APPLICATION FOR INTERDISCIPLINARY (ID) DESIGNATION WITHIN THE MAGIS CORE CURRICULUM

SINGLE COURSE

(Individual or Team Taught)

The approved learning outcomes for the Interdisciplinary (ID) element of the core:

"An Interdisciplinary Experience will satisfy the following learning outcomes:

I. Synthesize or draw conclusions by connecting examples, data, facts, or theories from more than one perspective or field of study.

II. Meaningfully synthesize connections among experiences outside of the formal classroom (e.g., life experiences, service learning, study abroad, internship) to deepen understanding of fields of study and to critically examine their own points of view.

III. Adapt and apply skills, theories, or methodologies across disciplines to explore complex questions and address problems."

1. Date Submitted: **4/4/19**

2. Instructors: **Ashley Byun and Dennis Keenan**

3. Course Prefix, Number & Title: **PH 216/BI 95: Philosophy and Biology of Evolutionary Theory**

4. Is this application only for the sections of this course that you will teach? **X**. Or will every section of this course count as an Interdisciplinary (ID) course? (Please check one.)

5. Is this course already in the University Catalogue? Yes **X**. If No, where is it in the review process?

6. Have you participated in a course or professional development program (e.g. at CAE) relevant to teaching an ID course (doing so is not required)? No **X**. If yes, please describe it in 200 words or less.

7. Courses that fulfill the ID element of the Magis Core Curriculum can also count for one but not two of the requirements in the "Orientation" or "Exploration" elements (see the next page). If this course is/will be cross-listed in two departments, in which Exploration element and department will it count?

   Humanities/Philosophy (PH 216) ***or*** **Natural Sciences/Biology (BI 95)**

   This course has already been approved as a team-taught course by (1) the Department of Biology, (2) the Department of Philosophy, (3) the Natural Science Core Curriculum Committee (which requires a laboratory component in the course), and (4) the College of Arts and Sciences Curriculum Committee. The course has been taught on five occasions (Fall 2002, Fall 2003, Spring 2010, Spring 2012, and Spring 2015).

8. Please provide the approved/proposed Catalog Description for the course:

   This course explores the question of evolutionary theory from the perspectives of philosophy and biology. From the biological perspective, the course focuses on genetics, adaptive evolution, neutral evolution, the genetic impact of selection on populations, the origin and maintenance of genetic variation, the importance of development in evolution, the expression of variation, and

coevolution. From the philosophical perspective, the course focuses on evolution as theory and ideology, the critique of the adaptationist program, evolution and contingency, typological versus population thinking, and the developmental systems critique. These foci will be used to illustrate how philosophy can provide an ontological foundation for the discipline of biology.

9. Please describe how your course will meet the approved learning outcomes for the Interdisciplinary (ID) element of the Core, how some of the content and pedagogies that you will use to meet these goals, and how you will evaluate students' fulfillment of these goals.

Learning Outcome	Pedagogy and Course Content that Will Prepare Students to Meet This Outcome	Evaluation of Students' Fulfillment of This Outcome
Synthesize or draw conclusions by connecting examples, data, facts, or theories from more than one perspective or field of study.	We not only teach the students the biology of evolutionary theory, but also the philosophical assumptions guiding the discipline. We teach them how these assumptions have both hindered and fostered the development of evolutionary theory. As a result of this, the students will have a facility with the biology of evolutionary theory, as well as the philosophical assumptions underlying the discipline of biology.	There are three exams and a "Hardy-Weinberg Problem Set"
Meaningfully synthesize connections among experiences outside of the formal classroom (e.g., life experiences, service learning, study abroad, internship) to deepen understanding of fields of study and to critically examine their own points of view.	We teach the students that in order to properly understand the natural sciences it is essential to do work in the laboratory. We also teach them that the philosophical assumptions with which one approaches an experiment determines the design of the experiment, what data one gathers, and the interpretation of the data. As a result of this, the students will have a facility with experimentation, as well as the philosophical assumptions underlying experimentation.	There are two laboratory components in the course ("Evolution Activity I" and "Evolution Activity II").
Adapt and apply skills, theories, or methodologies across disciplines to explore complex questions and address problems.	We give the students the biological and philosophical tools to properly understand topics in the media, e.g., the fallacious distinction between nature and nurture, and the insidious pronouncements of evolutionary psychology. We also teach them the ways that philosophy can provide an ontological foundation for the discipline of biology. As a result of this, the students will have a facility with important topics in the media.	There is a final paper that gives the student the opportunity to synthesize ideas from biology and philosophy.

