# Sustainable Development and Sustainability Science 2026

## Course PM

## Course Abstract

The Master of Science level academic course Sustainable Development and Sustainability Science (SDSS) has been developed by the Swedish Aral Sea Society (SASS) in cooperation with Uzbek academic research colleagues and gives an overarching introduction to the Sustainable Development challenges and a scientific view on how to approach them. The development of the course was based on SASS' interest in the Aral Sea ecological situation and contacts established with Uzbek researchers in the implementation of the so called UZWATER project, sponsored by European Union and carried out 2012-2016. The course has two main parts, one lecture part and one student seminar part. The lecture part comprises 15 lectures presented by both Swedish and Uzbek teachers. The academic presentation part has short student presentations in English, each followed by student opposition of the content and presentation. Important aims of the second part are (i) to train the students in presenting academic material in English and (ii) to present a balanced opposition that illuminates strengths and weaknesses of the presentation. A special aim of the student presentation part is to train students in critical thinking regarding the sources of information and its relevance and value. In spring 2026 we will continue to organize also a distance conference between students in Central Asia and Sweden. Teachers and students are encouraged to read the whole memo before taking part in the course.

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**Course PM**

# Sustainable Development and Sustainability Science Spring 2026 – Distance mode, 15 weeks, English language - 5 credits ECTS (suggested)

## Background

Sustainable Development is an overarching goal of most countries in the world and was first broadly accepted after publication of the so called Brundtland report *Our Common Future* in 1987. Its famous definition of sustainable development reads “a development that meets the needs of the present without compromising the ability of future generations to meet their own needs”.

Sustainable Development is not an easy task. It has several conflicting areas both within countries and between countries. Within countries, there are often conflicts between e.g. rural and urban areas and between indigenous minorities and the main population. Between countries, we can see conflicts of interest between already rich countries and low-income countries, especially when both strive for economic growth on a limited planet. Within countries there are developments that favour the already rich and press the poor.

Today the most discussed sustainability challenge at a global level is the climate crisis, that now has reached a critical situation according to the International Panel on Climate Change (IPPC). It is not unlikely, however, that the climate crisis is only a forerunner of an even more dangerous ecological crisis, manifested by the rapid decrease in biodiversity on earth.

The course will introduce the concepts of sustainability, especially emphasizing the systems approach. The focus of the course is physical resource management (energy and matter) with an understanding that most resources are finite and have to be used within their capacity to renew themselves and within the planetary boundaries. Resources treated will include energy, physical materials, water and ecosystems. The sustainable management of water will be developed in some more detail, especially with reference to the situation in the Aral Sea basin.

Among the consequences of resource management, it will treat climate change, biodiversity, environmental protection, and global health, as well as consequences of resource management for the economy of societies, the lifestyles of people and health. This year we will include more cases of good management and policy initiatives especially with reference to the UN Sustainable Development Goals.

The course was given for the first time for 11 students at the Karakalpak State University, spring 2021. During the period 2022-2025, the course participation has gradually increased and in 2025 gathered some 79 Master students from in total 7 universities, of which 6 Uzbek universities and one university from Kyrgyzstan. In addition, Bachelor students from even more universities followed the lectures.

Late in 2022, the admission rules for Uzbek students in English M.Sc. courses have become stricter and the English skills in student presentations have improved. In order to further improve the quality of the course a special Memo for participating researchers and teachers has been elaborated in preparation for the course 2026 (cf. Appendix 1). Regarding implementation of the course, the Central Asian teacher

involvement in lectures and in organizing student presentations is expected to increase compared to previous courses.

## Course aim and objectives

### Course aim

The course Sustainable Development and Sustainability Science has the main aim to give the students a science-based introduction to important current sustainability challenges with a specific focus on an ecologically sustainable development. A second aim is to train the students in presenting intellectual material for an audience and to train students in presenting a balanced feed-back based on critical thinking.

