

*Week 1 Introduction and start of Module Societies and Land use*

<b>Date Time</b>	<b>Topic Literature/assignments</b>	<b>Lecturer / Guest speaker</b>	<b>Location</b>
<b>Monday 1 September</b> 08.30 – 09.00 09.00 – 09.45 09.45 – 10.00  10.00 – 10.45 10.45 – 11.15 11.15 – 12.30 13.30 – 16.00	Signing in, picture taking Opening and Welcome speech Coffee & Tea  General Introduction to the minor and analysis of personal learning goals from motivation letters Icebreakers / group acquaintance Discussion groups: Sustainability propositions Workshop creating Academic Posters	Minor coordinator Frank de Wit ( <i>alderman D66, municipality of Leiden</i> )  Wil Tamis / minor coordinator Minor coordinator Arnold Tukker Lauran van Oers	E003A/B  Van Steenis building
<b>Tuesday 2 September</b> 09.30 – 10.30  10.30 – 12.30 13.30 – 15.00	Theory and instruction Presentations  Group work: Preparation posters and presentation Group presentations and feedback	Hermen Visser ( <i>Visser Visible Communication</i> ) students Lauran van Oers / Arnold Tukker	F104
<b>Wednesday 3 September</b> 09.30 – 10.00 10.00 – 11.00 11.00 – 12.00 12.00 – 13.00 14.00 - 15.00  afternoon	Start Module Societies and Land Use  Introduction to the module and the paper Assignment: Two factors for survival Discussion and Lecture: Stories of survival Lecture: stories of survival Workshop: English essay writing part I  Self study literature Reading material: Reader on Yap 1 (23 p), Diamond on Haiti/Dom.Rep. (29 p), Wilkinson on the UK 6 (25 p), Tiffen Chapter 1 and conclusion Chapter 11 (10 p). Optional: Book Tiffen, Mortimore & Gichuki ('More people, less erosion')	Wil Tamis  Wouter de Groot  Lisette van Hulst ( <i>Language Centre – UL</i> )	E003A/B
<b>Thursday 4 September</b> morning 12.00 afternoon 17.30	Self study literature Introduction on biodiversity Leiden Excursion Leiden Urban Nature and Waste Including diner (optional)	Floris de Boer ( <i>IVN Leiden</i> )  students/coordinator minor	E001  Leiden
<b>Friday 5 September</b> 09.30 – 12.15 afternoon	Lecture: Factors of survival Self study literature Reading material: De Groot on Von Thuenen (27 p), Malthus (10 p), Tiffen Chapter 16 (13 p), Turner, Hyden & Kates (from the Conclusion, 5 p), Homer-Dixon from the Conclusions ('Some factors...') (13 p), Diamond from Prologue and Chapter 14 (21 p). Optional: Homer-Dixon Hst 3('Two centuries', 17p)	Wouter de Groot / Wil Tamis	E003A/B

*Week 2 Module Societies and Land use*

<b>Date Time</b>	<b>Topic Literatuur / Opdrachten</b>	<b>Lecturer / Guest speaker</b>	<b>Location</b>
<b>Monday 8 September</b> 09.30 – 10.15 10.30 – 13.15 afternoon	Response lecture on the Survival theme Lecture: The world today Self study literature Reading material: The book of Lester Brown, 'Outgrowing the Earth'. Mandatory readings: chapter 2,3,5,6,8 and 9 (101 p)	Wouter de Groot / Wil Tamis	E003A/B
<b>Tuesday 9 September</b>	Reading, and paper elements		
<b>Wednesday 10 September</b> 09.30 – 10.15 10.30 – 13.15 afternoon	Response lecture on the Today theme and paper Lecture: Sustainability thinking I Self study literature - Problem-oriented: PiC (24 p) - Depth-oriented: Environmental etiquette (20 p)	Wouter de Groot / Wil Tamis	E003A/B
<b>Thursday 11 September</b>	Reading, and paper elements		
<b>Friday 12 September</b> 09.30 – 10.15 10.30 – 13.15 afternoon	Response lecture on the Thinking I theme and paper Lecture: Sustainability thinking II Self study literature Reading material: Hardin (Tragedy of the commons) (5 p), Ostrom (Governing the commons) (38 p) and Brox (The epistemological status ....) (8 p)	Wouter de Groot / Wil Tamis	E003A/B

