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Minor Booklet

Each minor available for Psychology students
described in one page



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Introduction

Welcome to the minor booklet for Psychology students! This booklet contains information about all minors Psychology students can choose from. First, this booklet describes the different types of minors available and the rules for combining minors are explained. After this general information, each minor is described in one page.

This minor-specific page contains basic information, like from what study the minor is and when the minor takes place. Some minors also have additional information regarding admission requirements. Furthermore, each page contains a short description of the context of the minor. Lastly, Psychology students who did the minor before have written down their experience with the minor whenever available.

Disclaimer!

This booklet is merely a starting point for getting an overview of what minor you could participate in. The information about the minor is based on the information available on the OSIRIS page of that minor and **does not contain all information available**. For some minors, information is kept out of this booklet to fit the one-page format. So use this booklet for getting an overview of what options you have, and when a minor sounds interesting to you, make sure to have a look at the official website of the minor. Below you can find links to the minor pages.

Official Information

The UT has a **minor tool**. This tool allows you to look up all minors and their OSIRIS page. The website also contains general information about the minor regulations. Make sure to select the Psychology programme and the blocks in which you want to do the minor to get the minors available for you.

<https://www.utwente.nl/en/education/electives/minor/offer/>

There is a separate page for all information regarding **going abroad** for your minor.

<https://www.utwente.nl/en/education/electives/study-abroad/#going-abroad-options-for-ut-students>

For more information about **prerequisites** and more detailed information about all the **rules and regulations** of the Psychology programme, look into the elective space manual on the Psychology elective space website.

<https://www.utwente.nl/en/psy/bachelor/third-year/information-electivespace/>

The annual **Minor Fair** is held on Tuesday 19th of March 2024 from 10:00 to 14:00 in the Design Lab. There you can visit stands from various minors and ask all your questions to teachers and students.

<https://www.utwente.nl/en/education/electives/minor/minor-fair/>

For any questions or concerns, you can visit the **study advisors** during their walk in hours on Tuesdays, Wednesdays, and Thursdays between 12:45 and 13:45 in Cubicus C112, C114, and C118, or make an appointment for another time.

Regulations regarding minors

To start with the minor, you need to meet certain prerequisites, which differ per type of minor. The table below shows the prerequisites.

Type of minor	Prerequisites
University of Twente minors	B1 and at least 30 EC of B2 completed (=90 EC)
Studying at another university in the NL	B1 and at least 30 EC of B2 completed (=90 EC)
Study Abroad	B1 and 1st semester of B2 completed

When you meet the prerequisites, you can continue with your minor-search. Keep in mind that there are rules for what minors you can do. For a full overview of all official information, read the elective

Rules for choosing minors **at the UT** are:

- You can only do one Psychology elective module
- You can only do maximum one first-year level module
- A module has to be completed as a whole, so the full 15 EC. You can't choose separate courses within the module

Rules for choosing minors **at another Dutch university** are a bit more complicated than for doing a minor at the UT. The courses you choose have to be approved by the UT, for example. Therefore it is important to have a look at the Psychology electives website.

The same goes for **studying abroad**. The courses you choose have to be approved by the UT. Have a look at the website below for more information.

For both minors at a different Dutch university and abroad, it is important to start investigating the possibilities on time!

<https://www.utwente.nl/en/psy/bachelor/third-year/information-electivespace/>

Different types of minors

The minors can be divided into seven categories. All categories have a different learning goal, ranging from deepening knowledge, broadening knowledge, to gaining international experience.

Psychology electives

These are the in-depth modules you can choose from in the first semester of the second year. For your minor, you can choose only one of the electives you did not participate in during your second year. If you want to do a Psychology master in one of the directions you have not done the corresponding elective in, this is a good choice for you.

High Tech Human Touch minors (HTHT)

The HTHT minors are courses not related to any of the study programmes at the UT. They are open to students from almost all Bachelor programs and are thus often very multidisciplinary. The main aim of the HTHT minors is to broaden your knowledge and finding solutions to societal problems. Sometimes the HTHT minors are offered as a 30 EC package, covering both modules in the first semester. However, you can choose only one of the two modules and do another minor as your second.

'Regular' UT minors

Alongside the Psychology electives and the HTHT minors, you can participate in courses of different studies. This minor option is perfect for broadening your knowledge by partaking in different study modules. To know which modules from which study programs can be chosen as a minor, you can go to the minor 'tool of options'.

Minor at a different Dutch University

You don't have to stay at the UT for your minor. Other cities offer minors as well. The application process for this is a bit more difficult. Make sure to read the information about a minor in a different Dutch city in the elective space manual if you are interested.

Minor Abroad

Besides minors in the Netherlands, you can study abroad as well. You will go to a different country during the first semester and follow courses at a university there. The countries vary from places close by like Belgium and Germany, to places on the other side of the world, like Australia and America.

Crossing Borders

Crossing borders is a unique minor that combines working on a report with a field study. The focus of the report and field study is on the United Nations Sustainable Development Goals. Within crossing borders, there are different options you can choose from. Going abroad is an option, but not necessary. Going abroad is for a maximum of around 3 months, so shorter than studying abroad.

Transfer Minor

If you want to do a non-Psychology master and need to take additional modules in order to be admissible, you might have the option to do these courses during your minor. This is what is called a *transfer minor*. As this is highly individualised, good preparation and contact with the study advisors of both the Psychology programme and the master programme is needed.

Health Psychology and Applied Technology

General Information



Faculty *BMS*



Credits *15*



Phase *1A*



Module *M5*

Description of the Minor

Students know the most important theories in health psychology, combine them with persuasive technology models and user centred design approaches. They are able to apply these theories, models and approaches to a practical problem regarding self management in chronic diseases. Students have learned to design a mini e-health intervention to improve, resp. support a highly relevant self management challenge from the perspective of the patients.

Health and well-being is of essential importance for everyone. We feel comfortable with a well-functioning body and mind. People try to maintain good physical and mental health, aim to improve health by changing their health behaviours or try to find beneficial coping strategies in case of being ill. Health psychology provides knowledge about coping with acute and chronic diseases and understanding how to motivate people to change their health behaviours. Applied technology can support the change in behaviours via persuasive designs and can motivate and support people to realise their goals.

Student Experiences

"Health Technology has multiple elements which one might recognise from the first year. The Module coordinator as well as the tutors are extremely enthusiastic, models that most first-year are familiar with are applied on concepts of chronic physical illness and the best part is that you have interviews with real people who actually experience that problem. You see there is a lot of passion behind the organisation of the Module. One thing to remember is that there is no point of "break" during the Module, everything goes very fast and there is at least one task at a time. So, if you're interested in how Psychology affects physical illness and would like to know more about persuasion to change behaviour, this Module is definitely for you! If you would like to have more of a relaxed time however, I would not recommend it."

"This module is very suitable for people interested in the medical side of psychology. I enjoyed that we got to interview people who actually have the chronic disease we were investigating for our project. Besides the initial interview, we got to design our own technology aimed to help these people and afterwards we did a think-aloud test to see how our intervention worked in practice. The persuasive design course was a lot of fun, as there are classes where you actually get to design a physical prototype in the Design lab! All in all a very interesting course to expand your knowledge in the psychology field."

Human Factors and Engineering Psychology

General Information



Faculty

BMS



Credits

15



Phase

1B



Module

M6

Description of the Minor

Engineers are the ones to build cars, power plants, smartphones or commercial websites. However, all these systems are ultimately operated by human beings with all their cognitive, motivational, sensor, and physical limitations, strengths and peculiarities. This issue is known as the “Human Factor”. Psychologists are the ones to know best about the human mind, which is why they are urgently needed for the successful design of socio-technical systems that are safe, efficient and pleasant for their human operators.

In the module Human Factors & Engineering Psychology, we will prepare you for a career as a Human Factors specialist. We first introduce you to the over-arching ideas and principles of Human Factors, say, for instance, the Anti-Procrustes principle, which says that the primary aim is to fit the technical system to the human being, never the other way around. Then, we will give you an introduction to different domains where Human Factors plays a crucial role, such as automotive design, medical devices, commercial software and websites. In the context of design values and principles, you will build on what you already learned about cognitive functioning and abilities. For example, you will see how the structure of human attention is at odds with highly automated systems, or what role working memory plays when browsing a website.

Programming skills are extremely useful for academic researchers as well as professional psychologists in technology domains, and beyond. In small teams, you will learn to program in the programming language Python and build your own sensor system that can collect and record bodily signals, such as heart rate (ECG) or electrodermal activity (EDA). In the research project component of this module, you will combine the acquired theoretical knowledge and practical skills of the other components, and you will design and conduct a human factors experiment involving various research methods.

Student Experiences

“During the course of Human Factors and Engineering Psychology I had the feeling that I was able to dive deeper into cognition and behaviour within the realm of technological products or systems. We looked a lot at how certain things can be made more usable or user-friendly but also how to get your clients to trust and feel safe with the products you are designing. We also discussed many processes that take place in the human mind and that can affect the way humans see and perceive their surroundings. It was also my first experience with programming and a really nice introduction into Python, a very handy programming language. It can be a bit scary at first but I felt like it was a very simple introduction and gave me at least the motivation to pursue a master in programming!”

“What happens to the brain of people when they interact with technologies? What is the best way to present your material on a screen? How can the communication between cognitive scientists and program developers be improved? What are cognitive and physical restraints of the humans in interaction with the technologies? Those are only some topics that are presented in the class. The students do not only get to know the theoretical background information, but also develop real applications (with the use of basic Python programming language) and test on real project application with actual data from the field.”

Mental Health

General Information



Faculty *BMS*



Credits *15*



Phase *1B*



Module *M6*

Description of the Minor

After completion of the module Mental health, the student: 1. Has knowledge about mental disorders and the positive psychological approach to mental disorders, 2. Has knowledge about the diagnostic methods to identify disorders and symptoms, just as well-being and strengths, and 3: Is able to critically apply, and communicate this knowledge, in a written psychological report and a written and presented treatment plan based on different case study patients.

The module prepares you to work (research and practice) in health care. Traditionally, psychological health is defined according to the medical model: someone is healthy when one does not experience any complaints or disorders. This module will complement this pathological perspective on mental health with the positive psychological approach to mental health. Positive human functioning is central to this approach and it focuses on well-being, strengths and talents.

Student Experiences

"This module is very interesting, it gave me the opportunity to learn about the topic of mental health and diagnostics in a much deeper level than I have before. I also had the opportunity to work on a psychological report for the first time, which of course is very valuable because I want to continue to work in the mental health domain in the future. The work and study load is hefty, and there is a lot of content to study for the exam, but if you enjoy the topic like I did it is not too strenuous."

"Mental health was mainly theoretically very elaborate. There were a lot of interesting guest speakers which really sparked my interest in this field of study. Additionally the module provided me with how to apply small parts of the clinical psychology process, like writing a case-report on a client. All in all this made the module very complete and well-rounded."

Professional Learning in Organisations

General Information



Faculty

BMS



Credits

15



Phase

1B



Module

/

Description of the Minor

Human Resource Development focuses on the learning and development of adults in the context of their professional work. It is often described as an organizational process that comprises the skillful planning and facilitation of formal and informal learning, knowledge development and innovation. HRD specialists may take on a host of different roles, such as coaches, trainers, internal advisors on educational programmes, developers of learning content and technology, but also as consultants or change managers. Increasingly, HRD professionals are becoming partners at the strategic level of organizations

.In the project, students will work in a consultancy team to give advice on a learning challenge of a real-life organization (e.g. healthcare organizations, high tech firms). During the project, the consultancy teams analyse and frame the challenges the client has with fostering on-going professional learning at the workplace. Together with the client organization the consultancy team will develop (directions for) solutions for enhancing professional learning in these organizations. Consultancy teams will present their findings and recommendations in a final advice report and present the outcomes to their client. During the project, students, teachers and experts, work together in a consultancy company to share knowledge about the challenges of the client organisations, possible influencing factors, solutions and approaches.

The theory component provides an overview of the most important theoretical perspectives and research on professional learning in organizations from a mixture of disciplines, including psychology, educational science, human resource management and sociology. In this component, students start to get a deeper understanding of how people learn and develop during their work and how this learning takes place at both individual, team and organization level. In addition, the theory will increase students' insights in how to facilitate learning at the workplace, how to design powerful interventions for attractive learning environments and the role technology and new media can play in designing learning interventions for workplace learning.