### Course objectives

The course objectives are the following:

1. To present the most important global ecological sustainability challenges by means of video linked lectures presented by Swedish and Central Asian internationally renowned teachers and experts;
2. To link these challenges to the situation in Central Asia through lectures presented in the same way by academic teachers and scientists from Uzbekistan and other Central Asian countries;
3. To illuminate the information presented by means of discussions between teachers and students during the lectures;
4. To train the students in preparing an English presentation, supported by information material such as slides and short videos in English;
5. To train the students in presenting intellectual material in English and in front of an audience;
6. To train the students in preparing a balanced opposition, illuminating the strong and weak parts of the student presentation and with special emphasis on fostering a critical thinking of the students.

## Intended learning outcomes (ILOs)

After fulfilling the course, the following student learning outcomes are expected:

The student should be able to demonstrate:

- A basic knowledge of the most important global and Central Asian ecological sustainability challenges;
- An understanding of the main reasons behind the climate crisis and current efforts to solve it;
- An understanding of the most important mechanisms behind local and regional water crises, such as e.g. the Aral Sea shrinking;
- A basic knowledge of the (ecologic) sustainability challenges of large urban areas;
- A basic skill in preparing and presenting information in English in front of an audience and supported by presentation support in the form of e.g. slides and short videos and
- A basic skill in presenting a balanced opposition to intellectual material to develop critical thinking.

## Course Programme

The course will start on 11 February 2025 and then there will follow a lecture each Wednesday until 20 May 2025, when it finishes. Lectures and student Seminars will follow the generalized and specific schedules presented in Table 1 and Table 2. In case the specific schedule will not hold, efforts will be made to hold lectures and student presentation sessions during 2 days the following week in order to be able to finish the course at the latest 20 May.

Table 1. Principal lecture day schedule for the 15 video link lectures and student presentation sessions.

| Lecture part | Time Uzbek time | Activity |
|---|---|---|
| 1 | 14.30 – 15.00 | Lecture part 1 |
| 2 | 15.00 – 15.10 | Presentation of 2 discussion questions and break |
| 3 | 15.10 – 15.30 | Discussion of questions |
| 4 | 15.30 – 16.00 | Lecture part 2 |
| 5 | 16.00 – 17.00 | Break |
| 6 | 17.00 – 18.00 | Student presentations with student opposition |

### Lectures

The planned specific lecture program is shown in Table 2.

Table 2. Schedule for the 2026 SDSS course as per 2025-12-14. (Yellow high-lighted not confirmed.)

| Lecture No | Title | Date | First half responsible | Second half responsible |
|---|---|---|---|---|
| **Part 1 – Basics of Sustainability Science** | | | | |
| 1 | Intro Sustainable Development | 11 Feb | Lars Rydén | |
| 2 | Resource flows | 18 Feb | Björn Frostell | |
| 3 | Energy | 25 Feb | Mikael Höök | Laziz Saribaev |
| 4 | Climate change | 4 March | Lars Rydén | Viktor Novikov (TBC) |
| 5 | Ecosystems, land use, agriculture, forestry, biodiversity | 11 March | Lars Rydén | Farhod Akhrorov |
| 6 | Quantification of sustainability, basic approaches | 18 March | Björn Frostell | |
| **Part 2 – Water and Sustainability** | | | | |
| 7 | Global water policies - Water and water cooperation in Central Asia | 25 March | Bo Libert | Comment from Tynarbek Musabaev, Abror? |
| 8 | Water use and management - Agriculture and Sanitation | 1 April | Björn Vinnerås | Husniddin Pardaev |
| 9 | The Aral Sea | 8 April | Yusup Kamalov | Vadim Sokolov |
| | ***Int. student Conference*** | | ***Repr. Uppsala University*** | |
| **Part 3 – Society and Sustainability** | | **X** | | |
| 10 | Urbanization; The sustainable city | 15 April | Lars Rydén | Rustam Eshniyazov, Lovisa Lingfors |
| 11 | A culture of mobility; Means of mobility; Energy of mobility | 22 April | Björn Frostell | Alijon Oripov |
| 12 | Economics and economy of sustainable development | 29 April | Lars Rydén | |
| 13 | Environmental decision making from the individual to the global level | 6 May | Björn Frostell | |

| | | | | |
|---|---|---|---|---|
| 14 | Transition to a Sustainable Society, Policies and practices | 13 May | Lars Rydén | Rakhmatulla Nurimbetov |
| **Course finalisation** | | | | |
| 15 | A. Final comments<br>B. Discussion and Conclusion | 20 May | Lars Rydén | All teachers and students |

