

Philosophy 110 Philosophy of Science

Schedule of Classes:

- Aug. 28 Introduction and Introductory Questionnaire. The conundrum of the cosmos; the puzzle of life; the strangeness of human beings; the inevitability of philosophy.
- 30 DeWitt, Ch. 1-2, pp. 7-31. Science and Truth. Stability, periodicity, symmetry, laws, matter, energy, forces, non-linear causality, evolution and the emergence of complexity.
- Labor Day*
- Sept. 4 DeWitt, Ch. 3, 4, 5, pp. 32-57. Fact & theory, argument & evidence, scientific method.
- 6 DeWitt, Ch. 6, 7, 8, pp. 58-77. Induction & deduction & abduction; falsifiability; instrumentalism & realism.
- 11 DeWitt, Ch. 9, 10, 11, pp. 81-105. Aristotle & Ptolemy. Empirical Facts.
- 13 DeWitt, Ch. 12, 13, 14, pp. 106-133. Concepts & theory. Ptolemy & Copernicus.
- 18 DeWitt, Ch. 15, 16, 17, pp. 134-163. Tycho Brahe, Kepler & Galileo. Mathematics, inertial motion, free fall, & the telescope.
- 20 DeWitt, Ch. 18, 19, 20, pp. 164-182. The new science, Leibniz & Newton.
- Sept. 25 DeWitt, Ch. 21, 22, pp. 183-204. Scientific Law and Newtonianism.
- 27 DeWitt, Ch. 23, 24, pp. 207-234. A very short introduction to Relativity Theory.
- Oct. 02 **First midterm exam.** Kant, *Critique of Pure Reason*, handout.
- 04 Summary and Preview. Essay by George Ellis, sec. 8, handout. Science & Philosophy.
- 09 Coles, Ch. 1 & 2, pp. 1-27. What is cosmology? Einstein, Friedmann, Lemaître.
- 11 Coles, Ch. 3 & 4, pp. 28-56. The expanding universe. Hubble, his law & constant.
- 16 Coles, Ch. 5 & 6, pp. 57-92. The Big Bang, cosmic background radiation, Ω , & inflation.
- 18 Coles, Ch. 7 & 8, pp. 93-127. Cosmic structures: galaxies, galaxy clusters, galaxy walls & voids; structure formation, matter & gravity; relativity theory & quantum mechanics.
- 23 Transition from Cosmology to Biology. The emergence of complexity; the importance of life, reasoning (scientific, philosophical, moral) and the role of the observer.
- 25 DeWitt, Ch. 27, pp. 287-309. The theory of evolution.

- 30 DeWitt, Ch. 28, pp. 310-340. The theory of evolution: philosophy & science.
- Nov. 01 DeWitt, Ch. 29, pp. 341-348. A theory of everything? Science & religion.
- 06 Lewontin, Ch. I, pp. 1-38. Non-linear causality & feedback mechanisms: Gene & organism. Phenotype & genotype.
- 08 **Second midterm exam.** Lewontin, Ch. II, pp. 41-68. Non-linear causality & feedback mechanisms: Organism & environment. Microenvironments.
- 13 Lewontin, Ch. III, pp. 71-105. Parts & wholes, causes & effects. Holism.
- 15 Shiva, Ch. 1 & 2, pp. 1-37. Science & nature, men & women, development & tradition.

Thanksgiving Holiday

- 27 Shiva, Ch. 3 & 4, pp. 38-95. The importance of trees.
- 29 Shiva, Ch. 5a, pp. 96-135. The importance of food. **Three page draft of final paper due.**
- Dec. 04 Shiva, Ch. 5b, pp. 135-178. The importance of food; technology & tradition.
- 06 Shiva, Ch. 6, pp. 179-217. The importance of water & rivers. Knowledge & wisdom.
- 11 Ellis Essay, sec. 9a, handout. The anthropic question. The emergence of complexity, environments, fine tuning. Science & metaphysics. Explanation & description.
- 13 Summary Discussion: Evolution. Ellis essay, sec. 9b, handout.

Final exam week. Monday December 17: **Final term paper due.**