The professional development lab offers guided practice to support the consultancy teams with the needed practical knowledge and consultancy skills to complete an HRD consultancy project. More specific, students will practice their interpersonal and consultancy skills that are needed for framing a problem, negotiating and dealing with facilitating and inhibiting factors and gaining support for implementation. Moreover, students will practice professional skills for performing fieldwork, i.e. consulting employees, staff members and managers, analysing complex information from the client organization and developing directions for advice. In addition, activities are organized to support your personal professional development as an HRD consultant.

Student Experiences

"This minor presents an interesting challenge as participants collaborate within a group for a period of ten weeks on a project for an actual organization, rendering it both relevant and meaningful. The module affords opportunities to explore the professional field and follows a structured system to yield a final product, occasionally offering an excess of guidance. Additionally, the module places emphasis on personal development, dedicating ample time for self-reflection and the cultivation of individual insights. While this approach demands substantial effort and time investment, it yields compelling perspectives. The theoretical underpinning, delivered through instructional sessions, provides a solid foundation for ensuring the success of the module."

Psychology in Learning & Instruction

General Information



Faculty *BMS*



Credits *15*



Phase *1A*



Module *M5*

Description of the Minor

In this module you will learn to understand the contribution and added value of psychology to education. Psychologists stood at the cradle of educational science and have put their mark on the developments in the field ever since. Some classic contributions are still 'in fashion' today, while other psychological insights have an equally important but less visible impact on contemporary educational practice. You will be introduced to both through a mixture of theoretical and practical coursework. During the course you will alternately assume the role of student, teacher, researcher, and designer.

In this module students will learn to understand the contribution and added value of psychology to education through a mixture of theoretical and practical coursework in which they alternately assume the role of student, teacher, researcher, and designer.

In the theory part students develop an initial understanding of how people learn and how instruction can promote the learning process while taking into account individual differences in age, cognitive development, and motivation. This theoretical knowledge is 'brought to life' in the skills lab where students will prepare and deliver a short instruction to their peers and investigate the learning activities and learning outcomes in these same lessons that are given by their peers. The theoretical and practical experiences are then used in the project where students work in small groups on the evaluation and (re)design of an instructional intervention.

Student Experiences

"This module was very enjoyable. If you enjoy writing essays and the topic of educational psychology and learning in a more applied way then this module will be great. I really enjoyed the teachers and module coordinators of this module, there was always a lot of academic support and discussions on improvement. In the module I had the opportunity to work alongside other students to design an educational intervention which was very interesting. The module really deepened my knowledge on education and specifically with regards to children, which I find very interesting and would want to specialize in later."

"The Learning minor is an intriguing program providing insights into the mechanisms of human learning and how to apply this knowledge in educational materials. The acquired theoretical framework proves highly applicable in the context of the group assignments integral to the minor. There is considerable room for individual interpretation and contribution to the group project, although group assignments are predetermined rather than allowing students to form their own teams."

"Through this course the students learn how people learn and what happens on the cognitive level when new information is presented to them. Multiple activities, and a longer project allow students to apply their knowledge and develop a course, assess the learning and evaluate a learning application. The students do not only learn about the theoretical content, but get also informed on how to improve their learning techniques!"

Psychology of Safety

General Information



Faculty *BMS*



Credits *15*



Phase *1A*



Module *M5*

Description of the Minor

Securing its citizens and infrastructure against disasters, terror/war, and crime is a central element of virtually every current society. This module focuses on understanding the (social) psychological dynamics of safety issues, particularly in the area of risk, conflict and deviant behaviour with the aim of developing effective interventions.

These themes are heavily affected by societal developments such as the growing need for resilient, adaptive citizens and communities as well as for citizens who actively engage in safety-related activities (e.g., community policing). Furthermore, awareness grows that many traditional interventions designed for safety-related incidents lack efficiency (and effectiveness). Therefore, there is a need for 'smart' and cost-efficient interventions.

Furthermore, technological developments are increasingly important for the psychological safety domain in three ways:

1. New technologies are usually accompanied by risk perceptions and aversion. We focus on how people perceive, make sense of and react to new technology-related risks (e.g.) nano-modification of food)
2. Due to new technology, humans are more socially connected than ever before. This may not only increase the potential for (different types of) risks, conflict and crime (e.g., cybercrime), but also has a profound impact on emotions and cognitions, and on how people interact (e.g. social sharing). It also provides opportunities for implementing new technology-based interventions to change safety-related behaviours.
3. The rapid growth of technology allowing for the monitoring and analyses of physiological and behavioural responses of individuals and groups in real life contexts (through sensors, etc.) creates innovative potential for the field of social psychology.

Student Experiences

"Psychology of Safety was rough, but overall my favourite Bachelor's course. The minor is really only composed of 2 parts, the group project and theory. The projects are really interesting and relevant to current themes, so as long as you and your group agree on the amount of effort you want to put in, that shouldn't be a problem. The theory exams are composed of social and physical safety and it's a lot (little less intense as mental health, as a comparison for those of you that did that one already)."

"The Risk and Safety minor was very interesting, and the lecturers were all very good at what they do. I enjoyed having the opportunity this module offered to learn more about the role of psychology in a more forensic scene. During the module I completed 3 project tasks with a group of other students, in which we applied all the topics we learned throughout the module to solve for problems that often take place in the real world, and after this we also presented our outcomes with the rest of the group. This allowed me to gain a deeper understanding of how to apply the knowledge to a practical scenario. The workload is hefty and there are many articles to read for the examinations, however once you find the right way of learning and studying the articles, the module is smooth."

Introduction for Neuroscience for Society and Business

General Information



Faculty

BMS

Credits

15

Phase



Module

Description of the Minor

This is a new minor starting in the next academic year 2024-2025. The information will be published around the end of February on OSIRIS so make sure to keep an eye out for the OSIRIS page if you are interested.

Student Experiences

Technology for Women's Health in a Life Span Perspective

General Information



Faculty *BMS*



Credits *15*



Phase



Module

Description of the Minor

This is a new minor starting in the next academic year 2024-2025. The information will be published around the end of February on OSIRIS so make sure to keep an eye out for the OSIRIS page if you are interested.

Student Experiences

High Tech Human Touch Minors

Aerospace Management & Operations

General Information



Faculty /



Credits 15



Phase 1A



Module /

Additional Information

5 modules of B1 and B2 have to be completed

Basic knowledge of calculus and probability theory is recommended

Description of the Minor

The module introduces the various actors of the aerospace industry, their strategic choices and business models, and connections with technological advances in aircraft development. Moreover, students will become acquainted with the operational decisions of airlines. The course Aerospace Industry serves to first gain a macro-level view of the industry and its developments, and then obtain micro-level knowledge about airline business models and operations and develop the skills to make management decisions. Dedicated module components exist for Revenue Management and Maintenance, where quantitative models and methods are applied to optimize these particularly important parts of airline operations. Throughout the module, this knowledge is used in a hands-on airline management simulation game, where in a team decisions are taken about issues like route choices, ticket prices, aircraft allocation, and marketing.

The course Airport Management mirrors the didactical build-up of Aerospace Industry by first discussing the macro-level structure and stakeholders in the airport industry, and then zooming in on airport economics, performance benchmarking, operations, marketing, and the relationship between airports and airlines. Finally, we zoom out again and exhibit the economic, social, and environmental impact of airports. In team challenges, students will analyse the performance of a self-chosen, real airport, and create a recommendation report to improve it.

They will discuss currently relevant topics from the perspectives of different actors (such as airlines, airports, manufacturers, and the government), gather knowledge from popular or scientific sources, and solve small operations assignments. Several guest speakers will talk about e.g. business models and decisions of real airlines and airports, cargo logistics, and the role of air traffic control.

The module is concluded with two written exams, group assignments, a report and a presentation.

Student Experiences

Cybersecurity & Cybercrime

General Information



Faculty /



Credits 15



Phase 1A



Module /

Description of the Minor

The Internet has started out as a toy academic exercise, but by now it is one of the greatest technological achievements of humanity. However, this technological advancement has also paved the way for new forms of crime.

This minor will introduce you to the fields of Cybersecurity and Cybercrime. Cybersecurity encompasses measures taken to protect a computer system, a network, or the Internet as a whole, against unauthorized access or attack. As far as the Internet is concerned, however, the spectrum of abuse is large: it ranges from cyberdeviance (a behavior outside or at the edge of the formal norms of society, but not yet illegal) to real cybercrime (an activity that violates a set of legal norms).

The Cybersecurity and Cybercrime minor is a multidisciplinary minor that will cover both high-tech and human-touch aspects of this discipline, and combines them in a hands-on final project. The minor aims at providing a comprehensive, multi-faceted view of the interaction between Internet technology and crime.

Student Experiences

Earth Observation

General Information



Faculty /



Credits 15



Phase 1B



Module /

Description of the Minor

Sensors can be mounted on Earth orbiting satellites, aircrafts, but can also be mounted on a car or even hand-held. Sensors measure electro-energetic emissions from objects and material on the earth's surface. Data processing techniques subsequently transform raw data into meaningful information sources for a large variety of applications.

This module consist of three stages: the first efficiently supplies basic knowledge to the corresponding theme, the second applies the knowledge in relevant, and the third integrates the acquired knowledge in a project framework. Currently, we aim at proposing at least two projects from which the participants can choose one. In a team of 5-10 persons, the participants will design and analyse methods and solutions (according to the principles of the Twente Educational Model (TEM)).

Student Experiences

Geographic Information Systems (GIS)

General Information



Faculty /



Credits 15



Phase 1A



Module /

Description of the Minor

In phase one of quartile 9 the student will get lectures in combination with (un)supervised exercises. Lectures and exercises are designed such that the basics of storing, accessing and analyzing geo information are covered.

In the second phase of quartile 9 knowledge on GIS is applied in various application domains. During this 3 week phase, students are encouraged to find creative solutions in the use, design and analysis of GIS functionalities. Treated in this phase are the concepts of multi-scale and geometric aspects of mapping in a GIS context, dissemination methods and environments, with emphasis on online and interactive methods.

The final part of this module consist of an inter- or multi-disciplinary project. Projects with an international flavour related to the various societal benefit areas (SBA's) are proposed from which the students can choose. Focus is on how GIS can be used effectively by combining (geo-) information to provide possible solutions/plans and to allow an efficient communication with stakeholders

Student Experiences

Governance of Innovation and Socio-technical Change

General Information

	Faculty	/
	Credits	15
	Phase	1B
	Module	/

Description of the Minor

In this module you will learn how society and technology influence each other, in particular how this plays out in innovation processes when new technologies are developed and embedded into society, and what are possibilities for purposefully shaping innovation processes and socio-technical change. Technologies play a central role for modern societies, be it in the form of enablers of key societal functions such as energy, water, mobility, public health etc., or as creating risks and unwanted effects. Thus, science and technology are also an important issue for governance, with policy and other societal actors trying to shape innovation. As part of this, prospecting possible technology dynamics and also their effects on society is a common activity for research, innovation and governance actors, but needs to be informed by an understanding of socio-technical dynamics.

The module consists of 3 thematic components and a project. The first component introduces students to concepts, theories and empirical examples which allow them to develop an understanding of the interrelations and dynamic patterns of innovation and social change. The second component delves into selected aspects of governance processes and the possibilities, approaches and limitations of governing innovation and socio-technical change. The third component addresses the role of 'prospects' (expectations, scenarios etc.) for the management and governance of innovation, forms of technology assessment and how insights of the former components can be used for prospecting on future developments of and around innovations. In the project, groups of students apply insights from the thematic components to a case of a particular technology or application, resulting in e.g. a strategy recommendation for an innovation actor, a policy recommendation, or a scenario development

Student Experiences

"In this minor I learned how science technologies can come into play as an interdisciplinary field. I think this course is very extensive as it allows you to think in different roles (policy makers, sociologist etc). And in the mean time you can see and explain how society and technology co-evolve! Moreover, you get a close look at how technology can be affected and influenced by the society and vice versa. I would say the biggest element I gained from this minor is critical thinking, innovation and creativity!"

"The minor is very very small; in my year the group was only 40 people. This made it a very tight-knit group and allowed for fruitful discussions within the classes. Despite this, the module was very well set up and everything seemed to flow together very well. It must be noted that the module was highly deadline-packed, however, since there were no tests this was completely fine for me. At times the material was a bit confusing as it goes into philosophy and ethics quite a lot. However, the three teachers from the module were very willing to take a step back and make it more understandable or easy to follow. All in all, I am glad I followed this minor!"