The course lectures and discussions have been divided into three main themes (cf. Table 2):

- Basics of Sustainability Science
- Water and Sustainability
- Society and Sustainability

Each lecture is divided into three main parts according to Table 1, where (i) the first general part is presented mainly by Swedish teachers, followed by (ii) a question formulation and discussion part and (iii) a second lecture part – mainly by Uzbek teachers or teachers from other Central Asian countries and with the aim to give a Central Asian perspective of the lecture theme.

**Student Seminars**

To fulfil the intended learning outcomes, it is required that each student taking the full course should prepare and present two oral contributions in the English language and supported by Power Point slides and/or short films. The Seminars will be organized in two separate Student Seminar Programs, one undertaken in cooperation between Central Asian universities and Swedish teachers, and one carried out at the individual Central Asian universities. Student seminars with Swedish teachers have to be limited to 39 students (see below under Course Admission and Examination, page 7).

Thus, the responsible teacher at each university will have to be practically responsible for (i) in cooperation between student and teacher identify and plan for one presentation per student to be presented and discussed in the main Student Seminar series and (ii) organize a local Seminar where each student is given the opportunity to prepare and present a topic according to the instructions given in Appendix 2.

Both Student Seminar Programs are carried out in English language. SASS has proposed that during the presentation and comments, a Swedish or Uzbek teacher will act as a chairman and give advice to the students both during the presentation and opposition. The Uzbek contact person is obliged to take part in all Seminars and coordinate them locally.

SASS has assumed the responsibility to organize a Zoom link for the course, both (i) for the lectures starting at 14.30 (Uzbek time) each Wednesday from 11 February to 15 May and (ii) the student presentation session starting each Wednesday from 26 February to 8 May at 17.00 hrs (Uzbek time).

**International student Conference**

During spring 2026 we will attempt to arrange a distant mode discussion conference between Central Asian and Swedish students. The date and time for this conference will be decided on later. The participating students are free to choose the topic of discussions themselves. The language used will be English. The conference is a non-

compulsory part of the course. They will be moderated by a representative from Uppsala University.

**Course lecture introductions, literature, and course website**

Each lecture will have a suggested literature list that will be distributed in a separate lecture list that will contain:

- Title of lecture;
- Short introduction to the lecture content (8-10 lines);
- Participating teachers and a short presentation of them (5-6 lines);
- Suggested readings - literature.

The literature of the course will all be available on the Internet and consists of book chapters and reports from research projects. To this will be added the Power Point pictures from the lectures. All material will be added to the course website.

## Course parts

Lectures: 15 x 1,5 hrs =22,5 hrs

Seminars: 13x1 h = 13 hrs per student plus individual preparation time for presentation and opposition

Examination: According to rules at participating Uzbek universities.

**Course admission and examination**

Admission to the first course part (lectures and discussion) is free, it is anticipated that it will be possible to have a large number of participating students and interested teachers in the on-line lectures. Here, especially B.Sc. students are welcome to participate besides accepted M.Sc. students. This part would typically be valued with two academic credits ECTS in the European academic system (ECTS=European Credit Transfer System).

Admission to the student seminar part with student presentations and student opposition will have to be restricted to a maximum of 39 students. This number is based on the following practical circumstances: There are 13 occasions when Student Seminars are organized with participation from both Central Asian and Swedish experienced teachers and each Student Seminar will be organized with 3 presentations/opposition, discussion, each with a duration of 20 minutes.

In order to match the ECTS credit requirements for the course, this part would typically be valued to 3 credits ECTS in the European academic system. The reason why the student Seminars are valued higher than the lectures is that it is expected to require more work for the students.

