

# SVF 8054 – THEORY OF SCIENCE

Autumn, 2020/2021 Academic year

## *Course Handbook*

### **I. Introduction**

The course aims to introduce doctoral students enrolled in the HSL Faculty into the theory of science. The course is designed to be offered to students with varied backgrounds and does not presuppose prior knowledge of philosophy.

The course consists of two parts. The first part contains common lectures and supervision within specialization groups (in humanities, linguistics and social science). The second part consists of lectures in specialization groups, student presentation and discussions.

For further information on the formal aspects of the course, see the [official course description on the UiT website](#).

The timetable for the course can be found [here](#). (The link is also available through the official course description.)

The course has its own [Canvas room](#). All students should make sure that *they are registered on Canvas for the course* since this is going to be the primary platform of communication between students and teachers. If you have problems, please write to Lena for help (see her contact details in the next section).

The course has *four* Canvas rooms, so-called sections. The main section is what contains all the general information as well as everything that concerns the common lectures part of the course. This room is administered by Attila Tanyi. The other three rooms are dedicated to the specialist groups and are administered by the respective specialist teachers (contact details follow below).

## II. Course personnel

The course is taught in collaboration by the Institute of Philosophy and First Semester Studies (IFF) and other parts of the HSL Faculty.

Administration

[Lena Cecilia Bogstrand](mailto:lena.bogstrand@uit.no) ([lena.bogstrand@uit.no](mailto:lena.bogstrand@uit.no))

Course leader:

[Attila Tanyi](mailto:attila.tanyi@uit.no) ([attila.tanyi@uit.no](mailto:attila.tanyi@uit.no))

IFF staff (Philosophy):

[Fredrik Nyseth](mailto:fredrik.nyseth@uit.no) ([fredrik.nyseth@uit.no](mailto:fredrik.nyseth@uit.no))

Specialization:

[Anniken Greve](mailto:anniken.greve@uit.no) ([anniken.greve@uit.no](mailto:anniken.greve@uit.no)) [Humanities]

[Marit Aure](mailto:marit.aure@uit.no) ([marit.aure@uit.no](mailto:marit.aure@uit.no)) with help from [Gunnar Aakvag](#) and [Håkon Leiulfstrud](#) [Social Sciences]

[Gillian C. Ramchand](mailto:gillian.ramchand@uit.no) ([gillian.ramchand@uit.no](mailto:gillian.ramchand@uit.no)) [Linguistics]

## III. Important dates

There aren't many dates to keep in mind in this course, but some do exist. Here are they:

1. *August 17 (extended to August 21)*. Submission deadline for the first (pre-course) assignment: a reflection paper of 1-2 pages (see UiT course description, first bullet point under 'Assessment'). Submission will be through WISEflow.
2. *Varying deadline (in September)*: In between the two halves of the course (the common lectures and the specialist teaching), you will have to submit a 3-5 pages draft of your final essay (see UiT course description, second bullet point under 'Assessment'). This deadline will be set by your respective specialist seminar leader. Submission will be through Canvas.
3. *October 30*. Submission deadline for final (second) assignment: this is your final essay or examination paper (see UiT course description under 'Assessment' on 'examination'). Submission will be through WISEflow.

#### IV. Language

The language of instruction in the course is English but in the specialization seminars, if all students and the teacher prefer it, Norwegian can also be used.

#### V. Course schedule

##### Week 36: Common lectures (fellesundervisning)

31.08, Monday, 9.00-16.00: Fredrik Nyseth (FN) 01.09, Tuesday, 9.00-12.00: Fredrik Nyseth
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*These meetings **won't** take place physically. Lectures will be **recorded** digitally and uploaded to Canvas. Fredrik will instead offer **two digital Q/A** one-hour sessions for students where he will answer questions:*

First Q/A, 31.08, Monday, 13.00-14.00

Second Q/A, 01.09, Tuesday, 9.00-10.00

*For these meetings a Zoom conference will be arranged. Students will be required to register to fulfil the attendance requirement.*

01.09, Tuesday, 13.00-16.00, Gunnar Aakvag (GA)
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*Same as with Fredrik: **recorded** lectures uploaded to Canvas plus a **digital Q/A**:*

