Cognitive Psychology builds a solid foundation for graduates to pursue careers in a range of directions and, in particular, roles that contribute to developing, evaluating, and applying strategies for facing the challenges of diversifying societies. People live and work together in novel cultural and generational constellations, which creates countless opportunities for 'richer' social interactions and for learning from each other. It takes evidence-based strategies to reap the benefits of and to tackle the issues that may follow demographic diversity. In research, cognitive and social psychologists contribute to a solid evidence base that informs good diversity practices in numerous professional fields. In personnel executive roles, psychologists design diversity management strategies in the workplace. In marketing functions, psychologists advise companies on diversifying their product portfolios and advertising campaigns to meet increasingly diverse customer needs. In our program, you equip yourself with the essential knowledge and skills that will help you develop a career in any of those directions.

1.2 Specific Advantages of ISCP at Constructor University

Whether as a practitioner or researcher, acting competently and professionally requires specialist skills, competencies, and knowledge for which the ISCP Program lays a solid foundation. A thorough understanding of individual behavior in its social contexts requires in-depth knowledge of both the biological and psychological constraints that shape individual cognitions, behaviors, and personalities. Beyond teaching you that knowledge, we emphasize *using* that knowledge to model in detail the interplay of social contexts and individual behaviors that influence one another.

The program's focus on social psychology and cognitive psychology gives you particular opportunities to build comprehensive qualitative, quantitative, and experimental research skills. Thanks to our small classes, you will be able to work intensively with professors to gather first-hand experience of harnessing a wide array of research methods to study the ways in which people perceive their environments, themselves and others, and how the people behave, decide, develop, feel, interact, learn, and remember. Once you have acquired essential analytical and conceptual tools in the introductory modules, you will begin to apply them to your own research projects, thus turning mere knowledge into real skills, even for ambitious research projects.

Our program gets you to 'immerse' yourself in research and will help clarify your academic interests, strengths, and weaknesses. Additionally, the program will strengthen your knowledge and skills to attain your career goals. As social psychology and cognitive psychology were foundational for the development of modern psychology, shaping it through their seminal theories and models, the advanced skills and knowledge you acquire in our program will be assets for helping you working your way into any field related to this multi-faceted discipline.

We pay great attention to meeting the latest standards of outcomes-based education. All courses adhere to constructive alignment standards. Each course has clearly defined learning outcomes that

all students are intended to reach. Aligned with the intended outcomes, the teaching activities let you apply the knowledge and practice the skills defined in the intended outcomes. Assessments are also aligned with the overall learning outcomes and allow for competence-oriented exams. Therefore, you will have clear criteria for what to learn, how to learn it, and if you have learned it. Our instructors will help you make the most of learning and performance-related feedback and to keep track of your academic development.

In sum, consistent with our multi-level approach, you will learn both to analyze the biological, psychological, and social levels of the mind and behavior in detail and to keep the sight of the big picture by exploring how these levels relate to one another. This involves making connections with both the natural sciences (e.g., biology, biochemistry, neuroscience) and the social sciences (e.g., economics, political science, sociology). This thorough overview will help you

- explore which psychological topics and approaches your interests and talents best suited to;
- analyze from a psychological perspective the trends and challenges of a globalizing world;
- develop your skills at generating boundary-spanning ideas for research and practice;
- adopt a transdisciplinary perspective and collaborate with researchers in other disciplines;
- choose from and prepare for a broad range of master's programs.

1.3 Program-Specific Educational Aims

1.3.1 Qualification Aims

Psychologists work in a broad range of fields. Diverse as these fields may be, they have two things in common. First, high-quality professional practice is evidence-based. An in-depth understanding of how that evidence is obtained is therefore crucial for working competently and responsibly. Moreover, psychologists themselves contribute to generating such evidence. Second, in any job role, much of a psychologist's work will be about making informed decisions – whether designing the experimental treatment of a study or selecting a training program for a group of employees. Therefore, the Constructor University BSc in ISCP is designed to help you build the knowledge, competency, and skills it takes to make use of and contribute to psychology's evidence base, and to become a competent decision-maker.

This requires *psychological literacy*, or “being insightful and reflective about one's own and others' behaviour and mental processes” (McGovern et al, 2010, p. 11) in order to be able to apply psychological principles to individual, social, and organizational issues at work, in relationships, and the broader community. Against this backdrop, our program aims to provide an intellectual environment that allows you to develop into a respectfully critical scientific thinker, and an ethically and socially responsible member of your community. Specifically, the qualification aims of the Constructor University's BSc in ISCP are to:

- promote specialist capabilities in specific areas of psychology congruent with the research foci of Constructor University, supported by its stimulating and supportive environment that is enriched by research and current practice in psychology;
- enable you to build the academic and transferable skills that will prepare you confidently for employment, further study, or training for professional practice;
- enable you to help shape social processes through evidence-based practice and responsible, informed decisions.

1.3.2 Intended Learning Outcomes

By the end of the ISCP program, you will be able to demonstrate

academic and scientific proficiency, as well as employability skills by

1. explaining the inherent variability and diversity of psychological functioning and the implications of the latter for psychological theories and applications;
2. demonstrating a critical understanding of core conceptualizations of cognition and social interaction (e.g., connectionism, information processing approach, neuroscience approach, social-cognitive framework);
3. applying quantitative theories to design behavior modification interventions in applied settings (e.g., health care programs, personnel trainings) considering both personal variables (e.g., attitudes, beliefs) and contextual variables (e.g., peer and supervisor support);
4. critically discussing the relationship between qualitative (ideographic) and quantitative (nomothetic) research approaches and drawing implications for theory building and for the development of interventions in psychological practice;
5. developing theoretical accounts with increased explanatory power or predictive validity by combining different theories from different levels (e.g., neuroscience and social cognition perspectives);
6. designing and conducting experimental and non-experimental studies (that may include neuroscience methods), analyzing the data and discussing findings regarding the behavior and experiences of individuals and groups;
7. demonstrating basic knowledge of the ethical context of psychology (including legal and regulatory issues in the practice of psychology such as in internships) and designing your research in accordance with the codes of conduct set forth by professional bodies (e.g., APA);

personality development Skills by

8. displaying basic mindfulness and self-awareness and engaging in reflection regarding psychological practice;
9. articulating your values and expectations toward your learning and professional development and undertaking self-directed study to meet specified objectives;
10. adhering to professional values and recognizing situations that challenge adherence to those values;

competence for engagement in society by

11. reflecting on new technologies and innovations in psychology and making decisions regarding their legitimacy, reliability and effectiveness;
12. explaining the relationships between psychology and related sciences (e.g., biology, computer science, economics, sociology) and identifying avenues to collaborate and synergize;
13. communicating effectively and fluently research ideas and findings through written, oral, and visual means to other psychologists and to professionals from other disciplines;
14. articulating the role of psychologists as change agents and demonstrating knowledge of individual, institutional and systems-level barriers to change;
15. evaluating based on relevant psychological evidence the arguments in societal debates that pertain to diversity (e.g., demographic change, migration).

1.4 Career Options and Support

The BSc in Integrated Social and Cognitive Psychology at Constructor University opens doors for a professional career and lays the groundwork for an academic career, especially in an international context. You will be a strong candidate for junior positions in all jobs that require skills in analyzing, designing, or improving human interaction, presentation, and communication. Therefore, your career opportunities will be in fields such as advertising, counseling, diversity management health promotion, human resource management, intercultural relations, management consulting, market research, media, as well as applied research in companies, public institutions, and non-governmental organizations.

Moreover, you will be well prepared for international specialized Master programs in psychology and its neighboring fields, as well as for integrated, research-focused Master-PhD Programs.

Requirements to practice in psychology differ by country, and often even by state. Please check the requirements of the respective country or state. A degree in ISCP qualifies for entry into many accredited M.Sc. programs in the U.S., the UK and other countries that in turn are requirements for licensure in those countries. For details, please check the respective university webpages. Given its interdisciplinary focus, a degree in ISCP does not guarantee admission to general Master programs in Psychology or Psychotherapy at German universities and hence does not prepare for licensure as a Psychotherapist in Germany.

For more information, see the website of the German Society of Psychology at <https://studium.dgps.de/> (site available in German only).

Graduates of the Psychology BA (former program of ISCP) have been admitted to renowned institutions such as:

- University of Exeter, Social Psychology, MSc
- University of Amsterdam; Cultural Psychology, MSc
- University of Groningen, Industrial and Organizational Psychology, MSc
- University of Heidelberg, Psychology, M.Sc.
- University of East Anglia, The Gut-Brain Axis in Ageing and Dementia, direct PhD
- Florida International University, Legal Psychology, direct PhD
- LMU München, Systemic Neurosciences, MSc
- Karolinska Institutet, Biomedicine, MSc
- King's College London, Terrorism, Security & Society, DWS, MA
- University of Aberdeen, Strategic Studies & Management, MSc
- Columbia University, Developmental Psychology, MA
- University of Cambridge, Biological Science (Psychology), MPhil
- University of Oxford, Psychological Research, MSc
- London School of Economics, Social and Cultural Psychology, MSc
- University College London, Mental Health Services, MSc

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 worldwide network which provides support 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 on the study program please contact the Study Program Coordinator:

Prof. Dr. Song Yan

Professor of Psychology

Email: syan@constructor.university

or visit our program website: <https://constructor.university/programs/undergraduate-education/integrated-social-cognitive-psychology>

For more information on Student Services please visit:

<https://constructor.university/student-life/student-services>

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 and the possibility to study abroad for one semester give students the opportunity 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 as well as minor study interests 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.

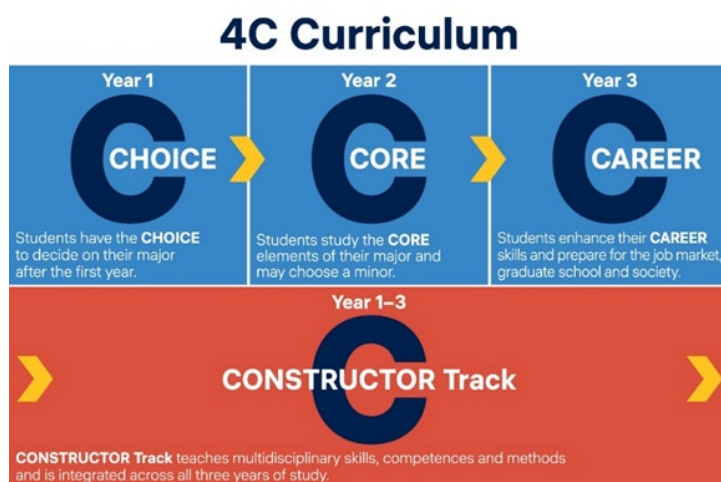


Figure 1: The Constructor University 4C-Model

2.2.1 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 freely upon entering 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 ISCP as a major, students need to take the following CHOICE modules (15 CP) as mandatory (m) modules:

- CHOICE Module: Essentials of Cognitive Psychology (m, 7.5 CP)
- CHOICE Module: Essentials of Social Psychology (m, 7.5 CP)

The *Essentials of Cognitive Psychology* module establishes a general framework for human cognition in which the many phenomena of associated with thinking, interaction, and communication can be analyzed and predicted. Attention, perception, learning, and memory will be some of the topics addressed in the first semester, as well as intelligence, language, emotion, motivation, and personality. This module covers the historical foundations of psychology, influential and current theories and models, as well as empirical research methods. The module also includes methods for critical thinking (evaluating current approaches and research results); the scientific cycle including basics of theory of science.

In the *Essentials of Social Psychology* module, you will deal with the influence that the actual or perceived presence of others can have on people's behavior and analyze how individual experience is embedded in different contexts at different levels of complexity, from immediate social situations, and institutions, to cultural meaning systems. This module will increase your insight into recent developments in social psychology, as well as help you acquire a broad and thorough understanding of the most important topics in social psychological research today.

Students can select the remaining CHOICE modules (30 CP) in their first year of studies according to their interests or with the intention to change their major until the beginning of the second year, when the major choice becomes fixed.

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.

ISCP students that would like to retain an option for a major change are strongly recommended to register for the CHOICE modules of one of the following study programs in their first year. The module descriptions can be found in the respective Study Program Handbook.

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

- International Business Administration (IBA)
CHOICE Module: Microeconomics (m, 7.5 CP)
CHOICE Module: Macroeconomics (m, 7.5 CP)
CHOICE Module: Introduction to International Business (m, 7.5 CP)
CHOICE Module: Introduction to Finance and Accounting (m, 7.5 CP)
- International Relations: Politics and History (IRPH)
CHOICE Module: Introduction to International Relations Theory (m, 7.5 CP)
CHOICE Module: Introduction to Modern European History (m, 7.5 CP)
- Biochemistry and Cell Biology (BCCB)
CHOICE Module: General Biochemistry (m, 7.5 CP)
CHOICE Module: General Cell Biology (m, 7.5 CP)
CHOICE Module: General and Inorganic Chemistry (m, 7.5 CP)
CHOICE Module: General Organic Chemistry (m, 7.5 CP)
- Medicinal Chemistry and Chemical Biology (MCCB)
CHOICE Module: General Medicinal Chemistry and Chemical Biology (m, 7.5 CP)
CHOICE Module: General Organic Chemistry (m, 7.5 CP)
CHOICE Module: General Biochemistry (m, 7.5 CP)
CHOICE Module: General Cell Biology (m, 7.5 CP)
- Chemistry and Biotechnology (CBT)
CHOICE Module: General and Inorganic Chemistry (m, 7.5 CP)
CHOICE Module: General Organic Chemistry (m, 7.5 CP)
CHOICE Module: General Biochemistry: Microbiology and Genetics (m, 7.5 CP)
CHOICE Module: Introduction to Biotechnology (m, 7.5 CP)
- Computer Science (CS)
CHOICE Module: Programming in C and C++ (m, 7.5 CP)
CHOICE Module: Algorithms and Data Structures (m, 7.5 CP)
CHOICE Module: Mathematical Foundations of Computer Science (m, 7.5 CP)
CHOICE Module: Digital Systems and Computer Architecture (m, 7.5 CP)
- Industrial Engineering and Management (IEM)
CHOICE Module: General Industrial Engineering (m, 7.5 CP)
CHOICE Module: General Logistics (m, 7.5 CP)
CHOICE Module: Introduction to International Business (m, 7.5 CP)
CHOICE Module: Introduction to Finance and Accounting (m, 7.5 CP)
- Management, Decisions and Data Analytics (MDDA)
CHOICE Module: Introduction to International Business (m, 7.5 CP)
CHOICE Module: Introduction to Finance and Accounting (m, 7.5 CP)
CHOICE Module: Introduction to Data Science (m, 7.5 CP)
CHOICE Module: Data Structures and Processing (m, 7.5 CP)

To allow further major changes after the first semester the students are strongly recommended to register for the CHOICE modules of one of the following study programs:

- Physics and Data Science (PHDS)
CHOICE Module: Classical Physics (m, 7.5 CP)
CHOICE Module: Scientific Programming with Python (m, 7.5 CP)
CHOICE Module: Modern Physics (m, 7.5 CP)
CHOICE Module: Mathematical Modeling (m, 7.5 CP)
- Mathematics, Modeling and Data Analytics (MMDA)
CHOICE Module: Analysis (m, 7.5 CP)
CHOICE Module: Scientific Programming with Python (m, 7.5 CP)
CHOICE Module: Linear Algebra (m, 7.5 CP)
CHOICE Module: Mathematical Modelling (m, 7.5 CP)
- Software, Data and Technology (SDT)
CHOICE Module: Programming in C and C++ (m, 7.5 CP)
CHOICE Module: Mathematical Foundations of Computer Science (m, 7.5 CP)
CHOICE Module: Core Algorithms and Data Structures (m, 7.5 CP)
CHOICE Module: Development in JVM Languages (m, 7.5 CP)

2.2.2 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 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 ISCP as a major, at least 30 CP from the following mandatory elective (me) CORE modules need to be taken:

- CORE Module: Learning and Memory (me, 5 CP)
- CORE Module: Social Cognition (me, 5 CP)
- CORE Module: Organizational Psychology & Communication (me, 5 CP)
- CORE Module: Neurobiology of Behavior (me, 5 CP)
- CORE Module: Neuroscience Methods (me, 5 CP)
- CORE Module: Attention, Sensation, and Perception (me, 5 CP)
- CORE Module: Judgment & Decision Making (me, 5 CP)
- CORE Module: Health Psychology (me, 5 CP)
- CORE Module: Cultural Psychology (me, 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.

The Learning and Memory module is geared toward understanding how information is stored and retrieved, why we forget, and whether we can improve memory. In the Neurobiology of Behavior module, students will acquire knowledge about basic brain structures and how they contribute to cognitive processing and social interactions, and how neuropsychologists arrive at their insights in the Neuroscience Methods module. In the Attention, Sensation and Perception module, students learn

how humans perceive the world through their senses; how (and why) perceptions deviate from the physical world; how attention shapes perception; and how all this can be investigated through psychophysical methods.

In the Social Cognition module, students will take an in-depth look – from the lab to the ‘real world’ – at the role of the actual or imagined presence of others. Students will also look at culture as one of the less obvious drivers in the Cultural Psychology module, analyzing why people from different corners of the world perceive the same things in very different manners. In the Organizational Psychology and Communication module, students will adopt a social cognition perspective in the study of behavior in organizations, as well as of the fundamental processes of (non-)verbal communication and interaction.

The Judgment & Decision Making module teaches students how humans make judgments about (uncertain) events, decisions that do or do not involve uncertainty, and how and why they deviate from normative (rational) decisions. As a practical application, students will learn how to conduct a decision analysis.

Students will learn to apply and to design models for health, behavior change, stress development and management in the Health Psychology module by focusing on the interaction between biology, health, and behaviors.

ISCP 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 ISCP students to:

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

The requirements for the specific minors 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.

2.2.3 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 ISCP 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 the natural sciences, 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).

The fifth semester also opens a mobility window for a diverse range of study abroad options. Finally, the sixth semester is dedicated to fostering the students' research experience by involving them in a Bachelor thesis project.

2.2.3.1 Internship / Start-up 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 a professional environment, apply their knowledge and understanding in a professional context, reflect on the relevance of their major to employment and society, reflect on their own role in employment and society, and find a professional orientation. The internship can also establish valuable contacts for the students' Bachelor's thesis project, for the selection of a Master program graduate school or 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 of their business plans.