Examination and course credits valuation will be the responsibility of the participating Uzbek and Kyrgyz universities and according to requirements in their academic systems. The suggested 5 credits ECTS, with 2 credits for the lecture part and 3 credits for the Seminar part is only provided as an information about how this course could be valued in the European academic system and in line with the so-called Bologna process for course valuation, where 1 week's work is valued with 1,5 ECTS credits.

At this moment, these admission and examination rules are only suggestions, considering SASS' academic experience from Sweden and will have to be discussed and decided upon before decision.

## Participating universities and contact persons

The participating universities and their contact persons and contact information are listed in Table 3 (yellow highlighted no confirmation for 2026).

Table 3. Participating universities, contact persons and contact E-mail in the course Sustainable Development and Sustainability Science.

| Participating University | Name of contact person | e-mail |
|---|---|---|
| **1. Karakalpak State University** | Dr Rustam Eshniyazov | esh-rustam@yandex.ru |
| **2. Samarkand State Architectural and Civil Engineering Institute** | Dr Abror Gadaev | gadayev.abror@samdaqu.edu.uz |
| **3. Samarkand Branch of the Tashkent Economic University** | Dr Farhod Akhrorov | fahrorov@yahoo.com |
| **4. Jizzakh Politechnical Institute** | Dr Akmal Sultonov | sultonovakmal19@mail.ru |
| 5. **Samarkand Agroinnovations and Research University** | Dr Husnuddin Pardayev<br>Dr Fotima Saydulllayeva | pardayev@yahoo.com<br>fsaydullayeva@yahoo.com |
| **6. Urgench State University** | Dr. Mansur Rajabov<br>Prof. Sherzod Kurambaev | m.radjabov04041972@gmail.com<br>sherzod.k@urdu.uz |
| **7. Kyrgyz State Technical University named after I. Razzakov** | Prof. Tashmukhamed Karimov<br>Dr Nazira kyzy Baigazy | tashmukhamied@mail.ru<br>nbaygazykyzy@bk.ru |
| **8. International Agriculture University in Tashkent** | Dr Umar Muhammad | muhammadumar.aslam@rau.ac.uk |
| **9. National University of Uzbekistan** | Dr Raima Shirinova<br>Dr. Alijon Oripov | r.shirinova@nuu.uz<br>oripov_a@nuu.uz |
| **10. Nordic University** | Dr Maskhurbek Maksudov | m.maksudov@nordicuniversity.org |
| **11. Only B Sc students: Nukus Branch of the Samarkand State University of Veterinary Medicine, Livestock and Biotechnologies** | Xojalepesov Polat<br>Esimbetov Adilbay | polatxojalepesov65@g99mail.com<br>samvminf@edu.uz |
| **12. Nukus University of Innovation Technologies** | Dr. Ruslan Ganiev | ruslanr0786@mail.ru |

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## Website and Zoom links

### Website

The SASS main website address is:

http://www.aralsjon.nu/en/

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where there is a link to the course homepage.

### Zoom link

The main common Zoom link that will be used for the lectures and student seminars is:

https://uu-se.zoom.us/j/65999488163

Please make sure to connect to the link in question a few minutes before the meeting – the link will be open from 10 minutes before meeting start.

## Others

The distribution of responsibilities between the SASS and the Uzbek universities are according to the following:

- Course responsibility (including course programme, course PM, course lectures and enrolling Swedish lecturers, setting up video links for lectures and student Seminars, leadership of student Seminars, management of Internet course home page) – SASS, Lars Rydén, Bo Libert, Björn Frostell and Christian Andersson;
- Coordination of Uzbek partners and necessary course administration in Uzbekistan – Karakalpak State University, Rustam Eshniyazov and a suggested Uzbek coordination group;
- Coordination and administration at participating Uzbek universities including enrolment of students, support to students in preparation of student Seminars – Contact persons at participating universities according to Table 3 above;
- Examination of students, including preparation of examination questions, exam correction and grading – Participating Uzbek and Kyrgyz universities.