Q/A, 01.09, Tuesday, 14.00-15.00

*As with Fredrik's, Gunnar's meeting will be moved to Zoom. Same registration requirement.*

02.09, Wednesday, 9.00-12.00, Gillian Ramchand (GR)
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*Gillian will offer **live streamed** (via Zoom) lectures in these three hours. A corresponding Zoom session will be arranged. Registration will be required.*

02.09, Wednesday, 13.00-16.00, Anniken Greve (AG)
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*This will again be **recorded** lectures uploaded to Canvas. A **digital Q/A** will take place live:*

Q/A, 02.09, Wednesday, 13.00-14.00

*A Zoom conference will be arranged. Registration will be required.*

IN SHORT: Students will be required to listen to the lectures uploaded to Canvas. In addition, they will have the following 'live' duties :

- Digital Q/A with FN, 31.08, Monday, 13.00-14.00 and 01.09, Tuesday, 9.00-10.00
- Digital Q/A with GA, 01.09, Tuesday, 14.00-15.00
- Live streamed lecture with GM, 02.09, Wednesday, 9.00-12.00
- Digital Q/A with AG, 02.09, Wednesday, 13.00-14.00
- Live digital lecture with GR, 02.09, Wednesday, 13.00-14.00

The – most probably Zoom - links for these meetings will be set up by us and sent to students.

#### Week 36: first meeting with specialist teachers

03.09, Thursday, 9.00-12.00

*These meetings will take place parallel (students will be grouped according to their specialization):*

Anniken Greve: **physical** (face-to-face) meeting. Students who cannot be present will be able to join online.

Gillian Ramchan: **physical** (face-to-face) meeting. Students who cannot be present will be able to join online.

Marit Aure: **digital** (Zoom videoconference) meeting. Usual Zoom setup with registration.

#### Week 40: specialist seminars

30.09, Wednesday, 09.00-16.00

*These meetings will take place parallel (students will be grouped according to their specialization):*

Anniken Greve: **physical** (face-to-face) meeting. Students who cannot be present will be able to join online.

Gillian Ramchand (with Fredrik Nyseth or Attila Tanyi): **physical** (face-to-face) meeting. Students who cannot be present will be able to join online.

Marit Aure and Håkon Leiulfsrud (NTNU): **physical** (face-to-face) meeting with two lectures by HL and one by MA. Students who cannot be present will be able to join online.

01.10, Thursday, 09.00-16.00
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*These meetings will take place parallel (students will be grouped according to their specialization):*

Anniken Greve: **physical** (face-to-face) meeting. Students who cannot be present will be able to join online.

Gillian Ramchand: **physical** (face-to-face) meeting with two lectures by HL and one by MA. Students who cannot be present will be able to join online.

Marit Aure, Attila Tanyi, Fredrik Nyseth: **physical** (face-to-face) meeting, two groups in the morning and two groups in the afternoon (that is, the original group will be quartered). Students who cannot be present will be able to join online.

## **VI. Course syllabus**

### **IFF (PHILOSOPHY), COMMON LECTURES**

*When:* Day 1 (August 31), Day 2 (September 1, morning session)

*Teacher:* Fredrik Nyseth (IFF)

The lectures in this part of the course are organised into four topics:

1. What does it mean to be scientific?

This topic concerns 'the demarcation problem' – i.e. the question of how to distinguish that which is genuinely scientific from that which is not (e.g. pseudoscience). We will mainly be concerned with two approaches to this issue: 'inductivism' which says, roughly, that a scientific theory is one that can be appropriately supported by observation via induction (inductive inferences), and Karl Popper's 'falsificationism', which tries to eschew induction completely, and says that a theory is scientific if and only if it can be potentially falsified by observation.

2. Does science progress rationally?

This topic concerns the question of whether scientific change can generally be understood as a rational process where (ideally) scientific theories are accepted, rejected and revised based on the available evidence. We shall mainly approach this issue via the influential account developed by Thomas Kuhn. Although Kuhn sometimes resisted this interpretation, his views are frequently said to imply that scientific change is not generally a rational process. This is connected, in particular, with Kuhn's controversial claim that different 'paradigms' are *incommensurable* – meaning, roughly, that there is no neutral way to compare their strengths and weaknesses.