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

2.2.3.2 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 ISCP as a major, 15 CP from the following major-specific Specialization Modules need to be taken:

- ISCP Specialization: Human Neuroscience Advanced Lab (Inter-session) (me, 2.5 CP)
- ISCP Specialization: Abnormal and Clinical Psychology (me, 2.5 CP)
- ISCP Specialization: Managing Demographic Change in Organizations (me, 2.5 CP)
- ISCP Specialization: Social Neuroscience (me, 5 CP)
- ISCP Specialization: The Science of Happiness (me, 5 CP)

The specialization modules are intended to let you apply the general psychological skills you acquired during your first two years of study to specific fields of empirical research or professional practice in order to expand and refine those skills and to foster self-reflection on your career perspectives. In order to provide you with ample opportunity to apply your skills and to reflect the broad range of subfields in psychology, we offer specialization modules of 2.5 CP in addition to the 5 CP default size.

As defined by the specific needs for action in a given field, you will familiarize with and acquire new and advanced methods of problem analysis, data collection and analysis, and problem-solving. The modules in application-oriented fields (e.g., Managing demographic change in organizations) may also

focus on exploring additional professional skills (e.g., Conflict management) and specific career profiles.

The respective modules are listed in Chapter 7.

2.2.3.3 Study Abroad

Students have the opportunity to study abroad for a semester to extend their knowledge and abilities, broaden their horizons and reflect on their values and behavior in a different context as well as on their role in a global society. For a semester abroad (usually the 5th semester), modules related to the major with a workload equivalent to 22.5 CP must be completed. Modules recognized as study abroad CP need to be pre-approved according to Constructor University study abroad procedures. Several exchange programs allow students to directly enroll at prestigious partner institutions worldwide. Constructor University's participation in Erasmus+, the European Union's exchange program, provides an exchange semester at a number of European universities that include Erasmus study abroad funding.

For further information, please contact the International Office

(<https://constructor.university/student-life/study-abroad/international-office>).

ISCP students that wish to pursue a study abroad in their fifth semester are required to select their modules at the study abroad partners such that they can be used to substitute between 10-15 CP of major-specific Specialization modules and between 5-15 CP of modules equivalent to the non-disciplinary New Skills modules (see CONSTRUCTOR Track). In their sixth semester, according to the study plan, returning study-abroad students complete the Bachelor Thesis/Seminar module (see next section), they take any missing Specialization modules to reach the required 15 CP in this area, and they take any missing New Skills modules to reach 15 CP in this area.

2.2.3.4 Bachelor Thesis/Seminar Module

This module is a mandatory graduation requirement for all undergraduate students. It consists of two module components in the major study program guided by a Constructor University faculty member: the Bachelor Thesis (12 CP) and a Seminar (3 CP). 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. In the seminar, students present and discuss their theses in a course environment and reflect on their theoretical or experimental approach and conduct. They learn to present their chosen research topics concisely and comprehensively in front of an audience and to explain their methods, solutions, and results to both specialists and non-specialists.

2.3 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.

2.3.1 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 and Skills area in their curriculum. The modules that are specifically assigned to each study programs 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 a minimum of 20 CP in the Methods area. The size of all Methods modules is 5 CP.

To pursue ISCP as major, the following Methods modules (20 CP) must be taken as mandatory modules:

- Methods Module: Academic Writing and Academic Skills (m, 5 CP)
- Methods Module: Applied Statistics with R (m, 5CP)
- Methods Module: Qualitative Research Methods (m, 5CP)
- Methods Module: Data Collection and Empirical Research Methodologies (m, 5CP)

2.3.2 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 20 CP of New Skills modules in their second year and third year of studies. Students choose New Skills modules from the following portfolio:

- New Skills Module: Logic* (me, 2.5 CP)
- New Skills Module: Causation and Correlation* (me, 2.5 CP)
- New Skills Module: Argumentation, Data Visualization and Communication* (me, 5 CP)
- New Skills Module: Models, Matrices and Theories of Complex Systems (me, 5 CP)
- New Skills Module: Complex Problem Solving (me, 5 CP).
- New Skills Module: Agency, Leadership and Accountability (me, 5 CP)
- New Skills Module: Community Impact Project (me, 5 CP).

Some of these modules (marked by *) will be offered with two different perspectives from which the students can only choose one for the fulfillment of graduation requirements of their degree program. The module perspectives are independent modules which examine the topic from different points of

view. Please see the module description in chapter 6 for more details such as scheduling, content and assessment.

2.3.3 German Language and Humanities Modules

Students are required to take 5 CP of German language or 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 (2.5 CP each), but are not obliged to do so. Native speakers and other students who are not taking advantage of this offer 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 Cognitive Psychology as a Minor

The minor in Cognitive Psychology is an asset in any field that requires significant interaction with people and is a great way to make you more attractive to employers. Students with a major in Biology (BCCB), Business (GEM, IBA), Computer Science (CS), or Industrial Engineering and Management (IEM) may find an ISCP minor to be particularly relevant. They can expect to glean from the ISCP minor and apply to their own fields:

- an appreciation for the variety of influences on human behavior;
- an understanding of psychological research and the applications of psychology;
- insight into human reasoning and decision making;
- interpersonal skills, including cross-cultural understanding; and
- increased critical thinking skills.

3.1 Qualification Aims

The Cognitive Psychology minor is designed to let you build your basic *psychological literacy*, i.e. by being insightful and reflective about your own and others' behavior and mental processes, you will be able to understand which psychological principles govern social interactions in relationships, the workplace, and in society. The intellectually stimulating environment of the minor will support the development of your skills as a respectfully critical scientific thinker and an ethically and socially responsible member of your community. Insights into research and current practice in psychology will enable you to build both academic and transferable skills that contribute to your employability, further study, or training for professional practice.

3.1.1 Intended Learning Outcomes

With a minor in Cognitive Psychology students will be able to:

1. describe the inherent variability and diversity of psychological functioning and the selected implications of the latter for psychological theories and applications;
2. demonstrate a critical understanding of core conceptualizations of cognition and social interaction (e.g., connectionism, information processing approach, neuroscience approach, social-cognitive framework);
3. explain how theories from different levels (e.g., neuroscience and social cognition perspectives) may be combined into theoretical accounts with increased explanatory power or predictive validity;
4. demonstrate basic knowledge of the ethical context of psychology including legal and regulatory issues in the practice of psychology (e.g., in internships);
5. explain the relationships between psychology and related sciences (e.g., biology, computer science, economics, sociology) and describe avenues to collaboration and synergies;
6. and articulate the role of psychologists as agents of change agents and demonstrate knowledge of the individual, institutional, and systems-level barriers to change.

3.2 Module Requirements

A minor in Cognitive Psychology requires 30 CP and includes the following CHOICE and CORE modules:

- CHOICE Module: Essentials of Cognitive Psychology (m, 7.5 CP)

- CHOICE Module: Essentials of Social Psychology (m, 7.5 CP)
- CORE Module: Learning and Memory (m, 5 CP)
- CORE Module: Attention, Sensation & Perception (m, 5 CP)
- CORE Module: Neurobiology of Behavior (m, 5 CP)

3.3 Degree

After successful completion, the minor in Cognitive Psychology will be listed on the final transcript under PROGRAM OF STUDY and BA/BSc – [name of the major] as “Minor: Cognitive Psychology”.

4 ISCP Undergraduate Program Regulations

4.1 Scope of these Regulations

The regulations in this handbook are valid for all students who entered the Integrated Social and Cognitive Psychology undergraduate program at Constructor University in Fall 2025. In case of conflict between the regulations in this handbook and the general Policies for Bachelor Studies, the latter applies (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).

Updates to Study Program Handbooks are based on the policies approved by the Academic Senate on substantial and nonsubstantial changes to study programs. Students are integrated in the decision-making process through their respective committee representatives. All students affected by the changes will be properly informed.

In general, Constructor University therefore reserves the right to change or modify the regulations of the program handbook also after its publication at any time and in its sole discretion.

4.2 Examination Concept

According to the Policies for Bachelor and Master studies, modules generally carry at least five ECTS. Each program ensures appropriate examination frequency and organization, justified in an examination concept and regularly reviewed with student involvement.

Constructor University's examination concept follows the principle of Constructive Alignment (Biggs 1996), ensuring that learning outcomes, activities, and assessments are consistently aligned: students learn what is intended, and assessments both measure and shape learning. Where one assessment cannot cover all Intended Learning Outcomes (ILOs) complementary forms could be used (e.g., written exams plus lab reports). Module descriptions map ILOs to assessments.

In specific contexts, such as asynchronous online modules or courses emphasizing student engagement, Module Achievements or other types of formative assessments may support competence-oriented assessment.

Student feedback, embedded in the Quality Assurance System (QAS), systematically monitors workload, competence orientation, and alignment of ILOs and assessments. Student surveys and feedback are regulated in the Policy for student surveys and evaluations.

4.3 Degree

Upon successful completion of the study program, students are awarded a Bachelor of Science degree in Integrated Social and Cognitive Psychology.

4.4 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.

4.5 Schematic Study Plan for ISCP

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 Plan in the following section.

C>ONSTRUCTOR UNIVERSITY

Integrated Social and Cognitive Psychology (180 CP)

CHOICE / CORE / CAREER						3 x 45 = 135 CP		CONSTRUCTOR Track 45 CP	
3 rd Year CAREER	Bachelor Thesis / Seminar (research or industry) m, 15 CP				Summer Internship / Start-Up (after 2 nd year) m, 15 CP		New Skills modules		
	Specialization I me, 5 CP		Specialization II me, 5 CP						
2 nd Year CORE	Neurobio. of Behavior me, 5 CP	Learning & Memory me, 5 CP	Judgement & Decision me, 5 CP	Org. Psych. & Communicati on me, 5 CP	Neuroscience Methods me, 5 CP	Cultural Psychology me, 5 CP	Data Collection, Empirical Research Methods m, 5 CP	me, 20 CP	
		Attention, Sensation Perception me, 5 CP	Social Cognition me, 5 CP			Health Psychology me, 5 CP	Qualitative Research Methods m, 5 CP		
1 st Year CHOICE	Essentials of Social Psychology m, 7.5 CP		Own Selection me, 7.5 CP		Own Selection me, 7.5 CP		Applied Statistics with R m, 5 CP	Language / Humanities me, 2.5 CP	
	Essentials of Cognitive Psychology m, 7.5 CP		Own Selection me, 7.5 CP		Own Selection me, 7.5 CP		Academic Writing and Academic Skills m, 5 CP	Language / Humanities me, 2.5 CP	
Minor Option in Cognitive Psychology (30 CP)		CP: Credit Points		m: mandatory me: mandatory elective		Study abroad Option in 5 th Semester (22.5 CP)			

Figure 2: Schematic Study Plan for ISCP

Integrated Social and Cognitive Psychology BSc									
Matrikelnummer Fall 2026									
Program-Specific Modules									
Year 1 - CHOICE	Unit	ECTS	Prerequisites	Assessment	Period	Status / Sem.	CP	CP	CP
Year 1 - CHOICE	Unit: Introduction to Psychology (default minor)	15							
	CH-340	Module: Essentials of Cognitive Psychology (default minor)	7.5						
	CH-341	Module: Essentials of Social Psychology (default minor)	7.5						
	CH-341-A	Unit: CHOICE (own selection)	1/2	30					
Take four further CHOICE modules from those offered for all other study programs.*									
Year 2 - COBE	Unit: Human Behavior in Social-Cognitive Context	15							
	CO-680-A	Module: Learning & Memory Lab	2.5						
	CO-680-B	Module: Social Cognition Lab	2.5						
	CO-681-A	Module: Social Cognition	3						
Year 2 - COBE	Unit: Applied Social and Cognitive Psychology	15							
	CO-682-A	Module: Organizational Psychology & Communication	2.5						
	CO-682-B	Module: Organizational Psychology & Communication	2.5						
	CO-682-C	Module: Organizational Psychology & Communication	2.5						
Year 2 - COBE	Unit: Neuro-cognitive perspective on behavior	15							
	CO-683-A	Module: Neurobiology of Behavior I	2.5						
	CO-683-B	Module: Neurobiology of Behavior II	2.5						
	CO-684-A	Module: Neuroscience Methods	3/4						
Year 2 - COBE	Unit: Cognitive perspective on behavior	15							
	CO-685-A	Module: Attention, Sensation & Perception	2.5						
	CO-685-B	Module: Attention, Sensation & Perception	2.5						
	CO-687-A	Module: Health Psychology	3						
Year 2 - COBE	Unit: Judgment & Decision Making	15							
	CO-686-A	Module: Judgment & Decision Making	2.5						
	CO-686-B	Module: Judgment & Decision Making	2.5						
	CO-687-B	Module: Health Psychology	2.5						
Year 2 - COBE	Unit: Applied Social and Cognitive Psychology	15							
	CO-688-A	Module: Cultural Psychology	2.5						
	CO-688-B	Module: Cultural Psychology	2.5						
	CO-688-C	Module: Cultural Psychology	2.5						

Year 3 - CAREER										45		15	
CA-INT-900		Module: Internship / Start-up and Career Skills						m		4/5	15		
CA-INT-900-0		Internship / Start-up and Career Skills		Internship	Project Report	During the 5 th semester							
Module Code		Module: Thesis / Seminar Psychology						m		6	15		
CA-ISCP-800-T		Thesis Psychology		Thesis	Thesis	15 th of May				12			
CA-ISCP-800-S		Thesis Seminar Psychology		Seminar	Presentation	During the semester				3			
		Unit: Specialization						m			15		
Take a total of 15 CP of specialization modules													
CA-S-ISCP-801		Human Neuroscience Advanced Lab (Intersession)		Lab/Seminar	Laboratory report	Examination period	me	5	✓	2.5			
CA-ISCP-807		Abnormal and Clinical Psychology		Seminar	Written Examination	Examination period	me	6	✓	2.5			
CA-S-ISCP-803		Managing Demographic Change in Organizations		Seminar	Presentation	During the semester	me	6	✓	2.5			
CA-S-ISCP-805		The Science of Happiness		Seminar	Project assessment and presentation	During the semester	me	6	✓	5			
CA-S-ISCP-806		Psychology of Digital Interventions		Lab	Presentation	During the semester	me	5	✓	2.5			
CA-S-ISCP-910		Intercultural Trainer Academy		Seminar	Term paper	During the semester	me			5			
Total CP													

Unit: New Skills										15	
Students must take a total 20 CP in New Skills modules in year 2 and 3											
CTNS-NSK-05		Module: Models, Matrices and Theories of Complex Systems						me		3/5	✓ 5
CTNS-05		Models, Matrices and Theories of Complex Systems				Seminar	Written examination	Examination period			
CTNS-NSK-06		Module: Complex Problem Solving						me		3/5	5
CTNS-06		Complex Problem Solving				Lecture (online)	Written examination	Examination period			
CTNS-NSK-07		Module: Argumentation, Data Visualization and Communication *						me		3/5	5
CTNS-07		Argumentation, Data Visualization and Communication (perspective Lecture (online)				Written examination	Examination period				
CTNS-NSK-08		Module: Argumentation, Data Visualization and Communication *						me		4/6	5
CTNS-08		Argumentation, Data Visualization and Communication (perspective Lecture (online)				Examination period					
CTNS-NSK-09		Module: Agency, Accountability and Leadership						me		4/6	✓ 5
CTNS-09		Agency, Accountability and Leadership				Lecture (online)	Written examination	Examination period			
CTNS-CIP-10		Module: Community Impact Project						me		3/5	5
CTNS-10		Community Impact Project				Project	Project Assessment	Examination period			
*These modules are offered with two different perspectives, students may only select one											
180											

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

² For a full listing of all CHOICE / CORE / CAREER / Constructor Track units / modules please consult the [CampusNet online catalogue](#) and /or the study program handbooks.

³ German native speakers will have alternatives to the language courses (in the field of Humanities).

⁴ Humanities I and II are optional to all students, except for German native speakers.

										15
Unit: New Skills										15
Students must take a total 20 CP in New Skills modules in year 2 and 3										
CTNS-NSK-05 Module: Models, Matrices and Theories of Complex Systems										me 3/5 5
CTNS-05	Models, Matrices and Theories of Complex Systems			Seminar	Written examination		Examination period			
CTNS-NSK-06 Module: Complex Problem Solving										me 3/5 5
CTNS-06	Complex Problem Solving			Lecture (online)	Written examination		Examination period			
CTNS-NSK-07 Module: Argumentation, Data Visualization and Communication*										me 3/5 5
CTNS-07	Argumentation, Data Visualization and Communication (perspective)			Lecture (online)	Written examination		Examination period			
CTNS-NSK-08 Module: Argumentation, Data Visualization and Communication*										me 4/6 5
CTNS-08	Argumentation, Data Visualization and Communication (perspective)			Lecture (online)			Examination period			
CTNS-NSK-09 Module: Agency, Accountability and Leadership										me 4/6 5
CTNS-09	Agency, Accountability and Leadership			Lecture (online)	Written examination		Examination period			
CTNS-CIP-10 Module: Community Impact Project										me 3/5 5
CTNS-10	Community Impact Project			Project	Project Assessment		Examination period			
*These modules are offered with two different perspectives, students may only select one										
										180

Figure 3: Study and Examination Plan for ISCP

5 Integrated Social and Cognitive Psychology Modules

5.1.1 Essentials of Cognitive Psychology

Module Name	Essentials of Cognitive Psychology
Module Code	CH-340
Module ECTS	7.5
Program Owner	ISCP-BA (Integrated Social and Cognitive Psychology)
Module Coordinator	Prof. Dr. Song Yan

Study Semester		
Program	Semester	Status
ISCP-BA Integrated Social and Cognitive Psychology	1	Mandatory
MDDA-BSc Management, Decisions and Data Analytics	1	Mandatory
Minor-Cog-Psych-BA Minor Cognitive Psychology	1	Mandatory

Student Workload	
Lecture	52.5
Independent Study	135
Total Hours	187.5

Module Components	Number	Type	CP
Essentials of Cognitive Psychology	CH-340-A	Lecture	7.5

Module Description

The module provides a comprehensive overview of the major fields of cognitive psychology and beyond. It focuses on how humans attend and perceive their environment; learn and remember information; solve problems and make decisions; differ in intelligence and personality; communicate via language; experience emotions; and what drives them (motivation) etc. The module covers the historical foundations of psychology, current influential theories and models as well as empirical research methods. This module also includes methods for critical thinking (evaluating current approaches and research results); the scientific cycle, including the basics of theory of science. The emphasis of this module is on human behavior, and it provides the basis for all other modules in psychology and prepares students for subsequent CORE and Specialization modules.

Intended Learning Outcomes

No	Competence	ILO
-----------	-------------------	------------

1	Explain	Explain basic concepts in psychology (sensation, perception, learning, memory, problem solving, decision making, intelligence, personality, language, emotion, motivation)
2	Explain	Explain the difference between scientific psychology and everyday psychology
3	Identify	Identify the limitations of theoretical approaches

Indicative Literature

Entry Requirements

Prerequisites	None
Co-requisites	None
Additional Remarks	None

Assessment and Completion

Module Component	Examination Type	Duration or Length	Weight (%)	Minimum for Pass	ILOs
Essentials of Cognitive Psychology	Written Examination	180 minutes	100	45%	All intended learning outcomes of the module.