*Week 3 Module Societies and Land use*

<b>Date Time</b>	<b>Topic Literature/assignments</b>	<b>Lecturer / Guest speaker</b>	<b>Location</b>
<b>Monday 15 September</b> 09.30 – 10.15 10.30 – 11.45  12.00 – 13.45  14.30 – 15.15 15.30 – 17.00	Doing Sustainability: two capita selecta Capita selecta I: Eutrophication Basic eutrophication mechanisms Eutrophication mini-excursion  Eutrophication details and policies  Capita selecta II: Getting people into action A theory of Action for the environment Footprint and other WWF strategies	Wil Tamis Eric Verlaan/ Johan Oosterbaan (HH Rijnland)  Bruce Michielsen (HH Rijnland)  Jeroen Admiraal Natascha Zwaal (WWF)	E003A/B
<b>Tuesday 16 September</b> morning  13.00  afternoon	Paper design  Upload your draft on Blackboard  Discuss drafts in groups (read each other drafts and discuss and answer questions)	Students  Student groups	
<b>Wednesday 17 September</b> 10.30 – 12.30  13.00 – 14.00 14.00 – 17.30	Lecture: the noble art of debating and discussing  Workshop: English essay writing part II Paper design discussion in groups (45 minutes per group of 5 students)	Kick Moors (FWN) + Wubbo Lameijer  Lisette van Hulst ( <i>language            centre – UL</i> )  Arnold Tukker, Wil Tamis	E003A/B  A303 / B302
<b>Thursday 18 September</b>	Self study: Paper writing		
<b>Friday 19 September</b> 09.30 – 12.30  13.00 – 17.00	Paper pitches (5 minutes each + 5 minutes discussion per student, group 1-4)  Paper pitches (5 minutes each + 5 minutes discussion per student, group 5-8)  <b>Upload your paper before Monday 22            September 18.00: Deadline</b> for uploading sustainability paper on Blackboard (see assignment: sustainability paper, definitive version)	Arnold Tukker  Wil Tamis  Students	E003A/B