3. Does science aim at truth?

This topic concerns the debate between 'scientific realism' (roughly: the view that science aims to provide a literally *true* description of an independent reality) and two forms of 'anti-realism': *instrumentalism* and *social constructivism*. Instrumentalism is, roughly, the view that scientific theories should be regarded as instruments for systematising and predicting observable phenomena (rather than attempts to say what the world is really like). Social constructivism is, roughly, the view that our best scientific theories and/or the scientific facts themselves are social constructs and therefore not reflections of an independent reality.

4. Is there a fundamental divide between the natural and the human sciences?

This topic revolves around the question of whether or not the human sciences can/should be governed by the same methodology as the natural sciences. According to *naturalism*, the methodology we find in the natural sciences provides the blueprint for how science in general should be done. Although the details are controversial, this methodology is typically understood to emphasise things like prediction, scientific laws and causal explanations. According to *interpretivism*, on the other hand, the subject matter of the human sciences is such that it makes the methodology of the natural sciences inappropriate. These sciences, it is said, deal with *meaningful* material, and the aim is not to provide causal explanations or predictions, but to *make sense of/understand* human actions and their products. This, moreover, is often said to require a *hermeneutic* methodology which is radically different from what we find in the natural sciences.

**Required reading:**

The required readings for this part of the course are collected in four documents – one for each topic. These are available both via Leganto and in the 'modules' section on Canvas. The readings add up to approximately 280 pages. In addition, there will be some suggested readings available on Canvas for those who want to delve deeper into a topic (e.g. for the purposes of writing the essay.)

## SOCIAL SCIENCES SPECIALIZATION

*When:* Common lectures (September 1, afternoon session); September 3, morning, first meeting of specialist group; two days of specialist seminars (September 30, October 1)

*Teacher:* Marit Aure (ISV), Gunnar Aakvag (ISV), Håkon Leiulfstrud (NTNU)

The specialization in social sciences deals with the relationship between everyday understanding and social science understanding and the role of theory and concept formation in social research. We look at different types of theory and concepts, theories at different levels and the role of theory and concepts within different traditions. The function of theories and concepts in research practices will be in focus. The specialization discusses different consequences these approaches may have for methodologies and the choice of methods and the role of the researchers. We will also spend time in the specialization sessions to develop and discuss suitable research questions for student papers and how relevant themes and issues brought up in the common part of the course related to social science disciplines and research themes.

These discussions will be organized around three themes:

- central features in the methodology and practices of the social sciences (such as concept formation, development and use of theory)
- issues on knowledge production: traditional models, critical models and democratization of science. The consequences for the role as researcher. Discussion of ethical issues following different positions. selected current challenges within the philosophies of social sciences relevant to students project
- selected current challenges within the philosophies of social sciences relevant to students project

### **Required reading (choose min. three chapters)**

Benton, Ted and Ian Craib (2011): *Philosophy of Social Science. The Philosophical Foundations of Social Thought*. London and New York; Palgrave Macmillan

### **Required reading (choose min. two texts)**

- Burawoy, Michael (2005): "2004 American Sociological Association Presidential Address: For public sociology", *The British Journal of Sociology* 56 (2), pp. 259-294.
- Cahill, Caitlin (2007): "The Personal is Political: Developing new subjectivities through participatory action research" in *Gender, Place and Culture*, vol. 14, no 3, pp 267-292.

- Eriksen, Thomas Hylland (2006): "Farewell to the gift economy?" english translation of "Farvel til gaveøkonomien" in Bjerk Hagen, Erik and Ander Johansen (red): *Hva skal vi med vitenskap?* Oslo; Universitetsforlaget.
- Johnson, Greg (2014): "Off the stage, on the page: on the relationship between advocacy and scholarship" in *Religion*, vol 44, no 2, pp 289-302.
- Kalleberg, Ragnvald (2010): "The Ethos of Science and the Ethos of Democracy" in Craig Calhoun (Ed.): *Robert K. Merton: Sociology of Science and Sociology as Science*. Columbia University Press pp 182-213.
- Knorr-Cetina, Karin (1981): "The Scientist as Practical Reasoner: Introduction to Constructivist and Contextual Theory of Knowledge" in Knorr-Cetina, Karin: *The Manufacture of Knowledge*. Oxford; Pergamon Press.
- Merton, Robert K (1942/1973): "The Normative Structure of Science" in Merton, R.K and Norman W. Storer: *The Sociology of Science, Theoretical and Empirical Investigations*. Chicago: The University of Chicago Press. Reprinted in different collections.
- Mirowsky, Philip (2011): "Has Science been 'harmed' by the commercial regime?" in Mirowski, Philip: *Science-Mart. Privatizing American Science*. Cambridge, Mass and London; Harvard University Press, ch 6 from p 259.
- Nowotny, Helga et al (2003): "Model 2' Revisited: The New Production of Knowledge" in *Minerva*, vol. 41, pp 179-194.
- Weber, M. (1958). Science as a Vocation. *Daedalus*, 87(1), 111-134.

