

MJ2659 Technology and ecosystems (7,5 credits) 2019

This course PM (course memo) is valid for the KTH course MJ2659 Technology and ecosystems (larger course) taught during study period 1 and 2, autumn 2019 (2019-08-27 – 2020-01-14). Please be aware that the information will be continuously updated. For the latest version, see the course page in Canvas.

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We work at the Department of Sustainable Development, Environmental Science and Engineering (SEED), located at Teknikringen 10B. Please primarily turn to Magnus and Hanna with any questions.

Course registration

If you have been admitted to a course at KTH, you need to register via the web to indicate that you indeed intend to attend the course in question. Course registration is a prerequisite for your course results to be registered and for you to be awarded with any higher education credits you earn during the course, as well as to obtain your student aid (CSN). Moreover, registration is necessary in order to maintain access to Canvas.

You find the web registration function via *Manage my studies* under *Services* in the personal menu at the top of the kth.se website. The registration period for courses starting in study period 1 (such as this course) is open from **Thursday 22 August** until **Monday 2 September**. Please find more information [here](#) (KTH > Student at KTH > Before and during a course).

Canvas

KTH uses the learning management system Canvas. In Canvas, you will find up to date information about the course, including the detailed course schedule and deadlines. This is also where you will upload your text submissions. It is important that you remember to register on the course in order to access the material. Please make sure to explore Canvas and familiarise with the content structure as soon as possible.

Language of instruction

The course is taught in English.

Lectures

The course lectures (see schedule below) cover some of the main topics of the course and are mainly thought to be a complement to the course literature. For recommended readings prior to the lectures, see detailed schedule in Canvas.

Course main content and intended learning outcomes

The overall aim of the course is to study the connection between ecosystems and socio-technical systems; how the socio-technical systems are dependent on functioning ecosystems at the same time as human use of natural resources influences structures and processes in the ecosystems.

Course main content

- Concepts such as ecosystems, ecosystem services, ecological carrying capacity and planetary boundaries as well as their relation to technical development, population growth, welfare and sustainable development.
- The most important global and regional environmental problems of today such as global warming, acidification, eutrophication, ozone layer depletion, environmental pollutants, biodiversity, freshwater scarcity and deforestation.
- Trends and changes around the use of natural resources such as forest, soil and drinking water.
- Analysis of a socio-technical system- e.g. production and use of energy, transports, foods, electronics and textiles and its dependence as well as influence on ecosystems.
- Which role societal actors at different levels e.g. individuals, companies, organisations and public authorities, play in relation to regional and global environmental problems and possible solutions.

Intended learning outcomes

On completion of the course, the student should be able to:

1. Account for central concepts in ecosystem ecology.
2. Describe and explain the most important global and regional environmental problems of today, different actors' contributions to the problems as well as the development of the problems over time.
3. Given a global or regional environmental problem, identify and assess possible measures for improvement.
4. Discuss consequences for the interpretation of sustainable development based on the concept ecological carrying capacity.
5. Define a socio-technical system with relevant system boundaries as well as identify and analyse the environmental impact associated with the system and potential improvement measures.
6. In writing and orally present literature and project assignment according to established scientific methodology as well as compare scientific and popular science written communication in the environmental context.

Examination, marks and final grade

This is a second cycle course (advanced level), comprising **7.5 credits (ECTS)** (3,5 credits in study period 1 and 4 credits in study period 2), corresponding to 5 weeks' worth of full-time studies (about 200 h).

Grading scale: A, B, C, D, E, FX, F

The grade Fx indicates that the result is close to pass, and that you need to supplement your assignment and resubmit within six weeks. Fx may be supplemented to grade E or P. The grade Fx cannot be used as a final grade for courses.

Improving a grade on a course, i.e. undergoing a new examination to improve a pass grade you have already received, is allowed. If you wish to do this, you need to contact Karin Orve (Administrator of Education) at karin.orve@abe.kth.se.

Examination

- **LIT1** - Literature Assignment, 1.0 credits, grading scale: P, F
- **PRO1** - Project 1, 2.0 credits, grading scale: P, F
- **PRO2** - Project 2, 1.5 credits, grading scale: P, F
- **TEN1** - Examination, 3.0 credits, grading scale: A, B, C, D, E, Fx, F

Requirements for course grade (final grade)

In order to pass the course, you must:

- pass a literature assignment (written book analysis + seminar) (LIT1);
- pass project work part 1 (analysis of the impact of a socio-technical system in relation to a set of planetary boundaries) (PRO1);
- pass project work part 2 (analysis of the impact of a socio-technical system in relation to one planetary boundary) (PRO2); and
- pass a written examination (TEN1).

Table 1 presents which examination (LIT1, PRO1, PRO2, TEN1) addresses which intended learning outcome. Connected to each examination is an assessment template that directs the marking of the submission in question. The assessment templates can also be used by the students as guides and support when conducting the different tasks.