**Week 4 start Module Biodiversity**

Date Time	Topic Literature/assignments	Lecturer / Guest speaker	Location
<b>Monday</b> <b>22 September</b> 09.30 – 10.30 10.45 – 12.00 12.15 – 13.30  Afternoon	<b>Start module Biodiversity</b>  Lecture: Introduction Module Biodiversity Lecture: Theory of Biodiversity I (species) Lecture: What are the threats to biodiversity?  <u>Self study:</u> Pereira et al. 2010; Mora et al. 2011  <b>Upload your Sustainability paper before Monday 22 September 18.00: Deadline</b> (see assignment: sustainability paper, definitive version)	Krijn Trimbos Kees Musters Krijn Trimbos	E003A E003B
<b>Tuesday</b> <b>23 September</b>	<ul style="list-style-type: none"> <li>- <u>Self study:</u> Miller (14th ed.) 3.1, 3.2, 4.1,4.2, 4.4 &amp; 4.5 + review questions on core case studies of the relevant sections (= 22 pg. incl. questions) (<i>see literature System Earth &amp; Climate Change</i>)</li> <li>- <u>Self study:</u> Millenium Ecosystem Assesment: Preface and Summary for decision makers (= 21 p.)</li> <li>- <u>Self study:</u> Admiraal (2013) <i>Ecological Economics</i>, 89, pp. 115-122. (8pg.)</li> </ul>		
<b>Wednesday</b> <b>24 September</b> 09.30 - 10.30  <b>10.30 – 11.45</b>  <b>12.00 – 13.30</b>  Afternoon	Lecture: Theory of Biodiversity II (populations & ecosystems) <b>Lecture: Ecosystem services</b>  <b>Presentation students: Pereira et al. 2010</b> <b>Presentation students: Mora et al. 2011</b>  <u>Self study: Breure et al. 2012: Ecosystem services: a useful concept for soil policy making!</u> <u>Self study: Van Bodegom and Price: A trait-based approach to quantifying ecosystem services</u>	Kees Musters  <b>Peter van Bodegom (VU) Students</b>	E003A E003B
<b>Thursday</b> <b>25 September</b>	<u>Self study: Boersema (2013) How much Biodiversity do we need: Chapter 19 from Artigas-Menant, Geneviève, Boersema Jan J. and Antonello La Vergata (Eds.) (2013) <i>Nature, Environment and Quality of Life</i>. Brepols, Paris.! (16 pg.)</u> <u>Self study: The landscape form of the Metropolis</u> <u>Screening: <i>Urban by nature paper belonging to May 2014 exposition Kunsthal Rotterdam</i></u> Van de Heide en Ruuijs 2010; Triall <i>et al.</i> 2007		
<b>Friday</b> <b>26 September</b> 9.30 – 10.45 11.00 – 12.00  Afternoon	<b>Lecture: Social aspects of biodiversity</b> Presentation students: Van de Heide en Ruuijs 2010 Presentation students: Triall <i>et al.</i> 2007 Self study: <i>Pletz et al.</i> 2012	<b>Henk Staats</b> Students	E003A E003B

*Week 5 Module Biodiversity*

<b>Date Time</b>	<b>Topic Literature/assignments</b>	<b>Lecturer / Guest speaker</b>	<b>Location</b>
<b>Monday 29 September</b> 09.30 – 10.45  11.00 – 12.15  12.30 - 13.00  13.30 – 14.00  14.00 – 15.00  Afternoon	Lecture: Ecosystem Services: combining economic values to ecological resilience  Lecture: Is urbanization a threat to biodiversity?  Presentation students: Pletz et al. 2012  Debate instructions  Documentary: Green Gold by John D. Liu  Six groups of students: three contra Faking nature and three pro Nature restoration and human interferences.	Jeroen Admiraal  Rene van de Velde (TUD) Students  Krijn Trimbos	E003A E003B
<b>Tuesday 30 September</b>	<u>Self study:</u> Prepare for discussion about Faking Nature: - R. Elliot: Faking Nature (8 pg.) - William R. Jordan: "Sunflower Forest": Ecological Restoration as the Basis for a New Environmental Paradigm (17 pg.)		
<b>Wednesday 01 October</b> 09.30 – 10.30 10.30 – 14.30  14.30 - 17.00	Lecture: Two ways of talking nature: De re/De dicto Preparation pitch  Active discussion on faking nature: wild versus manufactured (pro versus contra: pitch versus reference group)	Wil Tamis  Students + Krijn Trimbos + Kick Moors/Eric-Wubbo Lameijer	E003A E003B
<b>Thursday 02 October</b>	<u>Self study:</u> White and Walker 1997 White 2013 Preparing exam		
<b>Friday 03 October</b>	University is closed: Leidens Ontzet		

***Week 6 Module Biodiversity***

<b>Date Time</b>	<b>Topic Literature/assignments</b>	<b>Lecturer / Guest speaker</b>	<b>Location</b>
<b>Monday 6 October</b> 09.30 – 10.30 10.00 – 10.30 10.45 – 12.30  15.00 – 17.00	Presentation students: White and Walker 1997 Presentation students: White 2013 Lecture: Ethical aspects of biodiversity / nature conservation  <b>Exam</b> Biodiversity	Students  Matthijs Schouten (WUR)  Krijn Trimbos	E003A E003B   F104
<b>Tuesday 7 October</b>	N.B. Preliminary assignment for module System Earth and Climate Change: Watch the movie “An Inconvenient Truth” from Al Gore, before 8 October (e.g. at <a href="http://video.google.com">http://video.google.com</a> ; also downloadable from blackboard).	Students	

