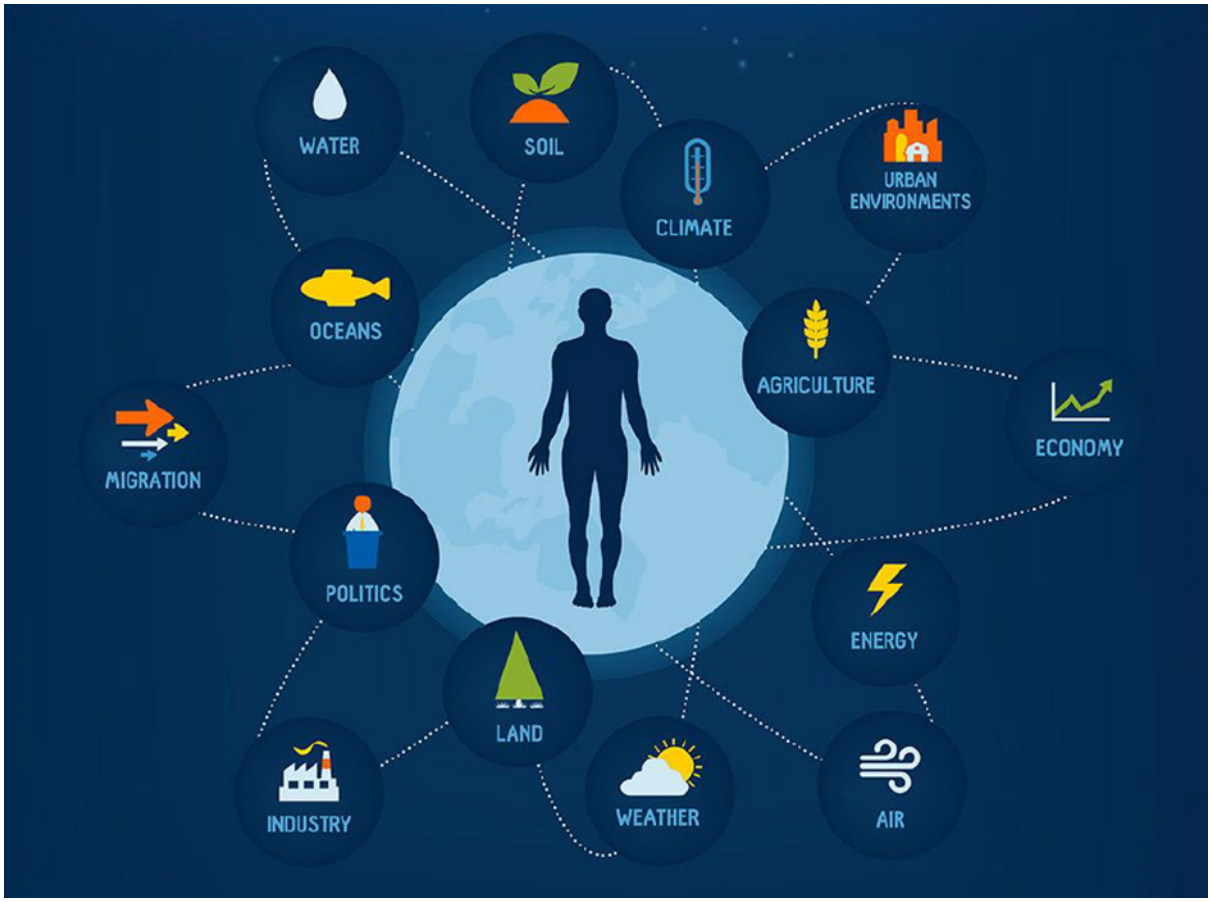
**Course proposal interfaculty honours course**
Version April 2023

# Planetary Health

- *The human–nature relationship and its impact on health*




## Summarized Description:

*Taking Action on Planetary Health introduces the emerging and transdisciplinary social movement of Planetary Health and offers the opportunity to develop and implement solutions that will allow humanity and the natural systems we depend on to thrive now and in the future.*
*The course 'Taking action on Planetary Health' focuses on the interconnection between the health of the planet and all life on Earth. Apart from understanding these connections, multidisciplinary problem analysis, and solution-based thinking plays a key role in the course. Together with stakeholders, students will seek solutions for an urgent, practical and well-defined ecological challenge and approach this from a variety of academic disciplines, creating new ways safeguarding the environmental limits within which humanity can safely operate.*

