

Undergraduate School of Geosciences: Bachelor's degree programme in Global Sustainability Science

ART. 2.1 – ADMISSION REQUIREMENTS

1. In addition to the diplomas specified in the Act that give admission to the degree programme, the holder of a diploma of equivalent previous education listed in the General EER Appendix 1 will be admitted to the degree programme provided that the conditions referred to in Section 2 (below) have been met.
2. Applicants who have completed previous education as stated in the General EER Appendix Par. 1, or who have a diploma for passing a first-year examination at a university of applied sciences may only register for the degree programme after it has been demonstrated that they possess sufficient knowledge at the level of the pre-university (VWO) final examination in accordance with the 2007 profiles in the following subjects: English, Mathematics A or Mathematics B and two of the following four subjects: Physics, Chemistry, Biology or Economics.
3. Deficiencies in the prior education of the subjects referred to in Section 2 can be remedied by sitting the relevant tests at Boswell Beta or the central Committees for Preliminary Examinations (*centrale commissies voortentamen*) in Physics, Chemistry, Mathematics and/or Biology. The missing subjects may also be achieved by means of state examinations or adult education. In exceptional cases, the Board of Examiners may ask a university lecturer in the subject concerned to administer one or more tests.

ART. 2.3 - UNIVERSITY ENTRANCE EXAMINATION (COLLOQUIUM DOCTUM)

The admission test referred to in Section 7.29 of the Act relates to the following subjects at pre-university (VWO) final examination level: English, Mathematics A or Mathematics B and two of the following four subjects: Physics, Chemistry, Biology and Economics.

ART. 3.1 – AIM OF THE DEGREE PROGRAMME

The programme aims to:

- provide knowledge, skills and insight into the field of sustainability science, and enable achievement of the exit requirements referred to in Section 2
- provide an academic education, which means that it aims to develop competences (knowledge, skills and attitudes) related to:
 - academic thought, actions and communication
 - the use of relevant academic instruments
 - (academic) communication in English
 - application of specific knowledge of a field in a broader academic, philosophy of science and socio-cultural context
 - standards of conduct applicable during studies and within the discipline
- prepare the student for further study

From their first year of study onwards, students will learn and understand the theory and practice of scholarly research.

1. General learning outcomes

Students with a Bachelor's degree in *Global Sustainability Science*:

- can acquire, interpret and conceptualise knowledge
- can analyse, structure and synthesise information
- can reason and argue logically, and think analytically and critically
- can apply methods and techniques in a scientific manner in order to solve problems
- can independently keep up to date with developments and new knowledge in their specialism
- can place their knowledge and understanding in a wider scientific and social context
- can convey scientific knowledge to both specialists and non-specialists

In addition, students have:

- a substantive understanding of research in their specialism
- the necessary basis for a university Master's education
- a reflective attitude with regard to their own functioning, individual development and career

2. Domain-specific learning outcomes:

Knowledge:

Students with a Bachelor's degree in *Global Sustainability Science* have:

- a basic knowledge and understanding of the nature, extent and causes of sustainability issues at different spatial (local to global) and temporal (short term to long term) levels of scale and the underlying concepts
- a basic knowledge and understanding of current and innovative solutions to sustainability issues at different levels of scale
- a basic knowledge and understanding of physical, chemical and biological processes in the natural system; social, ethical and economic processes in the social system; as well as interactions between both systems leading to sustainability issues
- knowledge of the multidisciplinary nature of sustainability issues, and of theories and methods of sustainability research, as well as an understanding of the possibilities and limitations of multidisciplinary approaches
- a more specific knowledge and understanding of the theories and methods of one of the sub-domains of sustainability issues relating to water, climate & ecosystems, energy & resources, sustainable and healthy food, governance & societal transformation and business & innovation
- an understanding of the complex social change processes related to the pursuit of a sustainable society and the ability to distinguish, identify and assess the effectiveness of various relevant management strategies (driven by science or social sciences)

Skills:

Students with a Bachelor's degree in *Global Sustainability Science* can:

- use the elementary knowledge and insights acquired in analysing and solving sustainability issues at different levels of scale
- formulate simple research questions, formulate hypotheses and statements for observation, test hypotheses and apply research methods in a sustainability study
- design a sustainability study and make a reasoned choice for quantitative and/or qualitative methods

- carry out empirical research, using techniques from science or social sciences, to process, analyse and correlate, interpret and/or model collected data, and to present the results in writing in an appropriate form (e.g. map or graph)
- find relevant literature and information on sustainability, and can study, analyse, assess and evaluate this literature and information critically
- as a sustainability expert, work together with specialists from other disciplines, and in particular have the ability within these multidisciplinary teams to confront and integrate the insights and approaches from the various disciplines with each other
- produce and orally present written work in English on their specialism and their own work, appropriate to a given forum
- reformulate a practical question or scientific problem in their specialism as a clear and researchable problem, effectively operationalise the terms therein, develop a usable conceptual framework, present the result in a coherent argument that ends with a clear, synthesising conclusion, use the results to answer the practical question or contribute to clarifying and solving the problem as far as possible, and express an opinion that is also based on weighing up relevant social, scientific or ethical aspects

Attitude

Students with a Bachelor's degree in Global Sustainability Science demonstrate:

- a scientific attitude (objective, critical, ethical, etc.) in describing, explaining and predicting phenomena
- a professional attitude in carrying out their work
- an awareness of the effects and consequences of human activity on sustainability systems, and of the moral aspects of sustainable development and the need for the sustainable management of the Earth.

ART. 3.5 – MAJOR

1. The degree programme comprises a part (the major) with a study load of 135 credits that concerns sustainability science. The components listed in Appendix 1A (cohort 2022) and Appendix 2A (cohort 2023), with a total study load of 60 credits, are compulsory.
2. The students choose the other components of the major from the components listed in Appendix 1B (cohort 2022) and Appendix 2B (cohort 2023).
3. Components that also relate to the scientific and social context of sustainability science, with a study load of at least 15 credits, must form part of the major.
4. The components of the major must be at in-depth level for at least 37.5 credits and at advanced level for at least 45 credits.
5. The major includes a thesis with a study load of 15 credits, in which, as proof of competence, the student has the option of producing a paper independently, bringing together the required knowledge, skills and attitudes.

ART. 4.2 – ENTRY REQUIREMENTS FOR COURSES; PRIOR KNOWLEDGE

1. For each component, Appendix 3 describes the entry requirements that must be met to be allowed to take part.
2. Without prejudice to the provisions in Section 1, the University Course Catalogue and the prospectus state for each course what prior knowledge is required in order to take part in the course successfully.

3. If courses in the major are provided by a different degree programme, the entry requirements as set out in the Education and Examination Regulations for that course are applicable.

ART. 4.7 – EVALUATION OF THE QUALITY OF EDUCATION

1. The Director of Education monitors the quality of education, and ensures that both the courses and the curriculum are evaluated. The Director takes into consideration the advice and suggestions given by the Education Committee regarding improving and ensuring the quality of the programme.
2. Students are informed of the outcomes of the course and curriculum evaluations.

APPENDICES

APPENDIX 1: EXAM PROGRAMME GLOBAL SUSTAINABILITY SCIENCE (COHORT 2022)

A. Compulsory components of the major (60 EC)

a. Courses at level 1 (introductory)

-	Sustainability Challenges	7.5 EC
-	Mathematics and Systems Analysis	7.5 EC
-	Natural Processes	7.5 EC
-	Foundations of Social Sciences for Sustainability	7.5 EC
-	Research Skills GSS	7.5 EC
-	Regional Integration Project	7.5 EC

b. Courses at level 2 (in-depth)

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-	Statistics GSS	7.5 EC
-	Global Integration Project	7.5 EC

B. Optional components of the major (75 EC)

WCE = Water, Climate & Ecosystems

E&R = Energy & Resources

GST = Governance & Societal Transformation

B&I = Business & Innovation

a. Track-specific courses at level 1 (introductory)