Module Completion Requirements

- **Module Examination:** minimum for pass- 45%.

Module Achievement

None.

5.1.2 Essentials of Social Psychology

Module Name	Essentials of Social Psychology
Module Code	CH-341
Module ECTS	7.5
Program Owner	ISCP-BA (Integrated Social and Cognitive Psychology)
Module Coordinator	Prof. Dr. Ulrich Kühnen

Study Semester		
Program	Semester	Status
ISCP-BA Integrated Social and Cognitive Psychology	2	Mandatory
MDDA-BSc Management, Decisions and Data Analytics	2	Mandatory
Minor-Cog-Psych-BA Minor Cognitive Psychology	2	Mandatory

Student Workload	
Lecture	52.5
Independent Study	135
Total Hours	187.5

Module Components	Number	Type	CP
Essentials of Social Psychology	CH-341-A	Lecture	7.5

Module Description

In this module, you will begin to explore the influence that the actual or perceived presence of others can have on people's behaviors, thoughts, judgments and emotions – which are very much influenced by contextual factors such as the living environment, the social structure, or the political sphere, to name a few. However, context also refers to factors that influence how an object or a person is perceived, such as the perceiver's mood, expectations, needs and prior knowledge of a perceiver. Other social psychology issues of interest include how people interact, how inter-group conflict can be understood, and when people help each other or aggress against each other.

This module reviews important aspects of social psychological research, which then will be discussed in more detail in the respective CORE and Specialization seminars. Therefore, you will be familiarized with fundamental theories and concepts such as theories of attribution, dissonance, and self-perception theory, person perception and social encoding, stereotypes, inter-group conflict, motivation, and social identity.

Intended Learning Outcomes

No	Competence	ILO
-----------	-------------------	------------

1	Explain	Explain seminal individual-level and group-level theories of social psychology
2	Explain	Explain major research approaches to psychological phenomena
3	Analyze	Analyze selected current social debates (e.g., about migration) in social psychological terms
4	Name	Name and describe relationships with related sciences (e.g., biology, sociology)
5	Describe	Describe current 'hot topics' in social psychological research

Indicative Literature

- Gilovich, T., Keltner, D., Chen, S. & Nisbett, R. (2018). Social Psychology. 5th International Student Edition. New York: W.W. Norton & Company Ltd

Entry Requirements

Prerequisites	None
Co-requisites	None
Additional Remarks	None

Assessment and Completion

Module Component	Examination Type	Duration or Length	Weight (%)	Minimum for Pass	ILOs
Essentials of Social Psychology	Written Examination	180 min	100	45%	All intended learning outcomes of the module.

Module Completion Requirements

- **Module Examination:** minimum for pass- 45%.

Module Achievement

None.

5.1.3 Learning and Memory

Module Name	Learning and Memory
Module Code	CO-680
Module ECTS	5
Program Owner	ISCP-BA (Integrated Social and Cognitive Psychology)
Module Coordinator	Prof. Dr. Song Yan

Study Semester		
Program	Semester	Status
ISCP-BA Integrated Social and Cognitive Psychology	4	Mandatory Elective
Minor-Cog-Psych-BA Minor Cognitive Psychology	4	Mandatory Elective

Student Workload	
Seminar/Laboratory	35
Independent Study	90
Total Hours	125

Module Components	Number	Type	CP
Learning and Memory	CO-680-A	Seminar	2.5
Learning and Memory Lab	CO-680-B	Laboratory	2.5

Module Description

The study of memory seeks to understand how information is stored and retrieved, how new information is integrated with existing information, why we forget, and whether or not we can improve memory. This module provides an introduction to the current models of memory and the mechanisms of learning and memory, including its neural basis and scientific approaches for studying about learning and memory. By conducting basic experiments, the concept of model testing is trained, i.e., stating assumptions and deriving predictions, empirical testing, and possible modifications to the model. Throughout the module APA style is strictly followed.

Upon successful completion of this module, you should have knowledge of models and methods of research in the study of learning and memory. The aim of the module is to provide you with a solid understanding of the cognitive processes that give rise to the phenomena of learning and memory, research methods with which to study learning and memory phenomena, and the practical experience to conduct experimental work on these phenomena.

A single assessment format is insufficient to evaluate the full range of intended learning outcomes. The written examination measures students' comprehension of foundational concepts, theoretical principles, and established research approaches in the domains of learning and memory. The project report, by contrast, assesses students' capacity to apply this knowledge in practice. It evaluates their

proficiency in conducting the scientific process, including research design, data collection, analysis, and the articulation of findings.

Recommended Knowledge

- Basic statistics
- Scientific writing

Intended Learning Outcomes

No	Competence	ILO
1	Describe	Describe the basic processes of learning and memory
2	Distinguish	Distinguish types of memory stores and their functions
3	Explain	Explain the relationships and differences between learning and memory
4	Evaluate	Evaluate research findings critically.
5	Conduct	Conduct lab experiments related to learning/memory and evaluate the results

Indicative Literature

- Baddeley, A., Eysenck, M., & Anderson, M. (2020). Memory. 3rd Edition. Routledge
- Gluck, M., Mercado, E., & Myers, C. (2020). Learning and Memory. From Brain to Behavior. 4th ed. New York: Worth Publishers

Entry Requirements

Prerequisites	CH-340 Essentials of Cognitive Psychology
Co-requisites	None
Additional Remarks	None

Assessment and Completion

Module Component	Examination Type	Duration or Length	Weight (%)	Minimum for Pass	ILOs
Learning and Memory	Written Examination	60 min	50	45%	All intended learning outcomes of the lecture (1-4).

Learning and Memory Lab	Project Report	20 min	50	45%	All intended learning outcomes of the lab (5).
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Module Completion Requirements

- **Module Component Examination:** minimum pass 45% of each assessment.

Module Achievement

None.

5.1.4 Social Cognition

Module Name	Social Cognition
Module Code	CO-681
Module ECTS	5
Program Owner	ISCP-BA (Integrated Social and Cognitive Psychology)
Module Coordinator	Prof. Dr. Christian Stamov Roßnagel

Study Semester		
Program	Semester	Status
ISCP-BA Integrated Social and Cognitive Psychology	3	Mandatory Elective
MDDA-BSc Management, Decisions and Data Analytics	3	Mandatory

Student Workload	
Seminar	35
Independent Study	90
Total Hours	125

Module Components	Number	Type	CP
Social Cognition	CO-681-A	Seminar	2.5
Social Cognition Lab	CO-681-B	Laboratory	2.5

Module Description

Individual experience is embedded in various social contexts ranging in layers of complexity from one's immediate social situation (e.g., others being present) to institutions (such as the workplace or the educational system) to cultural meaning systems. The components of this module investigate the dynamic and mutual relationship between individual actors and their social contexts across these layers of complexity. How is individual experience influenced by the actual or presumed presence of others? Do people act differently as members of social groups than they do as individuals? What are the implications of our insights into the social embeddedness of human behavior for interventions aimed at modifying behaviors?

This module will promote your insight into recent developments in social psychology as well as help you acquire a broad and thorough understanding of today's most important topics in social psychological research. You will refine your methodological skills by analyzing extant research as well as designing new studies. Moreover, you will be given sufficient opportunity to familiarize yourself with the approaches to and issues of application-oriented research.

A single assessment type cannot sufficiently test all intended learning outcomes. The laboratory report evaluates research design and analysis skills, whereas the term paper evaluates the capacity for applying core concepts, critical analysis, and academic writing.

Recommended Knowledge

Social Cognition self-assessment on Campusnet.

Intended Learning Outcomes

No	Competence	ILO
1	Explain	Explain seminal models and fundamental processes of social cognition and group processes
2	Describe	Describe and critically evaluate the social-cognitive approach
3	Analyze	Analyze and contrast selected alternative explanations
4	Explain	Explain major sources of individual-level and group-level social influence
5	Name	Name needs for and outline strategies to modify or extend current theories and models
6	Apply	Apply social cognitive theorizing to explain or predict real-world phenomena

Indicative Literature

Entry Requirements

Prerequisites	CH-340 Essentials of Cognitive Psychology
Co-requisites	None
Additional Remarks	None

Assessment and Completion

Module Component	Examination Type	Duration or Length	Weight (%)	Minimum for Pass	ILOs
Social Cognition	Term Paper	2000 words	50	45%	1-5
Social Cognition Lab	Laboratory Report	1500 Words	50	45%	1-3, 6

Module Completion Requirements

- **Module Component Examination:** minimum pass 45% of each assessment.

Module Achievement

None.

5.1.5 Organizational Psychology & Communication

Module Name	Organizational Psychology & Communication
Module Code	CO-682
Module ECTS	5
Program Owner	ISCP-BA (Integrated Social and Cognitive Psychology)
Module Coordinator	Prof. Dr. Christian Stamov Roßnagel

Study Semester		
Program	Semester	Status
ISCP-BA Integrated Social and Cognitive Psychology	3	Mandatory Elective
MDDA-BSc Management, Decisions and Data Analytics	3	Mandatory

Student Workload	
Seminar	35
Independent Study	90
Total Hours	125

Module Components	Number	Type	CP
Organizational Psychology	CO-682-A	Seminar	2.5
Communication and Interaction	CO-682-B	Seminar	2.5

Module Description

Building on the conceptual and methodological foundations established in the Social Cognition module, the general question guiding this module is how insights into the socio-cultural embeddedness of human behavior can help us ‘understand’ (e.g., assess, diagnose) and change behavior in complex real-world settings. One such setting are organizations, i.e. structured social units in which people collaborate to reach collective goals. We explore how person level and organizationlevel factors (e.g., organizational climate) interact to shape workers’ organizational behavior in terms of motivation, communication, and collaboration. We will pay special attention to the opportunities and challenges of the increasing diversity of people in contemporary organizations.

Communication, and the social interaction it involves, is a fascinating example of both such opportunities and challenges. While communicative processes unfold differently as a function of the diversity contexts they are embedded in, at the same time those processes are the means to systematically influence social interactions in diverse groups, teams, and organizations in a solution-oriented manner. Different as communicative processes may be at the surface level (including, for instance, verbal interactions, nonverbal cues, and human-computer interaction), there are fundamental cognitive and social processes that underlie human communication in all its forms. We will look at how communication shapes personal relationships and differentiates potentially hazardous

misunderstandings from successful interactions in a range of settings, such as sales communication, supervisor-employee interactions, therapeutic change talk, and conflict resolution and negotiation.

In addition to providing you with insights into current 'hot topics' in social and cultural psychology, this module focuses on the approaches and contemporary issues of application-oriented research in both fields. Using case studies from actual consulting projects as examples, you will refine your skills for analyzing real-life situations in a theory-based fashion and of designing strategies for assessments and interventions in selected communication settings.

Recommended Knowledge

- Basics of correlational statistics
- Concepts of generalizability, external, internal, and ecological validity

Intended Learning Outcomes

No	Competence	ILO
1	Explain	Explain how quantitative theories may and may not be applied to individuals, groups, or organizations
2	Explain	Explain how evidence-based problem solutions are generated
3	Apply	Apply qualitative and quantitative methods to design case-specific data collection strategies
4	Demonstrate	Demonstrate the ability to communicate high-level research findings to non-experts without information loss
5	Apply	Apply social influence theories to develop strategies for stakeholder management

Indicative Literature

- King, D. & Lawley, S. (2019). Organizational Behaviour (3e). Oxford: Oxford University Press. ISBN: 9780198807780
- Röhner J. & Schütz, A. (2021). Psychology of Communication. Wiesbaden: Springer. ISBN 978-3-030-60169-0

Entry Requirements

Prerequisites	CH-340 Essentials of Cognitive Psychology
Co-requisites	None
Additional Remarks	None

Assessment and Completion

Module Component	Examination Type	Duration or Length	Weight (%)	Minimum for Pass	ILOs
Organizational Psychology	Written Examination	60 Minutes	50	45%	All
Communication and Interaction	Written Examination	60 Minutes	50		All

Module Completion Requirements

- **Module Component Examination:** minimum pass 45% of each assessment.

Module Achievement

None.

5.1.6 Neurobiology of Behavior

Module Name	Neurobiology of Behavior
Module Code	CO-683
Module ECTS	5
Program Owner	ISCP-BA (Integrated Social and Cognitive Psychology)
Module Coordinator	Prof. Dr. Ben Godde

Study Semester		
Program	Semester	Status
ISCP-BA Integrated Social and Cognitive Psychology	3	Mandatory Elective
Minor-Cog-Psych-BA Minor Cognitive Psychology	3	Mandatory
BCCB-BSc Biochemistry and Cell Biology	5	Mandatory Elective

Student Workload	
Independent Study	90
Lecture	35
Total Hours	125

Module Components	Number	Type	CP
Neurobiology of Behavior I	CO-683-A	Lecture	2.5
Neurobiology of Behavior II	CO-683-B	Lecture	2.5

Module Description

This module introduces state-of-the-art knowledge of structure-function relationships in the mammalian nervous system, particularly at the large-scale systems level. Starting from the organization of neural systems and the neuroanatomy of the brain, this module focuses on the neurobiological basis of cognitive processing in the areas of perception, motor control, attention, emotion, memory, learning, and language, etc. How do neurons communicate? What do drugs do to the brain and how do they alter behavior? How is the brain involved in making decisions? How does the brain change? These and other questions as well as critical perspectives are addressed in this module.

With a clear focus on the human brain, the module provides a basic review of the brain as a biological organ, including its basic structure and operations, and teaches students how the brain gives rise to a wide variety of complex behaviors. You will learn how to integrate knowledge obtained from several levels of analysis –“ neurons, circuits, systems –“ into a coherent understanding of the brain’s structure and function. Thus, this module, lays the groundwork for other modules in psychology that relate behavior to underlying neural mechanisms. You will learn to evaluate the challenges and limits of modern, neuro-oriented psychology.

Intended Learning Outcomes

No	Competence	ILO
1	Explain	Explain the brain's basic structure and processes
2	Describe	Describe how brain structures and functions relate to psychological processes, phenomena, and behaviors
3	Evaluate	Evaluate the neuroscience approach to psychology critically.

Indicative Literature

- Breedlove SM & Watson NV. (2017) Behavioral Neuroscience, 8th ed. Sunderland: Sinauer
- Kolb B. & Wishaw IQ. (2015). Fundamentals of Human Neuropsychology, 7th ed. New York: Worth Publishers

Entry Requirements

Prerequisites	CH-340 Essentials of Cognitive Psychology
Co-requisites	None
Additional Remarks	None

Assessment and Completion

Module Component	Examination Type	Duration or Length	Weight (%)	Minimum for Pass	ILOs
Neurobiology of Behavior I	Written Examination	120 Minutes	100	45%	All
Neurobiology of Behavior II					

Module Completion Requirements

- **Module Examination:** minimum for pass- 45%.

Module Achievement

None.

5.1.7 Neuroscience Methods

Module Name	Neuroscience Methods
Module Code	CO-684
Module ECTS	5
Program Owner	ISCP-BA (Integrated Social and Cognitive Psychology)
Module Coordinator	Prof. Dr. Ben Godde

Study Semester		
Program	Semester	Status
ISCP-BA Integrated Social and Cognitive Psychology	3	Mandatory Elective
BCCB-BSc Biochemistry and Cell Biology	5	Mandatory Elective

Student Workload	
Independent Study	90
Seminar/Laboratory	35
Total Hours	125

Module Components	Number	Type	CP
Neuroscience Methods	CO-684-A	Seminar	2.5
Neuroscience Methods Lab	CO-684-B	Laboratory	2.5

Module Description

In neurobiology and cognitive psychology, respectively, a vast array of methods exists for investigating neuropsychological processes from single cells up to complex human behavior. Apart from basic research, these methods are very important in clinical investigations. Both in terms of methods that enable researchers to analyze processes (e.g., structural and functional neuroimaging, magnetoencephalography) and of techniques for manipulating processes (e.g., brain stimulation, optogenetic methods), fundamental new techniques have been developed recently.

Based on this, a thorough overview of available methods and their specific purposes is essential. With a strong focus on human brain imaging and electrophysiology, this module provides you with both practical skills and the conceptual knowledge to responsibly choose modern human brain imaging techniques for specific research or diagnostics purposes and to critically discuss their application potential as revealed by seminal or recent publications in the field.

The assessments target different ILOs for the two components. While the term paper is a critical reflection of the content and format of the mandatory presentation in the seminar component, the lab report reveals the skill level of the students in the application of methods learned in the lab component.

Intended Learning Outcomes

No	Competence	ILO
1	Choose	Choose and apply appropriate methods to answer specific research questions
2	Interpret	Interpret empirical results in the context of the chosen methods
3	Draw	Draw implications for further research from specific findings
4	Assess	Assess and compare critically the advantages and disadvantages of selected techniques.

Indicative Literature

- Kolb B & Wishaw IQ (2015) Fundamentals of Human Neuropsychology 7th ed, Chapter 7: Imaging the brain's activity New York: Worth Publishers

Entry Requirements

Prerequisites	CH-340 Essentials of Cognitive Psychology
Co-requisites	CO-683 Neurobiology of Behavior
Additional Remarks	None

Assessment and Completion

Module Component	Examination Type	Duration or Length	Weight (%)	Minimum for Pass	ILOs
Neuroscience Methods Lab	Laboratory Report	1.500 Words	50	45%	Intended learning outcomes of the lab (1)
Neuroscience Methods	Term Paper	1500 Words	50	45%	2-4

Module Completion Requirements

- Module Component Examination:** minimum pass 45% of each assessment.

Module Achievement

Giving a presentation is pre-requisite prior to submission of the term paper.

5.1.8 Attention, Sensation, & Perception

Module Name	Attention, Sensation, & Perception
Module Code	CO-685
Module ECTS	5
Program Owner	ISCP-BA (Integrated Social and Cognitive Psychology)
Module Coordinator	Prof. Dr. Song Yan

Study Semester		
Program	Semester	Status
ISCP-BA Integrated Social and Cognitive Psychology	3	Mandatory Elective
Minor-Cog-Psych-BA Minor Cognitive Psychology	3	Mandatory

Student Workload	
Seminar/Laboratory	35
Independent Study	90
Total Hours	125

Module Components	Number	Type	CP
Attention, Sensation & Perception	CO-685-A	Seminar	2.5
Attention, Sensation & Perception Lab	CO-685-B	Laboratory	2.5

Module Description

Attention and perception are essential processes for humans and animals to learn about the world around them. Sensation refers to the process of detecting a stimulus or a stimulus property in the environment. It is the necessary collection of information about the surroundings in which perceptions are made. Perception refers to the way in which we interpret the information gathered by our senses. Attention research seeks to understand how attention allows and affects detection, perception, and the encoding of information. Perception includes vision, audition, touch, smell, and taste. Attention focuses on divided, selective involuntary and voluntary attention and attention across modalities.