2026-01-11/ drafted by Björn Frostell with support from Lars Rydén, Rustam Eshniyazov and Bo Libert

## Appendix 1 – The teachers

**Farhod Ahrorov** is a Professor of Economics at the Samarkand Branch of Tashkent State University of Economics. His academic expertise covers sustainable development economics, environmental and agricultural economics, and ecosystem-based resource management.
Dr. Ahrorov has extensive experience in applied research and policy-oriented projects related to sustainable agriculture, natural resource management, and green economic transition in Uzbekistan, particularly in the Samarkand region. He has contributed to numerous national and international research initiatives and has supervised graduate research on sustainability indicators, ecosystem services, and resource efficiency**.**

**Rustam Eshniyazov** is a professor in Civil and Environmental Engineering Department at Karakalpak State University, where he teaches such courses as “Engineering Economic Analysis”, “City planning”, “Intro to Structural Engineering” for bachelor students and “, ”Theory and Practice of Construction Design” and “Sustainable Development and Sustainability Science” courses for master students. He has a PhD with specialization in Microeconomics. His research interests include issues of sustainable development of the building complex of Karakalpakstan, including energy and resource saving, as well as issues of training highly qualified specialists in the field of construction and the city planning.

**Björn Frostell** is a former Professor in Industrial Ecology at the Royal Institute of Technology (KTH), Stockholm, Sweden. His basic formation is Chemical Engineering and Environmental Biotechnology. In 1979, he presented a PhD Thesis focused on biogas production from waste, titled Anaerobic wastewater treatment with emphasis on sludge retention. In later years, his main research interest has been systems thinking and systems analysis for sustainable development. At the moment, he is involved in a Swedish research project with the aim to develop climate and energy accountings for municipalities. Besides research, he has during the last 25 years built up a 250 ha forest farm in middle Sweden, focusing on sustainable forest governance.

**Mikael Höök** is an Associate Professor in Natural Resources and Sustainable Development at Uppsala University in Sweden, where he leads the research group Global Energy Systems. He has a PhD with specialization in global energy resources. His research interests include quantitative modelling of energy systems, fossil fuel production, field-by-field analysis, and long-term supply of natural resources. Currently, he leads several research projects focused on global oil supply outlooks and resource supply for energy transitions. He teaches courses focusing on energy systems, energy security analysis, natural resources, and sustainability.

**Yusup Kamalov** is a Chair of NGO Union for Defence of the Aral Sea and Amudarya in Nukus, Karakalpaksatan, Uzbekistan. He is heat power engineer and ecologist. His field of interests is economy of natural resources, water management, renewable energy, hydro and aerodynamics. He had published a number of articles regarding rights of natural ecosystems, design of wind turbines, and so on. Currently he is developing project on distilling salt water by freezing using natural weather conditions in a large scale.

**Bo Libert** has an Agr Dr exam from the Swedish University of Agricultural Sciences, has been engaged in the environmental sector and has a long experience from working in Central Asia and Eastern Europe on a broad range of environmental issues representing OECD, Swedish Environmental Protection Agency and the UN. He has

been involved in the development of water cooperation in several transboundary river basins including in Central Asia. Mr Libert has written a number of scientific articles and is after his retirement from the UN engaged in various projects based in his home country Sweden.

**Lovisa Lingfors** - Sustainable Development Department Uppsala kommun

**Viktor Novikov** - project manager Zoi Environmental Network. Project manager at Zoi Environment Network (www.zoinet.org). Master in Environmental Science and Policy. Twenty five years of work experience, including 20 years as a project manager in international projects focusing on Central Asia jointly with UNEP, UNECE, World Bank and other partners. Team leader and key expert in regional assessments on environmental issues in Central Asia: Climate Change (2009, 2019); Biodiversity and Ecosystems (2012, 2017, 2025); Sustainable Mountain Development (2012, 2023); State of the Environment reporting and indicators (2002, 2015, 2022), Waste Management Outlook (2017), national communications, action plans and nationally determined contributions on climate change (2000, 2002, 2014, 2025), and Hydrometeorology Atlases (2019, 2021).

