Faculty of Engineering and Sustainable Development
Akademin för teknik och miljö

EDUCATION PLAN

HÖGSKOLAN I GÄVLE

Master in Sustainability Science – Environment and Decision Making 120 cr

Master i miljövetenskap - Beslutsfattande för hållbar utveckling 120 hp

Set by -

Version	**Set at**	**Valid from**
	9/29/20	**ST21**

Education level	Second cycle
Programme code	TAMBA
Credits	120 cr
Diary number	HIG-UTB 2020/22

Target

A Degree of Master of Arts/Science (120 credits) is awarded after the student has completed the courses required to gain 120 credits with a defined specialisation determined by each higher education institution itself, of which at least 60 credits are for specialised study in the principal field (main field of study) of the study programme. In addition the prior award of a Degree of Bachelor's degree, Degree of Bachelor's degree in fine arts, professional or vocational qualification of at least 180 credits or a corresponding qualification from abroad is required.

The requirement of the prior award of a qualification may be waived for a student admitted to the programme without the basic entry requirement in the form of a qualification. This does not, however, apply if a waiver was granted during admission pursuant to the second paragraph of Section 28 of the Chapter 7 of the Higher Education Ordinance (1993:100) on the grounds that the qualification had not yet been issued.

Knowledge and understanding

For a Degree of Master of Arts/Science (120 credits) the student shall

demonstrate knowledge and understanding in the main field of study, including both broad knowledge of the field and a considerable degree of specialised knowledge in certain areas of the field as well as insight into current research and development work, and
demonstrate specialised methodological knowledge in the main field of study.

Skills and abilities

For a Degree of Master of Arts/Science (120 credits) the student shall

demonstrate the ability to critically and systematically integrate knowledge and analyse, assess and deal with complex phenomena, issues and situations even with limited information

demonstrate the ability to identify and formulate issues critically, autonomously and creatively as well as to plan and, using appropriate methods, undertake advanced tasks within predetermined time frames and so contribute to the formation of knowledge as well as the ability to evaluate this work

demonstrate the ability in speech and writing both nationally and internationally to report clearly and discuss his or her conclusions and the knowledge and arguments on which they are based in dialogue with different audiences, and

demonstrate the skills required for participation in research and development work or autonomous employment in some other qualified capacity.

Judgement and attitudes

For a Degree of Master of Arts/Science (120 credits) the student shall

demonstrate the ability to make assessments in the main field of study informed by relevant disciplinary, social and ethical issues and also to demonstrate awareness of ethical aspects of research and development work

demonstrate insight into the possibilities and limitations of research, its role in society and the responsibility of the individual for how it is used, and

demonstrate the ability to identify the personal need for further knowledge and take responsibility for his or her ongoing learning.

Content and structure

Main field of study - Sustainability Science

Sustainability science is a main field of study that connects with many disciplinary domains. At the University of Gävle, the field is particularly linked to the engineering and social science disciplinary domains, but also to the natural science disciplinary domain. Sustainability science is a thematic main field that, with concepts, theories, methods and models, describes and answers questions related to the connections between environment, people and technology. The main field is thus to be regarded as interdisciplinary, where environment is the cohesive theme. The core of the main field is about the connections between people, the environment and technology. Environment refers to both the natural environment, the built environment and the social-ecological environment. Central to sustainability science is the interaction between the environment, human behaviors and psychological processes (cognition, emotion, perception, attitudes, etc.), the interaction between the environment and technology, as well as the tripartite interaction between environment, technology and people. The overall goal of sustainability science is to reduce human negative environmental impact, with a particular focus on climate impact, and at the same time to build local social-ecological resilience related expected environmental changes. The main field wants to contribute to low impact on the natural environment through good management, planning and housekeeping with natural resources and limited emissions to air, land and water which, in the long run, increase human well-being, from both systems, societal and individual perspectives. These are common goals for the research and education conducted in sustainability science. The common goals are achieved through the analysis and development of technical solutions (systems, processes, products and services), psychological factors and behavioral changes as well as their interaction and integration in socio-technical and social-ecological systems which have in common that they influence the natural environment directly or indirectly.

Arrangement

The program comprises 120 higher education credits and leads to a Master's degree in Sustainability Science. There is also the opportunity for the students to finish their education after 60 higher education credits and thus graduate with a “magister” degree. For this, the two final courses of the second semester are required to be replaced with a thesis of 15 higher education credits.

The study rate is 100%. The full-time studies are organized in such a way that the students sequentially read courses of about 7.5 higher education credits throughout the program, apart from the master's degree project, which comprises 30 higher education credits. All courses except one course are in the main field of Sustainability Science and give the students broad and deep knowledge, skills and values in the main field in which they graduate. In addition, the program provides broad and in-depth knowledge of the concept of sustainability and tools and strategies for achieving change at various levels, both at individual, group, organizational and community levels. The program has a thematic focus on decision making, both directly and indirectly. Students gain knowledge and skills in decision-making, the conditions of

decision-making, processes and tools, especially in relation to sustainable development.