Upon successful completion of this module, you understand the models and methods of research in perception and attention. The aim of this module is to provide you with a basic understanding of the physiological processes that give rise to perceptual phenomena, behavioral research methods that include programming to investigate perceptual and attentional phenomena, and practical experience to conduct experimental work on those phenomena.

Recommended Knowledge

- Basic statistics
- Scientific writing

- Wolfe, J.M. et al. (2015). Sensation & Perception, 4ed. Oxford: Sinauer.

Intended Learning Outcomes

No	Competence	ILO
1	Describe	Describe the basic processes of attention and perception
2	Explain	Explain the link between different sensory modalities (cross modal interaction)
3	Demonstrate	Demonstrate an understanding of the connection between neurophysiological processes and perceptual phenomena
4	Evaluate	Evaluate research findings critically.
5	Conduct	Conduct lab experiments related to attention/perception and evaluate the results

Indicative Literature

Entry Requirements

Prerequisites	CH-340 Essentials of Cognitive Psychology
Co-requisites	None
Additional Remarks	None

Assessment and Completion

Module Component	Examination Type	Duration or Length	Weight (%)	Minimum for Pass	ILOs
Attention, Sensation & Perception	Laboratory Report	1500 Words	100	45%	All intended learning outcomes of the module.
Attention, Sensation & Perception Lab					

Module Completion Requirements

- **Module Examination:** minimum for pass- 45%.

Module Achievement

None

5.1.9 Judgment & Decision Making

Module Name	Judgment & Decision Making
Module Code	CO-686
Module ECTS	5
Program Owner	ISCP-BA (Integrated Social and Cognitive Psychology)
Module Coordinator	Prof. Dr. Song Yan

Study Semester		
Program	Semester	Status
ISCP-BA Integrated Social and Cognitive Psychology	4	Mandatory Elective
MDDA-BSc Management, Decisions and Data Analytics	4	Mandatory

Student Workload	
Seminar	35
Independent Study	90
Total Hours	125

Module Components	Number	Type	CP
Judgment & Decision Making	CO-686-A	Seminar	5

Module Description

Judgment and decision-making are broad and complex areas of great theoretical interest and practical impact in almost all of contemporary disciplines. The focus here is on psychological perspectives. Applications of decision-making re-search in marketing, medicine, law, and other areas are discussed. This module includes topics such as heuristics and biases, decision making under risk and uncertainty, preference and choice, confidence, and more.

Upon successful completion of this module, you understand the models and methods of research in judgment and decision making. The aim of this module is to provide you with basic concepts from probability theory and expected utility theory to serve as a benchmark for evaluating judgments and decision-making. Psychological models of decision-making that describe human judgment and decision making are discussed. Historical background and classic paradigms are also provided to enable you to understand and evaluate current research.

Recommended Knowledge

- Basics in probability theory
- Scientific writing

Intended Learning Outcomes

No	Competence	ILO
1	Describe	Describe the major models and theories of behavioral decision making
2	Explain	Explain this field's major methods, results, and controversies
3	Select	Select generalizable findings and apply them to solve actual decision-making problems
4	Discuss	Discuss applications of decision-making research in marketing, medicine, and law

Indicative Literature

Entry Requirements

Prerequisites	CH-340 Essentials of Cognitive Psychology
Co-requisites	None
Additional Remarks	None

Assessment and Completion

Module Component	Examination Type	Duration or Length	Weight (%)	Minimum for Pass	ILOs
Judgment & Decision Making	Written Examination	120 min	100	45%	All intended learning outcomes of the module.

Module Completion Requirements

- **Module Examination:** minimum for pass- 45%.

Module Achievement

None.

5.1.10 Health Psychology

Module Name	Health Psychology
Module Code	CO-687
Module ECTS	5
Program Owner	ISCP-BA (Integrated Social and Cognitive Psychology)
Module Coordinator	Prof. Dr. Sonia Lippke

Study Semester		
Program	Semester	Status
ISCP-BA Integrated Social and Cognitive Psychology	3	Mandatory Elective

Student Workload	
Seminar/Laboratory	35
Independent Study	90
Total Hours	125

Module Components	Number	Type	CP
Health Psychology	CO-687-A	Seminar	2.5
Health Psychology Lab	CO-687-B	Laboratory	2.5

Module Description

Within the layered approach of the ISCP program, this module focuses on the interaction between biology, health and behavior. Theories and models of health, behavior change, and stress development and management are introduced, as well as health promotion including both a biological and social-cognitive approach. Theoretical knowledge will be translated into applications by use of through practical experiences.

The interaction between biology and behavior will be investigated using the example of health and health behaviors. An understanding of factors important for the prevention of illness and maintenance of physical and mental health will be obtained. You will understand how motivation and behavioral change can be promoted and learn how to conduct applied and laboratory research as well as practical applications.

Recommended Knowledge

- Knowledge of history and methods in Psychology
- Skills to measure sensation, perception, attention, intelligence, emotion, motivation and personality
- Ability to support learning, critical thinking, problem solving, decision making
- Marks, D. F., Murray, M. & Estacio, E. V. (2018). Health psychology. London: Sage.
- Naidoo, J., & Wills, J. (2016). Foundations for Health Promotion. Elsevier Health Sciences.

Intended Learning Outcomes

No	Competence	ILO
1	Identify	Identify factors that impact health, well-being, and coping with stress
2	Evaluate	Evaluate critically the theories and models covered in terms of their usefulness to improve motivation and behavior.
3	Design	Design research programs in the field of health psychology and set up quality management systems
4	Apply	Apply scientific approaches and evidence-based theories

Indicative Literature

- Davey, G. C. (Ed.) (2011). Applied psychology. Hoboken, N.J.: Wiley-Blackwell
- Marks, D. F., Murray, M. & Estacio, E. V. (2018). Health psychology. London: Sage
- Naidoo, J., & Wills, J. (2016). Foundations for Health Promotion. Elsevier Health Sciences
- Schaie, & S. L. Willis (Eds.), Handbook of the Psychology of Aging (8th ed.). Cambridge, MA: Academic Press

Entry Requirements

Prerequisites	CH-340 Essentials of Cognitive Psychology
Co-requisites	None
Additional Remarks	None

Assessment and Completion

Module Component	Examination Type	Duration or Length	Weight (%)	Minimum for Pass	ILOs
Health Psychology Health Psychology Lab	Written Examination	120 Minutes	100	45%	All intended learning outcomes of the module.

Module Completion Requirements

- **Module Examination:** minimum for pass- 45%.

Module Achievement

None.

5.1.11 Cultural Psychology

Module Name	Cultural Psychology
Module Code	CO-688
Module ECTS	5
Program Owner	ISCP-BA (Integrated Social and Cognitive Psychology)
Module Coordinator	Prof. Dr. Ulrich Kühnen

Study Semester		
Program	Semester	Status
ISCP-BA Integrated Social and Cognitive Psychology	4	Mandatory Elective

Student Workload	
Seminar/Laboratory	35
Independent Study	90
Total Hours	125

Module Components	Number	Type	CP
Culture and Cognition	CO-688-A	Seminar	2.5
Cultural Psychology Lab	CO-688-B	Laboratory	2.5

Module Description

Cognitive scientists and cultural theorists traditionally have thought about cultures' influences on cognition quite differently. From a cognitive science perspective, the study of cognition is typically construed as the search for those aspects of mental experience that are universally true for all. In fact, for much of the 20th century, most psychologists assumed that all normal human beings were equipped with the same set of attentional, perceptual, memorial, learning, and inferential procedures. From a cultural studies perspective, there is no avoiding the cultural framework within which individuals think and act. The idea of a universal mental experience is often rejected outright by many cultural theorists; every human thought and perception is uniquely situated within a very specific framework informed by history, tradition, language, and social context, etc. The goal of this module is to explore the dynamics of both perspectives by asking which aspects of human thinking and judgment are universal or culturally shaped. Spanning both individual-level and group-level analyses of the socio-cultural embeddedness of human experience and behavior, this module will help you acquire a broad and thorough understanding of today's most important current topics in cultural psychology research.

The class is divided into two subsections with different intended learning outcomes, thus requiring more than one assessment type. In the seminar part, students read and discuss research papers and textbook chapters which will be embedded into the larger research context by the instructor. The acquired knowledge and competencies of this class section are assessed by a final exam. In the lab section of this class, students develop a research idea, derive research hypotheses, design and conduct an online study to test these, analyze the data and interpret the findings in light of the proposed

hypotheses. The appropriate assessment format for this part is a lab report in the form of a research paper.

Intended Learning Outcomes

No	Competence	ILO
1	Reflect	Reflect critically on empirical and theoretical scientific articles from cultural psychology.
2	Integrate	Integrate current research evidence in cultural psychology into its scientific context
3	Describe	Describe the influence of one's own cultural experiences
4	Interpret	Interpret based on the background of evidence-based insights, the interactions of people from different cultural backgrounds
5	Comment	Comment critically on societal debates related to migration.

Entry Requirements

Prerequisites	CH-340 Essentials of Cognitive Psychology
Co-requisites	None
Additional Remarks	None

Assessment and Completion

Module Component	Examination Type	Duration or Length	Weight (%)	Minimum for Pass	ILOs
Culture and Cognition	Written Examination	60 Minutes	50	45%	All intended learning outcomes of the lecture (3-5)
Cultural Psychology Lab	Laboratory Report	1500 Words	50	45%	All intended learning outcomes of the lab (1-2).

Module Completion Requirements

- **Module Component Examination:** minimum pass 45% of each assessment.

Module Achievement

None.

5.1.12 Human Neuroscience Advanced Lab

Module Name	Human Neuroscience Advanced Lab
Module Code	CA-S-ISCP-801
Module ECTS	2.5
Program Owner	ISCP-BA (Integrated Social and Cognitive Psychology)
Module Coordinator	Prof. Dr. Ben Godde

Study Semester		
Program	Semester	Status
ISCP-BA Integrated Social and Cognitive Psychology	5	Mandatory Elective

Student Workload	
Seminar/Laboratory	17.5
Independent Study	42.5
Total Hours	60

Module Components	Number	Type	CP
Human Neuroscience Advanced Lab	CA-ISCP-801	Laboratory	2.5

Module Description

This module provides in-depth theoretical and practical insights into modern methods in human brain research, such as electroencephalography, brain imaging, and brain stimulation techniques. This module expands on the CORE module on Neuroscience Methods and prepares you to independently design and conduct experimental studies using these methods, as well as to process, analyze, and interpret acquired data. This module is mandatory if you aim to write a bachelor thesis using these methods.

This 2.5 CP module is part of a portfolio of several 2.5 CP modules in order to allow students to have a wider choice of electives. To compensate for the smaller size of this module, the assessment is of smaller scope.

Intended Learning Outcomes

No	Competence	ILO
1	Select	Select the appropriate brain imaging method for a specific research question
2	Design	Design, prepare, and conduct a study using methods such as electroencephalography or transcranial brain stimulation
3	Process	Process and analyze experimental data obtained with modern brain imaging techniques
4	Interpret	Interpret and evaluate findings obtained using such methods

Indicative Literature

- Kolb, B. & Wishaw I.Q (2015). Fundamentals of Human Neuropsychology, 7th ed. Chapter 7: Imaging the brain's activity. New York: Worth Publishers.

Entry Requirements

Prerequisites	CO-683 Neurobiology of Behavior CO-684 Neuroscience Methods CH-340 Essentials of Cognitive Psychology
Co-requisites	None
Additional Remarks	None

Assessment and Completion

Module Component	Examination Type	Duration or Length	Weight (%)	Minimum for Pass	ILOs
Human Neuroscience Advanced Lab	Laboratory Report	1500 Words	100	45%	All intended learning outcomes of the module.

Module Completion Requirements

- **Module Examination:** minimum for pass- 45%.

Module Achievement

None.

5.1.13 Abnormal and Clinical Psychology

Module Name	Abnormal and Clinical Psychology
Module Code	CA-ISCP-807
Module ECTS	2.5
Program Owner	ISCP-BA (Integrated Social and Cognitive Psychology)
Module Coordinator	Prof. Dr. Thomas Lang

Study Semester		
Program	Semester	Status
ISCP-BA Integrated Social and Cognitive Psychology	6	Mandatory Elective

Student Workload	
Seminar	17.5
Independent Study	45
Total Hours	62.5

Module Components	Number	Type	CP
Abnormal and Clinical Psychology	CA-ISCP-807	Seminar	2.5

Module Description

This course will provide an overview of the scientific study of mental illness (psychopathology) and clinical psychology. First, the course will cover basic concepts and definitions of psychopathology (what is “normal” vs. “abnormal?”), the assessment and diagnosis (categorical vs. dimensional classification; key elements of a diagnosis in DSM 5; behavioral and cognitive assessments) for mental illness. Second, the course addresses the leading categories of mental disorders among adults, including the description and classification of these disorders (diagnosis chapters of DSM 5), the leading theories and evidence explaining these disorders and the maintenance and treatment of these disorders (anxiety disorders, mood disorders, eating disorders and psychosis). Topics covered include also symptoms, etiology, maintenance, treatment of anxiety disorders, mood disorders, eating disorders and psychotic disorders.

This module is intentionally designed as a 2.5 CP module to enhance Employability by exposing students to a variety of professionally relevant topics rather than requiring in-depth specialization.

Intended Learning Outcomes

No	Competence	ILO
1	Use	Use the categorical systems of psychopathology
2	Use	Use diagnostic instruments for clinical assessment
3	Explain	Explain the pathopsychology, maintenance, and treatment of mental disorder

4	Explain	Explain CBT methods and effects for different disorder
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Indicative Literature

- American Psychiatric Association. (2013). Diagnostic and statistical manual of mental disorders (5th ed.)
- Barlow, D. H., Durand, V. M., & Hoffmann, S. G. (2022). Psychopathology: An Integrative Approach to Mental Disorders. Cengage Learning EMEA.

Entry Requirements

Prerequisites	None
Co-requisites	None
Additional Remarks	None

Assessment and Completion

Module Component	Examination Type	Duration or Length	Weight (%)	Minimum for Pass	ILOs
Abnormal and Clinical Psychology	Written Examination	60 Minutes	100	45%	Intended Learning Outcomes (1-4)

Module Completion Requirements

- **Module Examination:** minimum for pass- 45%.

Module Achievement

None.

5.1.14 Managing Demographic Change in Organizations

Module Name	Managing Demographic Change in Organizations
Module Code	CA-S-ISCP-803
Module ECTS	2.5
Program Owner	ISCP-BA (Integrated Social and Cognitive Psychology)
Module Coordinator	Prof. Dr. Christian Stamov Roßnagel

Study Semester		
Program	Semester	Status
ISCP-BA Integrated Social and Cognitive Psychology	6	Mandatory Elective

Student Workload	
Seminar	17.5
Independent Study	45
Total Hours	62.5

Module Components	Number	Type	CP
Managing Demographic Change in Organizations	CA-ISCP-803	Seminar	2.5

Module Description

In many industrialized countries, organizations face an aging labor force. Fewer young workers than ever before enter the labor force, while older workers retire at a higher age than previous cohorts. The general question that this demographic change raises is how organizations might have to adapt their personnel management strategies to keep productivity high. How does team-work, learning, or leadership change in an increasingly age-diverse work-place? How do the generations (e.g., Gen Y, Generation X, Boomers) actually differ from a personnel development point of view?

Applying general models of lifespan development, organizational climate, leadership, training and development, and work teams to real-world cases, you will slip into organizational consultants' shoes and develop strategies for organizational demographic change management that you will then present to the CHRO of your (fictitious) company. We will pay particular attention to the theory-practice gap and its implications for practical work in consultant roles and will learn how to appropriately use research findings in strategy development.

This module attaches particular importance to an in-depth treatment of the approaches and contemporary issues of application-oriented research. Using case studies from actual consulting projects as real-life examples, you will refine your ability to analyze real-life situations based on a theory-based fashion and to design strategies for assessments and interventions in selected workplace settings.

This 2.5 CP module is part of a portfolio of several 2.5 CP modules in order to allow students to have a wider choice of electives. To compensate for the smaller size of this module, the assessment is of smaller scope.

Recommended Knowledge

- Basics of correlational statistics
- Concepts of generalizability, external, internal, ecological validity

Intended Learning Outcomes

No	Competence	ILO
1	Explain	Explain how age-related changes in cognition and motivation influence work processes and outcomes
2	Develop	Develop a theory-based strategy for analyzing individual companies training and development needs
3	Apply	Apply organizational psychological theories to define specific interventions that address the negative effects of aging on individual and team performance
4	Translate	Translate research findings into implications that inform personnel-related decision-making.

Indicative Literature

- Boehm, S.A., & Kunze, F. (2015). Age Diversity and Age Climate in the Workplace. In P.M. Bal, D.T.A.M. Kooij, & D.M. Rousseau (Eds), *Aging Workers and the Employee-Employer Relationship* (pp. 33-56). Heidelberg: Springer.
- Hobfoll, S.E., Halbesleben, J., Neveu, J.-P., & Westman, M. (2018). Conservation of Resources in the Organizational Context: The Reality of Resources and Their Consequences. *Annual Review of Organizational Psychology and Organizational Behavior*, 5, 103-128.
- Truxillo, D.M., Cadiz, D.M., & Hammer, L.B. (2015). Supporting the Aging Workforce: A Review and Recommendations for Workplace Intervention Research. *Annual Review of Organizational Psychology and Organizational Behavior*, 2, 351-381.

Entry Requirements

Prerequisites	CTMS-MET-06 Data Collection and Empirical Research Methodologies CTMS-MET-03 Applied Statistics with R CTMS-MET-04
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	Qualitative Research Methods
Co-requisites	None
Additional Remarks	None

Assessment and Completion

Module Component	Examination Type	Duration or Length	Weight (%)	Minimum for Pass	ILOs
Managing Demographic Change in Organizations	Presentation	20 minutes	100	45%	All intended learning outcomes of the module.

Module Completion Requirements

- **Module Examination:** minimum for pass- 45%.

Module Achievement

None.

