

Theory of Science for TME, 7.5 ECTS

Henrik Berglund, Chalmers, TME. henber@chalmers.se

Tomas Hellström, Lund, FEK. tomas.hellstrom@fek.lu.se

Course description

This seminar is intended as an introduction to key issues in the theory of science that are of special relevance to doctoral students at TME. Topics include demarcation issues, i.e. what is science; the relation between science, humanities, and ‘design sciences’ such as engineering and management; and notions of theory and progress in the social sciences. In addition, we will discuss the TME research domain and the knowledge interests and conditions for knowledge production that exist here. As part of this, researchers from different TME department will join us to present their research as a basis for discussion of these topics.

The course is not open to first year PhD students. Student’s without prior background in the social sciences may consider postponing the course further to get the most out of it. If more than 15 students wish to enroll, priority will be given to advanced students.

Course requirements

This course is organized as a seminar. This means that we share responsibility for discussing the materials and for raising issues. Each of you is expected to do all required readings and come prepared to talk about them in class. The course is examined based on performance along three dimensions:

1. Group reflections and summaries of seminar readings

For each seminar you will be randomly assigned to a reading group consisting of two or three students. Each student will individually read the texts. Thereafter the group will set up a (virtual) meeting to discuss the seminar readings and write a three-page reflection, which is emailed to Henrik and Tomas the day before seminar.

2. Individual class participation

In general, quality is more important than quantity on this dimension. That said, excessive silence will affect your chances of getting a passing grade. Typically, Tomas or Henrik will present for the first 20 minutes or so before opening up for discussion. A good seminar should have active dialogue and debate. If someone proposes an idea that is counter to your view, please speak up. Your task is to engage each other in discussing the readings!

We realize that some texts can be a bit challenging at first, especially for more junior scholars unfamiliar with philosophical writing. However, we strongly urge you to come as prepared as possible.

3. Term paper

Before the final session, you are expected to submit a five-page essay (single spaced, 12-point, not including references and exhibits) relating the course contents to your own research. This paper is due one week before the last day of class.

In the essay, you will select a theme from the course as point of departure and use this to reflect on your own dissertation project or broader research field. Before you start writing, send a brief synopsis for approval to henber@chalmers.se and tomas.hellstrom@fek.lu.se.

Course content and literature

1. The scientific attitude September 18, (13.00 – 16.00)

This introductory section deals with ways in which science may distinguish itself from other social and cognitive forms, e.g. religion, politics or art. We discuss such ‘demarcation’ issues from various perspectives, including science as a social activity, as a system of norms, and as principles for knowledge.

Klemke, E.D., Hollinger, R. & Wyss Rudge, D. (1998). Introductory readings in the philosophy of science (pp. 19-37). New York: Prometheus Books.

Longino, H.E. (1990). Science as social knowledge (chapter 4). Princeton, NJ: Princeton University Press

Merton, R.K. (1973) [1942], ‘The Normative Structure of Science’, in Merton, Robert K. (ed.), *The Sociology of Science: Theoretical and Empirical Investigations*, Chicago: University of Chicago Press

Nola, R & Sankey, H. (2014). *Theories of scientific method: An Introduction* (chapter 2). New York: Routledge.

2. The science/technology relationship (October 2, 13.00 – 16.00)

The second section focuses on the relation between technology and science, in terms of their various goals, forms of knowledge production and their history. Special attention is paid to the issue of technology as a form of knowledge.

De Solla Price, D. (1984). The science/technology relationship, the craft of experimental science and policy for the improvement of high technology innovation. *Research Policy*, 13, 3-20.

Layton, E.T. (1974). Technology as knowledge. *Technology and Culture*, 31-41.

Niiniluoto, I. (1993). The aims and structure of applied research. *Erkenntnis*, 38, 1-21

3. *What is theory and progress? (October 16, 13.00 – 16.00)*

This section takes up key discussions in philosophy of science regarding the constitution of theory and progress in science including the social sciences. Drawing on previous sections, we will focus on where engineering and management stand in terms of these notions.

Bernstein, R.J. (1979). *The restructuring of social and political theory* (chapter 1). Oxford: Basil Blackwell.

Rule, J.B. (1997). *Theory and progress in social science* (chapter 1). Cambridge: Cambridge University Press.

Sutton, R.I. & Staw, B.M. (1995). What theory is not. *Administrative Science Quarterly*, 40, 371-384.

Weick, K. (1995). What theory is not, theorizing is, *Administrative Science Quarterly*, 40, 385-390.

4. *The research paradigm of TME (October 30, 13.00 – 16.00)*

In this session, we discuss whether scholars at the TME department can meaningfully be seen as part of a unitary research tradition. If so, what characterizes this tradition? If not, what are meaningful distinctions and how might these be reflected in our work and our organization?

Berglund, H., Bousfiha, M. and Mansoori, Y. (forthcoming). Opportunities as Artifacts and Entrepreneurship as Design. *Academy of Management Review*.

Romme, A. G. L. (2003). Making a difference: Organization as design. *Organization science*, 14(5), 558-573.

Simon, H. A. (1988). The science of design: creating the artificial. *Design Issues*, 67-82.

TME Strategic Direction 2020.

5. *Exemplars of TME inquiry paradigms (November 13, 13.00 – 16.00)*

In this session, three colleagues from TME will come and present texts they have written and to discuss how their work (in general and the particular text presented) relates to topics discussed throughout the course.

a. TBD

b. Henrikke Baumann, ESA

Baumann, H. (2004). Environmental assessment of organising: towards a framework for the study of organisational influence on environmental

performance. *Progress in Industrial Ecology, an International Journal*, 1(1-3), 292-306.

c. Per Lundin, STS

Lundin, P and Stenlås, N. (2010). Technology, State Initiative and National Myths in Cold War Sweden: An Introduction, in Per Lundin, Niklas Stenlås and Johan Gribbe (Eds.) *Science for Welfare and Warfare: Technology and State Initiative in Cold War Sweden*, 1–34, Sagamore Beach: Science History Publications.

6) Reflection and summary (November 27, 13.00 – 16.00)

During the final session, each student will present their essay and also read another student essay and prepare presentation and opposition. Presentations will last about five minutes plus ten minutes for discussion. If the class has more than ten students, we may divide the class into parallel sessions.