CCNM17-112 Philosophy of Science
Course Description

Aim of the course

Aim of the course: The course provides an introduction to modern analytic philosophy of science.

Learning outcome, competences
knowledge:

- broad theoretical knowledge in Philosophy of Science

attitude:

- comprehensive theoretical interest

skills:

- comprehensive methodological knowledge
- ability to test theoretical questions and for relevant hypotheses

Content of the course

Topics of the course

- I. Scientific inquiry: invention and test (Introductory examples for hypotheses, explanations, tests etc.)
- II. The test of a hypothesis (Experimental and crucial tests. Auxiliary and ad hoc hypotheses.)
- III. Observation and theory (The Baconian model of science. Novum Organum. Inductive reasoning. Nature and experiment. Observation and experiment. The decuctive-nomological model of explanation. Underdetermination of theories by facts. Observer influence in the various sciences.)
- IV. Positivism (The British Empiricists. Comte and origins of positivism. Mach and empiriocriticism. The Vienna Circle. The fall of positivism: protocol sentences, justification, demarcation. Problems of induction. Fallibilism.)
- V. Postpositivism (The cumulative view of XIX. century. Kuhn and scientific revolutions. Paradigms and normal science. Incommensurability. Lakatos and the methodology of scientific research programs. Feyerabend and the problem of development. Evolutionary models of knowledge.)
- VI. Introduction to sociology of science (Ethnometodology in the lab. The Strong Program in the Sociology of Knowledge. The Empirical Program of Relativism. The social constructivism.)
- VII. Summary and outlook

Learning activities, learning methods:
Lectures and interactive discussions

Evaluation of outcomes

Learning requirements, mode of evaluation, criteria of evaluation:
requirements

- Reliable basic knowledge in the domain of Philosophy of Science

mode of evaluation:

- oral exam, 1-5 scale.

criteria of evaluation:

- level of knowledge and understanding

Reading list

Compulsory reading list

- F. Bacon: Novum Organum – extracts
- W. O. Quine: Two Dogmas of Empiricism. Philosophical Review 60 (1951) 20-43. or in: From a Logical Point of View. Cambridge, Mass. 1961. – short extract
- C. G. Hempel: The Theoretician's Dilemma – extract
- R. Carnap: The Elimination of Methaphysics Through Logical Analysis of Language. In: A. J. Ayer (ed.): Logical Positivism. The Free Press, Glencoe1959.
- R. Carnap: Testability and Meaning. Philosophy of Science 3 (1936) and 4 (1937) – short extracts
- C. G. Hempel: Studies in the Logic of Confirmation. Mind 54 (1945) pp. 1-26 – extract
- C. G. Hempel and P. Oppenheim: Studies in the Logic of Explanation. Philosophy of Science 15 (1948) pp. 135-175.
- K. R. Popper: The Logic of Scientific Discovery. – extract
- T. S. Kuhn: The Structure of Scientific Revolutions – extract
- I. Lakatos: Falsification and the Methodology of Scientific Research Programmes. In: I. Lakatos and A. Musgrave (eds.): Criticism and the Growth of Knowledge. Cambridge University Press 1970. – extracts
- S. Toulmin: Human Understanding. Princeton University Press 1972. – extract
- K. Mannheim: Ideology and Utopia – extract
- D. Bloor: Knowledge and Social Imagery – extracts
- A. Sokal and J. Bricmont: Fashionable Nonsense – extract