5.1.15 Social Neuroscience

Module Name	Social Neuroscience
Module Code	CA-S-ISCP-808
Module ECTS	5
Program Owner	ISCP-BA (Integrated Social and Cognitive Psychology)
Module Coordinator	Prof. Dr. Arvid Kappas

Study Semester		
Program	Semester	Status
ISCP-BA Integrated Social and Cognitive Psychology	5	Mandatory Elective

Student Workload	
Lecture	35
Independent Study	70
Exam Preparation	20
Total Hours	125

Module Components	Number	Type	CP
Social Neuroscience	CA-ISCP-808	Lecture	5

Module Description

In this module, you will explore the biological foundations of social behavior, examining how the brain processes the actual or perceived presence of others. The course begins with Foundations and Methodology, where you will define the discipline's history and gain an overview of essential brain imaging tools such as fMRI, EEG, fNIRS, and lesion studies. You will also be familiarized with stimulation techniques like TMS and various psychophysiological methods, including the assessment of EMG, EDA, and cardiovascular activity.

As you progress into The Social Brain, the focus shifts to perception and basic interaction. You will explore how we process faces, bodies, and voices, while investigating the neural mechanisms behind imitation, social learning, and the mirror neuron system. A key component of this section involves understanding others through the exploration of "Theory of Mind" (mentalizing) and empathy, specifically how the brain distinguishes the "self" from others.

The module then delves into Emotional and Social Complexity, looking at the neural basis of the "social self," self-concept, and self-esteem. You will analyze the role of different brain systems in social contexts—focusing on emotion and motivation—and examine the neuroscience of affiliative states such as attachment, love, and loneliness.

Finally, you will study Group Dynamics and Applied Social Neuroscience, identifying the neural signatures of prejudice, stereotyping, and "in-group" vs. "out-group" dynamics. This includes an

examination of the brain's role in moral judgments and the biological roots of aggression. The module concludes with Development and Evolutionary Perspectives, where you will investigate how the social brain changes from infancy to adulthood and the evolutionary pressures that shaped it.

The term paper assesses the ability to analyze and evaluate core theories and research in social neuroscience, while the presentation evaluates the ability to describe key concepts and communicate complex findings clearly to different audiences.

Recommended Knowledge

For course preparation, familiarity with methods in neuroscience is required.

Usability and Relationship to other Modules

This course provides an integration of social, cognitive, and biological approaches in psychology. It follows the mandatory module in Methods in Neuroscience and assumes familiarity with contents and approaches in social and in cognitive psychology

Intended Learning Outcomes

No	Competence	ILO
1	Explain	Explain the core theories of social neuroscience, such as the Mirror Neuron System and Theory of Mind, as well as the physiological processes underlying social interactions, including the role of hormones (e.g., oxytocin) and neurotransmitters.
2	Analyze	Analyze the relationship between specific brain regions (such as the amygdala or medial prefrontal cortex) and social behaviors like prejudice or empathy. Analyze data from neuroimaging studies to draw conclusions about social cognitive processes.
3	Evaluate	Evaluate the strengths and limitations of different research methods, such as the trade-offs between fMRI spatial resolution and EEG temporal resolution. Critically evaluate the ethical implications of social neuroscience research, particularly regarding brain privacy and "neuromarketing."
4	Determine	Determine which neuroscientific paradigm (e.g., the Cyberball task for social exclusion) is most appropriate for testing a specific social psychological hypothesis, as well as the influence of evolutionary pressures on the development of the modern social brain.
5	Describe	Describe the functional anatomy of the "social brain" network. Also, the developmental trajectory of social capabilities from infancy through adolescence.
6	Demonstrate	Demonstrate the ability to synthesize findings from both psychology and biology to explain a single social phenomenon (e.g., altruism). Demonstrate the ability to interpret complex brain-map visualizations and statistical significance in a social context.
7	Communicate	Communicate complex neuroscientific findings to a non-specialist audience without losing the nuance of the social context.

		Convey scholarly arguments effectively using the specific technical terminology of the field (e.g., "mentalizing," "social canonical," or "somatic marker hypothesis").
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Indicative Literature

- J. Ward, The Student's Guide to Social Neuroscience (3rd edition), 2023
- J.T. Cacioppo, & S. Cacioppo, Introduction to Social Neuroscience, 2020

Entry Requirements

Prerequisites	CO-684 Neuroscience Methods
Co-requisites	None
Additional Remarks	None

Assessment and Completion

Module Component	Examination Type	Duration or Length	Weight (%)	Minimum for Pass	ILOs
Social Neuroscience	Term Paper	10 Pages	75	Ø 45% of component 1 and 2	1,2,3,4, 5,6
	Presentation	15 min	25		5,6,7

Module Completion Requirements

- **Module Examination:** Weighted average grading of both assessments.

Module Achievement

None.

5.1.16 The Science of Happiness

Module Name	The Science of Happiness
Module Code	CA-S-ISCP-805
Module ECTS	5
Program Owner	ISCP-BA (Integrated Social and Cognitive Psychology)
Module Coordinator	Prof. Dr. Song Yan

Study Semester		
Program	Semester	Status
ISCP-BA Integrated Social and Cognitive Psychology	6	Mandatory Elective

Student Workload	
Seminar	35
Independent Study	90
Total Hours	125

Module Components	Number	Type	CP
The Science of Happiness	CA-ISCP-805	Seminar	5

Module Description

Following the principles of positive psychology, this module will focus on the theories and research centered on the nature of happiness and psychological well-being. Topics covered will include concept(s) and measurement of happiness, determinants and correlates of happiness, theories of psychological well-being, culture and happiness, benefits of happiness and the implications of happiness research.

The aim of this module is to give you a greater understanding of what happiness is. Alongside theory, you will also engage in a series of exercises designed to increase your own happiness and benefit from learning and applying the psychological science of well-being.

This module will be a combination of lectures/presentations, class discussions and self-exploration exercises.

Recommended Knowledge

- Knowledge of general psychological concepts
- Basics of psychological research methods

Intended Learning Outcomes

No	Competence	ILO
1		Discipline Specific Skills:
2	Demonstrate	Demonstrate an understanding of concepts and contemporary approaches to happiness
3	Become	Become acquainted with scientific studies on subjective well-being
4	Identify	Identify the practical application of the science of happiness both for personal life and professional goals
5		Transferable and Key Skills:
6	Reflect	Reflect and think critically
7	Apply	Apply techniques to increase happiness and overall quality of life
8	Apply	Apply discussion and Communication skills
9	Apply	apply independent learning strategies

Indicative Literature

Entry Requirements

Prerequisites	None
Co-requisites	None
Additional Remarks	None

Assessment and Completion

Module Component	Examination Type	Duration or Length	Weight (%)	Minimum for Pass	ILOs
The Science of Happiness	Project Assessment	20 minutes presentation	100	45%	All intended learning outcomes of the module.

Module Completion Requirements

- **Module Examination:** minimum for pass- 45%.

Module Achievement

None.

5.1.17 Intercultural Trainer Academy

Module Name	Intercultural Trainer Academy
Module Code	CA-S-ISCP-910
Module ECTS	5
Program Owner	ISCP-BA (Integrated Social and Cognitive Psychology)
Module Coordinator	Prof. Dr. Ulrich Kühnen

Study Semester		
Program	Semester	Status
ISCP-BA Integrated Social and Cognitive Psychology	5	Mandatory Elective
ISCP-BA Integrated Social and Cognitive Psychology	6	Mandatory Elective

Student Workload	
Seminar	35
Independent Study	90
Total Hours	125

Module Components	Number	Type	CP
Intercultural Trainer Academy (Intersession)	CA-ISCP-910	Seminar	5

Module Description

This seminar complements the more theoretical seminars and lectures of the first semesters by applying the taught concepts in designing interventions on intercultural competence. Students participating in the Intercultural Trainer Academy will first receive a 4 day training for trainers with an external professional consultant teaching similar workshops for international organizations. During that period each student will actively facilitate some exercises. The seminar will then continue with an analysis of the methods for intercultural training varying in scope from culture-specific to culture-general, teaching and learning styles in cultural contexts, and the evaluation of their effectiveness. The examined and techniques applied will include deductive (such as classic lecture-style presentations) as well as highly interactive experiential components (such as role-play simulations).

Usability and Relationship to other Modules

Following this module, students may choose to participate in an additional three-day workshop. This workshop will give students the opportunity to apply the learned knowledge. Specifically, participants will design and facilitate parts of intercultural training units and will get intensive feedback about their performance. A cross-cultural researcher and a training expert will co-teach this workshop. After having participated for the complete 10 days (i.e. having taken the Intercultural Trainer Academy and this three-day workshop), class members can earn a certificate "Intercultural Trainer" awarded by the Constructor University and InterCultur.

Intended Learning Outcomes

No	Competence	ILO
1	Able	Able to name the important educational principles of intercultural competence trainings
2	Able	Able to mention all the important steps of developing one practical exercise to teach intercultural competence.
3	Able	Able to design, conduct, debrief and to evaluate one such exercise under supervision.

Indicative Literature

Entry Requirements

Prerequisites	CO-688 Cultural Psychology
Co-requisites	None
Additional Remarks	None

Assessment and Completion

Module Component	Examination Type	Duration or Length	Weight (%)	Minimum for Pass	ILOs
Intercultural Trainer Academy (Intersession)	Term Paper	3500 words	100	45%	All intended learning outcomes of the module.

Module Completion Requirements

- **Module Examination:** minimum for pass- 45%.

Module Achievement

None.

5.1.18 Internship / Startup and Career Skills

Module Name	Internship / Startup and Career Skills
Module Code	CA-INT-900
Module ECTS	15
Program Owner	Career (Career Module for UG programs)
Module Coordinator	Dr. Tanja Woebs Clémentine Senicourt

Study Semester		
Program	Semester	Status
BCCB-BSc Biochemistry and Cell Biology	5	Mandatory
CBT-BSc Chemistry and Biotechnology	5	Mandatory
CS-BSc Computer Science	5	Mandatory
ECE-BSc Electrical and Computer Engineering	5	Mandatory
ESSMER-BSc Earth Sciences and Sustainable Management of Environmental Resources	5	Mandatory
F-ACS-BSc Applied Computer Science	5	Mandatory
IBA-BA International Business Administration	5	Mandatory
IRPH-BA International Relations: Politics and History	5	Mandatory
ISCP-BA Integrated Social and Cognitive Psychology	5	Mandatory
MCCB-BSc Medicinal Chemistry and Chemical Biology	5	Mandatory
MDDA-BSc Management, Decisions and Data Analytics	5	Mandatory
MMDA-BSc Mathematics, Modeling, and Data Analytics	5	Mandatory
PHDS-BSc Physics and Data Science	5	Mandatory
BCCB-BSc Biochemistry and Cell Biology	6	Mandatory
CBT-BSc Chemistry and Biotechnology	6	Mandatory
CS-BSc Computer Science	6	Mandatory
ECE-BSc	6	Mandatory

Electrical and Computer Engineering		
ESSMER-BSc Earth Sciences and Sustainable Management of Environmental Resources	6	Mandatory
GEM-BA Global Economics and Management	6	Mandatory
IBA-BA International Business Administration	6	Mandatory
IRPH-BA International Relations: Politics and History	6	Mandatory
ISCP-BA Integrated Social and Cognitive Psychology	6	Mandatory
MCCB-BSc Medicinal Chemistry and Chemical Biology	6	Mandatory
MMDA-BSc Mathematics, Modeling, and Data Analytics	6	Mandatory
PHDS-BSc Physics and Data Science	6	Mandatory
RIS-BSc Robotics and Intelligent Systems	6	Mandatory
S-ACS-BSc Applied Computer Science	6	Mandatory
SDT-BSc Software, Data and Technology	6	Mandatory

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

Module Components	Number	Type	CP
Internship	CA-INT-900-0	Internship	15

Module Description

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 SCS, 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 Student Career Support.

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 Service 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.

Recommended Knowledge

- Information provided on CSC

- Major specific knowledge and skills

- 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://constructor.university/student-life/career-services>.

- Participating in the internship events of earlier classes

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.

Intended Learning Outcomes

No	Competence	ILO
1	Describe	Describe the scope and the functions of the employment market and personal career development.
2	Apply	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	Manage	Manage their own career orientation processes independently 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	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	Justify professional decisions based on theoretical knowledge and academic methods.
6	Reflect	Reflect on their professional conduct in the context of the expectations of and consequences for employers and their society.
7	Reflect	Reflect on and set their own targets for the further development of their knowledge, skills, interests, and values.
8	Establish	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	Discuss observations and reflections in a professional network.

Indicative Literature

Entry Requirements

Prerequisites	CA-INT-900 Internship / Startup and Career Skills At least 15 CP from CORE modules in the major
Co-requisites	None
Additional Remarks	None

Assessment and Completion

Module Component	Examination Type	Duration or Length	Weight (%)	Minimum for Pass	ILOs
Internship	Project Report	3500 words	100	Pass/Fail	1-9

Module Completion Requirements

- **Module Examination:** pass/fail grading.

Module Achievement

None.

5.1.19 Bachelor Thesis and Seminar

Module Name	Bachelor Thesis and Seminar
Module Code	CA-ISCP-800
Module ECTS	15
Program Owner	ISCP-BA (Integrated Social and Cognitive Psychology)
Module Coordinator	SPC

Study Semester		
Program	Semester	Status
ISCP-BA Integrated Social and Cognitive Psychology	6	Mandatory

Student Workload	
Independent Study/Laboratory Work	350
Seminar	25
Total Hours	375

Module Components	Number	Type	CP
Thesis	CA-ISCP-800-T	Thesis	12
Thesis Seminar	CA-ISCP-800-S	Seminar	3

Module Description

This module is a mandatory graduation requirement for all undergraduate students to demonstrate their ability to address a problem from their respective major subject independently using academic/scientific methods within a set time frame.

Although supervised, this module requires students to be able to work independently and systematically and set their own goals in exchange for the opportunity to explore a topic that excites and interests them personally and that a faculty member is interested in supervising. Within this module, students apply their acquired knowledge about their major discipline and their learned skills and methods for conducting research, ranging from the identification of suitable (shortterm) research projects, preparatory literature searches, the realization of discipline-specific research, and the documentation, discussion, interpretation, and communication of research 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 a conclusion. The seminar provides students with the opportunity to practice their ability to present, discuss, and justify their and other students' approaches, methods, and results at various stages of their research in order to improve their academic writing, receive and reflect on formative feedback, and therefore grow personally and professionally.

Recommended Knowledge

- 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
- Identify an area or a topic of interest and discuss this with your prospective supervisor in a timely manner
- 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 the University's Code of Academic Integrity and Guidelines to Ensure Good Academic Practice

Usability and Relationship to other Modules

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

Intended Learning Outcomes

No	Competence	ILO
1	Plan	Plan and organize advanced learning processes independently.
2	Design	Design and implement appropriate research methods, taking full account of the range of alternative techniques and approaches
3	Collect	Collect, assess, and interpret relevant information
4	Draw	Draw scientifically-founded conclusions that consider social, scientific, and ethical factors
5	Apply	Apply their knowledge and understanding to a context of their choice
6	Develop	Develop, formulate, and advance solutions to problems and debates within their subject area, and defend these through argument
7	Discuss	Discuss information, ideas, problems, and solutions with specialists and non-specialists

Indicative Literature

Entry Requirements

Prerequisites	None
Co-requisites	None
Additional Remarks	None

Assessment and Completion

Module Component	Examination Type	Duration or Length	Weight (%)	Minimum for Pass	ILOs
Thesis	Thesis	Approx. 6.000 – 8.000 words (15 – 25 pages), excluding front and back matter.	80	45%	All intended learning outcomes, mainly 1-6.
Thesis Seminar	Presentation	Approx. 15 to 30 minutes	20	45%	The presentation focuses mainly on ILOs 6 and 7, but by nature of these ILOs it also touches on the others.

Module Completion Requirements

- **Module Component Examination:** minimum pass 45% of each assessment.

Module Achievement

Two separate assessments are justified by the size of this module and the fact that the justification of solutions to problems and arguments (ILO 6) and discussion (ILO 7) should at least have verbal elements. The weights of the types of assessments are commensurate with the sizes of the respective module components.

6 Constructor Track Modules

6.1 Methods Modules

6.1.1 Academic Writing and Academic Skills

Module Name	Academic Writing and Academic Skills
Module Code	CTMS-MET-01
Module ECTS	5
Program Owner	CT (CONSTRUCTOR Track Area)
Module Coordinator	Dr. Mandi Larsen

Study Semester		
Program	Semester	Status
IRPH-BA International Relations: Politics and History	1	Mandatory
ISCP-BA Integrated Social and Cognitive Psychology	1	Mandatory

Student Workload	
Lecture	17.5
Tutorial	17.5
Independent Study	80
Assessment Preparation	10
Total Hours	125

Module Components	Number	Type	CP
Academic Writing and Academic Skills	CTMS-01	Lecture/Tutorial	5

Module Description

In this module, students acquire basic skills necessary for academic work and academic writing. The module introduces students to the differences between academic and non-academic sources, how to make use of online databases of academic literature, and how to properly conduct a literature search. Techniques will be demonstrated for the critical reading and understanding of academic sources (e.g., monographs, edited volumes, journal articles) necessary for their studies. The module also focuses on the fundamentals of academic writing, including the development of a clear thesis statement, organized structure, and rational argumentation. Students are presented with simple approaches to summarizing, paraphrasing, and synthesizing ideas and results found in academic social science literature. Additionally, students will acquire proficiency in citation and referencing rules, as well as style guides.

Recommended Knowledge

Should demonstrate a clear mastery of skills related to academic work and writing.

Usability and Relationship to other Modules

This module lays the foundation for the entire period of study at Constructor University, but is especially useful for modules with a specific focus on written work and for the Bachelor's Thesis.

Intended Learning Outcomes

No	Competence	ILO
1	Recognize	Recognize the difference between academic and non-academic sources
2	Conduct	Conduct an academic literature review
3	Synthesize	Successfully synthesize various academic sources to create a coherent argument
4	Apply	Accurately apply citation and referencing rules
5	Write	Write a clearly structured and organized academic essay

Indicative Literature

- Bailey, S. (2006). Academic writing: A handbook for international students. New York, NY: Routledge.
- Spatt, B. (2016). Writing from sources. Boston, MA: Bedford/St. Martin's.

Entry Requirements

Prerequisites	None
Co-requisites	None
Additional Remarks	None

Assessment and Completion

Module Component	Examination Type	Duration or Length	Weight (%)	Minimum for Pass	ILOs
Academic Writing and Academic Skills	Written Examination	120 Minutes	100	45%	All of the above ILOs.

Module Completion Requirements

- **Module Examination:** minimum for pass- 45%.

Module Achievement

None.