## Specific context:

*This course is being developed to offer to a group of 25-30 honours students with divers cultural and academic backgrounds. Honours students are well-performing students, in their 2nd or 3rd year, with a broad interest to study above and beyond their own study program. No specific pre-knowledge is required as the course is introductory in nature.*
*Honours courses are offered at Bachelor level 300-400, indicating an advanced undergraduate level of difficulty. In general, 300 and 400 level courses are expected to provide students with the opportunity to operate at the "synthesis" and "evaluation" levels. They are often of a "seminar" nature, with the students taking significant responsibility for the course agenda. The use of guest lecturers and the organization of out-of-class activities is encouraged.*

## 1.Course details

| | |
|---|---|
| **Min./max.nr. of students** | 25-30 |
| **Academic year** | 2023-2024 |
| **Semester** | 1 |
| **Period** | 1 |
| **Day(s)** | Tue (location ARTIS) & Wed (location VU) |
| **Time** | 2 x 2 h per week, 19.00 – 21.00 p.m. |
| **Number of meetings** | 16 meetings:<br>6 x 2 (guest) lectures (at ARTIS on Tuesdays)<br>6 seminars of 2 hours (at the VU on Tuesdays)<br>Excursions to Groote Museum, Library, and Micropia<br>1 Symposium of 2 hours (at ARTIS) |
| **Location** | VU & ARTIS |
| **Credits** | 6 EC |
| **Language** | English |
| **Course coordinator** | Remco Kort: Professor of Microbiology at VU and holder of the ARTIS-Micropia chair (r.kort@vu.nl) |
| **Hosting VU Faculty** | Faculty of Science |

## 2. Lecturers (including titles, universities and department):

Criteria:
- Excellent researchers
- Different disciplines
- International elements (such as guest lecturer)

Prof. Remco Kort – BETA- Professor of Microniology (A-LIFE)
Dr. Hans Ossebaard – BETA – Lecturer at Athena Institute/Strategic advisor at National Health Care Institute
Dr. Petra Verdonk – Amsterdam UMC – Principal Investigator – Ethics Law & Medical humanities
Dr. Julia Schaumburg – SBE – Associate Professor Econometrics and Data Science
Soesja van Wijgerden – FSS - Project facilitator Active8-Planet
Clemens Kaupa – Law Faculty – Assistant Professor EU Law, Emissions, Net Zero
Harry Wels – FSS -department ORG- expert human-nature relationship

Marjan Minnesma - Directeur Stichting Urgenda [TBC]
Joyce Brown – Associate Professor Global Health & Epidemiology – UU/ UMC Utrecht [TBC]
Karline Janmaat - Professor of Cognitive Behavioral Ecology - ARTIS and Leiden University [TBC]

## 3. Coordination and cohesion of the lectures: how will the various lectures and lecturers be coordinated? How will the cohesion between the lectures be guarded?

The lectures will be given by the course coordinator Remco Kort, guest lecturers of different faculties of the VU and guest speakers from the practical and professional field.
The course coordinator will be present at all times. The coordinator will take care of proper briefing to guest lecturers on the forehand – guest lectures will be briefly informed about the case studies, allowing them to connect to them during their lectures. Case study assignments will be the continuous element in the seminars. Ethics and personal reflections will be documented throughout the course in the portfolio assignment. All lectures will be linked to the building blocks of the course – as listed under the course content (5).

## 4. Main course elements and concepts:

Criteria:
- Interdisciplinary
- Related VU research profile

Planetary Health is a transdisciplinary, challenging and solution-oriented course. The course focusses on the interconnectedness between the health of the planet and all life on earth. Planetary Health does not only focus on understanding these complex connections. Next to multidisciplinary problem analysis, solution-based thinking plays a key role in the course. Together with all stakeholders, students seek solutions appropriate and feasible for every academic discipline, so that every sector tackles a part of the problem and creates new ways to use the planet's resources wisely to sustain planetary balance and protect both our health and the health of our planet that we depend on (co-benefits).

## 5. Course content:

The global environment is changing. From the hottest years on record, to the worldwide disappearance of pollinators, to the global collapse of fisheries, and to our use of about half of the planet's livable surface to feed ourselves.
This geological epoch, the Anthropocene, is characterized by humanity's dramatic and often irreversible impact on Earth's biophysical conditions. Although human health on average has improved over the past century, the stability of our planet's life-sustaining systems has sharply declined—threatening all life on earth including human health and development.