Choice 1 out of 4:

- WCE: Chemistry and the Environment 7.5 EC
- E&R: Science of Energy Technologies 7.5 EC
- GST: Politics of the Earth 7.5 EC
- B&I: Principles of Economics 7.5 EC

b. Track-specific courses at level 2 (in-depth)

Choice 2 out of 8:

- WCE: Global Climate Change 7.5 EC
- WCE: Ecological Field Research 7.5 EC
- E&R: Applied Thermodynamics & Energy Conversions 7.5 EC
- E&R: Global Climate Change 7.5 EC
- GST: Policy Evaluation and Design 7.5 EC
- GST: Environmental Law 7.5 EC
- B&I: Organisation & Innovation 7.5 EC
- B&I: Economics of Innovation 7.5 EC

c. Non-track-specific courses at level 2 (in-depth)

Choice 1 out of 2:

- Philosophy of Science and Ethics 7.5 EC
- Environmental Communication and Behaviour 7.5 EC

d. Track-specific courses at level 3 (advanced)

Choice 3 out of 5 or 6:

- WCE: Integrated Water and Soil Management 7.5 EC
- WCE: Ecohydrology 7.5 EC
- WCE: Landscape Ecology and Nature Conservation 7.5 EC
- WCE: Environmental Chemistry and Health 7.5 EC
- WCE: Land Change Science 7.5 EC
- WCE: Environmental Impact Assessment 7.5 EC
- E&R: Sustainable Energy Supply 7.5 EC
- E&R: Land Change Science 7.5 EC
- E&R: Life Cycle Assessment 7.5 EC
- E&R: Sustainable Resource Use 7.5 EC
- E&R: Energy Analysis 7.5 EC
- E&R: Energy Markets 7.5 EC
- GST: Sustainable Energy Supply 7.5 EC
- GST: Landscape Ecology and Nature Conservation 7.5 EC
- GST: Sustainable Land Use 7.5 EC
- GST: Integrated Water and Soil Management 7.5 EC
- GST: Environmental Impact Assessment 7.5 EC
- B&I: Business, Sustainability and Innovation 7.5 EC
- B&I: Innovation Strategies of Firms and Entrepreneurs 7.5 EC
- B&I: Sustainable Resource Use 7.5 EC
- B&I: Energy Analysis 7.5 EC
- B&I: Life Cycle Assessment 7.5 EC
- B&I: Energy Markets 7.5 EC

Choice 1 out of 4

- Bachelor's thesis WCE 15 EC
- Bachelor's thesis E&R 15 EC
- Bachelor's thesis GST 15 EC

- Bachelor's thesis B&I 15 EC

e. Non-track-specific courses at level 3 (advanced)

Choice 1 out of 2:

- Consultancy Project 7.5 EC

- Consultancy Project Aruba GSS (only for selected students) 7.5 EC

When choosing the major elective courses, the following rule applies:

Students must choose courses from their own track at levels 1, 2 and 3, and two non-track-specific courses, one at level 2 and one at level 3.

CONVERSION OF FORMER COURSES

Old course	New course 2023-2024
Principles of Economics (GEO1-2255)	Principles of Economics (GEO1-2435)
Ecohydrology (GEO2-2131)	Ecological Field Research (GEO2-2439)

APPENDIX 2: EXAM PROGRAMME GLOBAL SUSTAINABILITY SCIENCE (COHORT 2023)

A. Compulsory components of the major (60 EC)

a. Courses at level 1 (introductory)

- Sustainability Challenges 7.5 EC

- Mathematics and Systems Analysis 7.5 EC

- Natural Processes 7.5 EC

- Foundations of Social Sciences for Sustainability 7.5 EC

- Research Skills GSS 7.5 EC

- Regional Integration Project 7.5 EC

b. Courses at level 2 (in-depth)