Table 1. Intended learning outcomes, examinations and respective grade levels.

Intended learning outcome	Examined at level	LIT1	PRO1	PRO2	TEN1
1. Account for central concepts in ecosystem ecology	C-E				C-E
2. Describe and explain the most important global and regional environmental problems of today, different actors' contributions to the problems as well as the development of the problems over time.	A-E	P/F	P/F	P/F	A-E
3. Given a global or regional environmental problem, identify and assess possible measures for improvement.	A-E			P/F	A-E
4. Discuss consequences for the interpretation of sustainable development based on the concept ecological carrying capacity.	P/F	P/F			
5. Define a socio-technical system with relevant system boundaries as well as identify and analyse the environmental impact associated with the system and potential improvement measures.	P/F		P/F	P/F	
6. In writing and orally present literature and project assignment according to established scientific methodology as well as compare scientific and popular science written communication in the environmental context.	P/F	P/F	P/F	P/F	

Pass with distinction (LIT1 & PRO1)

The course grade is based on the written examination. However, if the student has exceeded expectations in relation to one or both of the two individual examinations (LIT1 and PRO1), there is the possibility to improve the course grade by up to two levels, according to Table 2. For more information on how to receive pass with distinction, see sections below. Please note that it is not necessary to have received passed with distinction on any of the individual examinations in order to receive a certain course grade (i.e. the student can receive any course grade based on the written examination) and that it is not possible to receive a course grade lower than the grade awarded for the written examination (TEN1).

The mark pass with distinction is only valid within the same course round (including the associated re-examination) as when it was awarded. Should the student finalise LIT1 and/or PRO1 this year and TEN1 another year, or vice versa, a pass with distinction (P+) cannot be used to improve the course grade.

Table 2. How the marks for the different examinations are combined to create the course grade (final grade).

LIT1* (1 hp)	P+	P+	P	P	P+	P+	P	P	P+	P+	P	P	P+	P+	P	P	P+	P+	P	P
PRO1* (2 hp)	P+	P	P+	P	P+	P	P+	P	P+	P	P+	P	P+	P	P+	P	P+	P	P+	P
PRO2 (1,5 hp)	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P
TEN1 (3 hp)	A	A	A	A	B	B	B	B	C	C	C	C	D	D	D	D	E	E	E	E
COURSE GRADE	A	A	A	A	A	A	A	B	A	B	B	C	B	C	C	D	C	D	D	E

Literature assignment (LIT1)

The literature assignment (LIT1) consists of an individual task and comprises a written book analysis, formulation of questions for discussion, reading two supplementary texts available online, and the active participation during a seminar. More detailed instructions are available in the Literature assignment PM. The official mark is pass/fail, but a significantly strong submission can be awarded a pass with distinction (P+), which can improve the overall course grade according to the conditions described in the section Examination, marks and final grade. A detailed assessment template is available in the Literature assignment PM.

In order to receive a pass with distinction (P+) for this task, at least four (4) of the criteria need to have been marked as such. It is only possible to receive a pass with distinction (P+) for the initial submission, which must be submitted on time. In case the initial submission is late and/or is marked as Fx (i.e. one or more criteria is marked Fx) and needs to be supplemented, it is only possible to receive a pass (P), even if the original submission was marked with pass with distinction for ≥ 4 criteria.

Project (PRO1 + PRO2)

The project work is based on the concept of planetary boundaries. The article *Planetary Boundaries: Exploring the Safe Operating Space for Humanity* by Johan Rockström and colleagues (2009) and the book *The Human Quest - Prospering within planetary boundaries* by Johan Rockström and Mattias Klum (2012) should be starting points for the project work where you, individually and together in a project group, will study the planetary boundaries in relation to a specific socio-technical system. The work process is divided in two phases, Project work part 1 (PRO1) and Project work part 2 (PRO2). More detailed instructions will be presented during the project initiation workshops and be made available in a project PM in Canvas.

Part 1 (PRO1)

Project part 1 (PRO1) consists of an individual task. The official mark is pass/fail, but a significantly strong submission can be awarded a pass with distinction (P+), which can improve the overall course grade according to the conditions described in the section Examination, marks and final grade. A detailed assessment template will be included in the project PM.

In order to receive a pass with distinction (P+) for this task, at least three (3) of the criteria need to have been marked as such. It is only possible to receive a pass with distinction (P+) for the initial

submission, which must be submitted on time. In case the initial submission is late and/or is marked as Fx (i.e. one or more criteria is marked Fx) and needs to be supplemented, it is only possible to receive a pass (P), even if the original submission was marked with pass with distinction for ≥ 3 criteria.

Part 2 (PRO2)

Project part 2 (PRO2) consists of a group task. The mark is pass/fail (P/F). A detailed assessment template will be included in the project PM.

