Schedule of Lectures for “Kant and the Philosophy of Science”

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Winter, 2014–2015  
Wednesdays, 14:00–16:00 C.T.  
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N.b.: many of the required and suggested readings are available online at the course’s website, though they may not be listed as such in the bibliography:


1 Weeks 1–2: Introduction, Historical Background, Newton (Oct. 08–15)

1.1 Week 1: Introduction (Oct. 08)
Introduction, historical background

Suggested Reading

1. Friedman (1992), Kant and the Exact Sciences: Introduction, pp. 1–54

1.2 Week 2: Newton (Oct. 15)
Newton’s achievements as background and foundation for Kant’s mature thought

Required Reading

1. Newton (1999), Philosophiæ Naturalis Principia Mathematica: Author’s Preface (pp. 381–383); Definitions and Scholium (pp. 403–415); Axioms, or the Laws of Motion and Scholium (pp. 416–430); Rules for the Study of Natural Philosophy (pp. 794–796); General Scholium (pp. 939–944)

Suggested Reading

Lectures: “Kant and the Philosophy of Science”

3. DiSalle (2006b), Understanding Space-Time: The Philosophical Development of Physics from Newton to Einstein: chs. 1–2
7. Maxwell (1877), Matter and Motion
10. Stein (npuba), “Further Considerations on Newton’s Method”
14. Stein (1990a), “‘From the Phænomena of Motions to the Forces of Nature’: Hypothesis or Deduction?”

2 Weeks 3–5: Kant (Oct. 22–Nov. 05)

2.1 Week 3: Kant, Critique of Pure Reason, Part 1 (Oct. 22)

Critique of Pure Reason: the analytic and synthetic, the a priori and a posteriori, the pure forms of perception

Required Reading

1. Kant (1929) or Kant (1998), Critique of Pure Reason: Preface to First Edition (pp. 7–16); Preface to Second Edition (pp. 17–38); Introduction, §§I–VII (pp. 41–64); Transcendental Aesthetic (pp. 65–91)

Strongly Suggested Reading


Suggested Reading

1. Allison (2004), Kant’s Transcendental Idealism: An Interpretation and Defense: passim
Lectures: “Kant and the Philosophy of Science”

5. Friedman (1992), *Kant and the Exact Sciences*: ch. 1 (pp. 55–95)
7. Guyer (1987), *Kant and the Claims of Knowledge*: passim
10. Kemp-Smith (1923), *Commentary to Kant’s Critique of Pure Reason*: passim

2.2 Week 4: Kant, *Critique of Pure Reason*, Part 2 (Oct. 29)

*Critique of Pure Reason*: the pure categories of the understanding, judgments of experience

**Required Reading**


**Strongly Suggested Reading**


**Suggested Reading**

1. Allison (2004), *Kant’s Transcendental Idealism: An Interpretation and Defense*: passim
4. Guyer (1987), *Kant and the Claims of Knowledge*: passim
5. Guyer (2010), *The Cambridge Companion to Kant’s Critique of Pure Reason*: passim
7. Kemp-Smith (1923), *Commentary to Kant’s Critique of Pure Reason*: passim
2.3 Week 5: Kant, *Prolegomena* (Nov. 05)

How is natural science of the sort Newton achieved possible, and what is its conceptual structure?

**Required Reading**

1. Kant (2004b), *Prolegomena to Any Future Metaphysics That Will Be Able to Come Forward as Science*

**Suggested Reading**

1. Allison (2004), *Kant’s Transcendental Idealism: An Interpretation and Defense*: passim
2. DiSalle (2006b), *Understanding Space-Time: The Philosophical Development of Physics from Newton to Einstein*: ch. 3, §§1–4
5. Friedman (1992), *Kant and the Exact Sciences*: chs. 2–4 (pp. 96–212)
7. Friedman (2002), “Kant, Kuhn and the Rationality of Science”
10. Guyer (1987), *Kant and the Claims of Knowledge*: passim
3 Weeks 6–7: Kant’s Influence in the 19th Century (Nov. 12–19)

3.1 Week 6: Riemann and Helmholtz (Nov. 12)

Mathematical and physical geometry after Kant

Required Reading


Suggested Reading

5. Hyder (2009), The Determinate World: Kant and Helmholtz on the Physical Meaning of Geometry: passim  
6. Sklar (1976), Space, Time and Spacetime  
7. Torretti (1978), Philosophy of Geometry from Riemann to Poincaré: ch. 2, §§1–2; ch. 3, §1  
8. Weyl (1949), Philosophy of Mathematics and Natural Science: ch. III (pp. 67–91)

3.2 Week 7: Hertz and Poincaré (Nov. 19)

Neo-Kantian mechanics; geometrical conventionalism

Required Reading

1. Hertz (1899), The Principles of Mechanics Presented in a New Form: Introduction (pp. 1–41)  
2. Poincaré (1905), Science and Hypothesis: Part II, chs. III–V (pp. 42–100)

Suggested Reading
Lectures: “Kant and the Philosophy of Science”

