

Week 1 Introduction and start of Module Societies and Land use

Date Time	Topic Literature/assignments	Lecturer / Guest speaker	Location
Monday 2 September 08.30 – 09.00 09.00 – 09.45 09.45 – 10.00 10.00 – 10.45 10.45 – 11.15 11.15 – 12.30 12.30 – 13.30 13.30 – 16.00 16.00 – 16.30	Signing in, Picture taking Opening and Welcome speech by the new CML director <i>Coffee & Tea</i> General Introduction to the minor and analysis of personal learning goals from motivation letters Icebreakers / group acquaintance Discussion groups: Sustainability propositions <i>Lunch break</i> Workshop creating Academic Posters Instruction Poster presentation	Arnold Tukker Wil Tamis / Rianne de Bree Wouter de Groot Luran van Oers Self study	F104/ F106 Van Steenis building
Tuesday 3 September 10.00 – 12.00 13.30 – 15.00	Self study: Preparation Posters and Presentation Group presentations and feedback	Kick Moors Wouter de Groot	F112/F114
Wednesday 4 September 09.15 – 10.00 10.15 – 11.00 11.15 – 12.00 12.15 – 13.00 13.30 – 17.30	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 Self study literature <i>Reading material is:</i> Reader on Yap 1 (23 pg), Diamond on Haiti/Dom.Rep. (29 pg), Wilkinson on the UK 6 (25 pg), Tiffen Chapter 1 and conclusion Chapter 11 (10 pg)	Wouter de Groot	F104/ F106
Thursday 5 September 09.00 – 10.00 10.00 – 10.30 10.30 – 12.00 12.00 – 12.45 12.45 – 14.00	Excursion Mybeach Cleanup Challenge Travelling to the beach (location to be announced) 10.00 – 10.30 Introduction by Stichting De Noordzee (North Sea Foundation) Cleaning & Counting on the beach Analysis & explanation of data Lunch (optional)	Jeroen Dagevos Rianne de Bree	the beach
Friday 6 September 09.15 – 12.00 12.15 – 17.30	Lecture: Factors of survival Self study literature <i>Reading material is:</i> De Groot on Von Thuenen (20 pg), Malthus (9 pg), Tiffen Chapter 16 (13 pg), Turner, Hyden & Kates (from the Conclusion, 5 pg.), Homer-Dixon from the Conclusions ('Some factors...') (13 pg), Diamond from Prologue and Chapter 14 (21 pp.). [Homer-Dixon Hst 3(' Two centuries ') optional].	Wouter de Groot	F104/ F106

Week 2 Module Societies and Land use

Date Time	Topic Literatuur / Opdrachten	Lecturer / Guest speaker	Location
Monday 9 September 09.15 – 10.00 10.15 – 13.00 13.30 – 17.30	Response lecture on the Survival theme Lecture: The world today Self study literature <i>Reading material</i> is: The book of Lester Brown, ‘Outgrowing the Earth’. Mandatory readings: chapter 2,3,5,6,8 and 9	Wouter de Groot	F104/ F106
Tuesday 10 September	Reading, and paper elements		
Wednesday 11 September 09.15 – 10.00 10.15 – 13.00 13.30 – 17.30	Response lecture on the Today theme and paper Lecture: Sustainability thinking I Self study literature <i>Reading material</i> is not fully decided yet, but is likely to contain: - Problem-oriented: PiC - System-oriented: MFA and C2C - Depth-oriented: Environmental etiquette	Wouter de Groot	F104/ F106
Thursday 12 September	Reading, and paper elements		
Friday 13 September 09.15 – 10.00 10.15 – 13.00 13.30 – 17.30	Response lecture on the Thinking I theme and paper Lecture: Sustainability thinking II Self study literature <i>Reading material</i> is: Hardin (Tragedy of the commons), Ostrom (Governing the commons) and Brox (The epistemological status).	Wouter de Groot	F104/ F106