The program also provides students with tools and capabilities to measure, change, and track environmental impacts from people, objects, and systems. In addition, the program provides students with an understanding of psychological processes that influence decision-making, at the individual level and in groups. Students are also given knowledge in group processes, social psychology, leadership, as well as the ability to lead projects for sustainable development.

Throughout the program, generic skills are trained, in particular decision making (making decisions yourself, applying decision making tools, and understanding the background to systematic decision making errors), critical thinking, analytical skills (through scientific methodology and training in intellectual abilities), leadership and project management. The students also gain skills in scientific writing and in the ability to express themselves well in text and dialogue. The latter part of the program deepens the knowledge within the above-mentioned knowledge and skills areas.

Course overview
During the first year of the program, the student reads an introductory course that deals with sustainability science and systems analysis, which is followed by scientific method and philosophy of science. The student then reads a course in group psychology, leadership and project management, followed by a course in natural resource management and social-ecological systems. All in all, the first semester provides both a broad overview and an in-depth understanding of the main field's central concepts, theories and methods, as well as knowledge of project management and group dynamics.

The second semester begins with a course in strategic management for sustainable development followed by a course in environmental assessment. The courses combine knowledge of how environmental impact is measured with how organizations should be managed to reduce their environmental impact. The semester ends with two courses that provide students with tools to solve sustainability problems: a course that provides tools to implement and evaluate attitudinal and behavioral change work, and a course that provides tools to deal with complex problems in a sustainability context.

During the first semester of the second year of the program, in-depth courses in life cycle analysis and measurement of environmental impact are obtained, in-depth courses in psychological perspectives on decision-making, in-depth knowledge in the management of individuals, organizations and communities, and in-depth knowledge in scientific methodology. During the second semester of the second year of study, the student conducts a thesis for a degree in sustainability science.

Internationalization
The program has an international acceptance of students, which allows the students to establish international contacts already during the program. In the main field of Sustainability Science, the University has well established international research collaborations. The international collaboration entails regular visits to the University by visiting researchers, which allows the students to have good contact with international representatives in the area during their studies. The content of the program also has an international character where international perspectives are a central part of the knowledge area.

Other degree Independent project (degree project)

A requirement for the award of a Degree of Master of Arts/Science (120 credits) is completion by the student of an independent project (degree project) for at least 30 credits in the main field of study. The degree project may comprise less than 30 credits, however no less than 15 credits, if the student has already completed an independent project in the second cycle for at least 15 credits in the main field of study or the equivalent from a programme of study outside Sweden.

Degree title Master of Arts/Science (120 Credits)

Prerequisites In order to be eligible for the program, a degree is required at the undergraduate level,

comprising at least 180 higher education credits

- 60 higher education credits in the major area of sustainability science, environmental engineering, technology, psychology, industrial design and natural resource management or other relevant major area.

English language proficiency equivalent to (the Swedish upper secondary school) English course 6.

Year 1

Period	Identifier	Title	Level	Credits	Field
1:1	MIA006	*Sustainability Science and Systems Theory*	A1N	7.5 cr	Sustainability Science
1:1	MIA007	*Philosophy of Science, Research Ethics, Quantitative and Qualitative Research Methods*	A1N	7.5 cr	Sustainability Science
1:2	MIA009	*Natural Resource Management and Resilience Building of Social-ecological Systems*	A1N	7.5 cr	Sustainability Science
1:2	MIA008	*Group Decision Making and Leadership for Sustainability*	A1N	7.5 cr	Sustainability Science
1:3	IEA005	*Strategic Sustainability Management*	A1N	6 cr	Industrial Economics
1:3	MIA301	*Methods for Environmental Assessment*	A1F	9 cr	Sustainability Science
1:4	MIA302	*Dealing with Wicked Problems of Sustainability*	A1F	7.5 cr	Sustainability Science
1:4	MIA010	*Behavioral and Attitudinal Change for Sustainable Development*	A1N	7.5 cr	Sustainability Science

Year 2

Period	Identifier	Title	Level	Credits	Field
2:1	MIA304	*The Psychology of Decision Making with Focus on Sustainability*	A1F	7.5 cr	Sustainability Science
2:1	MIA303	*Resource Efficiency and Management*	A1F	7.5 cr	Sustainability Science
2:2	MIA305	*Governance of Sustainability Transformations*	A1F	7.5 cr	Sustainability Science
2:2	MIA306	*Advanced Research Methods*	A1F	7.5 cr	Sustainability Science

2:3	MIA800	*Thesis for Master's Degree in Sustainability Science*	A2E	30 cr	Sustainability Science