Written examination (TEN1)

The written examination (“salsskrivning”) will mainly be based on the content of the two course books, Wright and Boorse (2014) and Rockström and Klum (2012), but may also be related to additional course literature, the lectures and the Project work. The examination is graded A-F. An assessment template for TEN1 is presented in Table 3. More information regarding the structure of the written exam will be presented during the course.

Table 3. Assessment template for written examination, defining criteria for grade levels E, C and A.

Intended learning outcome	E	C	A
1. Account for central concepts in ecosystem ecology	Name and briefly define/describe central concepts in ecosystem ecology. Give at least one relevant, and no irrelevant, example.	Describe how central concepts in ecosystem ecology relate to each other and to STS.	-
2. Describe and explain the most important global and regional environmental problems of today, different actors' contributions to the problems as well as the development of the problems over time.	Briefly describe the most important global and regional environmental problems of today. Give at least one relevant, and no irrelevant, example.	Explain the underlying processes/mechanisms behind the problems and the resulting environmental impacts (i.e. alteration of ecosystem functioning).	Critically discuss and analyse different actors' contributions to the problems.
3. Given a global or regional environmental problem, identify and assess possible measures for improvement.	Suggest ways to reduce the negative ecological impact (i.e. solutions).	Describe the solutions and motivate how they may address the problem.	Critically assess and discuss the potential of the solutions, including the risk of introducing additional/new negative impact(s), and suggest strategies for implementation.

The examination will be held **9 January 2020**. It is essential that you remember to **register in advance** for the exam. You can register via the personal menu located at the top of the KTH website. Under *Services* (Manage my studies), select *Exam registration*. Under *Current education*, you then select *Results* for the course (Current or Uncompleted) and there you can register for the exam. If you do not have the opportunity to write an exam you have signed up for, remember to cancel the registration. See more [here](#) (KTH > Student at KTH > Before and during a course > Examination).

The online registration for the written exams given during examperiod 2 opens **Thursday 28 November** and closes **Thursday 12 December (23:59)**.

Supplementary assignments

- In the case a submitted assignment (LIT1/PRO1/PRO2) does not meet the requirements as outlined in the task descriptions, each student/group can amend the text and re-submit within six weeks after the grade and feedback were announced. Should the text still not meet the requirements, the student/group will receive an “F” for the examination and will have to re-do the task during the next time the course is given in order to receive the associated credits and the final grade for the course.
- In case a student cannot attend the literature seminar, he or she will have to do a supplementary assignment (a written analysis based on the literature). More information will be available in Canvas after the date of the seminar.
- The written re-examination (“omtent”) will be in April 2020.

Schedule

The course introduction is held 27 August 2019 in room U21. A more detailed schedule is available in Canvas.

Course literature

The two course books:

- Wright, R. T. & Boorse, D. F., 2013. *Environmental Science Pearson New International Edition: Towards a Sustainable Future*. 12th ed. Pearson.
- Rockström, J. & Klum, M., 2012. *The human quest: prospering within planetary boundaries*. Stockholm: Bokförlaget Lagenskiöld.

Any additional literature will be made available via **Canvas**.

References and plagiarism

Plagiarism means that you submit someone else's work or parts of someone else's work under your own name. This is, of course, not allowed. KTH takes very seriously on plagiarism as well as on the use of other unauthorized methods or tools in order to gain an advantage ("cheating").

Occasionally, plagiarism happens because the student does not have sufficient knowledge about how to reference the material he or she has used. In short, you need to include references to make it clear to

the reader (or listener / viewer) where the information you present comes from, and whether it is reproduced as a direct quote (only for one or possibly a few sentences where the meaning would get lost if it was rephrased) or paraphrased (using your own words). When you write texts as part of your course work, it is very important that you are careful to indicate the sources of the information you present and clearly state what are your own and others opinions or explanations, respectively. In this course we use the so-called **Harvard system** for references. If you are unsure what this means, you can find links to guides in Canvas.

All submitted texts will be checked for plagiarism using the automated text matching tool **URKUND**. In case of suspected plagiarism or other fraud, the examiner is obliged to report to the Head of KTH, who assesses whether the matter is to be raised by the Disciplinary Board. The board decides whether any further action is to be taken, and if so, may decide to grant the student a warning or expel him or her during a specified period of time.

You can find more information about reference management and recommendations for reference management softwares on the [KTH Library webpage](#). To read more about plagiarism, please refer to the KTH publication [Guiding students away from plagiarism](#) by Jude Carroll and Carl-Mikael Zetterling (2009).

Course evaluation

A course evaluation will be conducted using feedback from an appointed **course committee** and a Learning Experience Questionnaire (LEQ). If you have any comments during the course, please feel free to contact the course committee or the course coordinator.

Students with disabilities

KTH is actively working to make the studies available for students with disabilities. KTH can offer different types of compensatory support customised to your specific needs. Please turn to [Funka](#) (KTH > Student at KTH > Student support and student life > Rights and responsibilities) for more information. We also ask you to inform the course coordinator of any special needs (Funka does not inform the course coordinator).