UMD PHIL 256 The Philosophy of Biology I Fall 2010

Professor: Erin Eaker (eeaker@umd.edu)

Office hours: TBA (and by appointment) in SKN 1118C

Class meeting times: Mondays and Wednesdays 10-10:50 in SKN 1115; Fridays "discussion section" online (details TBA)

Course Description: In this course we will explore the philosophical issues that arise in connection with the biological sciences. We will begin with the theory of evolution and Darwin's theory of natural selection, discussing its structure, its key principles and explanatory strategies, and the arguments and evidence Darwin presented in support of his theory. We'll discuss the differences between the physical sciences and biological sciences and why biological theories appear to be lacking in scientific laws of the kind familiar from physics and chemistry. Next, we will address the importance of the role played by adaptation and constraint in explaining the traits of organisms; the notion of drift and the role played by statistics and probability in biology; the notion of *function* that appears in biological explanations. Changing our focus to molecular biology, we will examine the question of reductionism in biology—i.e., whether the explanation of all biological processes will ultimately bottom out in descriptions at the molecular level of organisms. We'll look closely at the concept of 'gene'—the different historical and contemporary uses of this concept and its importance to the prospect of reductionism in biology and to our understanding of conceptual change in science. This will lead to a discussion of how developments in biology in the last 150 odd years have reignited interest in some ancient philosophical questions in ontology—are things like groups of organisms, species, populations, genera, just as "real" as the individual organisms that make them up (or, indeed, the molecules that "make up" those individuals?) After a discussion of the notion of mechanism in biology, we will shift to consider what biology can tell us about ourselves and our place in the world that is described by the biological sciences. We will discuss attempts to provide explanations of human psychology and behavior by appeal to natural selection and the ethical ramifications of such attempts. Finally, we will bring our developing understanding of the living world and our place in it to bear on the moral question of how we should relate to other living things. Here we will explore our own Chesapeake Bay region, the ecology of the bay, the evolutionary history of its living inhabitants and the history of human influence in the region. Students will have the opportunity to embark on a daylong learning trip on the bay aboard the Chesapeake Bay Foundation's "Skipjack". We'll learn about the oyster, its natural history and importance to the Bay and the Bay's inhabitants.

Course readings: The textbook for this course is *The Philosophy of Biology: a contemporary introduction* by Alex Rosenberg and Daniel W. McShea. Required readings will also be made available through the course Blackboard page.

Course requirements: There will be two midterm essay exams plus a final term paper/ project. In addition, students will be required to participate in online discussions every Friday on the course discussion board. Prompts will be given and student contributions will be monitored and graded.

Field trip: As noted above, I have applied to take students on a learning trip through the Chesapeake Bay Foundation. The trip is not required and space will, of necessity, be limited. More details will be provided at the beginning of term.