**Rakhmatulla Nurimbetov** – Ambassador of Uzbekistan in Sweden

**Khusniddin Pardaev** has been working as a senior teacher at the Department of Economics and Business (former Economics, sustainable agriculture, and digital technologies) at the Samarkand Agroinnovations and Research University since 2020. In 2023, he received the degree of Doctor of Philosophy (PhD) in economics. During his career, he participated in various international projects. He gained qualifications and experience in similar higher education institutions in the USA, Germany, Italy, Japan, Latvia, Lithuania, Slovakia, and Central Asia.

**Lars Rydén** is Professor emeritus at the Department of Earth Sciences; Natural Resources and Sustainable Development at Uppsala University in Sweden; he was director of the Baltic University Programme, a university network in the Baltic Sea region focusing on sustainable development, where he published extensively on the topics of environmental protection, climate change and in general sustainable development. He has a background in biochemistry and publication of science for the general public.

**Laziz Saribaev** is an Associate Professor in Physics Department of Karakalpak State University in Uzbekistan. He has a PhD with specialization in field of semiconductor physics. At present time his research interests lie in applications of magnetic resonance spectroscopy in thermoelectric materials. At current time, he leads research projects with several graduate students focusing on magnetic resonance spectroscopy of such materials as delafossites and clathrates and building atomic force instrument for further characterization of thermoelectric materials in research. He teaches fundamental courses such as Thermodynamics and statistical physics for baccalaureate students and Magnetic semiconductors for graduate students.

**Vadim Sokolov**, Manager of Agency for Projects Implementation of the International Fund for the Aral Sea Saving (IFAS) in Uzbekistan. Has over 45 years of professional experience in the field of Integrated Water Resources management (with specific focus on Hydrology, Irrigation, Land reclamation, Environmental protection) in Central Asia. Maintained a close link to National University “Tashkent Institute of Irrigation and Agricultural Mechanization Engineers” as External lecturer and member of Examination commission for master’s program of the faculty of Organization and Management of Water Resources.

As a Vice-President of the International Commission on Irrigation and Drainage (ICID) for period 2024 - 2026 contribute to activities under Permanent Committee on Strategy and Organization (PCSO) of ICID.
Vadim Sokolov is the author of more than 380 scientific publications, including 35 monographs and many articles in peer-reviewed international journals.

**Björn Vinnerås** is a professor of Environmental Engineering at the Swedish University of Agricultural Sciences, Uppsala, Sweden. His field of research is environmental engineering, with a focus on developing technologies to recycle plant nutrients from the city back to agricultural fields in an efficient and safe way. He has worked with sustainable sanitation for the last 15 years first for Swedish conditions and then in a more international context, both within systems development and educational training, initially on urine diversion systems.

## Appendix 2 - *How to teach the Sustainable Development and Sustainability Science Course*

We welcome all of you who have agreed to provide lectures and guide students of the Sustainable Development and Sustainability Science (SDSS) course 2026.

The course is an effort to describe and explain how it is possible to change a society to become sustainable. This means that it is a systems study. For any academic teacher who has a competence in a specific academic discipline this is a challenge. It is in fact a new discipline where we are all students. In this course we will not teach physics, chemistry, biology, economics etc. We will attempt to describe the status of our world and how it can become better in the future.

Thus, we will teach societal transformation. For example, talking about energy, we need to explain how the society use energy, from where it is generated, how it can be used more efficiently as well as drawbacks and advantages of different energy sources. It is not a question of physics, or thermodynamics even if those classical concepts are a necessary background. It is a question about our society and how it may change. In this context we should remember that students, listeners, are from all kinds of background, and the presentation need to be at a level where all can understand.

As the topic is new to almost all of us, it is important that we all try to follow the lectures of the course to learn from each other. It is a long-term experience that teachers are the best students. Let us be students so we all can contribute to the change of society in a sustainable direction that a global consensus deems necessary.

We also all need to support the master students who will make presentations. In addition to the challenge as such of making a presentation on a new subject, there is the circumstance that Central Asian students have much less experience of presentations than western students and thus need extra support. Teachers should help the students to select a topic, give comments on drafts, comment on the presentation and check that basic requirements, such as providing references, have been fulfilled.

