**II.2.12 SUSTAINABLE DEVELOPMENT**

**A. Course description**

**1. Credit points: 2 ECTS**

**2. Time commitment**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Items | Lecture | Tutorial/Exercise | Practice/Assignment | Lab-work | Total |
| No. of hours | 19 | 4 |  |  | 23 |

**3. Prerequisites**

**4. Recommended background knowledge**

**5. Subject description**

Sustainability describes the three columns “Economy, Ecology & Social Justice” as main parameter for sustainable development.

**6. Objectives & Outcome**

Students should be able to evaluate social processes and environmental solutions under the interdisciplinary focus of sustainability. They have the knowledge about different management strategies and measure­ment tools to develop, to characterize and to evaluate own sustainable environmental concepts.

**7. Assessment/ Evaluation**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Component | Attendance | Exercises | Assignments | Practicals | Midterm | Final |
| Percentage % | 10 | 10 | 0 | 30 | 0 | 50 |

**8. Prescribed Textbook(s)**

[1] Tom Theis and Jonathan Tomkin (Editors). Sustainability: A Comprehensive Foundation (<http://cnx.org/content/col11325/latest/>), 2012)

**B. Course content**

[1] “Global Thinking”:

+ international conventions (incl. UN-MDG)

+ global carbon cycles

+ global N, S and P-cycles

[2] Sustainability in geo- and environmental sciences:

+ definitions (incl. inter- & intrageneration concepts)

+ energy resources

 (incl. technology of renewable energy; renewable energy in agriculture)

[3] Evaluation of sustainability:

+ IPAT-equation

+ Life Cycle Assessment

+ Recycling in sense of “Hierarchy of Raw Materials”

+ Estimation by MIPS, virtual water and CO2-footprints

+ Land use in sense of “Valuing Ecosystem Services”

[4] Sustainable management:

+ PSR-model

+ Environmental Impact Assessment (EIA) & Environmental Impact Management (EIM)

+ Integrated Water Resources Management (IWRM)

+ Clean Development Mechanism (CDM)

+ “Cradle to Cradle”

[5] Review

**C. Reference Literature**

[1] United Nations: The Millennium Development Goals Report 2008, New York

[2] IPCC (2007): Climate Change 2007: the Physical Science Basis. Summary for Policy-makers. / http://www.ipcc.ch/

[3] Hoekstra, A.Y. & Chapagain, A.K. (2007). The Water Footprints of Nations: Water Use by People as a Function of their Consumption Pattern. Water Resource Management 21(1): 35–48. .

[4] United Nations General Assembly (March 20, 1987). Report of the World Commission on Environment and Development: Our Common Future; Transmitted to the General Assembly as an Annex to document A/42/427 - Development and International Co-operation: Environment; Our Common Future, Chapter 2: Towards Sustainable Development; Paragraph 1. United Nations General Assembly.

[5] Adams, W. M. (2006). The Future of Sustainability: Re-thinking Environment and Development in the Twenty-first Century. Report of the IUCN Renowned Thinkers Meeting, 29–31 January 2006.