### Recommended Literature

- Anderson, Elizabeth (2000/2011): "Feminist Epistemology and Philosophy of Science". *The Stanford Encyclopedia of Philosophy* (Fall 2012 Edition), Edward N. Zalta (ed.)
- Asdal, Kristin (2005): "Returning the Kingdom to the King: A Post-Constructivist Respons to the Critique of Positivism" in *Acta Sociologica*, vol 48, no. 3, pp 253-261
- Baert, Patrick (2005): *Philosophy of the Social Sciences: Towards Pragmatism*. Cambridge; Polity Press
- Coole, Diana and Samantha Frost eds (2010): *"New materialisms. Ontology, agency and politics."* Durham; Duke University Press
- Haraway, Donna (1988): "Situated Knowledges: The Science Question in Feminism and the Privilege of Partial Perspectives" in *Feminist Studies*, vol. 14, no. 3, pp 575-599
- Hastrup, Kirsten (2004): "Getting it Right. Knowledge and Evidence in Anthropology" in *Anthropological Theory*, vol. 4, no. 4, pp 455-472
- Larsen, Tord (2012): "Acts of Entification: The Emergence of Thinghood in Social Life" in Rapport, Nigel Eds: *Human Nature as Capacity: Transcending Discourse and Classification*. (pp 154-177)
- Mjøset, Lars (2009): "The Contextualist Approach to Social Science Methodology" in Byrne, D. & C. C. Ragin Eds: *Handbook of Case-Based Methods*. London; Sage



- Mol, Annemarie (2010): "Actor-Network Theory: Sensitive Terms and Enduring Tensions" in *Kölner Zeitschrift für Soziologie und Sozialpsychologie*, vol 50, no 1, pp 253-269
- Porpora, Douglas V. (2015): *Reconstructing Sociology. The Critical Realist Approach*. Cambridge; Cambridge University Press
- Steel, Daniel & Francesco Guala Eds (2011): *The Philosophy of Social Science Reader*. London; Routledge
- Swedberg, Richard (2012): "Theorizing in sociology and social science: turning to the context of discovery" in *Theory and Society*, vol 41, pp 1-40
- Verran, Helen & Michael Christie (2014): "Postcolonial Databasing? Subverting Old Appropriations, Developing New Associations" in Leach, J & L. Wilson (2014): *Subversion, Conversion, Development: Cross-cultural Knowledge Exchange and the Politics of Design*. MIT press
- Verran, Helen (2014): "Extending the Cosmopolitical Right to non-Humans" in *Valuation Studies* 2 (1) 2014:65-70
- Wendt, Alexander (2015): *Quantum mind and social science. Unifying physical and social ontology*. Cambridge; Cambridge University Press

**NB:** For your curriculum, choose approximately **400 pages** literature in Philosophy of *Social* Science in addition to approximately 400 pages Philosophy of *Science*. The curriculum should be specified and submitted together with your final paper. (The curriculum is not to be confused with the paper's literature list (which is the literature you have referred to) nor with the required reading for the course).

### LINGUISTICS SPECIALIZATION

*When:* Common lectures day 3 (September 2, morning session); September 3, morning, first meeting of specialist group; two days of specialist seminars (September 30, October 1)

*Teacher:* [Gillian C. Ramchand](#) (ISK)

#### **Common lectures**

These lectures will tackle a number of interrelated issues in science and science methodology, which transcend any particular academic subfield. These will be (i) the need for clearly defining the object of inquiry and the effect that this has on the nature of the data/empirical ground chosen to address it (ii) the interaction and feeding relationship between data observations, or 'facts' and theories (Popper) (iii) the nature of paradigms, paradigm shifts and use of a framework of ideas for organizing reality (Kuhn).

