

# **Sustainable Development and Sustainability Science 2023**

## **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.

## Table of Contents

<b>Course Abstract</b> .....	<b>1</b>
<b>Table of Contents</b> .....	<b>2</b>
<b>Background</b> .....	<b>3</b>
<b>Course aim and objectives</b> .....	<b>4</b>
Course aim .....	4
Course objectives.....	4
<b>Intended learning outcomes (ILOs)</b> .....	<b>4</b>
<b>Course Programme</b> .....	<b>4</b>
Lectures .....	5
Student Seminars.....	6
Course lecture introductions, literature and course website .....	6
<b>Course parts</b> .....	<b>6</b>
<b>Course admission and examination</b> .....	<b>7</b>
<b>Participating universities and their contact persons</b> .....	<b>7</b>
<b>Website and Zoom links</b> .....	<b>8</b>
Website.....	8
Zoom links.....	8
<b>Others</b> .....	<b>8</b>
<b>Appendix 1 - Master student presentations and comments</b> .....	<b>9</b>
Background.....	9
English language .....	9
Choose a subject.....	9
Outline the presentation .....	9
Make pictures, ppt slides.....	9
Rehearse the presentation .....	10
Comments to the presentation .....	10
Questions by the audience .....	10

**Course PM**

**Sustainable Development and Sustainability Science  
Spring 2023 – 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 (IPCC). 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 resource management with an understanding that all resources are finite and have to be used within their capacity to renew 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 life styles of people and health.

The course was given for the first time for 11 students at the Karakalpak State University spring 2021. During 2022, the course was presented for students from 7 Uzbek universities (the lecture part) and in the student presentation part, 4 universities participated. Late in 2022, the admission rules for Uzbek students in English M.Sc. courses have become stricter and in the 2023 course, the course organizers expect a maximum of 20 students. Regarding implementation of the course, the Uzbek teacher involvement in lectures and in organizing student presentations is expected to increase compared to the 2021 and 2022 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 internationally renowned teachers;
2. To link these challenges to the situation in Uzbekistan through lectures presented in the same way by Uzbek teachers;
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 in 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 Uzbek 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 and fostering a critical thinking.

### **Course Programme**

The course will start on Wednesday 22 February 2023 and then there will follow a lecture each Wednesday until 31 May 2023, when it finishes. Lectures and student Seminars will follow the schedule presented in Table 1. In case this preliminary schedule will not hold, efforts will be made to hold lectures and student presentation sessions during 2 days during the following week in order to be able to finish the course at the latest 31 May.

## SDSS Course PM 2023-03-25

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	Break and preparation of discussion questions
3	15.10 – 15.30	Discussion of specific issue
4	15.30 – 16.00	Lecture part 2
5	16.00 – 17.00	Break
6	17.00 – 18.00	3 Student presentations with student opposition

### Lectures

The planned lecture program is shown in Table 2.

Table 2. Preliminary lecture schedule as per 20 February 2023.

Lecture No	Title	Date	First half responsible	Second half responsible
<b>Part 1 – Basics of Sustainability Science</b>				
1	Introduction to Sustainable Development	22 Feb	Lars Rydén	Lars Rydén
2	Resource flows	1 March	Lars Rydén	Lars Rydén
3	Energy	9 March	Lars Rydén	Lars Rydén
4	Climate change	15 March	Lars Rydén	Urgench State University/Lars Rydén
5	Ecosystems, land use, agriculture, forestry, water, salinization and biodiversity	23 March	Lars Rydén	Farkhod Akhrorov/Björn Frostell
<b>Part 2 – Water and Sustainability</b>				
6	Water use and management - Cleaner production	29 March	Björn Frostell	Abror Gadaev
7	Global water policies - Water and water cooperation in Central Asia	5 April	Gunilla Björklund	Bo Libert
8	The Aral Sea	12 April	Rustam Eshnijazov	Bo Libert
9	Water use and management - Agriculture and Sanitation	19 April	Lars Hylander	Abror Gadaev
<b>Part 3 – Society and Sustainability</b>				
10	Urbanization; The sustainable city	26 April	Lars Rydén	Rustam Eshniyazov
11	A culture of mobility; Means of mobility; Energy of mobility	3 May	Björn Frostell	Jizzakh Politechnical Univ./Björn Frostell
12	Quantification of sustainability; Measuring resource flows	10 May	Björn Frostell	Farkhod Akhrorov
13	Sustainable lifestyles and the dilemma of economic growth, global justice and ecologic sustainability	17 May	Lars Rydén	Farkhod Akhrorov
14	The processes of individual change	24 May	Lars Rydén	Discussion as an important part
<b>Course finalisation</b>				
15	Discussion and Conclusion	31 May	Lars Rydén	All universities

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 and with the aim to give an Uzbek perspective of the lecture theme. Here, an aim is to have a high Uzbek participation.