- Statistics GSS 7.5 EC
- Global Integration Project 7.5 EC

B. Optional components of the major (75 EC)

WCE = Water, Climate & Ecosystems

E&R = Energy & Resources

GST = Governance & Societal Transformation

B&I = Business & Innovation

SHF = Sustainable and Healthy Food

a. Track-specific courses at level 1 (introductory)

Choice 1 out of 5:

- WCE: Chemistry and the Environment 7.5 EC
- E&R: Science of Energy Technologies 7.5 EC
- GST: Politics of the Earth 7.5 EC
- B&I: Principles of Economics 7.5 EC
- SHF: The Science of Food Systems 7.5 EC

b. Track-specific courses at level 2 (in-depth)

Choice 2 out of 10:

- WCE: Global Climate Change 7.5 EC
- WCE: Ecological Field Research 7.5 EC
- E&R: Applied Thermodynamics & Energy Conversions 7.5 EC
- E&R: Global Climate Change 7.5 EC
- GST: Policy Evaluation and Design 7.5 EC
- GST: Environmental Law 7.5 EC
- B&I: Organisation Theories 7.5 EC
- B&I: Innovation for Sustainability 7.5 EC
- SHF: Agroecology 7.5 EC

-	SHF: Sustainable and Healthy Food Consumption	7.5 EC
<i>c. Non-track-specific courses at level 2 (in-depth)</i>		
Choice 1 out of 2:		
-	Philosophy of Science and Ethics	7.5 EC
-	Environmental Communication and Behaviour	7.5 EC
<i>d. Track-specific core courses at level 3 (advanced)</i>		
Choice 1 out of 5:		
-	WCE: Ecohydrology	7.5 EC
-	E&R: Energy Analysis	7.5 EC
-	GST: Sustainable Land Use	7.5 EC
-	B&I: Business, Sustainability and Innovation	7.5 EC
-	SHF: Transforming Food Systems	7.5 EC
<i>e. Track-specific bachelor thesis at level 3 (advanced)</i>		
Choice 1 out of 5:		
-	Bachelor's thesis WCE	15 EC
-	Bachelor's thesis E&R	15 EC
-	Bachelor's thesis GST	15 EC
-	Bachelor's thesis B&I	15 EC
-	Bachelor's thesis SHF	15 EC
<i>f. Non-track-specific courses at level 3 (advanced)</i>		
Choice 1 out of 2:		
-	Consultancy Project	7.5 EC
-	Consultancy Project Aruba GSS (only for selected students)	7.5 EC
Choice 2 out of 15:		
-	Ecohydrology	7.5 EC
-	Landscape Ecology and Nature Conservation	7.5 EC
-	Environmental Chemistry and Health	7.5 EC
-	Land Change Science	7.5 EC
-	Life Cycle Assessment	7.5 EC
-	Energy Markets	7.5 EC
-	Sustainable Energy Supply	7.5 EC

- Sustainable Land Use	7.5 EC
- Integrated Water and Soil Management	7.5 EC
- Environmental Impact Assessment	7.5 EC
- Business, Sustainability and Innovation	7.5 EC
- Innovation Strategies of Firms and Entrepreneurs	7.5 EC
- Sustainable Resource Use	7.5 EC
- Energy Analysis	7.5 EC
- Transforming Food Systems	7.5 EC

When choosing the major elective courses, the following rule applies:

Students must choose:

- all courses from their own track at levels 1 and 2
- one non-track specific course at level 2
- one track-specific core courses from their own track at level 3
- one track-specific bachelor thesis from their own track at level 3
- and three non-track specific courses at level 3.

CONVERSION OF FORMER COURSES

Not applicable in 2023-2024.