### **Required reading:**

Karl Popper. 1959. *The Logic of Scientific Discovery*. Part I. (35 pages)

Monwhea Jeng. Hot Water Can Freeze Faster than Cold?!. arXiv:physics/0512262v1 [physics.hist-ph] 29 Dec 2005 (10 pages)

Kuhn, Thomas. 1962. *The Structure of Scientific Revolutions*. University of Chicago Press. pp 10-65 (55 pages).

### **Linguistics Speciality**

The specialization part in linguistics deals with: What are the challenges linguists face in the information age? How do these challenges inform our theoretical ideas, our methodologies and the data we choose to test our hypotheses against? We will discuss these questions against a historical background, and see how the language sciences have changed in the twentieth century, with special focus on:

- European and American structuralism
- the Chomskyan revolution
- the socio-linguistic turn in the seventies
- the renewed interest in language as a cognitive system towards the end of the twentieth century
- the quantitative turn in the beginning of the twenty-first century

With these historical events in mind we will ask how linguistics can find its place as a science between the humanities, the hard sciences and the social sciences.

The main issues we will address from a linguistic point of view are:

- How can we be explicit about our object of inquiry in a way that is not dependent on theory-internal jargon and unexamined assumptions.
- How do we understand the relationship between the theories we work with and data gathering techniques such as acceptability judgments, patterns found in corpora and the results of different kinds of psycholinguistic experimentation? How are our data gathering and interpretation techniques affected by the rise of Big Data?
- What is the relationship between Artificial Intelligence and actual human minds when it comes to language production and comprehension?

**NB: This year there will be no specialist seminars in linguistics (there are no students). Hence only the part 'Common lectures' above is relevant this year.**

## HUMANITIES SPECIALIZATION

*When:* Common lectures day 3 (September 2, afternoon session); September 3, morning, first meeting of specialist group; two days of specialist seminars (September 30, October 1)

*Teacher:* [Anniken Greve](#) (ISK)

### **Theme and topics:**

The specialization in the humanities will look at concepts and issues that bring out the tension between the natural sciences and the humanities, so as to help us reflect on the specific nature and character of research acts within the humanities.

The discussion will be organized around three themes:

1. The notions of rationality and reason, as viewed from the humanities.  
Being one of the fundamental notions of philosophy underpinning the scientific enterprise, rationality is a contested concept, often looked upon with great suspicion in the humanities: Claims to rationality are seen as covering up political and ideological biases. We will approach such issues through Stephen Toulmin's *Return to Reason* (see reading list), letting our discussion be informed by his historical account of the development of the notions of rationality and reason.
2. Hermeneutics, philosophically and methodologically considered.  
Starting off from the distinction between interpretation and explanation (or to use Windelband's terms: between idiographic and nomothetic acts of research), we will consider the characteristics of interpretive acts of research, the relation between interpretation and prejudice, and the role of method in acts of interpretation. In this part of the course Heidegger and Gadamer (see reading list) will play a seminal role.
3. The notion of theory, viewed from the humanities.  
Theory plays a central, but not altogether clear role in the humanities. In the course we will try to illuminate its role through a set of questions. If theories in the humanities are not subject to testing, what are their functions? How should we understand the plurality of theories within our fields of research? Is Kuhn's notion of paradigm transferable to the humanities?

### **Required Reading:**

- Stephen Toulmin: *Return to Reason*. Cambridge, Massachusetts, London, England

2002: Harvard University Press

- Martin Heidegger: *Being and Time*. Oxford UK, Cambridge US 1962: Basil Blackwell. §§ 31-32, pp. 182-195.
- Hans-Georg Gadamer: *Truth and Method*. Second Edition. London/New York 2006 [2004]: Continuum, pp. 235–382
- Thomas Kuhn: «The Natural and the Human Sciences» in Hiley, Bohman and Shusterman (eds): *The Interpretive Turn: Philosophy, Science and Culture*. Itacha and London: 1991: Cornell University Press, pp. 17–24.