Week 3 Module Societies and Land use

Date Time	Topic Literature/assignments	Lecturer / Guest speaker	Location
Monday 16 September 09.15 – 10.00 10.15 – 11.30 11.45 – 13.30 13.30 – 14.15 14.15 – 15.15 15.30 – 16.15 16.30 – 17.15	Doing Sustainability: two capita selecta Capita selecta I: Eutrophication Basic eutrophication mechanisms Eutrophication mini-excursion Eutrophication details and policies Lunch break Capita selecta II: Getting people into action A theory of Action for the environment Footprint and other WWF strategies	Wouter de Groot Kees/Erik Bruce Wouter de Groot Natascha Zwaal	F104/ F106
Tuesday 17 September	Paper design		
Wednesday 18 September 09.15 – 10.00 10.15 – 11.00 11.15 – 12.00 12.15 – 13.00 13.30 – 14.15 14.30 – 15.15 15.30 – 16.15 16.30 – 17.15	<i>Non-obligatory:</i> Paper design discussion in small group (group 1) Paper design discussion in small group (group 2) Paper design discussion in small group (group 3) Paper design discussion in small group (group 4) Paper design discussion in small group (group 5) Paper design discussion in small group (group 6)	Wouter de Groot student groups	F104/ F106
Thursday 19 September	Self study: Paper writing		
Friday 20 September	Self Study: Paper writing N.B. Preliminary assignment for module System Earth and Climate Change: Watch the movie “An Inconvenient Truth “from Al Gore, before 25 September (e.g. at http://video.google.com ; also downloadable from blackboard).		

Week 4 Exam S&L and start Module System Earth & Climate Change

Date Time	Topic Literatuur / Opdrachten	Lecturer / Guest speaker	Location
Monday 23 September 9.15 – 12.15 14.00 – 17.00	Paper pitches (5 minutes each + 5 minutes discussion per student, group 1) Paper pitches (5 minutes each + 5 minutes discussion per student, group 2)	Wouter de Groot Student groups	F104/ F106
Tuesday 24 September	Rounding off papers 18.00: Deadline for submitting sustainability paper on Blackboard (see assignment: sustainability paper)		
Wednesday 25 September 09.30 – 10.00 10.00 – 12.00 12.30 – 14.00 14.00 – 15.00	Start module System Earth and Climate Change Intro module and brainstorm session climate change Lecture climate change <i>Watch the movie “An Inconvenient Truth “ (see instructions 20/9) before the debate</i> Preparation debate ¹ Debate between supporters and opponents	Wil Tamis René Kleijn Wil Tamis	F104/F106
Thursday 26 September	Self study: Miller 14 ^e edition sections 3.3 & 3.4 en 15.4 t/m 15.6. ² (=21 p.) Report “Sustainable Energy: Without the hot air”, chapters 1, 2 en 18. (www.withouthotair.com) (= 38 p.)		
Friday 27 September 10.00 – 12.30 13.00 – 15.00 15.00 – 16.00	The use of climate models in environmental policy Complex systems and biogeochemical cycles Complex systems and agent based models	Jasper van Vliet (PBL) Ester van der Voet Stefano Cucurachi	F104/F106

¹ See also manual for suggestions further information about climate change.

² In 17th edition (Blackboard): 3.3-3.4, 19.1-19.3

Week 5 Module System Earth & Climate Change

Date Time	Topic Literature/assignments	Lecturer / Guest speaker	Location
Monday 30 September 10.00 – 12.00 13.00 – 15.00 15.00-16.00	Resources and scarcity Material requirements of energy (resource models) Earth system geo-engineering/ (documentaire BBC) Discussion afterwards, see instructions manual	René Kleijn Michel Rademakers Wil Tamis	F104/F106
Tuesday 1 October	Self study: Report Royal Society (Geo-engineering) especially chapters 1-4 see blackboard (=46 p.) Kleijn et al. 2011 (see blackboard) (=9 p.) optional		
Wednesday 2 October Morning 13.00 – 15.00 15.00 – 17.00	Self study Energy fluxes Energy	René Kleijn Gert Jan Kramer	F104/F106
Thursday 3 October	Leidens Ontzet No classes		
Friday 4 October	University is closed No classes		

Week 6 Module System Earth & Climate Change

Date Time	Topic Literature/assignments	Lecturer / Guest speaker	Location
Monday 7 October 10.00 – 12.00 12.00 – 12.30 Afternoon	Resources: impacts and linkages Response lecture on sustainability papers module Societies and Land use Self study: Graedel & van der Voet (eds.) final chapter (see blackboard) (10 p.) Miller 14 ^e edition (33 p.), 10.1 + 10.2 (land) 11.1 t/m 11.3 (water), 12.4 + 12.5 (materials). ³	Ester van der Voet Wouter de Groot	F104/F106
Tuesday 8 October	Self study, preparation presentations and exam		
Wednesday 9 October 09.00 – 12.30 13.00 – 13.20 13.20 – 13.40 13.40 – 14.00 14.00 – 14.20 14.40 – 15.00 15.00 – 15.20 15.20 – 15.40 15.40 – 16.00	Self study, preparation presentations Presentation article (see manual) climate change climate models in environmental policy complex systems and biogeochemical cycles energy energy fluxes geo-engineering resources and scarcity resources and linkages	Wil Tamis 2 students	F104/ F106
Thursday 10 October	Self study, preparation exam		
Friday 11 October 14.00 – 16.00	Exam System Earth & Climate Change	Wil Tamis	E 005