APPENDIX 3: ENTRANCE REQUIREMENTS PER COURSE

Course	Entrance requirements
Regional Integration Project (GEO1-2416)	Research Skills GSS (GEO1-2415) must be followed parallel to Regional Integration Project (GEO1-2416).
Environmental Communication and Behaviour (GEO2-2429)	At least 45 EC gained.
Global Climate Change (GEO2-2143)	Wiskunde en Systemanalyse (GEO1-2202) or Mathematics & Systems Analysis (GEO1-2411) or Wiskunde voor Aardwetenschappers (GEO1-1103) or Voortgezette Wiskunde/Fysica (GEO1-1121) or Systeembioogie (B-B1SYSB09) or Kwantitatieve biologie (B-B1KWBI20) or a comparable course
Statistics GSS (GEO2-2428)	Participated fully in Research skills GSS (GEO1-2415)
Global Integration Project (GEO2-2417)	Passed Research skills GSS (GEO1-2415) and Regional Integration Project (GEO1-2416).

	Participated fully in Statistics GSS (GEO2-2428)
The Sustainability Game (GEO2-2425)	At least 45 EC gained
Futuring for Sustainability (GEO2-2427)	At least 45 EC gained
International Sustainability Field trip (GEO2-2433)	At least 60 EC gained. Passed Research skills GSS (GEO1-2415) and Regional Integration Project (GEO1-2416).
Ecological Field Research (GEO2-2439)	GEO1-2415: Research Skills Participated fully in Statistics (GEO2-2428)
Business, Sustainability and Innovation (GEO3-2122)	At least 90 EC gained.
Innovation Strategies of Firms and Entrepreneurs (GEO3-2221)	At least 90 EC gained
Sustainable Land Use (GEO3-2121)	At least 60 EC gained. Participated fully in Politics of the Earth (GEO1-2414) and Policy Evaluation and Design (GEO2-2113)

Bachelor's thesis GSS (GEO3-2422)	<p>Passed all major obligatory courses GSS apart from Statistics GSS (GEO2-2428) and Consultancy Project (GEO3-2423) or Consultancy Project Aruba GSS (GEO3-2432);</p> <p>Participated fully in Statistics GSS (GEO2-2428) and Consultancy Project (GEO3-2423) or Consultancy Project Aruba GSS (GEO3-2432);</p> <p>Passed all track courses of the student's chosen track on level 1 and 2;</p> <p>Passed at least 1 track course of the student's chosen track on level 3.</p>
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Bachelor's thesis for LAS-DO students	<p>Passed:</p> <ul style="list-style-type: none"> • Mathematics & Systems Analysis (GEO1-2411) • Research Skills GSS (GEO1-2415) • Duurzame Ontwikkeling (GEO1-2103) • Natural Processes (GEO1-2412) • All courses at level 1 and 2 of your course package • At least 1 course at level 3 of your course package <p>Participated fully in Statistics GSS (GEO2-2428). LAS students who started their major in 2020-21 or earlier may have GEO2-2217 (Statistics) in their major declaration. They should have participated in that course before they can enroll for the Bachelor's thesis GSS.</p>
Consultancy Project (GEO3-2423)	<p>At least 90 EC gained in the major GSS, amongst which:</p> <ul style="list-style-type: none"> - Sustainability Challenges (GEO1-2410), and - Regional Integration Project (GEO1-2416), and - Global Integration Project (GEO2-2417)
Tailor-made course GSS (GEO3-2426)	<p>Passed all major GSS obligatory courses of year 1;</p> <p>Passed at least one GSS major elective course of year 1;</p> <ul style="list-style-type: none"> • Little to no study delay. • The course can only be taken if a lecturer from the GSS programme can be found to supervise the student (depends a.o. on available time, expertise and field of interest of the lecturer). • Approval received by the project supervisor and course coordinator at least 1 month prior to the start of the course. • Execute within a timeframe of no more than two education periods (22 weeks).
Stories and System Change (GEO3-2431)	At least 90 EC gained

Consultancy Project Aruba GSS (GEO3-2432)	<p>At least 90 EC gained in the major GSS, amongst which:</p> <ul style="list-style-type: none">- Sustainability Challenges (GEO1-2410), and- Regional Integration Project (GEO1-2416), and- Global Integration Project (GEO2-2417) <p>Students will go through a separate selection process for this course. Only selected students can take the course.</p>
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