6.1.2 Data Collection and Empirical Research Methodologies

Module Name	Data Collection and Empirical Research Methodologies
Module Code	CTMS-MET-06
Module ECTS	5
Program Owner	CT (CONSTRUCTOR Track Area)
Module Coordinator	Dr. Mandi Larsen

Study Semester		
Program	Semester	Status
IBA-BA International Business Administration	2	Mandatory Elective
IRPH-BA International Relations: Politics and History	4	Mandatory
ISCP-BA Integrated Social and Cognitive Psychology	4	Mandatory

Student Workload	
Lecture	35
Independent Study and Additional Readings	30
Questionnaire construction and data collection	35
Preparation of research report	25
Total Hours	125

Module Components	Number	Type	CP
Data Collection and Empirical Research Methodologies	CTMS-06	Lecture	5

Module Description

How exactly does empirical research work? This module gives an overview of the basic concepts and strategies involved in conducting empirical research in the social sciences. Students learn about basic approaches towards research, such as quantitative and qualitative, basic and applied, descriptive and explanatory research, and about core concepts of empirical research such as research ethics, generating hypotheses and hypothesis testing, measurement, and evaluation criteria such as reliability and validity. The module shows how these concepts and ideas are applied in the context of various research techniques. Students will actively apply this knowledge to the context of survey research, which is presumably the most widespread mode of gathering data in the social sciences and adjacent disciplines. Students will be familiarized with diverse aspects of sampling strategies, developing state-of-the-art questionnaires, and conducting cutting-edge survey research. Questionnaire construction for different data-gathering modalities (paper-pencil, telephone, face-to-face, online) will be

discussed, as will their utilization in diverse populations (different social groups, cultures and languages). Students will carry out small empirical survey research projects putting these skills into practice.

Usability and Relationship to other Modules

- This module builds on “Academic Writing and Academic Skills”, where students gain critical skills related to academic writing, as well as to understanding empirical literature.
- This module prepares IBA students with an interest in consumer or firm-level research for their Bachelor Thesis
- This module also provides students with a first opportunity to carry out their own data collection, which will be helpful for the Bachelor Thesis.

Intended Learning Outcomes

No	Competence	ILO
1	Describe	Describe basic concepts involved in conducting empirical research in the social sciences.
2	Outline	Outline the empirical research process.
3	Carry out	Carry out a small research project from start to finish.
4	Formulate	Formulate an empirical research question, as well as develop relevant hypotheses.
5	Address	Address issues of random probability sampling.
6	Recognize	Recognize issues related to various modes of data collection.
7	Construct	Construct a social science questionnaire.
8	Compose	Compose a first empirical research report.

Indicative Literature

- Fowler, F. J. (2015). Survey research methods. Thousand Oaks, CA: Sage.
- Gray, D. E. (2014). Doing research in the real world (3rd edition). London: Sage.
- Neumann, W. (2014). Social research methods: Qualitative and quantitative approaches (7th International Edition). Harlow: Pearson.
- Picardie, C. A. & Masick, K. D. (2014). Research methods: Designing and conducting research with a real-world focus. London: Sage.

Entry Requirements

Prerequisites	None
Co-requisites	None
Additional Remarks	None

Assessment and Completion

Module Component	Examination Type	Duration or Length	Weight (%)	Minimum for Pass	ILOs
Data Collection and Empirical Research Methodologies	Term Paper	2500-3000 words	100	45%	Should demonstrate: (1) knowledge of the empirical research process and its key concepts; (2) ability to carry out a small empirical research project; and (3) ability to accurately report on the research process in writing. All intended learning outcomes of the module.

Module Completion Requirements

- **Module Examination:** minimum for pass- 45%.

Module Achievement

None.

6.1.3 Qualitative Research Methods

Module Name	Qualitative Research Methods
Module Code	CTMS-MET-04
Module ECTS	5
Program Owner	CT (CONSTRUCTOR Track Area)
Module Coordinator	Dr. Irina Chiaburu

Study Semester		
Program	Semester	Status
GEM-BA Global Economics and Management	3	Mandatory
IBA-BA International Business Administration	3	Mandatory
IBA-Online-BA International Business Administration (Online)	3	Mandatory
IRPH-BA International Relations: Politics and History	3	Mandatory
ISCP-BA Integrated Social and Cognitive Psychology	3	Mandatory

Student Workload	
Independent Study	90
Class Attendance	35
Total Hours	125

Module Components	Number	Type	CP
Qualitative Research Methods	CTMS-04	Seminar	5

Module Description

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 a seminar, which incorporates a hands-on component, enabling students to not only

learn about different methods, but also apply them to various concrete research scenarios. 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.

The portfolio assessment for this module consists of six homework assignments, each dealing with one of the phases of the qualitative research process: preparation for the study, case selection and research design, data collection, data analysis, evaluation of the research, and reflection on the research process.

Recommended Knowledge

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

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.

Intended Learning Outcomes

No	Competence	ILO
1	Explain	Explain the principles underlying qualitative research.
2	Apply	Apply basic qualitative approaches and designs.
3	Identify	Identify and address ethical issues arising in qualitative research.
4	Apply	Apply strategies for purposefully selecting participants and cases.
5	Apply	Apply methods for collecting qualitative data.
6	Apply	Apply methods for analyzing qualitative data.
7	Know	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.

Entry Requirements

Prerequisites	None
Co-requisites	None
Additional Remarks	None

Assessment and Completion

Module Component		Examination Type	Duration or Length	Weight (%)	Minimum for Pass	ILOs
Qualitative Methods	Research	Portfolio Assessment	6 Homework assignments and reflection	100	45%	All

Module Completion Requirements

- **Module Examination:** minimum pass 45%- portfolio.

Module Achievement

None.

6.1.4 Applied Statistics with R

Module Name	Applied Statistics with R
Module Code	CTMS-MET-03
Module ECTS	5
Program Owner	CT (CONSTRUCTOR Track Area)
Module Coordinator	Prof. Dr. Adalbert F.X. Wilhelm

Study Semester		
Program	Semester	Status
ESSMER-BSc Earth Sciences and Sustainable Management of Environmental Resources	2	Mandatory
GEM-BA Global Economics and Management	2	Mandatory
IBA-BA International Business Administration	2	Mandatory Elective
IBA-Online-BA International Business Administration (Online)	2	Mandatory
IEM-BSc Industrial Engineering & Management	2	Mandatory
IEM-Online-BSc Industrial Engineering & Management (Online)	2	Mandatory
IRPH-BA International Relations: Politics and History	2	Mandatory Elective
ISCP-BA Integrated Social and Cognitive Psychology	2	Mandatory
MDDA-BSc Management, Decisions and Data Analytics	2	Mandatory

Student Workload	
Assessment Preparation	10
Lecture	17.5
Independent Study	80
Laboratory	17.5
Total Hours	125

Module Components	Number	Type	CP
Applied Statistics with R	CTMS-03	Lecture and Laboratory	5

Module Description

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-variables. 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.

Recommended Knowledge

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

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

Intended Learning Outcomes

No	Competence	ILO
1	Apply	Apply basic techniques in statistical modeling and quantitative research methods.
2	Describe	Describe fundamental statistical concepts, procedures, their assumptions and statistical fallacies.
3	Explain	Explain the potential of using quantitative methods in all fields of applications.
4	Express	Express informed skepticism of the limitations of statistical reasoning.
5	Interpret	Interpret statistical modeling results in scientific publications.
6	Perform	Perform basic and intermediate-level statistical analyses of data, using R.

Indicative Literature

- Charles Wheelan (2013). Naked Statistics: Stripping the Dread from The Data. New York: W.W. Norton & Company.
- Christopher Gandrud (2015). Reproducible Research with R and RStudio, Second Edition. The R Series, Chapman & Hall/CRC Press.
- 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.
- Michael J. Crawley (2013). The R Book, Second Edition. Hoboken: John Wiley & Sons.
- Peter Daalgard (2008). Introductory Statistics with R. Berlin: Springer.
- Randall E. Schumacker (2014). Learning Statistics Using R. Thousand Oaks: Sage.

Entry Requirements

Prerequisites	None
Co-requisites	None
Additional Remarks	None

Assessment and Completion

Module Component	Examination Type	Duration or Length	Weight (%)	Minimum for Pass	ILOs
Applied Statistics with R	Written Examination	120 Minutes	100	45%	All

Module Completion Requirements

- **Module Examination:** minimum for pass- 45%.

Module Achievement

None.

6.2 New Skills Modules

6.2.1 Logic (perspective I)

Module Name	Logic (perspective I)
Module Code	CTNS-NSK-01
Module ECTS	2.5
Program Owner	CT (CONSTRUCTOR Track Area)
Module Coordinator	Dr. Marina Christodoulou

Study Semester		
Program	Semester	Status
BCCB-BSc Biochemistry and Cell Biology	3	Mandatory Elective
CBT-BSc Chemistry and Biotechnology	3	Mandatory Elective
CS-BSc Computer Science	3	Mandatory Elective
ECE-BSc Electrical and Computer Engineering	3	Mandatory Elective
ESSMER-BSc Earth Sciences and Sustainable Management of Environmental Resources	3	Mandatory Elective
F-ACS-BSc Applied Computer Science	3	Mandatory Elective
GEM-BA Global Economics and Management	3	Mandatory Elective
IBA-BA International Business Administration	3	Mandatory Elective
IEM-BSc Industrial Engineering & Management	3	Mandatory Elective
IEM-Online-BSc Industrial Engineering & Management (Online)	3	Mandatory Elective
IRPH-BA International Relations: Politics and History	3	Mandatory Elective
ISCP-BA Integrated Social and Cognitive Psychology	3	Mandatory Elective
MCCB-BSc Medicinal Chemistry and Chemical Biology	3	Mandatory Elective
MDDA-BSc Management, Decisions and Data Analytics	3	Mandatory Elective
MMDA-BSc Mathematics, Modeling, and Data Analytics	3	Mandatory Elective
PHDS-BSc Physics and Data Science	3	Mandatory Elective

RIS-BSc Robotics and Intelligent Systems	3	Mandatory Elective
SDT-BSc Software, Data and Technology	3	Mandatory Elective
IRPH-BA International Relations: Politics and History	4	Mandatory Elective
ISCP-BA Integrated Social and Cognitive Psychology	4	Mandatory Elective
S-ACS-BSc Applied Computer Science	4	Mandatory Elective

Student Workload	
Tutorial	17.5
Independent Study	27.5
Online Lecture	17.5
Total Hours	62.5

Module Components	Number	Type	CP
Logic (perspective I)	CTNS-01	Lecture (Online)	2.5

Module Description

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.

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.

This 2.5 CP module supports Academic Excellence by providing essential contextual knowledge that underpins the program's qualification aims, while appropriately limiting academic depth relative to the core technical competencies of the field

Intended Learning Outcomes

No	Competence	ILO
1	Apply	Apply the various principles of logic and expand them to computational thinking.
2	Understand	Understand the way in which logical processes in humans and in computers are similar and different at the same time.
3	Apply	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	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 Saale: Verlag von Louis Nebert.
- Gödel, Kurt (1986), Russels mathematische Logik. In: Alfred North Whitehead, Bertrand Russell: Principia Mathematica. Vorwort, S. V–XXXIV. Suhrkamp.
- Kubica, Jeremy. Computational fairy tales. Jeremy Kubica, 2012.
- Leeds, Stephen. "George Boolos and Richard Jeffrey. Computability and logic. Cambridge University Press, New York and London 1974, x+ 262 pp." The Journal of Symbolic Logic 42.4 (1977): 585-586.
- 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.

Entry Requirements

Prerequisites	None
Co-requisites	None
Additional Remarks	None

Assessment and Completion

Module Component	Examination Type	Duration or Length	Weight (%)	Minimum for Pass	ILOs
Logic (perspective I)	Written Examination	60 Minutes	100	45%	All

Module Completion Requirements

- **Module Examination:** minimum for pass- 45%.

Module Achievement

None.

6.2.2 Logic (perspective II)

Module Name	Logic (perspective II)
Module Code	CTNS-NSK-02
Module ECTS	2.5
Program Owner	CT (CONSTRUCTOR Track Area)
Module Coordinator	Prof. Dr. Jules Coleman

Study Semester		
Program	Semester	Status
BCCB-BSc Biochemistry and Cell Biology	3	Mandatory Elective
CBT-BSc Chemistry and Biotechnology	3	Mandatory Elective
CS-BSc Computer Science	3	Mandatory Elective
ECE-BSc Electrical and Computer Engineering	3	Mandatory Elective
ESSMER-BSc Earth Sciences and Sustainable Management of Environmental Resources	3	Mandatory Elective
F-ACS-BSc Applied Computer Science	3	Mandatory Elective
GEM-BA Global Economics and Management	3	Mandatory Elective
IBA-BA International Business Administration	3	Mandatory Elective
IBA-Online-BA International Business Administration (Online)	3	Mandatory Elective
IEM-BSc Industrial Engineering & Management	3	Mandatory Elective
IEM-Online-BSc Industrial Engineering & Management (Online)	3	Mandatory Elective
IRPH-BA International Relations: Politics and History	3	Mandatory Elective
ISCP-BA Integrated Social and Cognitive Psychology	3	Mandatory Elective
MCCB-BSc Medicinal Chemistry and Chemical Biology	3	Mandatory Elective
MDDA-BSc Management, Decisions and Data Analytics	3	Mandatory Elective
MMDA-BSc Mathematics, Modeling, and Data Analytics	3	Mandatory Elective
PHDS-BSc Physics and Data Science	3	Mandatory Elective

RIS-BSc Robotics and Intelligent Systems	3	Mandatory Elective
SDT-BSc Software, Data and Technology	3	Mandatory Elective
IRPH-BA International Relations: Politics and History	4	Mandatory Elective
ISCP-BA Integrated Social and Cognitive Psychology	4	Mandatory Elective
S-ACS-BSc Applied Computer Science	4	Mandatory Elective

Student Workload	
Independent Study	45
Online Lecture	17.5
Total Hours	62.5

Module Components	Number	Type	CP
Logic (perspective II)	CTNS-02	Lecture (Online)	2.5

Module Description

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. One 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.

This 2.5 CP module supports Academic Excellence by providing essential contextual knowledge that underpins the program's qualification aims, while appropriately limiting academic depth relative to the core technical competencies of the field

Intended Learning Outcomes

No	Competence	ILO
1	Apply	Apply the various principles of logic.
2	Explain	Explain practical relevance of non-standard logic.
3	Describe	Describe how many-valued logic extends basic predicate logic.
4	Apply	Apply basic rules of fuzzy logic to calculate partial truth values.
5	Sketch	Sketch basic rules of temporal logic.
6	Implement	Implement predicates in a logic programming language.
7	Prove	Prove some simple non-standard logic theorems.

Indicative Literature

- Baader, Franz. "The Description Logic Handbook: Theory Implementation and Applications", Cambridge University Press, 2nd edition, May 2010.
- Bergmann, Merry. "An Introduction to Many-Valued and Fuzzy Logic: Semantics, Algebras, and Derivation Systems", Cambridge University Press, April 2008.
- Fisher, Michael. "An Introduction to Practical Formal Methods Using Temporal Logic", Wiley, Juli 2011.
- Sterling, Leon S., Ehud Y. Shapiro, Ehud Y. "The Art of Prolog", 2nd edition, MIT Press, March 1994.

Entry Requirements

Prerequisites	None
Co-requisites	None
Additional Remarks	None

Assessment and Completion

Module Component	Examination Type	Duration or Length	Weight (%)	Minimum for Pass	ILOs
Logic (perspective II)	Written Examination	60 Minutes	100	45%	All

Module Completion Requirements

- **Module Examination:** minimum for pass- 45%.

Module Achievement

None.

6.2.3 Causation and Correlation (perspective I)

Module Name	Causation and Correlation (perspective I)
Module Code	CTNS-NSK-03
Module ECTS	2.5
Program Owner	CT (CONSTRUCTOR Track Area)
Module Coordinator	Dr. Marina Christodoulou

Study Semester		
Program	Semester	Status
BCCB-BSc Biochemistry and Cell Biology	4	Mandatory Elective
CBT-BSc Chemistry and Biotechnology	4	Mandatory Elective
CS-BSc Computer Science	4	Mandatory Elective
ECE-BSc Electrical and Computer Engineering	4	Mandatory Elective
ESSMER-BSc Earth Sciences and Sustainable Management of Environmental Resources	4	Mandatory Elective
F-ACS-BSc Applied Computer Science	4	Mandatory Elective
GEM-BA Global Economics and Management	4	Mandatory Elective
IBA-BA International Business Administration	4	Mandatory Elective
IBA-Online-BA International Business Administration (Online)	4	Mandatory Elective
IEM-BSc Industrial Engineering & Management	4	Mandatory Elective
IEM-Online-BSc Industrial Engineering & Management (Online)	4	Mandatory Elective
IRPH-BA International Relations: Politics and History	4	Mandatory Elective
ISCP-BA Integrated Social and Cognitive Psychology	4	Mandatory Elective
MCCB-BSc Medicinal Chemistry and Chemical Biology	4	Mandatory Elective
MDDA-BSc Management, Decisions and Data Analytics	4	Mandatory Elective
MMDA-BSc Mathematics, Modeling, and Data Analytics	4	Mandatory Elective
PHDS-BSc Physics and Data Science	4	Mandatory Elective

RIS-BSc Robotics and Intelligent Systems	4	Mandatory Elective
SDT-BSc Software, Data and Technology	4	Mandatory Elective

Student Workload	
Tutorial	17.5
Independent Study	27.5
Online Lecture	17.5
Total Hours	62.5

Module Components	Number	Type	CP
Causation and Correlation	CTNS-03	Lecture (Online)	2.5

Module Description

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.

This 2.5 CP module supports Academic Excellence by providing essential contextual knowledge that underpins the program's qualification aims, while appropriately limiting academic depth relative to the core technical competencies of the field

Intended Learning Outcomes

No	Competence	ILO
1	Formulate	Formulate testable hypotheses that are designed to reveal causal connections and those designed to reveal interesting, important and useful correlations.
2	Distinguish	Distinguish scientifically interesting correlations from unimportant ones.
3	Apply	Apply critical thinking skills to evaluate information.
4	Understand	Understand when and why inquiry into unrealized possibility is important and relevant.

Indicative Literature

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

Entry Requirements

Prerequisites	None
Co-requisites	None
Additional Remarks	None

Assessment and Completion

Module Component	Examination Type	Duration or Length	Weight (%)	Minimum for Pass	ILOs

Causation and Correlation	Written Examination	60 Minutes	100	45%	1-4
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Module Completion Requirements

- **Module Examination:** minimum for pass- 45%.

Module Achievement

None.