Innovation & Entrepreneurship

General Information



Faculty /



Credits 15



Phase 1A



Module /

Description of the Minor

The first week starts with an introductory Acceleration Programme that provides students with an awareness of the dynamics of entrepreneurial business model development for 4 days. This is a quick way of making students aware of the knowledge they lack and need to master for operating in and communicating about business. It also introduces the concept of developing a technology-based start-up into a successful company. Participants interact in multidisciplinary teams in the Acceleration programme, following the structure of the UT Massive Open Online Course "Technology Entrepreneurship: How to Start a New Venture"

I2E, IM and FMIE are used to convey the theoretical knowledge students learn in the introductory business game. This knowledge is gained through lecturing, tutorials, within and inter-group discussion and prepares the students for the theory exam as well as for the project. In the tutorials, a number of exam questions will be discussed as examples. At the end of the Acceleration week, the teachers of IM introduce the Innovation Scan, which will be applied to real-life companies from the Twente Regio. These companies may also present a business idea for the students to work on during the project – although some groups may be allowed to further work on their business idea from the Acceleration Programme I2E and FMIE also have assignments related to the project.

The project is based on the Lean Start-up approach (by Eric Ries) and this method of building a business requires continuous testing and field research which produces intermediate products of technology adoption and market analysis as well as financial forecasting to be reported to the lecturing team. Teams are composed of students from the two different categories we produce as a university: engineering and social sciences. Participating students are supervised by coaches from the lecturing team in this module. They report to the supervisors in writing and receive feedback and report to fellow students from other teams by presenting their findings orally to facilitate mutual learning in the whole group.

Student Experiences

Innovations in Sustainable Chain Management: Analysis

General Information



Faculty /



Credits 15



Phase 1A



Module /

Description of the Minor

All products and services we consume and use are part of at least one chain from production/design/development to consumption/use and eventually – in the case of products – waste generation (and sometimes, this may not be the end of a product). When we think of a chain of production/consumption of, for example, an electronic device such as your laptop, you may imagine that it's not a 'simple' process: there are resources involved that need to be mined, parts to be designed, rules/laws to be obeyed, money to be made, carbon emissions to be offset (?) etc. Organising these elements including the people involved in the process such that the desired product comes out of it entails a fair share of management or governance. Analysing how this organisation can be improved to achieve more economically, socially and environmentally sound products and services, thereby contributing to a more sustainable future, is the core interest of the course.

Student Experiences

Innovations in Sustainable Chain Management: Design

General Information



Faculty /



Credits 15



Phase 1B



Module /

Description of the Minor

(Re-)Designing elements of the production and consumption sectoral (supply) chains, network and institutional context is the central focus in this module. Sustainable supply chain management (SSCM) refers to 'the management of material, information and capital flows as well as cooperation among organizations along the supply chains to provide products and services in societal sectors while taking goals from all three dimensions of sustainable development, that is, economic, environmental and social, into account which are derived from government, customer and stakeholder requirements. In simple words it is about how we affect the planet with the way mankind consumes and produces products and services, how it impacts the planet and its population and how we can reach out for improvements (innovations transitions).

Student Experiences

New Technology Business Development

General Information



Faculty /



Credits 15



Phase 1B



Module /

Additional Information

HTHT minor 'Innovation & Entrepreneurship', or CreaTe M7, or IBA M6 are required.

Description of the Minor

The course New Technology and Business Development concentrates on the following question: how can new technology (including new ideas, products or services) turn into viable business opportunities?

Exploring strategies for new technology development through business development implies that one has a clear overview of the needs of future scenarios, customer needs, competing forces, intellectual property concerns and present/future structure of a market. Knowing this does not only reduce the uncertainties associated with the development of new technology but also the decision to continue and craft a business model based on a viable value proposition. However, the development of new technology also implies dealing with structural, ethical and societal implications which are rarely taken into consideration by businesses when it comes to introducing new technological solutions. By social / ethical concerns is implied dealing with the controversies produced and surrounded by the new technology but also structural aspects such as path dependencies which makes it difficult to introduce new technological based solutions-even if society is better off. Thus, we also take into consideration the unintended consequences of new technology such as the ones nicely documented in the Netflix series Black Mirror. Hence, there is a need to look into these unintended consequences but also the taken for granted market practices, forces and path dependencies in relation to the existing technology in use to fully understand the value and hook ups of the new technological solutions. This course combines knowledge in the field of Service dominant High-Tech marketing, Technology Management, Science & Technology including ethics in new technological and business development.

Student Experiences

Philosophy of Science and Technology

General Information



Faculty /



Credits 15



Phase 1A



Module /

Description of the Minor

The minor analyses and evaluates the influence of science and technology on humans and society. In the first weeks, you will be introduced to main approaches and theories from the history of philosophy. But rather than merely studying the philosophical tradition in itself, the minor subsequently aims to develop your skills to systematically and critically reflect on science & technology and their social roles. We offer you philosophical tools to address questions like: Which view of science is underlying technological research that develops, for example, organs-on-a-chip or brain-computer interfaces? How will wearable technologies change and shape our social interactions? Will we be able to maintain traditional ideas about privacy in an age of exponential increase of information and communication technologies? Should society allow for new forms of genetic modification of human beings? How can our society and culture incorporate and shape those technologies? The acquired perspectives and insights from philosophy set the stage for the final project. In a so-called Philosophy of Technology Lab you will work in a multidisciplinary team to identify and answer philosophical and ethical questions concerning a specific technology in development

The minor consists of three components. Philosophical Theories and Methods (5 EC) offers a high speed introduction in the history of philosophy, while also training your reading, argumentation and writing skills. Essays in Philosophy of Technology (6 EC) reflects on the ways three sets of questions have been addressed in contemporary philosophy of science and technology; research on new technologies, how technologies set the boundaries between humans and machines and how technology shapes the way that humans perceive and act in the world, and thirdly on how to assess the ethical and societal desirability of new and emerging technologies and how to analyse ethical controversies. In the module project, called Philosophy of Technology Lab (4 EC), students work in groups to philosophically analyse technologies developed at the University of Twente. They will identify and analyse philosophical and ethical issues associated with these technologies, but also investigate how technologies impact certain philosophical assumptions

Student Experiences

"Philosophy in Science and Technology was a great introduction to the field of Philosophy and its applications in modern day life. It gives you a better view of the history of philosophy and on how it is still relevant in technologies and science today. The workload initially seemed like a lot, but it turned out to be a lot more manageable as the minor progresses. Overall, it was a very informative and fun experience and given the choice I would choose to do it again."

"The PST minor was an amazing journey back to the Greek ancient and explore the philosophical view of world. I had a fun time reading the philosophical text from famous philosophers like Aristotle, Socrates and nietzsche. The best part is to interpret and define these texts in your own words. And is not just about going back to history, but also foreseen the technology of future. We discussed about the possible ethical issues with the growth of technology (designer babies, cyborgs). I had very much fun in this course specially as a psychology student!"

Science to Society: from Idea to Prototype

General Information



Faculty /



Credits 15



Phase 1A



Module /

Additional Information

This minor has a follow-up minor in quartile 1B, but both can be taken separately.

Description of the Minor

Our society is confronted with both challenges and opportunities in diverse fields like Energy, Health, Learning and Robotics. We are in the middle of an energy transition; technology enables us to monitor and act on our health status in real time; learning is not bounded to location or time anymore; and robotics is entering our daily lives.

These challenges require us to learn how to design solutions, and utilize knowledge and research methods from not a single, but multiple scientific domains. To be successful, robotic solutions in healthcare for example have to be approached from a technical, psychological but also an ethical, business and philosophical standpoint.

During the module, you have to be creative and work in a multidisciplinary team to integrate knowledge from different domains in a product you are going to design. In this module you will make a prototype and in the following module (from prototype to society) the prototype will be developed further.

Student Experiences

Science to Society: from Prototype to Society

General Information



Faculty /



Credits 15



Phase 1B



Module /

Additional Information

This minor is the continuation of the Science to Society minor in quartile 1A, but both can be taken separately.

Description of the Minor

Our society is confronted with both challenges and opportunities in diverse fields like Energy, Health, Learning and Robotics. We are in the middle of an energy transition; technology enables us to monitor and act on our health status in real time; learning is not bounded to location or time anymore; and robotics is entering our daily lives.

These challenges require us to learn how to design solutions, and utilize knowledge and research methods from not a single, but multiple scientific domains. To be successful, robotic solutions in healthcare for example have to be approached from a technical, psychological but also an ethical, business and philosophical standpoint.

We need to learn to be creative, and apply available expertise in radical new ways, while at the same time work in a structured and agile manner. "Science 2 Society" does not end with "prototype". It ends with "2 society". We are not looking for a concept, we are looking for a solution. During the second 10 week module of the Science 2 Society minor (Module 2: From Prototype to Solution) you and your team members will focus on realizing your concept, grinding, grounding and researching issues surrounding the implementation and use of your prototype. In the process, your prototype is enriched with a business model addressing its feasibility. In the second module you get the job done! Your team will have access to state-of-the-art domain knowledge, workshops and process management tools. There will be close interaction with problem owners from the world of business, government or science. A tutor will coach your group, both in managing your project and in acquiring any further knowledge and skills you will need for a successful design.

Student Experiences

"My experience during the minor from prototype to society was overall rather challenging but also because my topic was difficult. It was cool working with an official group on official projects and preparing the products for entering the market. This minor was all about working together interdisciplinary and learning about business prerequisites."

UT study programme minors

The following pages describe modules from other study programmes that are available for Psychology students during the minor space. Below you find a list of abbreviations used in the descriptions.

Faculties

BMS	Behavioural, Management, and Social Sciences
EEMCS	Electrical Engineering, Mathematics and Computer Science
ET	Engineering Technology
TNW	Science and Technology

Study Programmes

IBA	International Business Administration
IEM	Industrial Engineering and Management
COM	Communication Sciences
MS&T	Management, Society & Technology
AM	Applied Mathematics
BIT	Business Information Technology
TCS	Technical Computer Science
CE	Civil Engineering
ME	Mechanical Engineering
GZW	Health Sciences
CSE	Chemical Science and Engineering

Digital Marketing for Networked Business

General Information



Faculty *BMS*



Credits *15*



Phase *2A*



Module *M7*

Additional Information

Basic knowledge about subjects like organization, operational management, strategy, marketing, bookkeeping and finances, and statistical computer skills are required.

Description of the Minor

The emergence of the Internet as commercial platform in the early 90s and the arrival of the second generation of Internet applications (known as Interactive Web, Web 2.0 or Social Media) combined with fast expanding mobile technologies, social networking and a large number of technologies are shifting the focus of the marketing from mass production, mass communication and mass distribution to the one-to-one approaches, transparency, mass customization and customer engagement. The increasing application of digital technologies as marketing tools have also contributed to a substantial market power migration from the producers to the customers. These developments have resulted in new forms of marketing strategies and approaches: Collaborative Marketing (Kotler et al, 2010), Co-creation, Content Marketing, Viral Marketing, Behavioral Targeting. These new forms of marketing activity in combination with an ever developing technological domain (AI, Big Data, Apps, wearable technologies, Cloud Computing, Semantic Web, Internet of Things (IoT), autonomous vehicles, robotics etc.) present marketers and strategists with serious new challenges. In addition to these challenges the business organization of today becomes more and more technologically sophisticated and networked: businesses are increasingly operating in business networks with suppliers, retailers or intermediaries and often competitors but also in online social networks with business clients, the final customers and other stakeholders. This way the classic distinction of B2B or B2C markets begins to fade; the Networked Business that emerges operates on networks where the parties co-create and re-shape the organization and its product portfolio, and its related business models. The emerging organization, often described as the Networked Business or Networked Enterprise, is "A new class of company ...that uses collaborative Web 2.0 technologies to connect its employees and to forge close networks with customers, business partners and suppliers" (McKinsey Quarterly, 2011). Managing the Networked Business requires new approaches, new knowledge, new skills and new managerial capabilities. Next to that, organizational adaptability and agility are becoming critical parameters of market success. New Digital Marketing strategies are one of the most crucial success factors of Networked Businesses. The module will introduce the students to the various aspects of the Digital Marketing, will provide them the basic knowledge on managing the marketing activities of a networked business context and identify areas where businesses must focus in order to become successful networked enterprises. Advanced skills and knowledge of E-Commerce, Social Media strategies and Analytics are the basic underpins of such processes.