10. Please attach the approved/proposed/existing course syllabus. Please highlight the following in yellow:

- A brief statement (one or three sentences) that notes how the course addresses and fulfills the Interdisciplinary element of Core. This can be part of the course description or included as a separate category.
- Brief statements of how the course engages the approved ID learning outcomes. (E.g., As a result of their work in this course, including… students will…)

Philosophy 216 / Biology 95

Philosophy and Biology of Evolutionary Theory

Spring Semester, 2015

"The Darwinian Revolution is both a scientific and a philosophical revolution, and neither revolution could have occurred without the other."
—Dennett, *Darwin's Dangerous Idea*

Dr. Soyong Ashley Byun, Biology
Office: Bannow Science Center 211
Office Phone: (203) 254-4000 ext. 2742
E-mail: sbyun@fairfield.edu
Office Hours: Thursday 9:30-10:30 am.
Meetings may also be arranged by appointment.

Dr. Dennis Keenan, Philosophy
Office: Donnarumma Hall 318
Office Phone: (203) 254-4000 ext. 2558
E-mail: dkkeenan@fairfield.edu
Office Hours: Tuesday 11:00 a.m. — 12:00 noon
Wednesday 11:00 a.m. — 12:00 noon
Meetings may also be arranged by appointment.

Course Description

This course explores the question of evolutionary theory from the perspectives of philosophy and biology. From the biological perspective, the course focuses on genetics, adaptive evolution, neutral evolution, the genetic impact of selection on populations, the origin and maintenance of genetic variation, the importance of development in evolution, the expression of variation, and coevolution. From the philosophical perspective, the course focuses on evolution as theory and ideology, the critique of the adaptationist program, evolution and contingency, typological versus population thinking, and the developmental systems critique. These foci will be used to illustrate how philosophy can provide an ontological foundation for the discipline of biology.

Learning Goals

1. The ability to identify arguments and provide counter-arguments.
2. The critical engagement with and the questioning of one's assumptions.
3. The thoughtful integration of action with values.
4. The existential risking of crisis and transformation through self-reflection.
5. The acceptance of the invitation of philosophy to wonder at the "big questions."

Measurable Learning Outcomes

1. Thinking Skills: Students should be able to construct (or re-construct) a philosophical argument, both verbally and in writing. They should be able to anticipate and clearly articulate counter-arguments. Students should be able to recognize and question their own assumptions/prejudices. Students should be able to frame questions aware that what is asked often determines the response.
2. Reading Skills: Students should be able to interpret texts and to recognize and reflect

on textual ambiguities. Students should be able to discern the steps of a philosophical argument, as well as the stated and (more importantly) unstated presuppositions of the argument.

3. Writing Skills: Students should be able to write logically compelling arguments in a clear, concise, and well-ordered manner. Students should be able to:
    a. Use writing as an instrument of inquiry across a variety of writing situations, both formal and informal
    b. Respond to and use responses to drafts in revision, and in this way and other ways demonstrate metacognitive awareness about their writing
    c. Engage in writing that explores and responds to texts in ways that deepen student understanding, and communicate that understanding in rhetorically appropriate ways that provide information to others
4. Familiarity with some of the central philosophical questions in the History of Philosophy (broadly construed): Students should have a rudimentary knowledge of the history of philosophical questions and their attendant concepts and arguments, and be able to recognize versions of these questions in contemporary philosophical discussions. Students should be able to recognize and articulate alternative perspectives to the problems and claims with which they are confronted in contemporary life.
5. Students should be able to reflect critically on philosophical questions in the context of their own lives.