Welcome to become an essential partner in our quest to become sustainable, for ourselves, our children, our planet and our societies. In this strive, education is a necessary component.

## Appendix 3 - Master student presentations and comments

Last revised 2025-12-01

### Background

Master students at universities around the world need to develop their skills in writing papers and make presentations. All students have to do this when making their diploma work, but it is common to request both small papers and presentations already during the master studies. It is important to develop this competence. During working life, presentation skills are requested repeatedly, at least for the better positions in companies and authorities.

### English language

English language is since the end of WWII the world-wide common language for science, as well as for all international communication, e.g. in air traffic, in business, in culture and in negotiations. As science and engineering is an international undertaking, it is essential for all university students to be able to use the language, to understand spoken and written English as well as to speak and write English. A presentation is a very good tool to develop these skills.

A note: There are some 6000 languages used around the world. If we want to talk to each other we need to have one common language, so-called *lingua franca*. This is particularly important in science since the knowledge of science should be general, valid everywhere and thus we need to share it. In old times the lingua franca of science was Latin. Today it is English, for the better or worse.

### Choose a subject

For small presentations, around 5 minutes, the student needs to choose a subject which can be treated in a few minutes. The subject should be chosen well in advance of the Seminar and in dialogue with the local teacher/advisor. Thus, pick a very limited question, such as what happened at a particular site, in a particular process or with a particular substance. Then learn enough about the topic, much more than is possible to include in the presentation. Search information in books, on the Internet or in research publications. This allows you to develop your own understanding and opinions on the topic. If it is at a nearby site take photos and show as part of the presentation. An obvious possibility is to choose a part of the future diploma work.

### A Seminar schedule

We need a list (schedule) of the presentations. The idea is to start creating a living document and gradually fill in student seminars, beginning already at the start of the course. This living document should be updated regularly and at least one week in advance, next week's program should be ready. The living document should contain the following information: Topic, title, student name, name of local teacher/advisor and finally name of student discussant. Responsible for the living student seminar document is Rustam Eshniyazov (esh-rustam@yandex.ru).

### Outline the presentation

Make an outline of the presentation. Note that you need to make it understandable for your fellow students who know very little about the topic. Thus introduction, description of the situation or problem which you want to address, and finally what could be done to improve or develop the topic.

**Make pictures, ppt slides**

For a small presentation there is room for no more than say 5-8 pictures, or even less. Then there is about 1/2 to 1 minute for each slide. During this time everyone in the audience should be able to read the text and understand the picture. There is thus room for only a few words, a line or two or three. For each fact or piece of information you have found somewhere and cite, you must give the source, i.e. a reference or a link. It is simply illegal not to do that. On the first slide you should always include a title of your presentation, your own name and affiliation (where you belong). It is customary to include a “thank you” on the last slide.

**Rehearse the presentation**

When you are done you have to rehearse the presentation to yourself, or even better to a student friend, so you know for sure what you want to say for each slide, how to read the words and what is the main message of the presentation.

**Comments to the presentation**

To give the audience a better chance to understand the subject presented, it is customary in academic discussions to have a so-called discussant. A discussant’s task is to closely examine what is presented. In student seminars this opposition may be named “Comments” instead of “Opposition” and this term is used in the Sustainable Development and Sustainability Science course. The discussant’s part is expected to be prepared by a fellow student who preferably is getting access to the presentation beforehand and has the chance to read it carefully and prepare comments on it. These comments should highlight the strong and weak aspects of the student presentation in a fair and objective way.

A very important aspect of such comments is to foster the development of a critical thinking among the Seminar participants, i.e. the presenting student, the discussant, and the audience. As a support for the discussant, a simple so-called SWOT analysis could be a useful tool. A SWOT analysis (Strengths, Weaknesses, Opportunities, Threats) aims at identifying and listing specific strengths, weaknesses, opportunities and threats to a successful implementation of the results or the arguments of the presentation.

**Questions by the audience**

The last part of a student presentation session including comments is to allow the audience to raise questions. Typically, a student presentation, student opposition and following questions part in the course will require 20 minutes in total.