Student Experiences

Financing Entrepreneurial Startups and Innovative Firms

General Information



Faculty

BMS



Credits

15



Phase

2B



Module

M8A

Additional Information

Basic knowledge of multiple subject matters is assumed. See Osiris for the full recommendations.

Description of the Minor

Finance managers of all firms need to make smart decisions that can increase firm performance and create firm value. They not only communicate with venture capitalists, angel investors, private equity firms, financial institutions and capital markets in raising necessary funds to carry out the required investments, but also ensure generating sufficient cash to reinvest and payback investors. Finance managers regularly take many other decisions too. Start-ups and SMEs in particular are confronted with the option of whether to continue accessing funds from banks, venture capitalists, or to go for initial public offering (for example, Takeaway on 30 September 2016) and issue new securities in the public capital market.

The module integrates three closely-related areas of financial management: Corporate Finance, Investments and Entrepreneurial Start-up valuation. It will enable students to become familiar with financial decisions by combining important theoretical concepts with institutional contexts and real-life examples. Students will deepen their understanding of financing sources, and valuation of start up, that have zero or negative cashflows and learn how firms interact with diverse categories of investors and capital markets. They will learn how financial decisions are affected by global, economic, social and technological considerations. Attention will also be given to distinct issues, for example, behavioural finance, crowdfunding, peer-to-peer lending or socially responsible investments.

In addition to learning different concepts, theories and analytical methods, all knowledge comes together in the project. It will enable students to develop various skills, e.g. analytical (both qualitative and quantitative), problem-solving, reporting and group working.

Student Experiences

Going Dutch: Kickstart your Dutch Work-life

General Information

	Faculty	<i>BMS</i>
	Credits	15
	Phase	1A
	Module	/

Additional Information

Look at OSIRIS for the full admission details

Description of the Minor

Dutch Language (5 EC): In this course, you will acquaint yourself with the Dutch language and build up your knowledge to the level of a basic language user (A2). You will learn Dutch to the level in which you can communicate with your Dutch colleagues (among others) in everyday situations, using frequent and basic expressions. For example, you will learn how to introduce yourself, buy and return products at a store or online, talk about your home and neighbourhood, give and ask directions, or talk about health and safety. Additionally, you will learn how to make basic small talk about how you are doing or the news, to speak about personal relationships, talk about your current or previous education and your qualities, read job listings and apply for a job (writing a CV, filling out job application forms and doing an interview), all of which will be useful if you want to work at a Dutch company.

In the second part of the minor the student will be learning cultural theory and models, and the basics of Dutch culture will be taught (5 EC). Next the analytical tool of Critical Incident Technique, interview techniques and analysis of interview data are being treated. After this the student will do his own research on the differences between his own culture and Dutch culture in the workplace. At the same time the student will make a SWOT analysis of his own qualities and the Dutch labour market. The two assignments during this part are challenging the student to reflect on cultural differences and on his own strengths/weaknesses in relation to the Dutch labour market, hopefully leading to the optimal study choice for the Master phase.

Organisational Cultures and Consultancy in the Netherlands (5 EC): When working within an organisation it is key to both sense and understand the organisational ways of working, which might differ substantially among different types of firms. At the same time, cross-cultural differences on the work floor can lead to frictions. Organisational cultures can be hard to grasp, but the right knowledge and skills will help. Management consultancy is a field of business which is geared towards analysing an organisation's current situation (including organisational culture) and advising them on how to improve, as well as a popular sector for both business and technical students to start their career. Hence, in this course you will learn what it means to work in a variety of small, medium-sized or large organisations in the Netherlands while at the same time developing your consulting skills such as analysing, observing, asking questions, and providing constructive feedback and advise. This course brings theoretical depth and integrates (regional) company field visits, role play, and video analyses of regular work team meetings to make (various!) Dutch organisational cultures more tangible as well as how cross-cultural differences can be dealt with in the workplace. Students will be challenged to explore and experience the theory first-hand, thereby also offering advise to regional businesses on how to keep talent in Twente as part of their final challenge-based learning project.

Student Experiences

High Tech Talent Management in a Global Context

General Information



Faculty *BMS*



Credits *15*



Phase *1B*



Module *M6*

Description of the Minor

This minor is designed to develop knowledge on different aspects of digitalisation of (Global) Talent management in an international context. It covers both basic theories and concepts related to (Global) Talent Management practices, as well as digitalisation of such with e-HRM. The former, in this course, is an indicator of “human touch”, while the latter is an indicator of “high tech” vision of our University. The course builds on the latest developments accumulated in several fields of research and practice such as Human Resource Management, Cross-Cultural Communication, Organisation Studies, Information Technology and Systems, Organisational Behaviour, and Innovation. During the course students will be discussing views/perspectives of different scholarly and business experts, and will be engaged in a research and design project to analyse advantages and limitations of high-tech solutions for enabling (global) talent management.

Student Experiences

“The minor attempts to offer an overview of the different elements that need to be taken into consideration regarding talent management (business & human resource management) for multinationals. The course develops along several weekly topics, the knowledge for which is stimulated through in class assignments and interactive sessions. The teachers are highly engaging and challenge the students to think critically and develop further, without this impacting their grades. Student progression is tested through an interdisciplinary group work among students from different studies, which means that the students get to know how other studies work and study as well.”

Regional Sustainable Development

General Information



Faculty *BMS*



Credits *15*



Phase *1A*



Module *M9*

Description of the Minor

In this module, students can already make their mark on the world by using and expanding their competences in the entrepreneurial process of regional sustainable development and setting up supply chains that connects supply and demand. In a nutshell, students will learn what new public management entails, the underlying psychological and entrepreneurial processes and the role of communication applied in the context of regional sustainable development. This learning experience will help students to sustain their future careers in important ways because students know what it takes to strategize when faced by complex challenges in many domains of society and have developed important social and practical competences to actually embark on such challenges and create favorable outcomes.

This on minor puts the student in the front seat of their own learning process but this comes with a responsibility of students and educational staff. Students must have a general interest in sustainable regional development. Furthermore, students must be interested to expand their knowledge of theoretical domains of entrepreneurship, psychology, new public governance and communication. Also, students need to be interested to apply these different theoretical domains to explore valuable socio-technological solutions to real-life challenges on a learning by doing basis. In doing so, students will benefit from deep-learning in multidisciplinary settings and gain important transferable skills valuable to advance their future careers.

Working with external stakeholders is a key feature of this minor. This minor considers external stakeholders as challenge providers. Challenge providers can be any regional party (citizen groups, networks, communities, entrepreneurs, municipalities, consultants, or policy makers) with an idea for regional sustainable development. However, it is important that there is no solution readily available and that the case/idea is complex and even controversial. Given the joint interest and efforts, challenge providers too are invited to engage and learn with the student team assigned to their challenge. In practice, this means that challenge providers are willing to participate in weekly meetings with their team to provide feedback and reflect on the progress including the final solution offered to them.

Student Experiences

"I really enjoyed it. My favourite part was the challenge based learning approach, providing room for self improvement in a fun interdisciplinary group environment. If you are interested in a active modern approach and the topic of sustainability in the future I can really recommend this minor. You will be working with real stakeholders on a real life problem. If you are not into groupwork and presentations it could be a little uncomfortable. But I didn't mind that. Just like with every group Assignment you need a little luck to be paired up with people who are motivated and want to put in some work."

Supply Management

General Information



Faculty

BMS



Credits

15



Phase

2A



Module

M7B

Additional Information

Basic knowledge about subjects like organization, operational management, strategy, marketing, bookkeeping and finances, and statistical computer skills are required.

Description of the Minor

The relationships between a firm and its suppliers are crucial in acquiring essential resources for achieving firm-level competitive advantage. It is argued that the nature of competition has shifted from interfirm competition toward supply chain versus supply chain struggles. In an average industrial firm in Central Europe, 60% of the turnover is purchasing volume. For firms to be successful, it is thus essential to professionally manage their main cost block. Therefore, the supply management function of a firm plays a vital and increasing role in attaining firm-level competitiveness. However, there are few opportunities for students to prepare for taking a job in purchasing, and the course supply management – SUM is one of them.

The SUM module will mainly consist of four integrated components, content-wise covering the year cycle of a purchaser and preparing an understanding of the work of a “commodity buyer”, i.e. a buyer responsible for sourcing a particular group of materials:

Tactical buying: This component covers demand identification over supplier selection till negotiation and contracting. This part also covers how to prepare for negotiations, what to consider and strategic decision-making, how to negotiate, create and claim value, and how to maintain a good relationship while staying firm on positions.

Strategic sourcing: This component covers the supplier performance evaluation as input for new commodity group strategy formulation and the required organisational and operational knowledge for its implementation. Tactical buying and strategic sourcing represent the central knowledge transfer part of the elective.

Supply management game & training: The students play a supply management game that cover topics from the “tactical buying” and “strategic sourcing” components. This skill development component aims to familiarise students with practices in the supply management domain. Therefore, the students will join an experiential learning design and apply the knowledge they acquired in the “tactical buying” and “strategic sourcing” components. Further, the students join a negotiation training that provides a deeper understanding of the social interactions involved in supply management.

In the project, students will research leading topics in practice and academia such as preferred customer status, public procurement, sustainable procurement, innovation-driven procurement, purchasing – R&D interface and strategic supply management.

Student Experiences

“The supply management minor is a great introduction to procurement in large companies. The theoretical part of the course focuses mainly on different strategies that buyers can use. Furthermore, you learn procurement through a serious game, in which you battle against other groups in class. There is more learning through competition in this minor, since you will be put up against your classmates in mock business negotiations. Lastly, throughout the whole minor you will work on a research project with your group and write a paper. Overall a very fun and refreshing way to learn practices utilized in the business world.”

Technology, Organisations and People

General Information



Faculty *BMS*



Credits *15*



Phase *1A*



Module *M1*

Description of the Minor

The module is based on four knowledge domains. (1) Operations Management: after completion of the course, students should have introductory knowledge of the following operations management theories and approaches: transformation process, manufacturing and service technologies, departmental technologies and workflow interdependence. (2) Organisation Theory: after completion of the course, students should have knowledge of the following organisational theories and approaches: scientific management, bureaucracy, strategic choice, open systems, contingency theory, resource dependency theory, stakeholder theory, organisational culture, organisational design and structure, including socio-technical designs. (3) Organisational Behaviour: after completion of the course, students should have introductory knowledge of the following organisational behaviour theories and approaches: motivation theories, communication, teams, and work design. (4) Research methods: after completion of the course, students should have a basic understanding of research methods to describe, analyse and design organisations, their people and their technology.

The goal of the project is to describe and analyse a real-life company. In this project, students will describe an organisation and analyse the fit between its organisational structure, technology, people, and other contingency factors, in to make an assessment of the effectiveness of the organisation. Next to the content-related challenges of this, the project work contains some further challenges for students: working together in a multinational team, writing a structured report based on academic standards, present orally and in writing the results of their company description and analysis to peers, coping with different interests and conflicts, planning and controlling a project, cooperating with companies based on a shared code of conduct, understanding the needs and expectations of the customer, interviewing, coordination between groups of students.

Student Experiences

"As it is a first-year module the classes were rather easy to follow. Despite this, I do think that the knowledge obtained within the minor is very valuable as you get the basics of management, and how organizations take shape. Another valuable aspect of the minor was that the project revolves around an actual company which you get to visit. Personally this was very exciting as this is not something you see within Psychology. The teachers in the module are very nice and willing to help you navigate the module! Definitely glad I choose this minor!"

Circular Economy Transition

General Information



Faculty *BMS*



Credits *15*



Phase *1B*



Module *M10*

Description of the Minor

The transition towards the Circular Economy requires that companies, citizens, and governments cooperatively take action for Circular Economy transition, which requires a multiple- and integrated-stakeholder understanding. The content of this module is divided into three different but interrelated perspectives, each related to one of the stakeholders: companies, society, and governments.

Within the company perspective, students will address the main circular strategies that companies can adopt to support the transition towards the Circular Economy, such as waste prevention, waste management, urban-industrial symbiosis, sustainable services, and end-of-life product management.

Within the society perspective, students will address the role that citizens, as (potential) consumers of goods and services produced by companies, can play to foster the Circular Economy transition (e.g., pro-environmental behaviour, sustainable consumption). The society perspective is approached from two perspectives. The society perspective is fostered via stakeholder communication perspective, where students will address the interplay between the three different stakeholders and learn how different communication strategies can foster the Circular Economy Transition. Within the government perspective, students will address the main policy actions that policymakers, at national and global level, can design to foster the Circular Economy transition (e.g., actions supporting environmental innovations by companies and sustainable behaviour by citizens).