³ In 17th edition (Blackboard): 12.1-12.2,13.1-13.5,14.4-14.5.

Week 7 Module Economy & Technology

Date Time	Topic Literature/assignments	Lecturer / Guest speaker	Location
Monday 14 October 09.00 – 09.30 09.30 – 10.30 10.30 – 10.45 10.45 – 12.30 12.30 – 13.00 13.00 – 14.00 14.00 – 14.15 14:15 – 15:15 15.15 – 15.30 15.30 – 16.00	Brainstorm session Economy, technology and environment relations <i>Break</i> Introduction to tools (IPAT, LCA, SFA, MFA, EIOA) <i>Lunch-break</i> Introduction to MFA <i>Break</i> Mapping global material flows <i>Break</i> Introduction to the assignments: E&T, MFA	Jeroen Guinée (JG) Laurant v. Oers (LvO) & Sebastiaan Deetman (SD)	F104/ F106
Tuesday 15 October	Self study / Literature / assignments		
Wednesday 16 October 09.00 – 10.00 10.00 – 10.15 10.15 – 11.15 11.15 – 11.30 11.30 – 12.30 12.30 – 13.00 13.00 – 14.30 14.30 – 14.45 14.45 – 16.00 16.00 – 16.30	Presentations & discussion: E&T/MFA assign. <i>Break</i> Presentations & discussion: E&T/MFA assign. <i>Break</i> Brainstorm session: how green is packaging? <i>Lunch-break</i> Introduction to LCA & Packaging studies <i>Break</i> My First LCA Introduction to the assignments + role-play game	Students + JG, SD, LvO Jeroen Guinée Jeroen Guinée + LvO	F104/ F106
Thursday 17 October	Self study / assignments		
Friday 18 October 09.00 – 10.00 10.00 – 10.15 10.15 – 11.15 11.15 – 11.30 11.30 – 12.30 12.30 – 13.00 13.00 – 14.00 14.00 – 14.15 14.15 – 16.30	Presentations & discussion: packaging assign. <i>Break</i> Presentations & discussion: packaging assign. <i>Break</i> Packaging and Policy, theory and practice (1) <i>Lunch-break</i> Packaging and Policy, theory and practice (2) <i>Break</i> Role-play game: policy negotiations	Students+ JG, LvO Robbert van Duin Jeroen Guinée + RvD	F104/ F106

Week 8 Module Economy & Technology

Date Time	Topic Literature/assignments	Lecturer / Guest speaker	Location
Monday 21 October 09.00 – 10.00 10.00 – 10.15 10.15 – 11.15 11.15 – 11.30 11.30 – 12.30 12.30 – 13.00 13.00 – 14.00 14.00 – 14.15 14.15 – 15.15 15.15 – 15.45	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> 9 Billion wealthy people by 2050: scenario development <i>Break</i> Scenario case study Assignment: Scenario Storylines	Sebastiaan Deetman Arjan de Koning (AdK) Sebastiaan Deetman Sebastiaan Deetman /pm	F104/ F106
Tuesday 22 October	Self study / assignments		
Wednesday 23 October 09.00 – 10.00 10.00 – 10.15 10.15 – 11.15 11.15 – 11.30 11.30 – 13.00 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 Sebastiaan Deetman	F104/ F106
Thursday 24 October	Self study / Literature / assignments		
Friday 25 October 09.00 – 09.15 09.15 – 10.00 10.00 – 10.15 10.15 – 11.00 11.00 – 11.15 11.15 – 12.00 12.00-12.45 12.45-13.15 13.15-14.15	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	Jeroen Guinée Patrik Henriksson (PhD student) Benjamin Sprecher (PhD student) Coen van der Giesen (PhD student) David Font Vivanco (PhD student) JG, SD, LvO, AdK	F104/ F106

