COURSE PLAN

PhD- Course IØ 8503- Spring 2013
Environmental and Social Responsibility- Theoretical and Methodological Approach to Multi-Disciplinary Research

Responsible: Prof. Annik Magerholm Fet, Department of Industrial Economics and Technology Management, annik.fet@iot.ntnu.no

Faculty of Approval: Faculty of Social Sciences and Technology

Working hours: 10 credits

Objective: The course shall deliver the students insights on the theories and research traditions of distinct disciplines and their interactions. It should also give support to develop an individual research design for the students' concrete "research-case". This design includes the ability to understand which methods from the Natural Sciences, Technology, the Humanities and Social Sciences are appropriate for the particular work, how to classify and give preference to the single approaches and how to integrate them in the doctoral project where sustainability, industrial ecology and environmental responsibility has a central position.

The course-content covers central research methods: - qualitative and quantitative methods, - systems theory and engineering, - business research methods and action research. In addition the course will give an overview of the most relevant decision supporting methods related to industry; environmental management, material flow analyses, LCA, risk assessment, multi criteria decisions support tools and standardisation methodologies and their implication on development and improvements on products, processes, organisations and value chains. Strategies and logistics in industrial networks will also be touched upon if relevant. Some attention will be given to writing for peer-reviewed journals.

Modes of teaching: Lectures, group work and presentation, plenary discussion.

Examination req.: Obligatory course attendance. An essay (10-15 pages) is to be delivered by 30th June 2013. The essay will be evaluated with grades from A-F.

Education req.: PhD-programme access.

Participants: The course is suitable for PhD- candidates who work in the field of technology, engineering, environmental planning, social and political sciences and environment.

Course plan

The course will be conducted through three meetings:

Meeting 1: Introduction systems theory, sustainability and multidisciplinarity (14.02-15.02)
Meeting 2: Decision supporting methods and theories (14.03-15.03)
Meeting 3: Research science, decision supporting tools and scientific writing (11.04-12.04)
I. Meeting: Introduction systems theory, sustainability and multidisciplinarity (14.02-15.02)

Day 1 14.02 Location: Room xx, Gløshaugen, Trondheim
14.15-14.30 Presentation of course objectives and literature,
14.30-16.00 Systems theory and Challenges in Multidisciplinary Research, Annik Magerholm Fet

Day 2 15.02, Location: Room xx, Gløshaugen, Trondheim
0915-10.00 Presentation of own projects, candidates
10.15-12.00 Industrial ecology and green economy, frameworks for sustainability, by Dr. John Hermansen
12.00-13.00 Lunch
13.00-15.30 Introduction to multidisciplinary research
   Research methodology – qualitative versus quantitative
   Business research techniques:
   - Interview techniques, use and interpretation
   - Surveys, design and statistical analysis
   - Action research
   - Research design and epistemology of research
15.30-16.00 Discussion of the PhD students´ research design

II. Meeting: Decision supporting methods and theories (14.03-15.03)

Day 1 14.03. Location: IPD, NTNU, Gløshaugen, Trondheim (coordinated with PD 8300)
12.30-14.00 Core methods in Design Research, Dr. Martina Keitsch
14.00-16.00 Lecture and exercise: How to find literature for the PhD thesis? Discussion
   Evening: Dinner - social event

Day 2 15.03 Location: Room xx, Gløshaugen, Trondheim
9-10 Presentation of own research project and research design
10-11 Grounded Theory and Network Theory
11-12 Multi Criteria Decision Analysis (MCDA), Dr Magnus Sparrevik
   1. Differences between single – and multi-criteria problems
   2. Structuring the problems
12-13 Lunch
13-15 3. Normalization and how to use this
   4. Multi criteria analytical methodologies MAUT/MAVT, AHP, Outranking
   5. How to use weighting techniques?
   6. The methodology as part of a greater model
   7. Treatment of uncertainties and sensitivity analyses
15-16 Discussion and plans for intermediate period

III. Meeting: Research science, supporting tools and scientific writing (11.04-12.04)

Day 1 11.04 Location: IPD, Gløshaugen, NTNU
12.30-13.00 Experiences of PhD candidates (with Kjersti Schulte Øverbø, Ingrid Bouvier Utne)
14.00-15.30 Practicalities around the PhD defense , Martina Keitsch
15.30-16.00 PhD roadmaps

Day 2 12.04 Location: Room xx, Gløshaugen, Trondheim
09.00-11.00 Science and Research Methods - a broader perspective, by Dr Martina Keitsch
11.00-12.00 Essay presentations and discussion
12.00-13.00 Lunch
13.00-15.00 Environmental, sustainability, indicators and CSR management methods, Professor Annik Magerholm Fet
15.00-16.00 Summing up and preparation for assignment