Human induced climate change is the biggest human health threat of our century. These anthropogenic environmental changes affect the quality of the air we breathe and of the water we drink, the quality and quantity of food we produce, the spread of infectious diseases, and even the habitability of the places where we live. Already, disrupted life-sustaining systems have threatened the lives of people in communities in low- and middle-income countries who contributed the least to this crisis, and no place is safe. Also, in high-income countries the climate and ecological crises are already impacting health, and this crisis is projected to drive the majority of the global burden of disease over the coming century.

Understanding and acting upon these challenges calls for massive collaboration across disciplinary and national boundaries to safeguard all life on the planet. We need everybody on board: judges reviewing ecocide legislation, policymakers grabbing hold of unlimited consumption, medical professionals warning for health effects of climate change, engineers working on green energy transition, journalists warning for greenwashing, CEO's investing in green business policies, scientists investigating the complex effects on ecosystems, economists advocating a circular economy, politicians pleading for a green government policy and so on. Commitment, solutions, and ideas from all fields need to unite, to build a movement to accomplish a social transition towards a sustainable, green, healthy and safe future.

In 2021, the Planetary Health Alliance (Harvard University, Boston, USA) redefined planetary health as: "A solutions-oriented, transdisciplinary field and social movement focused on analyzing and addressing the impacts of human disruptions to Earth's natural systems on human health and all life on Earth".

The 10 building blocks of this course therefor include:

1. *Introduction:*
   Basic structures, facts and figures. The necessary information is provided so that students have a deep enough understanding of planetary health, to sufficiently follow the next lectures.
2. *Philosophical perspective: Environmental ethics*
   The differences between anthropocentrism, ecocentrism and theocentrism are explained. The concept of nature is analyzed as instrumentally and intrinsically valuable, to assess the moral obligations of humankind towards nature.
3. *An economic perspective on pollution*
   The problem of pollution is analyzed as an economic problem of externalities. In relation to this problem, concepts like the Coase theorem of property rights, Pigouvian taxation and cap-and-trade systems are explained.
4. *Human health effects of a changing planet*
   The understanding that human health is inevitably related to planetary health is explained. This is made clear by examples from the field of medicine, like the relationship of air quality and asthma or extreme heat and cardiovascular diseases. It is explored how the field of medicine could prepare for the effects of a changing planet and collaborate to build a climate-resilient and eco-friendly healthcare system.
5. *Social justice*
   The intersection between planetary health and global inequality is explored. For example, attention is given to the role of indigenous communities, to assess how issues of planetary health can be addressed in a way that is sustainable for all.
6. *Nature-inclusive agriculture and food security*
   The challenges of feeding the world with a growing population while minimizing the impact on planetary health are analyzed. Concepts like biodiversity and circular farming are explained, and it is assessed how these concepts could help the agricultural sector.
7. *Water*
   The importance of water for the planetary system is explained. It is analyzed how water scarcity, water pollution and rising sea levels can be a threat to life on earth, in order to assess what proper water-management would look like.
8. *Micro-organisms* [RK] [JH]
   Attention is given to the critical role that microorganisms play in maintaining the health of the planet and the health of humans. Additionally, it is explained how human activities have impacted microbial communities, having far-reaching effects on planetary health.
9. *Activism as a driver of global change*
   Advice is given on how to put your ideals into action, in the context of problems related to planetary health. Using historical examples and examples from the present, it is explained how activism can influence policies, and be a driver of global change.
10. *Conflict and migration / Green cities and urban design /*
    *The human-nature/animal relationship* [KJ]

## 6. Course objective: learning goals

The Planetary Health course is designed to allow honours students to gain an understanding of planetary health, its transdisciplinary nature, and relevance to global health and sustainability. This will be done by investigating real-world cases, and looking into the impacts on human health, including the connection between environmental factors, social issues, mental health, diseases and other examples. Students will consider their own responsibility for global health and learn to think towards interdisciplinary systemic solutions for the many problems we face today.

- Students can describe the vital relationship between nature and humans, and why it is important
- Students can give examples of cases where the relationship between nature and humans is out of balance
- Students can use knowledge of various disciplines to explain cases related to planetary health
- Students can come up with practical, interdisciplinary and systemic proposals for cases related to planetary health, while incorporating interests of the stakeholders involved

## 7. Teaching methods and working formats:

Criteria:
- Extensive contact between student and lecturer
- Peer interaction
- General Academic skills

Lectures, group discussions, seminars and fieldtrips.