Week 9 Exam E&T and start Module Biodiversity

Date Time	Topic Literature/assignments	Lecturer / Guest speaker	Location
Monday 28 October	<i>Self study time / preparation for exam</i>		F104/ F106
Tuesday 29 October 14.00 – 15.00	Exam Economy and Technology	Supervisor	E 005
Wednesday 30 October 9.30 – 10.30 10.45 – 12.00 12.15 – 13.30 afternoon	Start module Biodiversity Lecture: Introduction Module Biodiversity Lecture: Theory of Biodiversity I (species) Lecture: What are the threats to biodiversity? Self study	Martina Vijver Kees Musters Martina Vijver	F104/ F106
Thursday 31 October	Self study: Miller (14th ed.) 3.1, 3.2, 4.1,4.2, 4.4 & 4.5 + review questions on core case studies of the relevant sections (= 23 p. incl questions) Self study: Millenium Ecosystem Assesment: Preface and Summary for decision makers (= 21 p)		
Friday 1 November 09.30 - 10.30 10.30 – 11.45 12.00 – 13.30 Afternoon	Self study: Admiraal (2013) <i>Ecological Economics</i> , 89, pp. 115-122. Lecture: Theory of Biodiversity II (populations & Ecosystems) Lecture: Ecosystem Services: combining economic values to ecological resilience Self study: Breure et al 2012: Ecosystem services: a useful concept for soil policy making! Self study: Pletz 2012: Modelling land management effect on ecosystem functions and services: a study in the Netherlands	Kees Musters Jeroen Admiraal	F104/ F106

Week 10 Module Biodiversity

Date Time	Topic Literature/assignments	Lecturer / Guest speaker	Location
Monday 4 November 9.30 – 10.45 11.00 – 12.45 Afternoon	Lecture: Ecosystem services in the Netherlands Lecture: 2500 years of positioning nature Self study	Dick Melman (Alterra) Wouter de Groot	F104/ F106
Tuesday 5 November	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. Self study: The landscape form of the Metropolis Screening: Urban by nature paper belonging to May 2014 exposition Kunsthal Rotterdam		
Wednesday 6 November 9.30 – 10.45 11.15 – 12.30	Lecture: relationship between biodiversity and “the viewpoints of life” Lecture: urbanization not only a threat to biodiversity Two groups of students: one contra Faking nature and one pro Nature restoration and human interferences. Self study: Prepare for discussion	Jan Boersema Rene van de Velde (TUD)	F104/ F106
Thursday 7 November	Self study: Prepare for discussion about Faking Nature: <ul style="list-style-type: none"> - R.Elliot: Faking Nature - William R. Jordan: “Sunflower Forest”: Ecological Restoration as the Basis for a New Environmental Paradigm 		
Friday 8 November 9.30 – 10.45 11.00 – 11.45 11.45 – 12.45 Afternoon	Documentary: Green Gold by John D. Liu Two ways of talking: De re/De dicto Active discussion on faking nature: wild versus manufactures Prepare for presentations on Monday <i>Master Event Universiteit Leiden</i>	Martina Vijver, Wouter de Groot Students + Martina Vijver	F104/ F106

Week 11 Module Biodiversity

Date Time	Topic Literature/assignments	Lecturer / Guest speaker	Location
Monday 11 November 09.30 – 9.50 09.50 – 10.10 10.10 – 10.30 10.30 – 10.50 11.00 – 11.20 11.20 – 11.40 11.40 – 12.00 12.00 – 12.20 12.20 – 12.30	Prepare for exam via group presentations: Presentation group 1 Presentation group 2 Presentation group 3 Presentation group 4 Presentation group 5 Presentation group 6 Presentation group 7 Presentation group 8 Wrap up	2 students per group	F104/ F106
Tuesday 12 November 14.00 – 15.30 15.45 – 18.00	Exam Biodiversity Closing Seminar: Answers to the Big Issues Course evaluation Drinks	Supervisor Wil Tamis Rianne de Bree	E 005 F110
Wednesday 13 November	Start Project Groups: Design of European Research See separate schedule		F104/ F106

Monday 23 December 11.00 – 12.30 13.00 – 14.30	Retake System Earth & Climate Change Retake Biodiversity	Supervisor	F104/ F106
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Tuesday 24 December 11.00 – 12.30	Retake Economy & Technology	Supervisor	F104/ F106
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