SAN FRANCISCO STATE UNIVERSITY
Department of Philosophy

Phil 350
Philosophy of Science

Instructor: **Dr. Isabelle Peschard**

COURSE OUTLINE

W1-5: Scientific Development

- Inductive method

  Bacon, *The New Organon* (excerpt on Inductive Method)
  Case Study: The nature of heat

  Hume *An Enquiry concerning Human Understanding* [excerpts]

- Hypothetico-Deductive method

  C. Hempel, *Philosophy of Natural Science* (excerpts)
  'Scientific Inquiry: Invention and test'
  'The test of a hypothesis: Its logic and its force'
  Case Study: Semmelweis' inquiry

  H. Reichendach, excerpt from *Experience and Prediction*

- Normal Science, Paradigms and Revolutions

  T. Kuhn, *The structure of scientific revolutions (*excerpts)
  Case Studies: The copernican revolution
  The beginning of the science of electricity

- Model construction and model testing (DNA)

  R. Giere, *Understanding Scientific Reasoning* (excerpts)
  Case Study: The model of the DNA molecule

Assignment 1: compare the different methods, explaining why one method is not sufficient to account for the diversity of scientific activity, and illustrate the use of each of these methods will new examples

W6-9: Scientific Reliability and Objectivity

- Experimental Reliability

  F Guala: Experimentation, methods and errors

P. Achinstein: Excerpt from Evidence, Explanation, and Realism
Case Study: Experiments on cathode rays

L. Lloyd: 'When the models are right and the data are wrong'
Case study: Measurement of the temperature of the troposphere

- Objectivity (peer-review, plurality of perspectives)

L. Datson and P Galison: 'Short History of Objectivity'
H. Longino 'Values and Objectivity' (Reader)
Case study: Research on the hormonal basis of "sex-differentiated behavior"

Assignment 2: students should select one case study in the list provided by the instructor and construct a coherent and sound argument with support from multiple sources to support or contest the claim, model or theory in question. Make sure to indicate clearly the nature of the source of the information that will be used and to distinguish scholarly/non-scholarly information and primary/secondary sources

W10-12: Values in Science and Ethical dilemma

- Values in science

D. Allchin: "Values in Science and in Science Education".
Philip Kitcher: Excerpt from Science, truth and democracy
Ethics of inquiry

Alison Wylie: The engendering of archeology
Case study: Archeological study of the emergence of agriculture

E. Anderson: 'Use of value judgments in science'
Case Study: Anthropological research on divorce

- Ethical dilemma and choice

T. Fischmann and E. Hildt (eds) *Ethical Dilemma in Prenatal Diagnosis* (excerpt)
B. Orlans *In the Name of Science: Issues in Responsible Animal Experimentation* (excerpt)

Case study: Human genome

Assignment 3: investigate the different types of predicted consequences of climate change, and the different aspects of the decisions that need to be taken to avoid these consequences.

W13-15: Science and Reality

- Knowing reality

  G.Gutting: "Scientific Realism versus Empirical Constructivism"
  E. McMullin: "A Case for Scientific Realism"
  I Hacking: Excerpt from: The social construction of what?
  ***Case Study*: Pasteur and the birth of lactic acid ferment**

- Transforming reality

  Osborne, J. (2000) Science for citizenship
  Bodmer, W., F.(1985) *The Public Understanding of Science*
  Case study: Models of climate change
  Case study: Vaccination

Assignment 4: research on the use of vaccination in different countries and analyze the causes and consequences of the differences in the use of vaccination.