Finally, students will enjoy an online serious "circular economy transition game" where they will experience the content of the lectures in a virtual environment and play the role of a citizen, a company, and a policy-maker to achieve circular economic transition in a cooperative way. Serious game is a group work and challenge-based and it is set up as a trans-disciplinary edutainment environment where technological innovations and energy transition challenges are in the practical core and embedded in the game set up.

Student Experiences

"The minor circular economy transition is all about sustainability and how 3 components, the consumers, the companies, and the government play a part in making the world a better place. Next to learning about all 3 components, there is a group game which nicely visualizes how difficult it is to balance every stakeholder's needs and values."

"The Circular Economy Transition is definitely a good minor if you just want to breathe for a bit. It is not particularly difficult and the exams are all very doable (except the CMT one, I did not study a minute for the other two). Nothing is mandatory, but if you attend the classes you are definitely in the advantage and do not have to study a lot over the winter break. The hardest part is without question the group work - at least for psychology students - which is a so-called "game". In reality, you just fill in a bunch of excel tables and need to calculate a lot, but my groupmates from other studies were way better at this. Overall, it is a super chill module, especially in the beginning and it is very exciting to learn about how to fix climate change from a psychological and economic perspective. One big critique for me which might not be as significant for others is that often companies are taken as positive examples that have absolutely nothing to do with actual environmentalism, so the module often falls trap to greenwashing. Otherwise I can totally recommend!"

Lead the Change

General Information



Faculty

BMS

Credits

15

Phase

1B

Module

M6

Description of the Minor


The future of organisational communication is complex and rapidly changing. Technology transforms current organisations, the job market, and our careers. Technological advances such as artificial intelligence, 3D printing, and robotics will change how we make products and deliver services. New jobs will be created, while some traditional work roles will probably vanish. Therefore, much like in the first industrial revolution, the role of humans is again being rapidly redefined. This module addresses the question of what the organisation of the future may look like and how communication processes can be optimised in these modern organisations. This is relevant as organisations are changing in many ways: our future workplace might be underpinned by virtual conferencing, as new work-based technologies and applications allow employees to work when, how, and where they want. New technologies will replace traditional jobs with “gig” or “freelance” work performed by self-employed workers. And other organisations are seeking to run their businesses using self-managing teams, without hierarchical managers that lead employees. But how do people identify with a virtual organisation when there is no physical space in which to meet colleagues face-to-face? What does leadership mean in organisations with self-managing teams? How do new work-based technologies affect collaboration between employees, their work attitudes, and optimal functioning? In this module, students will get acquainted with a variety of perspectives and processes regarding organisational communication, as these continue to develop and evolve.


Student Experiences

The Innovation Journey

General Information

 Faculty *BMS*

 Credits *15*

 Phase *2A*

 Module *M3*

Additional Information

Basic knowledge of descriptive and inferential data analysis, and experience with the description and analysis of data using R

Description of the Minor

Technological innovations are being developed faster than ever. However, many innovations do not successfully make it to market as they are often met with resistance and doubts by society. This is especially because innovators do not take into account the many possible forces that influence the success of their innovation, including the perception of relevant stakeholders. In reality, innovation projects usually involve many different stakeholders that have a 'make-or-break' influence, including competitors, investors, the government, and the general public. Luckily, the perceptions of these stakeholders are often freely available as they are reflected in the media. However, it is not easy to make sense of the multitude of opinions and views of all these stakeholders. Furthermore, unexpected events happening in society might negatively affect the perception of the innovation, ultimately leading to a crisis that seriously impacts the organization's reputation.

In this module, students will learn about the successes and failures during innovation development and implementation from a corporate communication perspective focusing on the role of stakeholder-, media-, and crisis communication. Students learn about the key processes of innovation development, the different stakeholders involved in those processes, the role of (news) media, and how to effectively use public relations and crisis communication. Students set up their own consultancy agency and are asked to professionally guide an innovator that is being exposed to the many forces and challenges that reflect organizational life in contemporary society.

Student Experiences

The Network Society

General Information



Faculty

BMS



Credits

15?



Phase

1A



Module

M5

Additional Information

Basic knowledge of descriptive and inferential data analysis, and experience with the description and analysis of data using R

Description of the Minor

The Internet is everywhere, all the time. With the shift from 'cables to wifi', the Internet as an infrastructure, however, has receded into the background of everyday life overhauled by powerful terms and metaphors, such as 'networks' and 'platforms'. This new language is used to describe relationships, economies, the movement of people and goods around the globe, technological infrastructures, and politics, or in short, the way contemporary society organizes itself. For example, the dominance of the Google search engine has turned 'google' into a transitive verb, while the world's biggest retailer Amazon lends itself perfectly to explore the impact of digital and communication technologies on labour, supply chains, publishing, urban planning, gaming, and so forth. In this module we will explore and discuss the multiple facets and dynamics of the 'network(ed) society.' We will explore how the 'digital' is shaping and being shaped by social, economic, and political forces with a special interest in relationships - who is in contact with who behind the scenes and with what social, political, economic and epistemological ramifications? We will particularly delve into the relationships between networked digital technologies, economics, governance, labour, cultures, and the ways we think about ourselves, communities, careers, and futures. In addition to these discussions, we will use R - a software environment for statistical computing and graphics - to learn how to conduct social network analysis and try out a variety of social media technologies, thereby focusing on aspects of (transmedia) storytelling and audio-visual design, culminating in the creation of a transmedia story (using a combination of e.g., vlog, podcast, Instagram stories, live-stream and social network analysis) on technology and society. At the end of the module, students will be able to critically assess the increasing global infrastructure for connectivity associated with the network society, and to discuss the challenges this process brings in terms of access to communication, knowledge and democratic life.

Student Experiences

"This minor offers the opportunity to learn about how networking works and how information spread through (social) media, but also through interaction with others. You work along a group of experienced COM students and on real application cases, where you design COM solutions and promotion material, like in a real project. The course offers a variety of shorter assignments, which test the different knowledge input, the most exciting of which are short debates where the opinion and knowledge of the students is tested. Given the fact that the study is smaller than PSY, the teachers are friendlier and more available to the students. Networking Society is all about communication and networking, which makes the minor so much fun!"

Global Crises, Local Challenges

General Information

**Faculty***BMS***Credits***15***Phase***1A***Module***M1*

Description of the Minor

In our Challenge-Based Learning (CBL) minor, you will become familiar with the global climate and ecological crises we are facing and with the ways scientists and citizens can help address these challenges. The minor has two taught components and a challenge-based project. The core course (5 ECTS) consists of ten lectures dealing with climate change, biodiversity loss and the global injustices that are bound up with them. You will learn about successes and failures in governing these crises and the steep road ahead of us. The skills workshop (5 ECTS) consists of eight seminars dealing with the qualitative and quantitative methods of action research. You will learn about interviewing, interdisciplinary collaboration and the forms of citizen inclusion that are quintessential to CBL. The challenge-based component (5 ECTS) extends upon the insights from the core course and the skills you have developed. In a smaller group, you learn how to translate global crises into a local challenge related to energy poverty, fast fashion or (un)sustainable food practices. The interaction with – and learning from – communities and stakeholders beyond the campus is key here. In three interactive ‘pop-up classrooms’ you engage with stakeholders, learning from their experiences and questions, developing a solution that could help them move further and reflect together on the possibilities and pitfalls of your proposal.

By studying global crises in the above-mentioned ways, you will be able to apply systems thinking at large to the many social and ecological challenges we face today. To do so, you will be asked to co-define a contemporary challenge related to the implementation of and propose solutions indicating the way ahead from a variety of stakeholder and governance perspectives. In this way, you will contribute to solutions that do justice to local and global communities as well as to the urgency and speed of the societal transformations needed to secure a liveable planet for future generations.

Student Experiences

Public Governance across Countries

General Information



Faculty

BMS



Credits

15



Phase

1B



Module

M6

Description of the Minor

The focus of this module is on comparative public governance in a globalizing, dynamic, complex, and transforming world context. Many of the contemporary challenges facing governments today are similar in nature, transcending borders and regime types. However, the contexts in which governments seek to solve such problems vary across the globe. It is thus critical for us to adopt a comparative lens in thinking about public governance. Students are encouraged to think beyond their national contexts, to a globalizing world in which transboundary policy issues are becoming increasingly prevalent. We place particular emphasis on the national government as the key political-administrative actor of interest in this module. We give special attention to the plurality of contexts and varying perspectives, especially in the global South and we attempt to move away from having a Western perspective as the dominant framework. This module builds on the basics of globalization as a societal process of transformation, which students were introduced to in Module 2. To understand differences in national contexts, and how to analyze and study them, this module builds on theoretical and methodological core foundations. Digital governance, and the governance of digital technologies, are key considerations for 21st century governments across the globe and will be a key element of this module. The design of comparative research based on sound and rigorous methods is important for examining different national contexts. Students enrolled in this module will be equipped with the key methods for conducting comparative research.

This module will have four built-in perspectives: (a) global exposure; (b) critical analytical perspective; (c) socio-technological consciousness; and (d) problem-oriented focus.

Some of the central questions this course will expose students to are:

- How can we analytically compare between different national contexts?
 - How can variations in national contexts influence policy output and outcomes?
- How are digital transformations influencing governments around the world? and how do governments try to govern technology?

Finally, by way of applying the theories and methods learned, students enrolled in this module will comparatively reflect on the performance of nations around the world, with their varying political systems, path-dependent histories, power structures, administrative traditions, and socio-economic profiles, in achieving the UN Sustainable Development Goals.

Student Experiences

"I chose the minor 'Public Governance Across Countries' in my 3rd year (some parts I, apparently, liked so much that I completed the exam 4 times (once successfully)). Overall, the minor was a good and basic introduction/foundation for insights into European politics. I can recommend the minor to everyone that is interested in European/Global politics as you will be expected to independently keep up with news since they are relevant to most courses. As well as that an interested/liking for (political) discussions is a benefit."

Behavioural Public Administration

General Information



Faculty *BMS*



Credits *15*



Phase *2B*



Module *M8B*

Additional Information

Basic knowledge of inferential statistics and public organisations is recommended (there is a pdf book to get the basic knowledge about public organisations)

Description of the Minor

This module equips students with a fundamental understanding of how the individual micro-foundations of citizens' and public servants' behaviour affect public administration processes and it provides students with tools to discover these relationships. The module comprises four integrated parts, including lectures, tutorials and project work groups.

Component A provides key behavioural concepts and theories that help to understand the general micro-foundations of citizens' and public servants' behaviour especially but not limited to times of technological change. The module introduces how experimental research helps to understand the drivers of individual behaviour in specific public administration contexts.

Component B provides detailed insights in the determinants of public order and social safety to provide in-depth knowledge and understanding of a specific domain of behaviour public administration. In the context of neighbourhood safety and community-policing, students will become acquainted with the ways cities transform and their impact on public order and social safety, and with the influence of technology on public behaviour, social control and societal reactions to disorder (among these civic activism and surveillance by government). The student will describe and apply relevant theories and identify factors influencing societal and administrative reactions to disorder and protests.

This module explores how individual human behaviour is influenced by external factors, changes and can trigger change. We can analyse triggers like reward and punishment and determinants as treatments in experimental settings – with the advantage of getting closer to causal relationships than other research designs do. These advantages, but also disadvantages and concrete design elements are the core topic of the method course in this module: experimental research methods (Component C). In the project component (Component D), experimental designs will be applied in a research project, in which students focus on behaviour in public safety relevant scenarios.

Student Experiences

EU Governance and Policy: Shaping Europe

General Information



Faculty

BMS

Credits

15



Phase

2A



Module

M7A

Description of the Minor

This module is part of the European Studies (ES) specialization track of Management, Society and Technology and Public Governance across Borders. Many of today's grand societal challenges, including mass migration, sustainability challenges, and digital transformation, are of such a nature that they cannot be effectively addressed by national or local governments. As such challenges transcend local and national borders, they are typically addressed by international, inter-governmental and supra-national authorities like the European Union. This module focuses on the EU's addressing of grand societal challenges (for instance, in the form of the European Green Deal, the EU's AI Strategy and the European Digital Single Market), in a context of structural societal and technological transformation and the shaping of a new technological era (like the 'era of AI'). The EU must find new ways to govern and to strengthen existing policy infrastructures, to keep the European economy running, protect democratic values and institutions, and to ensure prosperity for all European citizens. And for this, the EU needs political and administrative capabilities to deal with the grand challenges and consequences of transformations in various of the EU's policy domains, such as security, economic policy, welfare policy, migration policy, protection of democratic values, and so forth. Theoretically, using various theories and scholarly insights on (re-)shaping Europe, we explore how the EU addresses grand societal challenges in a context of transformation of the European economy and society at large. In the project, small project groups of students closely study various policy issues of the EU's shaping of digital Europe, in order to make sense of how and to what extent the EU responds to the grand challenge of digital transformation and seeks to shape a fair, digital and sustainable Europe.