6.2.4 Causation and Correlation (perspective II)

Module Name	Causation and Correlation (perspective II)
Module Code	CTNS-NSK-04
Module ECTS	2.5
Program Owner	CT (CONSTRUCTOR Track Area)
Module Coordinator	Dr. Eoin Ryan Dr. Irina Chiaburu Prof. Dr. Keivan Mallahi Karai

Study Semester		
Program	Semester	Status
ISCP-BA Integrated Social and Cognitive Psychology	3	Mandatory Elective
S-ACS-BSc Applied Computer Science	3	Mandatory Elective
BCCB-BSc Biochemistry and Cell Biology	4	Mandatory Elective
CBT-BSc Chemistry and Biotechnology	4	Mandatory Elective
CS-BSc Computer Science	4	Mandatory Elective
ECE-BSc Electrical and Computer Engineering	4	Mandatory Elective
ESSMER-BSc Earth Sciences and Sustainable Management of Environmental Resources	4	Mandatory Elective
F-ACS-BSc Applied Computer Science	4	Mandatory Elective
GEM-BA Global Economics and Management	4	Mandatory Elective
IBA-BA International Business Administration	4	Mandatory Elective
IBA-Online-BA International Business Administration (Online)	4	Mandatory Elective
IEM-BSc Industrial Engineering & Management	4	Mandatory Elective
IEM-Online-BSc Industrial Engineering & Management (Online)	4	Mandatory Elective
IRPH-BA International Relations: Politics and History	4	Mandatory Elective
ISCP-BA Integrated Social and Cognitive Psychology	4	Mandatory Elective
MCCB-BSc Medicinal Chemistry and Chemical Biology	4	Mandatory Elective

MDDA-BSc Management, Decisions and Data Analytics	4	Mandatory Elective
MMDA-BSc Mathematics, Modeling, and Data Analytics	4	Mandatory Elective
PHDS-BSc Physics and Data Science	4	Mandatory Elective
RIS-BSc Robotics and Intelligent Systems	4	Mandatory Elective
SDT-BSc Software, Data and Technology	4	Mandatory Elective
MMDA-BSc Mathematics, Modeling, and Data Analytics	5	Mandatory Elective

Student Workload	
Independent Study	45
Online Lecture	17.5
Total Hours	62.5

Module Components	Number	Type	CP
Causation and Correlation (perspective II)	CTNS-04	Lecture (Online)	2.5

Module Description

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.

This 2.5 CP module supports Academic Excellence by providing essential contextual knowledge that underpins the program's qualification aims, while appropriately limiting academic depth relative to the core technical competencies of the field

Recommended Knowledge

Basic probability theory

Intended Learning Outcomes

No	Competence	ILO
1	Have	Have a clear understanding of the history of causal thinking.
2	Form	Form a critical understanding of the key debates and controversies surrounding the idea of causality.
3	Recognize	Recognize and apply probabilistic causal models.
4	Explain	Explain how understanding of causality differs among different disciplines.
5	Demonstrate	Demonstrate how theoretical thinking about causality has shaped scientific practices.

Indicative Literature

- Ilari, Phyllis McKay and Federica Russo. Causality: Philosophical Theory Meets Scientific Practice. Oxford University Press 2014.
- Paul, L. A. and Ned Hall. Causation: A User's Guide. Oxford University Press 2013.

- Pearl, Judea, Glymour Madelyn and Jewell, Nicolas. Causal Inference in Statistics: A Primer. Wiley 2016.
- Pearl, Judea. Causality: Models, Reasoning and Inference. Cambridge University Press 2009.

Entry Requirements

Prerequisites	None
Co-requisites	None
Additional Remarks	None

Assessment and Completion

Module Component	Examination Type	Duration or Length	Weight (%)	Minimum for Pass	ILOs
Causation and Correlation (perspective II)	Written Examination	60 Minutes	100	45%	1-5

Module Completion Requirements

- **Module Examination:** minimum for pass- 45%.

Module Achievement

None.

6.2.5 Models, Matrices and Theories of Complex Systems

Module Name	Models, Matrices and Theories of Complex Systems
Module Code	CTNS-NSK-05
Module ECTS	5
Program Owner	CT (CONSTRUCTOR Track Area)
Module Coordinator	Prof. Dr. Marc-Thorsten Hütt

Study Semester		
Program	Semester	Status
BCCB-BSc Biochemistry and Cell Biology	5	Mandatory Elective
CBT-BSc Chemistry and Biotechnology	5	Mandatory Elective
CS-BSc Computer Science	5	Mandatory Elective
ECE-BSc Electrical and Computer Engineering	5	Mandatory Elective
ESSMER-BSc Earth Sciences and Sustainable Management of Environmental Resources	5	Mandatory Elective
GEM-BA Global Economics and Management	5	Mandatory Elective
IBA-BA International Business Administration	5	Mandatory Elective
IBA-Online-BA International Business Administration (Online)	5	Mandatory Elective
IRPH-BA International Relations: Politics and History	5	Mandatory Elective
ISCP-BA Integrated Social and Cognitive Psychology	5	Mandatory Elective
MCCB-BSc Medicinal Chemistry and Chemical Biology	5	Mandatory Elective
MDDA-BSc Management, Decisions and Data Analytics	5	Mandatory Elective
MMDA-BSc Mathematics, Modeling, and Data Analytics	5	Mandatory Elective
PHDS-BSc Physics and Data Science	5	Mandatory Elective
RIS-BSc Robotics and Intelligent Systems	5	Mandatory Elective
SDT-BSc Software, Data and Technology	5	Mandatory Elective

Student Workload	
Independent Study	90
Online Lecture	35
Total Hours	125

Module Components	Number	Type	CP
Models, Matrices and Theories of Complex Systems	CTNS-05	Seminar (Online)	5

Module Description

Linear and nonlinear models together with matrix approaches can be useful in diverse disciplines to implement quantitative, computational approaches to exploring complex systems. Some of the most popular data and systems analysis strategies are built upon matrices. 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 and graph theory (part 2) and the embedding of these concepts in nonlinear dynamics (part 3). At the end of the course, we outline applications to graph theory and machine learning (part 4). Along the way we will encounter some of the classical approaches in complex systems: self-organization, deterministic chaos, cellular automata and fractals. 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?

In the end, students will have a clearer understanding of matrix approaches as well as linear and nonlinear models 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 a linear to a nonlinear thinking.

Recommended Knowledge

The modules Logic and Causation & Correlation are highly recommended.

Intended Learning Outcomes

No	Competence	ILO
1	Apply	Apply the concept of linear modeling in their own discipline.
2	Distinguish	Distinguish between linear and nonlinear interpretation strategies and understand the range of applicability of linear models.

3	Make	Make use of data analysis / data interpretation strategies from other disciplines, which are derived from linear algebra.
4	Know	Be aware of the ties that linear models have to machine learning and network theory,
5	Note	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: Mainzer, Klaus. "Introduction: from linear to nonlinear thinking." Thinking in Complexity: The Computational Dynamics of Matter, Mind and Mankind (2007): 1-16.; material from Mathematics of Big Data: Spreadsheets, Databases, Matrices, and Graphs, Jeremy Kepner, Hayden Jananthan, The MIT Press, 2018.; material from Introduction to Linear Algebra (5th Edition), Gilbert Strang, Cambridge University Press, 2021.
- Part 4: material from Linear Algebra and Learning from Data, Gilbert Strang, Wellesley-Cambridge Press, 2019.

Entry Requirements

Prerequisites	None
Co-requisites	None
Additional Remarks	None

Assessment and Completion

Module Component	Examination Type	Duration or Length	Weight (%)	Minimum for Pass	ILOs
Models, Matrices and Theories of Complex Systems	Written Examination	120 Minutes	100	45%	1-4

Module Completion Requirements

- **Module Examination:** minimum for pass- 45%.

Module Achievement

None.

6.2.6 Complex Problem Solving

Module Name	Complex Problem Solving
Module Code	CTNS-NSK-06
Module ECTS	5
Program Owner	CT (CONSTRUCTOR Track Area)
Module Coordinator	Prof. Dr. Marco Verweij

Study Semester		
Program	Semester	Status
BCCB-BSc Biochemistry and Cell Biology	5	Mandatory Elective
CBT-BSc Chemistry and Biotechnology	5	Mandatory Elective
CS-BSc Computer Science	5	Mandatory Elective
ECE-BSc Electrical and Computer Engineering	5	Mandatory Elective
ESSMER-BSc Earth Sciences and Sustainable Management of Environmental Resources	5	Mandatory Elective
GEM-BA Global Economics and Management	5	Mandatory Elective
IBA-BA International Business Administration	5	Mandatory Elective
IBA-Online-BA International Business Administration (Online)	5	Mandatory Elective
IRPH-BA International Relations: Politics and History	5	Mandatory Elective
ISCP-BA Integrated Social and Cognitive Psychology	5	Mandatory Elective
MCCB-BSc Medicinal Chemistry and Chemical Biology	5	Mandatory Elective
MDDA-BSc Management, Decisions and Data Analytics	5	Mandatory Elective
MMDA-BSc Mathematics, Modeling, and Data Analytics	5	Mandatory Elective
PHDS-BSc Physics and Data Science	5	Mandatory Elective
RIS-BSc Robotics and Intelligent Systems	5	Mandatory Elective
SDT-BSc Software, Data and Technology	5	Mandatory Elective

Student Workload	
Tutorial	17.5
Independent Study	72.5
Online Lecture	35
Total Hours	125

Module Components	Number	Type	CP
Complex Problem Solving	CTNS-06	Lecture (Online)	5

Module Description

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 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.

Recommended Knowledge

- Being able to read primary academic literature
- Willingness to engage in teamwork
- Camillus, J. (2008). Strategy as a wicked problem. Harvard Business Review 86: 99-106;
- Rogers, P. J. (2008). Using programme theory to evaluate complicated and complex aspects of interventions. Evaluation, 14, 29–48.

Intended Learning Outcomes

No	Competence	ILO
1	Identify	Identify a complex problem.
2	Develop	Develop an acceptable recommendation for resolving complex problems.

3	Understand	Understand the roles that natural and social scientists can play in helping stakeholders resolve complex problems.
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Indicative Literature

- Camillus, J. (2008). Strategy as a wicked problem. Harvard Business Review 86: 99-106; Rogers, P. J. (2008). Using programme theory to evaluate complicated and complex aspects of interventions. Evaluation, 14, 29–48.
- 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.

Entry Requirements

Prerequisites	None
Co-requisites	None
Additional Remarks	None

Assessment and Completion

Module Component	Examination Type	Duration or Length	Weight (%)	Minimum for Pass	ILOs
Complex Problem Solving	Written Examination	120 Minutes	100	45%	1-3

Module Completion Requirements

- **Module Examination:** minimum for pass- 45%.

Module Achievement

The module achievement is designed to encourage students to regularly engage with the online course materials throughout the semester, thereby providing them with a sufficient grounding in the concepts and applications of complex problem-solving to take the exam. The module achievement consists of online quizzes tied to the course content. In order to fulfill the module achievement — and to be eligible to sit for the final exam — students are required to participate in at least 80% of the available online quizzes. The module achievement is assessed on a pass/non-pass basis and does not affect the overall module grade. Given the flexible, online nature of the quizzes, students are able to complete them at their own convenience within the set timeframes. Students who do not meet the 80% participation threshold before their first exam attempt will have the opportunity to fulfill the module achievement prior to their second exam attempt.

6.2.7 Argumentation, Data Visualization and Communication (perspective I)

Module Name	Argumentation, Data Visualization and Communication (perspective I)
Module Code	CTNS-NSK-07
Module ECTS	5
Program Owner	CT (CONSTRUCTOR Track Area)
Module Coordinator	Prof. Dr. Arvid Kappas

Study Semester		
Program	Semester	Status
BCCB-BSc Biochemistry and Cell Biology	5	Mandatory Elective
CBT-BSc Chemistry and Biotechnology	5	Mandatory Elective
CS-BSc Computer Science	5	Mandatory Elective
ECE-BSc Electrical and Computer Engineering	5	Mandatory Elective
ESSMER-BSc Earth Sciences and Sustainable Management of Environmental Resources	5	Mandatory Elective
F-ACS-BSc Applied Computer Science	5	Mandatory Elective
GEM-BA Global Economics and Management	5	Mandatory Elective
IBA-BA International Business Administration	5	Mandatory Elective
IBA-Online-BA International Business Administration (Online)	5	Mandatory Elective
IRPH-BA International Relations: Politics and History	5	Mandatory Elective
ISCP-BA Integrated Social and Cognitive Psychology	5	Mandatory Elective
MCCB-BSc Medicinal Chemistry and Chemical Biology	5	Mandatory Elective
MDDA-BSc Management, Decisions and Data Analytics	5	Mandatory Elective
MMDA-BSc Mathematics, Modeling, and Data Analytics	5	Mandatory Elective
PHDS-BSc Physics and Data Science	5	Mandatory Elective
RIS-BSc Robotics and Intelligent Systems	5	Mandatory Elective

S-ACS-BSc Applied Computer Science	5	Mandatory Elective
SDT-BSc Software, Data and Technology	5	Mandatory Elective

Student Workload	
Tutorial	17.5
Independent Study	72.5
Online Lecture	35
Total Hours	125

Module Components	Number	Type	CP
Argumentation, Data Visualization and Communication (perspective I)	CTNS-07	Lecture (Online)	5

Module Description

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.

This course is divided into three sections. Section one develops argumentation skills, including how to construct and evaluate claims, how to reason from evidence to conclusions, and how to recognize the cognitive biases and fallacies that can cause arguments to fail. Section two focuses on data visualization as a tool for supporting arguments. A well-designed graph can clarify complex evidence and make an argument accessible, while a poorly designed one can distort the truth. Section three addresses communication. Even a well-designed and supported argument will not persuade its audience if it is not communicated well. You will explore models of communication, the importance of rhetorics, and the ethics of attempting to change the mind of others, including the new and exciting challenges posed by generative AI.

The thread that runs through these sections is a consistent concern with how to support what we claim effectively. Some reasoning is linear: from A we infer B, and from A and B, we infer C, building stepwise towards a conclusion. But not all reasoning takes this form. Sometimes we argue for a claim by showing

that it slots neatly, or fits coherently, with other claims for which we have independent support, or by establishing that those individual pieces of evidence mutually reinforce one another. A key goal of this course is to introduce you to these different structures of justification so that you are aware of both the norms of your discipline and to what makes knowledge trustworthy in the first place.

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.

Recommended Knowledge

The modules Logic and Causation & Correlation are highly recommended.

Intended Learning Outcomes

No	Competence	ILO
1	Distinguish	Distinguish among different modalities of argument, e.g. legal arguments, vs. scientific ones.
2	Construct	Construct arguments using tools of data visualization.
3	Communicate	Communicate conclusions and arguments concisely, clearly and convincingly.

Indicative Literature

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

Entry Requirements

Prerequisites	None
Co-requisites	None
Additional Remarks	None

Assessment and Completion

Module Component	Examination Type	Duration or Length	Weight (%)	Minimum for Pass	ILOs

Argumentation, Visualization Communication (perspective I)	Data and	Written Examination	120 minutes	100	45%	1-3
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Module Completion Requirements

- **Module Examination:** minimum for pass- 45%.

Module Achievement

None.

6.2.8 Argumentation, Data Visualization and Communication (perspective II)

Module Name	Argumentation, Data Visualization and Communication (perspective II)
Module Code	CTNS-NSK-08
Module ECTS	5
Program Owner	CT (CONSTRUCTOR Track Area)
Module Coordinator	Prof. Dr. Arvid Kappas

Study Semester		
Program	Semester	Status
BCCB-BSc Biochemistry and Cell Biology	6	Mandatory Elective
CBT-BSc Chemistry and Biotechnology	6	Mandatory Elective
CS-BSc Computer Science	6	Mandatory Elective
ECE-BSc Electrical and Computer Engineering	6	Mandatory Elective
ESSMER-BSc Earth Sciences and Sustainable Management of Environmental Resources	6	Mandatory Elective
F-ACS-BSc Applied Computer Science	6	Mandatory Elective
GEM-BA Global Economics and Management	6	Mandatory Elective
IBA-BA International Business Administration	6	Mandatory Elective
IBA-Online-BA International Business Administration (Online)	6	Mandatory Elective
IRPH-BA International Relations: Politics and History	6	Mandatory Elective
ISCP-BA Integrated Social and Cognitive Psychology	6	Mandatory Elective
MCCB-BSc Medicinal Chemistry and Chemical Biology	6	Mandatory Elective
MDDA-BSc Management, Decisions and Data Analytics	6	Mandatory Elective
MMDA-BSc Mathematics, Modeling, and Data Analytics	6	Mandatory Elective
PHDS-BSc Physics and Data Science	6	Mandatory Elective
RIS-BSc Robotics and Intelligent Systems	6	Mandatory Elective

S-ACS-BSc Applied Computer Science	6	Mandatory Elective
SDT-BSc Software, Data and Technology	6	Mandatory Elective

Student Workload	
Independent Study	80
Online Lecture	35
Tutorial	10
Total Hours	125

Module Components	Number	Type	CP
Argumentation, Data Visualization and Communication (perspective II)	CTNS-08	Lecture (Online)	5

Module Description

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.

Recommended Knowledge

- The modules Logic and Causation & Correlation are highly recommended.
- Ability and openness to engage in interactions
- Media literacy, critical thinking and a proficient handling of data sources
- Own research in academic literature

Intended Learning Outcomes

No	Competence	ILO
1	Analyze	Analyze communication processes in formal and informal contexts.
2	Identify	Identify challenges and failures in communication.
3	Design	Design communications to achieve specified goals to specific target groups.
4	Understand	Understand the principles of argumentation theory.
5	Use	Use data visualization in scientific communications.

Indicative Literature

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

Entry Requirements

Prerequisites	None
Co-requisites	None
Additional Remarks	None

Assessment and Completion

Module Component		Examination Type	Duration or Length	Weight (%)	Minimum for Pass	ILOs
Argumentation, Visualization Communication (perspective II)	Data and	Presentation	7-11 mins	100	45%	1-5

Module Completion Requirements

- **Module Examination:** minimum for pass- 45%.

Module Achievement

None.