### **Student Seminars**

The Student Seminars will be practically organised at each university by the responsible contact persons and according to the instruction in Appendix 1. The Seminars are carried out in the English language. A maximum of appr. 20 students in total can be admitted to the Seminar part, preferably Master students. 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.

Considering that preliminarily only a maximum of 20 students will take part in the course, SASS suggests that the Seminars can be carried out in one single session each Wednesday.

SASS has assumed the responsibility to organize with all the Zoom links for the course, (i) the lecture links starting 14.30 (Uzbek time) each Wednesday from 22 February to 31 May and (ii) a student presentation session link each Wednesday from 1 March to 24 May.

### **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 PPT 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. This part would typically be valued with two academic credits ECTS in the Swedish academic system.

Admission to the student seminar part with student presentations and student opposition will have to be restricted to a maximum approx. 20 students. This number assumes that the Seminars will be convened in 1 single Seminar Session, led by an experienced teacher. This part would typically be valued to 3 credits ECTS in the Swedish 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 universities and according to requirements in the Uzbek academic system. 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 Swedish academic system and in line with the so called Bologna process for course valuation, where 1 week's work is valued with 1,5 credits ECTS (ECTS=European Credit Transfer System).

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 their contact persons

The participating universities and their contact persons and contact information has been listed in Table 3.

Table 3. Participating universities, contact persons and expected number of students in the course Sustainable Development and Sustainability Science as of 2022-02-19.

Participating university	Name of coordinating person	Expected number of students
Karakalpak State University	Rustam Eshniyazov <a href="mailto:esh-rustam@yandex.ru">esh-rustam@yandex.ru</a>	9 M.Sc. and 1 B.Sc. students
Samarkand State Architecture-Building Institute	Abror Gadaev <a href="mailto:abror_g@yahoo.com">abror_g@yahoo.com</a>	Not finally clear - expected 1 M.Sc. student
Samarkand State University	Eshkuvat Arzikulov <a href="mailto:eshquvat@mail.ru">eshquvat@mail.ru</a>	Not finally clear - expected 2-3 M.Sc. students
Samarkand Branch of the Tashkent Economic University	Farkhod Akhrorov <a href="mailto:fahrorov@yahoo.com">fahrorov@yahoo.com</a>	2 M.Sc. students
Jizzakh Politechnical Institute	Akmal Sultonov <a href="mailto:sultonovakmal19@mail.ru">sultonovakmal19@mail.ru</a>	2 M.Sc. and 2 B.Sc. students
Urgench State University	Mansur Radjabov <a href="mailto:m.radjabov04041972@gmail.com">m.radjabov04041972@gmail.com</a>	1 M.Sc. and 4 B.Sc. students

## Website and Zoom links

### Website

The SASS main website address is:

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

and the course homepage direct address:

<http://www.aralsjon.nu/en/sdss-course-2023/course-program>

### Zoom links

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

<https://uu-se.zoom.us/j/67582765309>

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 and Björn Frostell;
- Coordination of Uzbek partners and necessary course administration in Uzbekistan – Karakalpak State University, Rustam Eshniyazov;
- 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 universities.

2023-02-19/Lars Rydén, Bo Libert, Björn Frostell and Rustam Eshniyazov.

## Appendix 1 - Master student presentations and comments

Lars Rydén 2022-01-26, revised 2023-02-13

### 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, one need to choose a subject which can be treated in a few minutes. 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.

The subject should be chosen well in advance of the Seminar and in dialogue with the local teacher/advisor. 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](mailto: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 have to 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 to something presented. A discussant's task is to closely examine what is presented and highlight the strong and weak aspects of the presentation. 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 discussants 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.