Student Experiences

Global Governance

General Information



Faculty

BMS

Credits

15

Phase

2B

Module

M8A

Description of the Minor

The module has three taught components and a project. In this module, you will learn about Global Governance from a plurality of perspectives. The first perspective will give students insight over the key institutional players of global governance with special attention to Institutions (UN and the EU) and international regulatory regimes such as development cooperation, migration, data protection, and trade). Secondly, Information and Communication Technology for Development (ICT4D) aims to integrate ICTs in development strategies, planning, implementation, and evaluation to close the digital divide, build ICT capacity for development, and empower individuals to reach their potentials with the help of enabling technologies. Thirdly, students will learn more about the role of cities in shaping global governance. It will learn about innovations in urban governance and how local governments are leveraging these innovations alongside trans-municipal cooperation to exert their influence in the global policy arena.

By studying global governance in the above-mentioned perspectives, you will be able to apply insights from public administration at large to the many human and technological challenges of the contemporary world. To do so, you will be asked to analyse a contemporary wicked challenge related to the implementation of the UN Sustainable Development Goals and propose solutions indicating the way ahead from a policy and governance perspective. In this way, you will contribute to building resilient communities for future generations.

Student Experiences

Governance and Sustainability

General Information



Faculty

BMS

Credits

15



Phase

1A



Module

M5

Additional Information

Knowledge about introduction to public administration and political science is assumed

Description of the Minor

This module serves to study governance as a concept and a practice in urban settings. Governance is all about steering. It concerns who sits at the table when discussing priorities and benchmarks for public policy, urban planning, allocating resources or evaluating performance in preparation for policy assessment and change, and the dynamics between them. It is the process through which resources are accessed and distributed in a polity. We apply these concepts to urban policies related to the United Nation's 2015 Sustainable Development Goals (SDGs). At the same time, the city is shaped by accompanying developments that has both enabled and spurred cities to innovate their governance systems, and given rise to new dynamics which are interesting for study. Thus, this module focuses on city making at the locus of policy, governance and technology, and evaluates its performance.

Set against the backdrop of rapid societal, ecological, and technological change, this module examines how governance arrangements impact the ability of cities to become more sustainable and resilient. Local communities are where the "rubber meets the road" in the pursuit of SDGs. To understand these processes, students will examine a broad range of urban governance arrangements that veer away from traditional governance architectures. Recently, activists, scholars, and citizens have begun to challenge old paradigms and ask, "Who has the right to the city?" These stakeholders make a claim on their rights to participate, advise and (co-)determine outcomes. City officials are increasingly heeding these claims, and involving citizens in city making. The current impetus (both political and practical) for governance arrangements to balance attention to various stakeholders and requires a revision of how local officials do their jobs. Rapid digitalization in cities create new challenges and opportunities in this regard while influencing how citizens relate to one another and to government. Accordingly, the module explores the biases that different governance arrangements carry forward and evaluate their impact on sustainability outcomes (as outlined in the SDGs).

Student Experiences

Policy-Making and Planning

General Information



Faculty

BMS

Credits

15



Phase

2A



Module

M7B

Description of the Minor

Anyone who has been involved in complex policymaking (politicians, managers, lobbyists, citizens) notices that good ideas sometimes disappear during the decision-making process, while sub-optimal outcomes are chosen. This observation touches upon a core question of Public Administration: complex decision-making processes often produce outcomes that are contested and perceived as illegitimate—at least by some stakeholders. With only 20% information available, public leaders must select a course of action. The question is: how can we explain and steer the outcomes of policymaking, so that better and more impactful collective decision are adopted? In this module students learn the intricacies of collective decision-making. They learn to understand analytically that there exists no design of decision-making that can fully protect groups of decision-makers from irrational decisions. From that axiomatic starting point, the module explores the conditions under which collective decision-making can become predictable (stable) and legitimate. We borrow from the fields of Political Science, Public Administration, Economics, and Law. Practically, students apply their knowledge using analytical models that allow them to explain or predict why some collective outcomes can be attained, while other outcomes are unreachable in the dynamics of political interaction. Students practise and reflect on their political decision-making skills in a simulation of collective decision-making about a complex technological project.

Students learn, moreover, the determinants of policy success and failure, what policy evaluation entails and what functions it performs. Often, governments and public organisations have a legal obligation to carry out policy evaluations. Frequently, when introducing new statutory regulations, it is required that the new regulation must be evaluated within a certain period. Sometimes, evaluations are 'enforced' by 'external parties' (e.g., initiated by parliament towards administration). Public administrations can also take the initiative themselves to review policies. Students learn to understand and apply different models of evaluation and various methods and techniques of policy evaluation. Practically, students apply their knowledge in small groups to explain or predict why some policies succeed or fail. In the project, small project groups of students closely study a complex empirical policymaking process of their own choice, to explain and predict the outcomes of policymaking and their success or failure. Examples include: the location of new nuclear power plants, the development of the JSF fighter, the adoption and implementation of EU artificial intelligence policy, or the construction and planning of the new Berlin airport.

Student Experiences

Intelligence, Creativity and Responsible Technological Innovation in Societal Transformations 47

General Information



Faculty *BMS*



Credits *30*



Phase *1A + 1B*



Module */*

Additional Information

This minor can only be taken as a 30 EC course and will thus be during both block 1A and block 1B

Description of the Minor

This Challenge-Based Research/Learning (CBR/L) minor will provide students with the knowledge and skills necessary to understand the complex issues of modern society, and to conduct inter-and transdisciplinary research aimed at mitigating these issues. In the CBR/L project, students will learn to investigate these issues (the challenges) from various disciplinary perspectives. The overarching learning objective of the minor is the ability to conduct inter-and transdisciplinary research aimed at responsible and innovative technology in the context of societal challenges. Students will learn to investigate a challenge that requests a trans- and interdisciplinary approach, utilising and integrating knowledge and methods from the engineering and social sciences and the humanities. They will collaborate on a challenge in a multidisciplinary team consisting of students and teachers from different bachelor programmes, researchers from other institutes, and the 'challenge-provider' from companies, NGOs, industry, etc. Students will put together their own personal study programme. We call this a personal development plan (PDP). Writing the PDP starts with the question of what you would like to learn in the CBR/L project given the overarching learning objective. Hence, the minor has a general learning objective, but students decide how they fill this in. To support the development of personal, professional and academic skills relevant to the overarching learning objective (i.e., ability to conduct inter-and transdisciplinary research etc.), the minor programme offers a menu of micro-modules (1 ECs). Students can choose a set of micro-modules from this menu to help them develop the skills described in their PDP – this approach is called scaffolding. In addition, students can choose content courses (from other programmes or online courses) to gain knowledge relevant to the CBR/L project. The study-units (micro-modules and courses) each have their own learning objectives and assessment. The educational idea is that students exercise what they learn in the micro-module (on skills) when conducting the CBL project. Altogether, the 30 ECTS programme will consist of 13-18 ECs coursework, consisting of the micromodules and one or two electives. The remaining 12-17 ECs consists of project work. The choice between these versions of the minor is substantiated and justified in the PDP.

Student Experiences

Governance of Student Organisation (Board Minor)

General Information



Faculty

BMS



Credits

15



Phase

*1B, 2A
and 2B*



Module

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Additional Information

Only applicable for students doing a Board year

Description of the Minor

The university has more than one hundred student organisations, which enrich students' academic learning, personal development, and social life in numerous ways. The students who take up a position in the governing board of such organisations sometimes put their degree programme on a hold for a year, while others combine their board membership with teaching. The aim of this minor is to provide both groups of students an opportunity to broaden and deepen their academic development by offering a teaching programme that exploits the unique opportunity that their special position in a governing board brings. On the one hand, this minor aims to familiarise such students with insights from governance sciences from which they may benefit in their role on such a board. On the other hand, the minor also takes advantage of the situation by using those positions and organisations as an object of study.

Student Experiences

Structures and Models

General Information



Faculty

EEMCS



Credits

15



Phase

1A



Module

M1

Description of the Minor

This module is the first acquaintance with studying Applied Mathematics. An important step towards being a mathematician is to be able to perform abstract and formal reasoning. The first taste of these is received through the courses Linear Structures-1 and Analysis-1. On the other hand, an integral part of being an applied mathematician is to be able to formulate mathematical models for real-life problems and analyse them, which, in turn, may require programming. Exposure to these skills will be brought through the course Modeling and Programming-1.

Study units:

- Linear Structures 1
- Modelling and Programming 1
- Analysis 1

Student Experiences

Structures and Systems

General Information



Faculty

EEMCS

Credits

15

Phase

1B

Module

M2

Description of the Minor

This module continues the fundamental courses Analysis and Linear Structures from the Applied Mathematics module 1. In Systems Theory, the concepts from Linear structures are applied.

Study units:

- Linear Structures 2
- Systems Theory
- Analysis 2

Student Experiences

Business and Process Analytics

General Information



Faculty

EEMCS



Credits

15



Phase

2A



Module

M3

Additional Information

Module 1 and 2 of the BIT programme are advised

Description of the Minor

This module lies at the border between Business and IT. More exactly, all topics included in the module reveal yet another aspect related to the usage of IT in organisations. Another core idea behind this module is that students learn how to design information systems that provide solutions for a business problem. To this end, the idea we promote is that systems must be designed to serve the business and its needs, as opposed to the idea that organisations must use information systems.

The study units:

- | | |
|---------------------------------------|----------|
| ▪ Business Intelligence and Databases | 4,5 ECTS |
| ▪ Business Process Management | 4,5 ECTS |
| ▪ Research Methods | 2,5 ECTS |
| ▪ Academic Skills | 0,5 ECTS |
| ▪ Linear Algebra | 3 ECTS |

Student Experiences

Esports

General Information



Faculty

EEMCS



Credits

15



Phase

2A



Module

M

Description of the Minor

In esports professional gamers compete in global gaming competitions, while being part of (professional) esports organisations. A popular games in which players and teams compete is League of legends. Similar to traditional sports teams, these organisations are composed of athletes, sport psychologists, cognitive scientists, nutritionists, health specialists, and data scientists that are all aiming to optimise the performance of the exporters. Other key stakeholders in the esports ecosystem are the publishers (owners of the games in which is being competed), the event organisers (and broadcasters) and the spectators. What sets esports organisations apart from traditional sports organisations is that they are highly digital by nature, per definition are multidisciplinary, often multinational, and operate in a rapidly changing (global) environment that is highly influenced by internet and gaming culture.

As a discipline that is maturing as a sport, a vast amount of effort is put into analysing the player, the game and the context in which both operate. What player attributes determine player performance? How can we extract and interpret performance-related variables from the game? How can we prepare players for the adrenaline-filled matches (performing under stress)? How should an esports organisation operate in the multidisciplinary, multinational, culturally diverse and digital environment? How can we create novel insights for the player, the coach, the audience, but also for the growing number of casual gamers and society. The latter, society, refers to the fact that esports organisations can be seen as highly dynamic digital organisations from which lessons learned can be transferred to 'traditional' organisations (i.e. remote work, team collaboration, -event- logistics, ict infrastructure, performance dashboards), other domains (i.e. health, data science, nutrition, sensing) or which can be applied within a specific domain for a specific purpose (i.e. youth care, recruitment, inclusion).

In the current minor students will learn about the challenges in esports as well as the opportunities that esports provides for other domains. During the minor students will also be provided with the opportunity to gain experience in tackling these challenges first hand by applying state of the art measurement techniques, scientific and practical knowledge from literature and (guest) lecturers.

Student Experiences

"The course teaches the students about the trending topic of competitive electronic games. It focuses on the competitive elements, the game development and the company supporting e-sports. The students work in interdisciplinary groups on smaller projects, as well as a longer project, where an e-sports company is presented. The students get a lot of contact with not only the teacher of the course, but also with a variety of experts in the field, who can guide them further in the business and help them network already at this learning stage. Throughout the course, electronic gaming is kind of expected."