In the course two forms of teaching will be used namely lectures and seminars. The seminars will be given by the course coordinator Remco Kort. In these seminars the students will work together in groups of 4-5 students and work on a case study. The structure of the course is based on a teaching method called problem-based learning. The seminars, which are centered around the case study projects, are based on an educational approach referred to as problem-based learning (PBL). With this approach, a real-life problem is the start of the project. The topic can be formulated by the teacher, but students can also choose to participate in participant-directed learning, in which the students come up with their own topic for a case study.

Seven steps of PBL can be identified, namely: 1. clarify the concepts; 2. define the problem; 3. analyze the problem; 4. find the explanation; 5. formulate the learning objective; 6. search for further information; and 7. report and test new information (De Graaf & Kolmos, 2003).

During a large part of this course, students will work on these case studies. They work towards creating a final 'proposal' which can take different shapes, including a policy advice paper, an intervention, a role-play, an opinion piece for the newspaper, a contribution to a website, etc. To conclude this seminar trajectory, a final symposium will be organized at Artis for all stakeholders involved, where these solution proposals are presented by the students.

Students are challenged to appoint drivers that induce environmental changes and exceed planetary boundaries or investigate the changes that come with it. Next to multidisciplinary problem analysis, strategic solution-based thinking will play a key role in this course. It is unrealistic to expect students to provide solutions for entire problems. Instead, students are required to identify a single issue within their assigned case and offer innovative solutions to address this specific problem. Students will focus on a particular issue within their assigned case, research and gather relevant information, and offer a creative solution to address the identified problem. Four examples concerning significant contemporary Planetary Health issues, to clarify what kind of case-study students are supposed to be working on:

**Case #1 ~ Nitrogen crisis in the Netherlands**

The nitrogen crisis in the Netherlands has sparked controversy and protests from farmers who are impacted by government proposals to reduce livestock populations and cut nitrogen emissions. Your task as a student is to identify a specific problem within the nitrogen crisis, such as the impact on a particular farm or the conflict between government policies and farmers' livelihoods. Through research and fieldwork, you will gather information from relevant stakeholders and develop creative solutions to address the specific problem you have identified. Your solutions should consider the perspectives of all stakeholders involved, including farmers, the government, policy makers, and the general population. The goal of this assignment is to understand the complexities of the nitrogen crisis and propose feasible and socially ethical solutions that can benefit all parties involved.

**Case #2 ~ Tata steel**

The goal of this assignment is to investigate the health risks associated with industrial emissions in IJmuiden, specifically, the emissions of PAK chemicals and lead by the TATA steel factory. Through research and analysis, students will be able to identify a specific problem within this case and develop innovative solutions to address this issue.

**Case #3 ~ Amsterdam donut economy (solution based)**

In Amsterdam, the city government has adopted the doughnut economy as a framework for its economic policy. The city has committed to becoming a "doughnut city" by 2050, which means that it will work towards meeting the needs of all citizens within the boundaries of the planet's resources.

Some of the specific solutions that Amsterdam is pursuing as part of this initiative include:

1. Encouraging circular economy: Amsterdam is focusing on a circular economy where waste is minimized, and resources are used more efficiently.
2. Developing sustainable transportation: Amsterdam aims to make it easier and more affordable for people to use public transportation and bicycles, rather than cars.
3. Promoting renewable energy: The city is working to shift to 100% renewable energy sources to reduce its carbon footprint.

Overall, the doughnut economy initiative in Amsterdam aims to create a sustainable and inclusive economy that can meet the needs of all citizens while respecting the limits of the planet's resources. The goal of this assignment is to identify and address a specific challenge in the transition towards the donut economy.

**Case #4: ARTIS – The relationship between nature and art**

ARTIS is placed in a long tradition defining the connection between nature and art. For example, in the Greco-Roman tradition, in which the Greek philosopher and astronomer Democritus stated that human beings ‘are pupils of animals: of the spider in weaving and darning, of the swallow in building houses, and in singing of the swan and the nightingale by the way of imitation'. There was the statement by Lucretius, who wrote in his *De Rerum Natura* that nature is *'rerum creatrix'*, she is the first artist. Goethe paraphrased this by writing that ‘*Die Natur ist aller Meister Meiste (…) sie zeigt uns erst den Geist der Geister*’. It is a concise expression of this essential truth for art and science, which has been published since the 16th century in the countless treatises on art, science, architecture, and nature that have been published. Nature and art became commonplace in our conversations. How can we revive and vitalize these conversations in modern day society in the interest of our planet and our health?

