

Course Guide

BCT32806 Sustainability Analysis (version 2017-2018)

Period 5, morning (19 March – 11 May 2018)

Coordinator

Ellen Slegers; ellen.slegers@wur.nl

Lecturers

PM Slegers (ORL)

R Akkerman (ORL)

A Kanellopoulos (ORL)

M van der Voort (BEC)

S van den Burg (Wageningen Economic Research)

Examiner

Slegers, van der Voort

Teaching assistants

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Language

English

Profile of the course

Sustainability is a growing concern in the design and operation of many production and supply chain activities. Next to the traditional economic concerns, companies therefore also increasingly consider the environmental and social impacts of their activities. To support these initiatives, and to improve the related decision-making processes, a solid foundation of quantitative methods for sustainability analysis is required.

This course aims for a systematic analysis of sustainability. Definitions and concepts of sustainability are explained and discussed whereby attention is given to the following three aspects: economy, environment and social/ethical considerations. Understanding the role of these aspects is important to perform sustainability analyses. This course shows how to quantify sustainability of a product or production process. The sustainability analysis involves the selection of sustainability criteria, choice of a reference scenario, collection of data (partially from databases), quantification of criteria, the comparison and discussion of the results. In the course attention is given to sustainability criteria guidelines, the weighing of criteria and the implications of the analysis.

From 2017/2018 this course is coordinated and given by the Operations Research and Logistics group. Therefore, the course is slightly changing to include multi-objective optimisation.

The course is intended for all third year BSc and MSc students from Wageningen with an interest in sustainability and an affinity with (decision-sciences-based) quantitative analysis. The quantitative approach to sustainability analysis is a key characteristic of the course and students with a background in operations research/decision science and/or process engineering are more likely to successfully complete this course.

Commonly, students are enrolled in the minors Biobased Technology (WUBBT) and Biobased Transition (WUBTR), or in the Master Programmes Management Economics and Consumer

Sciences (track ORL), Biosystems Engineering, or Biotechnology.

Assumed prerequisite knowledge

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Continuation courses

Advanced Biorefinery, Sustainable food and biobased processing, Decision science 2, Operations Research and Logistics

Learning outcomes

After successful completion of this course students are expected to be able to:

- describe and explain definitions related to sustainability;
- collect data from databases for sustainability analysis;
- select and quantify sustainability criteria;
- apply a sustainability analysis to presented data;
- compare sustainability criteria and discuss the implications.

Course materials and resources

The book 'Hitch Hiker's guide to LCA' of Baumann and Tillman is used. Other reading materials as well as exercises are compiled in a reader. The book and reader are mandatory and can be bought at the WUR shop/Study Store. All other course materials can be found on the Blackboard site. The lecture sheets are presented at the beginning of each lecture week. Answers to exercises are made available online at the end of each week.

Educational activities

In week 1-4 lectures, and supervised tutorials and computer practicals are given. In addition, selfstudy is scheduled to read literature and make exercises. The knowledge and skills learned in the first weeks will be applied to a case study in week 4, 5 and 6. The groups for the case study will be announced during the course. The case study results are presented (20 min) and discussed (15 min) in week 6. A short report (about 10 pages A4) has to be handed in at the end of the case study.

Active participation in the computer practicals to learn SimaPro is required to be able to start the case study. The case study (including presentation session) is also mandatory, students can miss at most 1 day.

Assessment strategy

- report and participation assessment of the case study (40%)
- written exam – closed book (60%)

The report should be passed with at least a 6.0, the exam with 5.0. The case study report is valid for 2 years.

Exam

11 May, 13:30-16:30.

Re-exam

August, February

The principal themes of the content & course schedule

The detailed timetable with the scheduled in-class and out-of-class activities of the students will be announced before the start of the course on Blackboard.