From Product Design to Online Business

General Information



Faculty

EEMCS



Credits

15



Phase

2A



Module

M7

Additional Information

Knowledge of M1-6 from the IEM programme is preferred

Description of the Minor

Students will learn theory and practice of designing and implementing an innovative business. The knowledge acquired applies to both startup business as well as innovating business models in existing industries. Key to this module is that theory of module 1-6 will be applied as well as extended with new concepts from strategy, business modelling, marketing, finance, production and service design, supply chain management, ICT architecture and ERP systems, sustainability ethics and philosophy, and legal. In all these areas the module will put emphasis on how these functional areas are transformed using ICT in firms engaged in e-business, thus making extensive use of the possibilities of ICT and internet. Such firms are also called the digital firm, industry 4.0 etc. Unique to the module is the project in which teams of students create an online business in several weeks from a design concept to a working online business configuring and setting up an ERP system that provides integrated support from an online shop to procurement, finance, project management, marketing, etc. Student thus experience how all these business areas are related and can benefit from process integration. Students will also reflect on their business design, sourcing decisions, and sustainability policies and the regulatory framework their business operates in. The module further develops research and professional skills such as creative thinking, reflecting on scientific theories and communicating complex concepts.

Student Experiences

Introduction to BIT

General Information



Faculty

EEMCS

Credits

15

Phase

1A

Module

M1

Additional Information

Highschool math A and B preferred

Description of the Minor

This module aims to give students an overview of the field of Business & IT (BIT), by analyzing several business and IT problems from different perspectives, and teaching students how to design an integral solution. Students are supplied with the necessary know-how, and experience that design, research, and decision-making can be done in a systematic way, as opposed to a merely common-sense approach. Secondly, this module gives an overview of the topics to come during their bachelor program. Several Computer Science and Business Administration themes are discussed weekly, which will be explained in depth in one of the later modules in their studies. Finally, this module aims to be selective. By giving students a good overview of the themes and the academic level of the courses, at the end of the module students should be able to understand if this is the right study program for them.

During each odd week (1, 3, 5, and 7) teaching is focusing on a certain BIT theme: production management, information management, supply chain management & sourcing, and financial management. Additionally, throughout the module, students will focus on acquiring basic algorithmic and programming skills in languages such as Python and Java, and on understanding the foundational knowledge concerning computer networks and operating systems. Most of the above-mentioned themes and the project follow the design & engineering cycle: Introduction –Analysis –Design –Implementation –Evaluation. The design cycle is the methodological core of all BIT modules. By connecting the teaching to the design cycle, the knowledge and skills to be taught are put in context. Although project work starts right from week 1 of the module, from week 8 the major focus is on finalizing the project. For the BIT students the project aims at designing and implementing an App for different users and stakeholders of the Batavieren Race (athletes, spectators, organizing committee, different assisting groups (doctors, first aid, parking planners, etc.).

Student Experiences

Serious Gaming

General Information



Faculty *EEMCS*



Credits *15*



Phase *1A*



Module */*

Description of the Minor

The Serious Game Design Module provides students with a theory-driven play-centric approach to serious game design. This course does not need programming skills and will focus on design. During the module groups of students will develop, play and validate a serious game. The developed games should have an instructional value in other courses within the University of Twente, or have an added value for external partners. Domains are (but are not limited to) health, logistics & retail, business processes, psychology and game development itself. During the Serious Game Design Module two parallel tracks co-exist: the serious game design project and a theoretical serious game design track both following a cyclic model:

1. Apply Business Modeling Theory, Create BM for serious games, experiment, and reflect
2. Create, Play, and Reflect on a Serious Game in one application domain
3. Logistical game theory, play a supply chain game, create, play, and reflect on logistic applications of gaming & simulations
4. Health game theory, play obesity game, create, play, and reflect on health apps
5. Investigate the entertainment gaming domain, play a music learning game, create, play, and reflect on the entertainment domain
6. Safety game theory, play disaster game, create risk management, and reflect

Student Experiences

"It's lots of fun but something to get used to first, particularly if you're generally very organised and like the structure of a minor/class to be organised. You have endless freedoms and might get surprised by what else you need to do :D. It's a minor that is as creatively constructed as the creative style of working itself. It teaches you to take initiative and go outside of your box. Also you play lots of games and create many of your own. And you don't need to particularly like playing games to enjoy these activities :) (extra note from someone that initially had nothing to do with games)."

General Information



Faculty *EEMCS*



Credits *15*



Phase *1B*



Module *M2*

Additional Information

The minor builds upon programming knowledge acquired in the BIT M1 course

Description of the Minor

In this module, the students are introduced to the design, implementation, and testing of software systems and independently perform a project.

Students learn to use Software Engineering models in the design unit, particularly the UML diagrams (class diagrams, activity diagrams, and state charts). Students also get acquainted with the waterfall software development processes.

In the programming learning unit, students learn the core concepts of computer programming with the language Java. It includes object-orientation programming (OOP), and multi-threading. Students learn to develop software with attention to correctness through (informal) preconditions and postconditions. The module also addresses security engineering aspects in the context of Java. For testing software systems, the students learn to distinguish among the different levels at which testing can be performed (especially unit testing and system testing), the principles underlying a test plan, and a couple of relatively simple testing techniques.

The academic skills unit focuses on techniques for effective self-learning and ownership of one's Learning Journey, receiving and giving constructive feedback, task planning and progress tracking, time management, and procrastination avoidance. This unit is tightly attached to the Programming unit. Therefore, following the programming unit requires following the Academic Skills unit too. The techniques for effective self-learning are learned and immediately applied to the learning of programming.

Student Experiences

Network Systems

General Information



Faculty *EEMCS*



Credits *15*



Phase *2A*



Module *M3*

Description of the Minor

The Internet is a good example of a computer network. How does this kind of network operate? In this module, you will learn more about how information is sent and received in small packets – through cables or a wireless system – how the best path through a network is found, and how you can prevent the packets from getting damaged or lost on the way. Other topics in this module are network applications, protection against misuse, and the scalability of large networks.

Study units:

- Network Systems Core 12 EC
- Programming 2 3 EC

Student Experiences

Pearls of Computer Science

General Information



Faculty

EEMCS

Credits

15

Phase

1A

Module

M1

Additional Information

Highschool VWO Math B is required

Description of the Minor

The module Pearls of Computer Science is the first module of the first year of Technical Computer Science. The student receives an introduction to eight 'pearls' of computer science covering the breadth of the discipline. The pearls are computer architecture, algorithms, designing database systems, functional programming, cryptography, computer networks and operating systems, and intelligent interaction. They are followed by a pearl on designing requirements for a project, then by the project itself. The content of these eight pearls is covered in more depth in the remainder of the TCS programme; either in the mandatory core (consisting of modules 1-7) or in the elective space.

Study units:

- Pearls of Computer Science Core 11 EC
- Intro to Math + Calculus 4 EC

Student Experiences

Software Systems

General Information



Faculty *EEMCS*



Credits *15*



Phase *1B*



Module *M2*

Additional Information

Highschool VWO Math B is required

Description of the Minor

Software Systems is the second module of the first year of Technical Computer Science. In this module, the students are introduced to the design, implementation and testing of software systems, and to performing a project independently.

For the design of software systems, they learn to design and document systems using Software Engineering models, such as class diagrams, activity diagrams and state machines; they also get familiar with the waterfall software development processes and using software metrics.

For the programming of software systems, they learn the important concepts of iterative programming, object-oriented programming, programming patterns, basic concurrency and basic networking with the help of the Java programming language.

Study units:

- Software Systems Core 12 EC
- Calculus 1B for Computer Science 3 EC

Student Experiences

Area Development

General Information



Faculty

ET



Credits

15



Phase

2A



Module

M7

Description of the Minor

This module provides an interdisciplinary perspective on area development. Students learn how to develop an area with attention for the impacts on water, transport and other spatial functions, the energy transition and adaptation to climate change and taking into account the stakeholder, policy and legal context, and societal costs and benefits. The module includes four subjects and one integrated project. Each subject is assessed in an individual (digital) exam. In the project, students apply their knowledge about these subjects and additional themes to a real-life case.

Subjects

- Practical GIS
- Spatial Policy & law
- Economic Assessment
- Stakeholder Analysis & Management

Student Experiences

Smart Cities – Multifunctional Flood Defences

General Information



Faculty

ET



Credits

15



Phase

1A



Module

/

Additional Information

Knowledge of Math and Physics at VWO level is assumed

Description of the Minor

In this module students will create and design a Multifunctional Flood Defences as an innovative Nature Based Solution. Students will master learn in-depth knowledge related to MFDs and apply this knowledge in an interdisciplinary design and co-create a physical scale model for the study area.

Under the increasing pressure of growing population, urbanisation and climate change, the worldwide number of citizens threatened by floods is increasing. This increase puts pressure on the use of space in deltaic regions – where roughly 40% of the global population nowadays live – all around the world; there is an urge to effectively use the available space along coasts and rivers. Multifunctional flood defences increasingly raise interest as a nature-based solution in many regions around the world (e.g. New York, Japan and the Netherlands). Compared to conventional flood defences, an increasing number of design requirements needs to be considered for MFDs, such as its use functions, spatial planning, flood safety and location specific environmental characteristics, with an associated increasing number of actors. In this module, students are introduced to the opportunities and challenges in Nature Based Solutions for flood protection. This module teaches integration of knowledge from various scientific fields, addresses interdisciplinary co-creation and combines it in a practical design project. Students are asked to go in-depth in their own scientific field, while integrating their results in interdisciplinary teams. The final product of this module is a design of a MFD for the study area for which students will also create a physical visualization in the form of a scale model.

In this module, students learn to integrate knowledge from various scientific fields related to Multifunctional Flood Defences, learn to design in an interdisciplinary team and learn to use expert knowledge to co-create a physical scale model of a Multifunctional Flood Defence. Yearly varying state-of-the-art topics, essential for MFD design, are introduced. Students go in-depth into one of these topics, while integrating their results in interdisciplinary teams.

Student Experiences

Water Management

General Information



Faculty

ET



Credits

15



Phase

1B



Module

M2

Additional Information

Knowledge of Math A and Physics
A level is assumed

Description of the Minor

The module Water Management focuses on the physical and governance aspects of water management. In this module, students learn about the behaviour of different natural water systems and the effects of human interventions on these systems. Students get acquainted with the basic principles of policy processes such that they understand how certain management objectives related to (natural) water systems can be achieved administratively. An important aspect within the module is that the students learn i) to describe the behaviour of water systems quantitatively, ii) to simulate the dynamics of a water system using mathematical formulations and models and quantify the effects of changes in the natural system due to human interventions, and iii) to apply appropriate methods for stakeholder analysis and to incorporate stakeholder preferences into the weighting of alternatives.

The project focuses on the design and management of a reservoir in the Blue Nile River regarding an optimal water distribution amongst different users in Ethiopia and Sudan. The students need to make a proposal for the design of a reservoir in project groups, taking into account different scenarios (e.g. with respect to meteorological conditions and user criteria). In the first orientation phase a Plan of Action is made for the project. Thereafter, a Broad Problem Exploration is carried out, focusing on the system analysis of the Blue Nile. Several perspectives have to be included (technical and non-technical) using information about this specific case, computer models (Python) for simulating water system dynamics, technical knowledge about fluid mechanics and water management, and methods from governance of multi-actor problems. The students need to select a location for the dam based on this knowledge, design the dam and develop a simulation model (using Python) to optimize the management of the reservoir for specific scenarios.

Student Experiences

Fluid Mechanics and Heat Transfer

General Information



Faculty

ET



Credits

15



Phase

2A



Module

M7

Description of the Minor

The module “Fluid Mechanics & Heat Transfer” aims at learning to understand and being able to apply the disciplines of fluid mechanics and heat transfer in view of engineering problems. The module consists of several module parts, every part has its own learning objectives. The module overview is given below:

- Fluid Mechanics 1
- Heat Transfer
- Project Fluids Engineering & Academic Skills 7

Student Experiences

Consultants in de Zorg

General Information



Faculty

TNW



Credits

15



Phase

2B



Module

M8

Additional Information

Course is in Dutch

Basic knowledge about organisational structures, management and research methods (more on the Osiris page)

Description of the Minor

De studenten leren een vraagstelling binnen het domein van gezondheidswetenschappen op methodische wijze te benaderen (Algemeen Bedrijfskundige Probleemaanpak, ABP) en in samenwerking met collega's een advies te formuleren voor de opdrachtgever. Zij doen dit door de mening van alle stakeholders mee te nemen en financiële, personele, technische en juridische kaders in acht te nemen bij de implementatie van een mogelijk ontwerp. De wijze van onderzoeken en ontwerpen kenmerkt zich door de wetenschappelijke benadering. Studenten kunnen kenmerken van effectieve teams beschrijven en deze toepassen in de zorgcontext. Studenten kunnen het werkproces in het eigen projectteam analyseren en reflecteren op de persoonlijke rol als consultant.