Skills that will be further developed:

- Interdisciplinary collaboration
- Critical and systems thinking
- Social engagement
- Being able to turn frustration into action
- Collaborate with different fields of work and study

## 8. ARTIS Excursions

### The ARTIS-Library of Natural History

**About the library** - In 1838 the founders of the society Natura Artis Magistra aimed to collect living nature in the garden and to present dead nature in a museum. Soon a third goal was added: nature on paper, to gather information about the part of nature for which simply was no place in the garden or in the museum. The building in which the library is still housed dates to 1868 and was designed by Gerlof Salm (1831-1897). The manuscripts, printed books, drawings, watercolors, periodicals, and archives belong to the most beautiful of what the history of natural history has to offer.
**Relevance -** The natural sciences have a rich history, which is closely interwoven with other fields of knowledge such as geography, anthropology, economy, and the arts. Central question during the visit to the library will be: How has humankind viewed, researched, and interpreted nature from the sixteenth to the nineteenth century? And how does this relate to our present-day knowledge and attitude towards nature?' An understanding of our current attitude towards nature plays an essential role in the new transdisciplinary field of Planetary Health.

### The ARTIS-Groote Museum

**About the Groote Museum**- The Groote Museum is the very first museum in Amsterdam, founded in 1855 by the Royal Dutch Zoological Society organizing gatherings for members only to contemplate nature. Recently, this tradition has been revived, as the Groote Museum has been closed for 75 years and reopened its doors to the public on May 9, 2022. ARTIS-Groote Museum is the museum of the big questions – questions about us and about our relationship to nature.
**Relevance -** The underlying story in each of the fourteen zones in the Groote Museum is to understand the impact of humankind on the surrounding world and its natural systems– and reflect on this relationship.

### ARTIS-Micropia, the microbe museum

**About Micropia**- ARTIS-Micropia is the world's first and only microbe museum. Here, visitors can meet living microorganisms for the first time in a museum or a 'microbe zoo'. Micropia adds an important new chapter to ARTIS' long tradition of nature education: an enlightening experience with the most powerful, most successful and at the same time smallest organisms on earth – 'the unseen majority'.
**Relevance for the course -** ARTS-Micropia shows that humans are literally part of nature, as they live in symbiosis with microbes; in fact, the number of human cells equals the number of microbes in our body, representing an intricate part of our physiology. This realization could encourage us to value our connections to and dependence of nature in general, and the microbial world in particular.

## 9. Relevance of the course:

Criteria:
- Social relevance
- Scientific relevance
- Relevant for VU identity (responsible, open and personally engaged)

The course focusses on the interconnectedness between the health of the planet and all life on earth - we are only as healthy as the systems we depend upon. Planetary Health concerns to everyone. Therefore, an important objective of the course is to bring all stakeholders (the faculties of the VU) together and achieve joint consultation leading to successful collaboration in terms of Planetary Health.

This course was developed mainly by honours students. During the 'Rebuilding Education course', they were able to participate in guest lectures, exchange ideas and feedback with professors, professionals and other students in the fields of education and planetary health, in order to create an implementation plan for this interdisciplinary course. Educating students about these topics and teaching them how to think of and develop practical solutions, noticing different perspectives of a story and getting a global understanding of the issues is not only in line with the principles of the VU, but also impersonates them: this course's educational aspect is open: to several disciplines, to confrontation with stakeholders, and to the students' ideas, opinions, and action plans. It is personal in the sense that students can choose what project to work on, finding motivation and developing skills useful for their own future and it's responsible in the sense that it presumes that students and staff will engage not only with other academic fields but also with people from different backgrounds. Finally, this course seeks innovation in the minds of the students, and in the cooperation across disciplines and fields.

## 10. Practical information:

Seminars will be offered at VU campus, but all guest lectures take place at one of the oldest lecture rooms of the Netherlands in ARTIS. All of ARTIS will be integrated in the course to teach planetary health: The Planetarium, the Micropia microbe museum, the Groote museum, the zoological and botanical garden and the Library for natural history.