**Week 6 Start Module System Earth & Climate Change**

<b>Date Time</b>	<b>Topic Literatuur / Opdrachten</b>	<b>Lecturer / Guest speaker</b>	<b>Location</b>
<b>Wednesday 8 October</b>	<b>Start module System Earth and Climate Change</b>		
09.30 – 10.00 10.00 – 12.00 12.00 – 12.15	Intro module and brainstorm session climate change Lecture climate change Instructions debate	Wil Tamis René Kleijn	E003A/B
12.30 – 14.00 14.00 – 15.00	<i>Watch the movie “An Inconvenient Truth “ (see instructions 6/10) before the debate</i> Preparation debate <sup>1</sup> Debate between supporters and opponents	Wil Tamis Kick Moors / Eric-Wubbo Lameijer	
15.30 – 17.30	Introduction class Area study Watermanagement in the Philippines	Gerard Persoon & Merlijn van Weerd	FSW, Pdl Court Build, room t.b.a.
<b>Thursday 9 October</b>	Self study:  Miller 14 <sup>e</sup> edition sections 3.3 & 3.4 en 15.4 t/m 15.6. <sup>2</sup> (=21 p.) Report “Sustainable Energy: Without the hot air”, chapters 1, 2 en 18. (www.withouthotair.com) (= 38 p.)		
<b>Friday 10 October</b>	There are several master information events who will take place during the last part of the morning and the afternoon.		

<sup>1</sup> See also manual for suggestions further information about climate change.

<sup>2</sup> In 17<sup>th</sup> edition (Blackboard): 3.3-3.4, 19.1-19.3

***Week 7 Module System Earth & Climate Change***

<b>Date Time</b>	<b>Topic Literatuur / Opdrachten</b>	<b>Lecturer / Guest speaker</b>	<b>Location</b>
<b>Monday 13 October</b> 09.30 – 10.00 10.00 – 12.00  12.30 – 13.00 13.00 – 15.00  15.00 - 16.00	Presentations paper by students The use of climate models in environmental policy  Presentations paper by students Complex systems and biogeochemical cycles  Complex systems and agent based models	students Andries Hof (PBL)  students Ester van der Voet  Benjamin Sprecher	E003A/B
<b>Tuesday 14 October</b>	Self study:  Report Royal Society (Geo-engineering) especially chapters 1-4 see blackboard (=46 p.) Kleijn et al. 2011 (see blackboard) (=9 p.) optional		
<b>Wednesday 15 October</b> 09.30 – 10.00 10.00 – 12.00  12.30 – 13.00 13.00 – 15.00  15.00-16.00	Presentations paper by students Resources and scarcity  Presentations paper by students Material requirements of energy (resource models)  Earth system geo-engineering/ (documentary BBC)	students René Kleijn  students Michel Rademakers (CSS)  Wil Tamis	E003A/B
<b>Thursday 16 October</b>	Self study:  Graedel & van der Voet (eds.) final chapter (see blackboard) (10 p.) Miller 14 <sup>e</sup> edition (33 p.), 10.1 + 10.2 (land) 11.1 t/m 11.3 (water), 12.4 + 12.5 (materials). <sup>[1]</sup>		
<b>Friday 17 October</b> 09.30 – 10.00 10.00 – 12.00  12.30 – 13.00 13.00 – 15.00  15.00 – 17.00	Presentations paper by students Resources: impacts and linkages  Presentations paper by students Social sciences and climate change  Pitches and discussion on Earth system geo- engineering, see instructions manual	students Ester van der Voet  students Marius de Geus (IPW) Wil Tamis	E003A/B

<sup>[1]</sup> In 17<sup>th</sup> edition (Blackboard): 12.1-12.2,13.1-13.5,14.4-14.5.