Tien tot twaalf organisaties in het zorgdomein hebben een gezondheidswetenschappelijk vraagstuk. Elk van deze opdrachtgevers legt één vraagstuk voor aan een projectgroep met daarbij de verwachting dat zij hun expertise inzetten om te komen tot een advies. Tijdens deze module zal elke projectgroep functioneren als een team van zorgconsultants werkzaam bij zorgadviesbureau dat ingeschakeld is door de betreffende zorgorganisatie om een advies te kunnen geven ten aanzien van de gestelde vragen. Naast een adviesrapport verwacht de opdrachtgever ook een mondelinge presentatie van het advies en het proces dat is doorlopen om tot het advies te komen.

Student Experiences

Health Technology in Society

General Information



Faculty

TNW



Credits

15



Phase

2A



Module

M7

Additional Information

Knowledge about statistical analyses in R is assumed.

Description of the Minor

Newly graduated Health Scientists undoubtedly have the ambition to improve healthcare. Increasingly, health technology is used to reach this goal. The basic assumption underlying this is that technology will lead to lower cost, better and more efficient care. However, the practice of implementing new technologies in care is challenging, complex and sometimes even controversial. For example, think about the changing views on sickness and health because of the use of health technology, as can be seen by the changed perspective on the status of a foetus since the introduction of the ultrasound. Also, think about the shifting tasks and responsibilities because of the implementation of technology. A diabetic patient now monitors their own health values and only meets their physicians once a year instead of monthly. What does that mean for their responsibilities, who is responsible for the patients health? Finally, the implementation itself raises an array of questions and challenges, because of which promising technologies do not reach the market or practice, despite successful pilot tests.

An important aim of this module is to make Health Science students aware of, and offer them the knowledge and skills that are needed to deal with the complexity of development and implementation of health technology. Students are given a broad theoretical base about the development and implementation of health technologies that are aimed at changing behaviour. Students are also given insight into philosophical approaches within philosophy and ethics of technology, and learn to apply these insights to health technologies.

Besides that, students gain experience with the different roles a Health Scientist can fulfil, via project work: from giving policy advice and writing scientific articles, to dealing with the media and giving an elevator pitch for investors. Therefore, students who have completed this module will be able to, with their critical-analytic thinking, contribute to successful and responsible implementation of new health technologies in existing healthcare.

Student Experiences

Health Economics & Accounting

General Information



Faculty

TNW



Credits

15



Phase

1A



Module

M5

Additional Information

Basic knowledge of the statistical software R is assumed

Description of the Minor

The number of health care technologies and services to care and cure ill-health are exponentially increasing in the last decade, due to, among others, rapid development in digital health services like mobile phone applications, AI, AR, and VR. These are increasingly used to empower patients, but also to provide health care at the right place and at the right moment. Using these new technologies and services however comes at a cost which puts pressure on the health care budget. To prevent health care costs to exceed the set budget, local governments, health insurers and health care providers strive to come up with appropriate and cost-effective services for society. The goal of this module is to provide students with theoretical training in the economics of health and healthcare, health economic evaluation and financial management as well as soft skills in program development and marketing. Combined with the creative and critical thinking of students, innovative processes and “products” for specific patient groups will be developed in the project of this module. The project is articulated around real-world challenges, introduced by stakeholders from the field, for which students have to design solutions. To support students in their project work, they will be armed with theoretical skills that will allow them to appreciate the causes and consequences of the growing and changing demand for health care including the (macro) socio-economic and (meso) financial aspects of care processes and products. Key concepts that will be covered include the supply (of health care) and (derived) demand (for health care) and the (health care) market. In addition, the concepts of efficiency and cost-effectiveness will be addressed given the challenge of balancing scarce resources with the wants and needs of the population. During the project, the stakeholders introducing the challenge will be available to answer the students’ question concerning the suitability of their designed solution. Besides the fundamentals of (health) economics, students will likewise be afforded important, principal training in management with a focus on financial and management accounting.

Student Experiences

Klinisch Wetenschappelijk Onderzoek

General Information



Faculty *TNW*



Credits *15*



Phase *1B*



Module *M6*

Additional Information

This module is given in Dutch only

Description of the Minor

In deze module leert de student academische onderzoeksvaardigheden welke aansluiten bij problemen uit de dagelijkse praktijk van de gezondheidszorg en de klinische praktijk. De student leert problemen op het terrein van de kliniek in kaart te brengen en deze om te zetten in een medisch wetenschappelijke vraagstelling. Er wordt ingegaan op een aantal nieuwe ontwikkelingen op het gebied van diagnose en behandeling van ziekten. Daarbij staan vooral de ontwikkelingen op het gebied van diagnose en behandeling van oncologie, neurologie, hart- en vaatziekten en psychische aandoeningen centraal. De student raakt vertrouwd met epidemiologische begrippen en de specifieke methoden en technieken van 'evidence-based' onderzoek. De valkuilen die bij bepaalde vormen van onderzoek kunnen optreden en mogelijke oplossingen hiervoor komen aan de orde. De student krijgt inzicht in univariate methoden, o.a. toetsen van twee groepen en variantie- en regressieanalyse, en inzicht in multivariate statistische methoden, o.a. multiple lineaire regressie, logistische regressie en analyse van overlevingsgegevens (Cox regressie). Door het kritisch lezen en becommentariëren van medisch wetenschappelijke artikelen wordt de toepassing van onderzoeksmethoden en statistische analyses inzichtelijk. Als afsluiting leert de student het geheel toe te passen door zelf een onderzoeksvoorstel te ontwerpen.

Student Experiences

Industrial Processes

General Information



Faculty

TNW



Credits

15



Phase

1A



Module

M5

Additional Information

Assumed knowledge from CSE M2 and M4

Description of the Minor

During this module students explore chemical processes in detail, both on a molecular level, where kinetics and catalysis are important topics, and on a process level, where the aim is to create an overview of the most important stepping stones in the process of realising a desired product from a variety of optional raw materials, such as petroleum, natural gas and biomass. In this module, you will use specific knowledge acquired in previous modules, especially concerning thermodynamics (modules 2 and 4) and separation methods (module 2). Furthermore, industrial processes will be evaluated on their sustainability using a SELCA (social-ecological life cycle analysis). In preparation of making the SELCA a number of lectures will be taught. During these lectures Dr. Laura Franco Garcia and Prof. Boelo Schuur (and others) will discuss the social aspects and the ecological impact assessment. The SELCA methodology will be introduced by studying a Jeans-to-jeans recycling case. In vector calculus specific attention will be paid to the integral calculus of vector fields. In this sense it builds on Math D1, emphasizing double and triple integrals for multivariable functions.

Student Experiences

Other minors





Other minors you can choose from are Crossing Borders, doing a transfer minor, studying at a different Dutch university, and studying abroad.

These four categories all consist of several to many different options. Furthermore, they all require significantly more preparation than doing a minor at the UT.

Therefore, if you are interested in one of these minors, start investigating your possibilities and wishes in time. Make use of the information available on the general minor pages of the UT, the Psychology specific minor pages, and register for canvas pages whenever available to get the most up-to-date information.

Crossing Borders

General Information

	Faculty	/
	Credits	15/30
	Phase	1A/1B
	Module	/

Additional Information

Have a look at the Crossing Borders website, as there are different versions in Crossing Borders to choose from.

Description of the Minor

This minor offers students opportunities to gain international experience by going abroad for a field study / internship, or by working from the Netherlands with international partners. Where possible, the students' study background will be connected to an international project that they will have to carry out. Crossing Borders consists of two modules, each of 15 EC, which can be taken separately.

Students who wish to participate in Crossing Borders will work on a challenging project in a new and challenging environment. They will bring their knowledge and competences to a higher level. The design of the minor is framed around the world's Grand Challenges, expressed in the Sustainable Development Goals (SDGs) of the United Nations. The educational goal of this minor is to contribute to the students' international skills and orientation. Students will learn about the SDGs and will become aware of the differences between their own country and other countries – in terms of technology, socio-economic structures, and culture. This will allow them to develop a deeper insight into the world's challenges.

The minor Crossing Borders is grounded on the belief that the most important issues for ensuring a sustainable future are cross-disciplinary. This will require knowledge, creativity, innovation, and thinking in terms of systems and cross-overs. Tomorrow's professionals will have to be prepared to work and live in an international environment, where they develop and implement solutions and ways to address the global challenges.

Student Experiences

"Crossing Borders is a great minor which I would recommend to anyone with even the slightest wish to explore new cultures. There are many options within Crossing Borders so you can basically shape the minor exactly to your wishes. In the 6 weeks prior to going abroad, we learned about SDGs and cultures, which I found very interesting, especially as it helps you prepare your life abroad. The three months abroad were truly some of the best of my life. Besides working on the project, which took not even a full day per week, I worked at an orphanage in South Africa. I learned about the psychology behind childhood trauma, got the chance to immerse myself into the culture, and met amazing people who I still consider family."

Transfer Minor

General Information



Faculty



Credits



Phase



Module

Description of the Minor

A transfer minor consists of courses you may need to follow if you want to do a Master to which you are not immediately admissible with a Psychology Bachelor degree from the University of Twente.

The kind of courses you may need to follow are dependent on the Master you want to do. Therefore, it is important to contact both the study advisor of the Psychology programme, as well as the study advisor of the Master programme you wish to do. They can help you figure out if doing a transfer minor is possible, and what courses you need to follow then.

Student Experiences

Minor at a different university in the Netherlands

General Information



Faculty



Credits



Phase



Module

Description of the Minor

If you are interested in a specific discipline which is not among the minor possibilities as offered by the University of Twente, you can put forward a proposal for an exchange minor at a university-level institution elsewhere in the Netherlands which includes courses in that specific discipline.

Based on your registration as a student at the University of Twente, you are allowed to take courses at other university-level institutions in the Netherlands. If you are considering this option, be sure to get all the information you need from the other university about the options for participating in these courses, their timetable, and how and when to apply for admission.

Keep in mind that other universities don't necessarily work with the module-system (15EC packages). Furthermore, the starting dates of quartiles might not be the same as at the UT either.

Student Experiences

Minor Abroad

General Information



Faculty



Credits 30



Phase



Module

Description of the Minor

Instead of staying in the Netherlands, you can follow courses at universities all over the world. The UT has a database with a list of partner universities and the courses they offer.

Keep in mind that the application deadline for minor abroad is earlier than for UT minors (usually mid-January).

Secondly, be aware that preparing before going abroad takes a long time and can be rather difficult.

This is the general webpage for studying abroad:

<https://www.utwente.nl/en/education/electives/study-abroad/>

Student Experiences

"A minor abroad is so much more than it might seem at first glance. It is not just an educational endeavor, but an investment in your personal and professional development. While I was abroad, I have gotten to know a new culture, started learning a new language and have discovered so many new areas that I otherwise would never have visited! Next to taking trips and doing as much as possible in this period, I also experienced academic growth in the sense of a diversity of new subjects that you otherwise would never have learned about, combined with a wide array of new and unfamiliar teaching methods and university culture. Additionally, I think the most important thing I have gained is independence. You are thrown into a new country with unfamiliar surroundings, new rules and regulations that brings about challenges. You develop more and more responsibility to face these challenges which feels so empowering."

"For my minor I went abroad to Glasgow in Scotland to study at the University of Strathclyde for half a year. In my time abroad I was able to combine exploring another country and sight-seeing with studying at a different university that also offers different courses than the UT does. At the University of Strathclyde, I took 3 courses within the Psychology department and one History class. The phase while you are experiencing a new university and living in a new country at the same time can be quite a lot, but as Scotland is still within Europe, I would say it is less intense than in other destinations abroad. Still Scotland has much to offer, as well as its close proximity to England, Wales, Northern Ireland as well as the Republic of Ireland, which makes travelling to these countries while you are abroad as well very easy. Glasgow itself also has much to discover and has a very welcoming and inviting atmosphere. The only struggle I experienced going to Scotland was finding an apartment or a shared flat to stay for my time abroad, so make sure to start as early as possible to avoid last minute panic moments."