3. Helmholtz (1899), Preface (pp. i–xx) to The Principles of Mechanics Presented in a New Form by H. Hertz
5. Mach (1960), Space and Geometry
7. Schlick (1953), “Are Natural Laws Conventions?”
8. Sklar (1976), Space, Time and Spacetime
10. Torretti (1978), Philosophy of Geometry from Riemann to Poincaré: ch. 4, §4
11. Weyl (1949), Philosophy of Mathematics and Natural Science: ch. III (pp. 67–91)

4 Week 8: NO SEMINAR (Nov. 26)

5 Weeks 9–11: Kant’s Influence in the Early 20th Century (Dec. 03–Dec. 17)

5.1 Week 9: Russell (Dec. 03)

Russell’s structural view of physical knowledge

Required Reading

1. Russell (1927), The Analysis of Matter: ch. i (pp. 1–10); Part i, ch. xiv (pp. 130–140); Part ii, chs. xv–xxiv (pp. 141–256)

Suggested Reading

Lectures: “Kant and the Philosophy of Science”


5.2 Week 10: Reichenbach (Dec. 10)

The constitutive and the relative a priori in scientific knowledge

Required Reading

1. Reichenbach (1965), The Theory of Relativity and A Priori Knowledge: ch. i (pp. 1–5); chs. iv–vii (pp. 34–92)

Suggested Reading

1. Cassirer (1980b), Substance and Function
2. Cassirer (1980a), Einstein’s Theory of Relativity
3. Coffa (2008), The Semantic Tradition from Kant to Carnap: To the Vienna Station: passim
8. Reichenbach (1958), The Philosophy of Space & Time: ch. 1

5.3 Week 11: Carnap (Dec. 17)

Observational versus theoretical concepts and terms; the analytic, the synthetic and the a priori in linguistic frameworks

Required Reading


Suggested Reading
Lectures: “Kant and the Philosophy of Science”

2. Carnap (1959), The Logical Syntax of Language
3. Coffa (2008), Semantic Tradition Kant to Carnap: To the Vienna Station: passim
7. Friedman (2002), “Kant, Kuhn and the Rationality of Science”

6 Week 12: NO SEMINAR (Dec. 24)

7 Weeks 13–16: Contemporary Neo-Kantianism (Jan. 07–28)

7.1 Week 13: Michael Friedman (Jan. 07)

The relativized a priori and the structure and nature of scientific knowledge

Required Reading

1. Friedman (2001), The Dynamics of Reason

Suggested Reading

2. Domski and Dickson (2010), *Discourse on a New Method: Reinvigorating the Marriage of History and Philosophy of Science*
3. Fraassen (2008), *Scientific Representation*: ch. 5, pp. 115–140
12. Quine (1980a), *From a Logical Point of View*
13. Quine (1969), *Ontological Relativity and Other Essays*

### 7.2 Week 14: Data and Phenomena (Jan. 14)

How does experimental data get turned into structured phenomena of the sort amenable to making contact with scientific theories?

**Required Reading**


**Suggested Reading**

1. Fraassen (1980), *The Scientific Image*, chs. 3–4
2. Fraassen (2008), *Scientific Representation*: chs. 6–7, pp. 141–190

7.3 Week 15: The Structure of Scientific Theories (Jan. 21)

What structure must scientific theories have in order to represent phenomena and encode scientific knowledge?

Required Reading


Suggested Reading


7.4 Week 16: Realism and Empiricism (Jan. 28)

The status of the noumena today.

Required Reading


Suggested Reading

3. Demopoulos (2013a), “Carnap’s Analysis of Realism”
5. Fraassen (2008), Scientific Representation: chs. 12–13, pp. 269–308

8 FINAL PAPER DUE (Mar. 27)

References


Lectures: “Kant and the Philosophy of Science”


Massimi, M. (Ed.) (2008a). Kant and Philosophy of Science Today, Volume 63 of


Newton, I. (Unknown). De gravitatione et æquipondio fluidorum. Excerpts of the original Latin translated by H. Stein, with interpolated com-


Stein, H. (1994). Some reflections on the structure of our knowledge in physics. In D. Prawitz, B. Skyrms, and D. Westerståhl (Eds.), *Logic, Methodology and Philosophy of Science*, Proceedings of the Ninth International Congress of Logic, Methodology and Philosophy of Science, pp. 633–55. New York: Elsevier Science B.V. I do not have access to the published version of Stein’s paper, but rather only to a typed manuscript. All references to page numbers, therefore, do not correspond to those of the published version. The typed manuscript I have is about 17 pages long, and the published version about 22. Multiplying the page numbers I give by $\frac{17}{22}$ and adding the result to 633 (the number of the first page in the published version) should give approximately the page number in the published version.

Stein, H. (2004a). The enterprise of understanding and the enterprise of knowledge—for Isaac Levi’s seventieth birthday. *Synthese* 140, 135–176. I do not have access to the published version of Stein’s paper, but rather only to a typed manuscript. All references to page numbers, therefore, do not correspond to those of the published version. The typed manuscript I have is 65 pages long, and the published version about 41. Multiplying the page numbers I give by $\frac{41}{65}$ and adding the result to 135 (the number of the first page in the published version) should give approximately the page number in the published version.