***Week 8 Module System Earth & Climate Change***

<b>Date Time</b>	<b>Topic Literatuur / Opdrachten</b>	<b>Lecturer / Guest speaker</b>	<b>Location</b>
<b>Monday 20 October</b> 09.30 – 10.00 10.00 – 12.00  12.30 – 13.00 13.00 – 15.00  15.00 – 15.45	Presentation paper Energy fluxes  Presentation paper Energy  Review lecture on sustainability papers module Societies and Land Use	students René Kleijn  students Gert Jan Kramer  Wil Tamis	E003A/B
<b>Tuesday 21 October</b>	Self study, preparation presentations and exam		
<b>Wednesday 22 October</b> 09.30 – 12.30  13.00 – 17.30	GIS as a tool in climate change and environmental process studies  GIS practical / lab: Introduction to ARCGIS 10 – Plotting species distributions on a map	Maarten van 't Zelfde	GIS-lab
<b>Thursday 23 October</b>	Self study, preparation exam		
<b>Friday 24 October</b> 9.30 – 11.30	Exam System Earth & Climate Change	Wil Tamis	E004



***Week 10 Module Economy & Technology – life-cycle approaches to sustainability***

<b>Date Time</b>	<b>Topic Literature/assignments</b>	<b>Lecturer / Guest speaker</b>	<b>Location</b>
<b>Monday 3 Nov</b> 09.30 – 10.30  10.30 – 10.45 10.45 – 11.45  11.45 – 12.00 12.00 – 13.00  13.00 – 13.30 13.30 – 14.15 14.15 – 15.00 15.00 – 15:15 15:15 – 16:00	Introduction to economy & technology scenarios towards 2050 <i>Break</i> Sustainable industrial transformation: past, present & future (1) <i>Break</i> Sustainable industrial transformation: past, present & future (2) <i>Lunch-break</i> Backcasting scenarios: the ‘Bulgarian’ lifestyle Forecasting scenarios: 9 Billion people by 2050 <i>Break</i> Assignment: Scenario Storylines	SD  Arjan de Koning (AdK)  JG SD	E003A E003B
<b>Tuesday 4 Nov</b>	Group assignments (whole day!!) Suggested meeting schedule: 9.00-10.00: action plan + division of tasks 16.00-17.30: drafting of presentation	Students	
<b>Wednesday 5 Nov</b> 09.30 – 10.30 10.30 – 10.45 10.45 – 11.45 11.45 – 12.00 12.00 – 13.30 Afternoon	Presentations & discussion: scenario assign. <i>Break</i> Presentations & discussion: scenario assign. <i>Break</i> Scenario evaluation & role of tools <i>Self study time / preparation for exam</i>	Students + SD, JG/LvO  SD	E003A E003B
<b>Thursday 6 Nov</b>	Self study / preparation for exam		
<b>Friday 7 Nov</b> 09.30 – 09.45 09.45 – 10.30 10.30 – 10.45 10.45 – 11.30 11.30 – 11.45 11.45 – 12.30  12.30-13.15 13.15-13.45 13.45-14.45	Introduction to the theme of the day Food: Transitions in food supply by aquaculture <i>Break</i> Waste2resource: transition of resource mining <i>Break</i> Renewable energy: Biosolar systems  Sustainable transport: from innovation2transition <i>Lunch-break</i> Response session	SD Angelica Mendoza (PhD student) Benjamin Sprecher (PhD student) Coen van der Giesen (PhD student) David Font Vivanco (PhD student) JG, SD, LvO, AdK	E003A E003B

***Week 11 Module Economy & Technology – life-cycle approaches to sustainability***

<b>Date Time</b>	<b>Topic Literature/assignments</b>	<b>Lecturer / Guest speaker</b>	<b>Location</b>
<b>Monday 10 Nov</b>  Time: t.b.a.	<b>Exam Economy &amp; Technology</b>		t.b.a.