6.2.9 Agency, Leadership, and Accountability

Module Name	Agency, Leadership, and Accountability
Module Code	CTNS-NSK-09
Module ECTS	5
Program Owner	CT (CONSTRUCTOR Track Area)
Module Coordinator	Dr. Marina Christodoulou

Study Semester		
Program	Semester	Status
S-ACS-BSc Applied Computer Science	5	Mandatory
BCCB-BSc Biochemistry and Cell Biology	6	Mandatory Elective
CBT-BSc Chemistry and Biotechnology	6	Mandatory Elective
CS-BSc Computer Science	6	Mandatory Elective
ECE-BSc Electrical and Computer Engineering	6	Mandatory Elective
ESSMER-BSc Earth Sciences and Sustainable Management of Environmental Resources	6	Mandatory Elective
F-ACS-BSc Applied Computer Science	6	Mandatory Elective
GEM-BA Global Economics and Management	6	Mandatory Elective
IBA-BA International Business Administration	6	Mandatory Elective
IBA-Online-BA International Business Administration (Online)	6	Mandatory
IRPH-BA International Relations: Politics and History	6	Mandatory Elective
ISCP-BA Integrated Social and Cognitive Psychology	6	Mandatory Elective
MCCB-BSc Medicinal Chemistry and Chemical Biology	6	Mandatory Elective
MDDA-BSc Management, Decisions and Data Analytics	6	Mandatory Elective
MMDA-BSc Mathematics, Modeling, and Data Analytics	6	Mandatory Elective
PHDS-BSc Physics and Data Science	6	Mandatory Elective
RIS-BSc Robotics and Intelligent Systems	6	Mandatory Elective

SDT-BSc Software, Data and Technology	6	Mandatory Elective
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Student Workload	
Tutorial	17.5
Independent Study	72.5
Online Lecture	35
Total Hours	125

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

Module Description

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

No	Competence	ILO
1	Understand	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	Understand how science is an economic sector, populated by large powerful organizations that set norms, fund research agendas.
3	Identify	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	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

- Feinberg, Joel. "Doing & deserving; essays in the theory of responsibility." (1970).
- Hull, David L. "Science as a Process." Science as a Process. University of Chicago Press, 2010.

Entry Requirements

Prerequisites	None
Co-requisites	None
Additional Remarks	None

Assessment and Completion

Module Component	Examination Type	Duration or Length	Weight (%)	Minimum for Pass	ILOs
Agency, Leadership, and Accountability	Written Examination	120 Minutes	100	45%	1-4

Module Completion Requirements

- **Module Examination:** minimum for pass- 45%.

Module Achievement

None.

6.2.10 Community Impact Project

Module Name	Community Impact Project
Module Code	CTNS-CIP-10
Module ECTS	5
Program Owner	CT (CONSTRUCTOR Track Area)
Module Coordinator	CIP Faculty Coordinator

Study Semester		
Program	Semester	Status
BCCB-BSc Biochemistry and Cell Biology	5	Mandatory Elective
CBT-BSc Chemistry and Biotechnology	5	Mandatory Elective
CS-BSc Computer Science	5	Mandatory Elective
ECE-BSc Electrical and Computer Engineering	5	Mandatory Elective
ESSMER-BSc Earth Sciences and Sustainable Management of Environmental Resources	5	Mandatory Elective
GEM-BA Global Economics and Management	5	Mandatory Elective
IBA-BA International Business Administration	5	Mandatory Elective
IRPH-BA International Relations: Politics and History	5	Mandatory Elective
ISCP-BA Integrated Social and Cognitive Psychology	5	Mandatory Elective
MCCB-BSc Medicinal Chemistry and Chemical Biology	5	Mandatory Elective
MDDA-BSc Management, Decisions and Data Analytics	5	Mandatory Elective
MMDA-BSc Mathematics, Modeling, and Data Analytics	5	Mandatory Elective

Student Workload	
Introductory, Accompanying, and Final Events	10
Self-Organized Teamwork	115
Total Hours	125

Module Components	Number	Type	CP
Community Impact Project	CTNS-10	Project	5

Module Description

CIPs are self-organized, major-related, and problem-centered applications of students' acquired knowledge and skills. These activities will ideally be connected to their majors so that they will challenge the students' sense of practical relevance and social responsibility within the field of their studies. Projects will tackle real issues in their direct and/or broader social environment. These projects ideally connect the campus community to other communities, companies, or organizations in a mutually beneficial way.

Students are encouraged to create their own projects and find partners (e.g., companies, schools, NGOs), but will get help from the CIP faculty coordinator team and faculty mentors to do so. They can join and collaborate in interdisciplinary groups that attack a given issue from different disciplinary perspectives.

Student activities are self-organized but can draw on the support and guidance of both faculty and the CIP faculty coordinator team.

Students may begin their project in the 4th semester but must complete it by the end of the 5th semester; the module counts toward the workload of the 5th semester.

Usability and Relationship to other Modules

Students who have accomplished their CIP (6th semester) are encouraged to support their fellow students during the development phase of the next year's projects (4th semester).

Recommended Knowledge

- Basic knowledge of the main concepts and methodological instruments of the respective disciplines.
- Develop or join a community impact project before the 5th or 6th semester based on the introductory events during the 4th semester by using the database of projects, communicating with fellow students and faculty, and finding potential companies, organizations, or communities to target.

Intended Learning Outcomes

No	Competence	ILO
1	Understand	Understand the real-life issues of communities, organizations, and industries and relate them to concepts in their own discipline.
2	Enhance	Enhance problem-solving skills and develop critical faculty, create solutions to problems, and communicate these solutions appropriately to their audience.
3	Apply	Apply media and communication skills in diverse and non-peer social contexts.
4	Develop	Develop an awareness of the societal relevance of their own scientific actions and a sense of social responsibility for their social surroundings.
5	Reflect	Reflect on their own behavior critically in relation to social expectations and consequences.

6	Work	Work in a team and deal with diversity, develop cooperation and conflict skills, and strengthen their empathy and tolerance for ambiguity.
		The Community Impact Project is designed to convey the required personal and social competencies for enabling students to finish their studies at Constructor University as socially conscious and responsible graduates (part of the Constructor University's mission) and to convey social and personal abilities to the students, including a practical awareness of the societal context and relevance of their academic discipline.

Indicative Literature

Entry Requirements

Prerequisites	None
Co-requisites	None
Additional Remarks	None

Assessment and Completion

Module Component	Examination Type	Duration or Length	Weight (%)	Minimum for Pass	ILOs
Community Impact Project	Project Assessment		100	Pass/Fail	All

Module Completion Requirements

- **Module Examination:** pass/fail grading.

Module Achievement

None.

6.3 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>).

6.4 Humanities Modules

6.4.1 Introduction to the Philosophy of Science

Module Name	Introduction to the Philosophy of Science
Module Code	CTHU-HUM-002
Module ECTS	2.5
Program Owner	CT (CONSTRUCTOR Track Area)
Module Coordinator	Dr. Eoin Ryan

Study Semester		
Program	Semester	Status
BCCB-BSc Biochemistry and Cell Biology	1	Mandatory Elective
CBT-BSc Chemistry and Biotechnology	1	Mandatory Elective
CS-BSc Computer Science	1	Mandatory Elective
ECE-BSc Electrical and Computer Engineering	1	Mandatory Elective
ESSMER-BSc Earth Sciences and Sustainable Management of Environmental Resources	1	Mandatory Elective
GEM-BA Global Economics and Management	1	Mandatory Elective
IBA-BA International Business Administration	1	Mandatory Elective
IBA-Online-BA International Business Administration (Online)	1	Mandatory Elective
IEM-Online-BSc Industrial Engineering & Management (Online)	1	Mandatory Elective
IRPH-BA International Relations: Politics and History	1	Mandatory Elective
ISCP-BA Integrated Social and Cognitive Psychology	1	Mandatory Elective
MCCB-BSc Medicinal Chemistry and Chemical Biology	1	Mandatory Elective

MDDA-BSc Management, Decisions and Data Analytics	1	Mandatory Elective
MMDA-BSc Mathematics, Modeling, and Data Analytics	1	Mandatory Elective
PHDS-BSc Physics and Data Science	1	Mandatory Elective
RIS-BSc Robotics and Intelligent Systems	1	Mandatory Elective
SDT-BSc Software, Data and Technology	1	Mandatory Elective
BCCB-BSc Biochemistry and Cell Biology	2	Mandatory Elective
CBT-BSc Chemistry and Biotechnology	2	Mandatory Elective
CS-BSc Computer Science	2	Mandatory Elective
ECE-BSc Electrical and Computer Engineering	2	Mandatory Elective
ESSMER-BSc Earth Sciences and Sustainable Management of Environmental Resources	2	Mandatory Elective
IBA-BA International Business Administration	2	Mandatory Elective
IBA-Online-BA International Business Administration (Online)	2	Mandatory Elective
IEM-BSc Industrial Engineering & Management	2	Mandatory Elective
IEM-Online-BSc Industrial Engineering & Management (Online)	2	Mandatory Elective
IRPH-BA International Relations: Politics and History	2	Mandatory Elective
ISCP-BA Integrated Social and Cognitive Psychology	2	Mandatory Elective
MCCB-BSc Medicinal Chemistry and Chemical Biology	2	Mandatory Elective
MDDA-BSc Management, Decisions and Data Analytics	2	Mandatory Elective
MMDA-BSc Mathematics, Modeling, and Data Analytics	2	Mandatory Elective
PHDS-BSc Physics and Data Science	2	Mandatory Elective
RIS-BSc Robotics and Intelligent Systems	2	Mandatory Elective
SDT-BSc Software, Data and Technology	2	Mandatory Elective

Student Workload	
Independent Study	45
Online Lecture	17.5
Total Hours	62.5

Module Components	Number	Type	CP
Introduction to the Philosophy of Science	CTHU-002	Lecture (Online)	2.5

Module Description

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.

This 2.5 CP module is part of a portfolio of several 2.5 CP modules designed to allow students to have a wider choice of electives. To compensate for the smaller size of this module, the assessment is of smaller scope.

Intended Learning Outcomes

No	Competence	ILO
1	Understand	Understand key ideas from the philosophy of science.
2	Discuss	Discuss different types of inference and rational processes.
3	Describe	Describe differences between how the natural sciences, social sciences and humanities discover knowledge.
4	Identify	Identify ways in which science can be more and less value-laden.
5	Illustrate	Illustrate some important conceptual leaps in the history of science.

Indicative Literature

- James Ladyman, *Understanding Philosophy of Science* (2002).
- Paul Song, *Philosophy of Science: Perspectives from Scientists* (2022).
- Peter Godfrey-Smith *Theory and Reality* (2021)

Entry Requirements

Prerequisites	None
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Co-requisites	None
Additional Remarks	None

Assessment and Completion

Module Component	Examination Type	Duration or Length	Weight (%)	Minimum for Pass	ILOs
Introduction to the Philosophy of Science	Written Examination	60 Minutes	100	45%	1-5

Module Completion Requirements

- **Module Examination:** minimum for pass- 45%.

Module Achievement

None.

6.4.2 Introduction to Visual Culture

Module Name	Introduction to Visual Culture
Module Code	CTHU-HUM-003
Module ECTS	2.5
Program Owner	CT (CONSTRUCTOR Track Area)
Module Coordinator	Dr. Irina Chiaburu

Study Semester		
Program	Semester	Status
BCCB-BSc Biochemistry and Cell Biology	1	Mandatory Elective
CBT-BSc Chemistry and Biotechnology	1	Mandatory Elective
CS-BSc Computer Science	1	Mandatory Elective
ECE-BSc Electrical and Computer Engineering	1	Mandatory Elective
ESSMER-BSc Earth Sciences and Sustainable Management of Environmental Resources	1	Mandatory Elective
IBA-BA International Business Administration	1	Mandatory Elective
IEM-Online-BSc Industrial Engineering & Management (Online)	1	Mandatory Elective
IRPH-BA International Relations: Politics and History	1	Mandatory Elective
ISCP-BA Integrated Social and Cognitive Psychology	1	Mandatory Elective
MDDA-BSc Management, Decisions and Data Analytics	1	Mandatory Elective
MMDA-BSc Mathematics, Modeling, and Data Analytics	1	Mandatory Elective
PHDS-BSc Physics and Data Science	1	Mandatory Elective
RIS-BSc Robotics and Intelligent Systems	1	Mandatory Elective
SDT-BSc Software, Data and Technology	1	Mandatory Elective
BCCB-BSc Biochemistry and Cell Biology	2	Mandatory Elective
CBT-BSc Chemistry and Biotechnology	2	Mandatory Elective
CS-BSc Computer Science	2	Mandatory Elective

ECE-BSc Electrical and Computer Engineering	2	Mandatory Elective
ESSMER-BSc Earth Sciences and Sustainable Management of Environmental Resources	2	Mandatory Elective
GEM-BA Global Economics and Management	2	Mandatory Elective
IBA-BA International Business Administration	2	Mandatory Elective
IBA-Online-BA International Business Administration (Online)	2	Mandatory Elective
IEM-BSc Industrial Engineering & Management	2	Mandatory Elective
IEM-Online-BSc Industrial Engineering & Management (Online)	2	Mandatory Elective
IRPH-BA International Relations: Politics and History	2	Mandatory Elective
ISCP-BA Integrated Social and Cognitive Psychology	2	Mandatory Elective
MCCB-BSc Medicinal Chemistry and Chemical Biology	2	Mandatory Elective
MDDA-BSc Management, Decisions and Data Analytics	2	Mandatory Elective
MMDA-BSc Mathematics, Modeling, and Data Analytics	2	Mandatory Elective
PHDS-BSc Physics and Data Science	2	Mandatory Elective
RIS-BSc Robotics and Intelligent Systems	2	Mandatory Elective
SDT-BSc Software, Data and Technology	2	Mandatory Elective

Student Workload	
Independent Study	45
Online Lecture	17.5
Total Hours	62.5

Module Components	Number	Type	CP
Introduction to Visual Culture	CTHU-003	Lecture (Online)	2.5

Module Description

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.

This 2.5 CP module is part of a portfolio of several 2.5 CP modules designed to allow students to have a wider choice of electives. To compensate for the smaller size of this module, the assessment is of smaller scope.

Intended Learning Outcomes

No	Competence	ILO
1	Understand	Understand a range of key concepts pertaining to visual culture, art theory and cultural analysis.
2	Understand	Understand the role visuality plays in development and maintenance of political, social, and intellectual discourses.
3	Think	Think critically about images and their contexts.
4	Reflect	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.

Entry Requirements

Prerequisites	None
Co-requisites	None
Additional Remarks	None

Assessment and Completion

Module Component	Examination Type	Duration or Length	Weight (%)	Minimum for Pass	ILOs
Introduction to Visual Culture	Written Examination	60 Minutes	100	45%	1-4

Module Completion Requirements

- **Module Examination:** minimum for pass- 45%.

Module Achievement

None.

6.4.3 Introduction to Philosophical Ethics

Module Name	Introduction to Philosophical Ethics
Module Code	CTHU-HUM-001
Module ECTS	2.5
Program Owner	CT (CONSTRUCTOR Track Area)
Module Coordinator	Dr. Eoin Ryan

Study Semester		
Program	Semester	Status
BCCB-BSc Biochemistry and Cell Biology	1	Mandatory Elective
CBT-BSc Chemistry and Biotechnology	1	Mandatory Elective
CS-BSc Computer Science	1	Mandatory Elective
ECE-BSc Electrical and Computer Engineering	1	Mandatory Elective
ESSMER-BSc Earth Sciences and Sustainable Management of Environmental Resources	1	Mandatory Elective
IBA-BA International Business Administration	1	Mandatory Elective
IBA-Online-BA International Business Administration (Online)	1	Mandatory Elective
IEM-BSc Industrial Engineering & Management	1	Mandatory Elective
IEM-Online-BSc Industrial Engineering & Management (Online)	1	Mandatory Elective
IRPH-BA International Relations: Politics and History	1	Mandatory Elective
ISCP-BA Integrated Social and Cognitive Psychology	1	Mandatory Elective
MCCB-BSc Medicinal Chemistry and Chemical Biology	1	Mandatory Elective
MDDA-BSc Management, Decisions and Data Analytics	1	Mandatory Elective
MMDA-BSc Mathematics, Modeling, and Data Analytics	1	Mandatory Elective
PHDS-BSc Physics and Data Science	1	Mandatory Elective
RIS-BSc Robotics and Intelligent Systems	1	Mandatory Elective
SDT-BSc Software, Data and Technology	1	Mandatory Elective

BCCB-BSc Biochemistry and Cell Biology	2	Mandatory Elective
CBT-BSc Chemistry and Biotechnology	2	Mandatory Elective
CS-BSc Computer Science	2	Mandatory Elective
ECE-BSc Electrical and Computer Engineering	2	Mandatory Elective
ESSMER-BSc Earth Sciences and Sustainable Management of Environmental Resources	2	Mandatory Elective
GEM-BA Global Economics and Management	2	Mandatory Elective
IBA-BA International Business Administration	2	Mandatory Elective
IBA-Online-BA International Business Administration (Online)	2	Mandatory Elective
IEM-Online-BSc Industrial Engineering & Management (Online)	2	Mandatory Elective
IRPH-BA International Relations: Politics and History	2	Mandatory Elective
ISCP-BA Integrated Social and Cognitive Psychology	2	Mandatory Elective
MCCB-BSc Medicinal Chemistry and Chemical Biology	2	Mandatory Elective
MDDA-BSc Management, Decisions and Data Analytics	2	Mandatory Elective
MMDA-BSc Mathematics, Modeling, and Data Analytics	2	Mandatory Elective
PHDS-BSc Physics and Data Science	2	Mandatory Elective
RIS-BSc Robotics and Intelligent Systems	2	Mandatory Elective
SDT-BSc Software, Data and Technology	2	Mandatory Elective

Student Workload	
Independent Study	45
Online Lecture	17.5
Total Hours	62.5

Module Components	Number	Type	CP
Introduction to Philosophical Ethics	CTHU-001	Lecture (Online)	2.5

Module Description

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.

This 2.5 CP module is part of a portfolio of several 2.5 CP modules designed to allow students to have a wider choice of electives. To compensate for the smaller size of this module, the assessment is of smaller scope.

Intended Learning Outcomes

No	Competence	ILO
1	Describe	Describe normative ethical theories such as consequentialism, deontology and virtue ethics.
2	Discuss	Discuss some metaethical concerns.
3	Analyze	Analyze ethical language.
4	Highlight	Highlight complexities and contradictions in typical ethical commitments.
5	Indicate	Indicate common parameters for ethical discussions at individual and social levels.
6	Analyze	Analyze notions such as objectivity, subjectivity, universality, pluralism, value.

Indicative Literature

- Mark van Roojen *Metaethics: A Contemporary Introduction* (2015).
- Russ Shafer-Landay *A Concise Introduction to Ethics* (2019).
- Simon Blackburn *Being Good* (2009).

Entry Requirements

Prerequisites	None
Co-requisites	None
Additional Remarks	None

Assessment and Completion

Module Component	Examination Type	Duration or Length	Weight (%)	Minimum for Pass	ILOs
Introduction to Philosophical Ethics	Written Examination	60 Minutes	100	45%	1-6

Module Completion Requirements

- **Module Examination:** pass/fail grading.

Module Achievement

None.

7 Appendix

7.1 Intended Learning Outcomes Assessment-Matrix

Integrated Social and Cognitive Psychology (BSc)																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																		
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*Competencies: A-scientific/academic proficiency; E-competence for qualified employment; P-development of personality; S-competence for engagement in society

Figure 4: Intended Learning Outcome Matrix for ISCP