## 11.Study materials:

- Planetary Health Alliance. What is Planetary Health? Available from: https://www.planetaryhealthalliance.org/planetary-health
- Myers, S, & Howard Frumkin, H. (2020). Planetary Health. Protecting Nature to Protect Ourselves. Washington: Island Press.
- Haines, A., & Frumkin, H. (2021). Planetary Health: Safeguarding Human Health and the Environment in the Anthropocene. Cambridge: Cambridge University Press.
- Planetary Boundaries. Stockholm Resilience Center. (2022) Available from: https://www.stockholmresilience.org/research/planetary-boundaries.html
- Climate effects on Health. Center for disease control and prevention. (2022) Available from: https://www.cdc.gov/climateandhealth/effects/default.htm#:~:text=The%20health%20effects%20of%20these,and%20threats%20to%20mental%20health

## 12. Assessment method(s):

Criteria:
- Both knowledge and academic skills
- Also point out how these several methods add up to the final score (proportions in percentages)

- A reflective portfolio throughout the course (will be evaluated by a fail/pass by the use of

peer-to-peer assessment. Elements include but are not limited to:

- Description of process and motivation for the selection of your case study
- Connecting the dots: Preparation of a short perspective (1 paragraph) on how each of the guest lecture (see building block above) relate to your case
- Personal reflection: What are the values you would like to act upon? How often is it difficult? Can you identify the underlying reasons, or just the surface of the problem? What concepts discussed in the lecture does this difficulty relate to?
- Interview for the guest speaker of a selected lecture
- Preparation of field work: which stake holders would you like to interview? How is result of the interview presented in your case study?

- A written report (10 pages maximum) about the case study – a group effort of 3- 5 students (60%)
- An vlog/blog/podcast/opinion piece on the case study, in which students should come up with a solution (20%)
- The group-presentation of the case study at the conference (20%).

## 13.Study load and composition:

Total workload: 168 hours
Contact hours: 30-35 hours

**Examples of assessment methods:**

- Students are evaluated based on a research proposal or poster (60%), an oral presentation (20%), as well as their performance on the weekly multiple choice questions and participation in class discussions (20%).
- Students are evaluated by means of an exam, a presentation, and their participation in class discussions.
- Examination at end of lecture series, Position paper, Presentation
- Students are evaluated based on a research proposal, the oral presentation, and their participation in class discussions.
- Individual essay. Students will have an opportunity to safeguard a higher grade via individual or group presentations about relevant judgments of the international tribunals.
- The students will have to produce a short paper each day. The final assessment will be an oral exam.
- mid-term test on basic anatomy and biomechanics (20%), final test on full course content (30%), mini tutorial (40%), professional conduct (10%).
- Participation in discussions, including contributions on Canvas (10%), Individual oral presentation (25%), Written essay (65%)
- Participation in lectures and discussions (including assignment to respond to one of the lectures), Essay (4000-5000 words) on a theme or case study, Exam about literature
- Blog Entries / Portfolio; Student Presentations in the museums and during excursion; Mid-term Research paper; Group work
- Students will be given weekly quizzes on the reading material, Students will give a group presentation to the class, There will be a final exam that includes multiple choice, free response,

and essay questions.

- The final grade will be based on an essay and the exam (both 50%).
- Assignments with written reports and an oral presentation. Every participant of the course is required to give one presentation, Take home examination
- The assessment is individual. There is a (written) take-home exam, and each student has to deliver a short paper. The subject of this paper is chosen by the student, but has to be approved by the main lecturer. The final grade will be based on both the take-home exam and the paper, based on equal weight.

**Attendance policy:**

When they have a reason student are allowed to miss 2 meetings but will have to catch up the missing information.

**Study load guidelines for interdepartmental Honours courses**

The guideline is the following distribution of the study load for a subject of 6 credits (6 x 28 = total 168 hours)

Contact hours: 30 - 40 hours (interdisciplinary or extra-curricular courses have approximately 2 - 3 hours of teaching per meeting, 2 x per week for 7 weeks or once a week for 14 weeks)

Pages of literature to be studied: maximum 656 (82 hours, based on 8 pages per hour standard)

Example of Assessment:

• presentation of 20 minutes (preparation 4 hours) and
• short paper of 5 pages (40 hours, based on the standard 8 hours per page).

This is an example. With a paper of a larger number of pages, less literature to study is given, as well as when a presentation is not part of the completion of the course.

Depending on the content and learning outcomes of a course, other forms of assessment and a different division between contact hours, literature and completion may be necessary and / or desirable.