Texts

Darwin, "Natural Selection" (from *The Origin of Species*)
Sober, "Evolution, Population Thinking, and Essentialism"
Gould, "The Panda's Thumb" and "Exapting the Rich and Inevitable Spandrels of History" (from *The Structure of Evolutionary Theory*)
Nietzsche, *On the Genealogy of Morals* (Second Essay, Section 12)
McKinnon, *Neo-Liberal Genetics: The Myths and Moral Tales of Evolutionary Psychology*
Gray, "Death of the Gene: Developmental Systems Strike Back"
Moss, "Deconstructing the Gene and Reconstructing Molecular Developmental Systems"

Grading System

There will be three examinations: two examinations during the semester and a final examination. The final examination will be a comprehensive examination. All of the examinations will consist of objective, short answer, and essay questions. The examinations will allow you the opportunity to demonstrate your understanding of evolutionary theory from both scientific and philosophical perspectives. The answers should be clear, concise, well ordered, and precise. IF (FOR *WHATEVER* REASON) YOU ARE NOT ABLE TO TAKE AN EXAMINATION AT THE SCHEDULED TIME, YOU *MUST* CONTACT ONE OF US *BEFORE* THE SCHEDULED TIME OF THE EXAMINATION. IF YOU DO NOT CONTACT ONE OF US *BEFORE* THE SCHEDULED TIME OF THE EXAMINATION, YOU WILL NOT BE ALLOWED TO TAKE THE EXAMINATION.

There will be a laboratory component to the course.

The paper is not to exceed 5 double-spaced, typed pages with standard (1") margins (4 ½ pages is the *minimum* requirement). We are most interested in the paper as a presentation of your own critical reflection. The paper is *not* a summary or a report. We expect your paper to explore a specific thesis. The thesis should be stated clearly and concisely at the beginning of the essay, and everything in the essay should be dedicated to demonstrating this thesis using specific evidence. Note that the thesis of the essay is the one, central idea that you want to convince the reader of. A good thesis is one that can be demonstarted (that is, there is objective evidence to support it) and that needs to be demonstrated (that is, it is not obvious or self-evident). You therefore need to avoid vagueness and state the thesis with as much specificity as possible. For example, if you choose to write on developmental systems theory, the title of your paper might be "How is the Traditional Concept of the Gene Called into Question by Developmental Systems Theory?" Your thesis should be articulated in the title of your paper, in the form of a question (as in the example provided here). It will provide the standard by which we will evaluate your paper. Your thesis, in the form of a question, should *also* be present in the first paragraph of your paper in **bold font**. YOU MUST RECEIVE APPROVAL OF YOUR THESIS. You must examine your thesis critically, i.e., you must explore its assumptions, put your own questions to it, etc. In addition, you should be able to formulate credible judgments about the material that reflect your understanding of it.

Examination I	= 20%
Examination II	= 20%
Evolution Activity I	= 6%
Evolution Activity II	= 6%
Paper	= 15%
Hardy-Weinberg Problem Set	= 3%
Final Examination	= 30%

No extra credit work will be accepted.

Helpful Information

Fairfield University is committed to achieving equal educational opportunities, providing students with documented disabilities access to all University programs, services and activities. In order for this course to be equally accessible to all students, different accommodations or adjustments may need to be implemented. Accessibility Supports for students with disabilities are available through the Academic and Career Development Center located in the Kelley Center. Accessibility can be reached at 203-254-4081. They are your primary resource on campus to help you develop an accessibility plan to help you achieve equal access in your courses this semester. Please make an appointment with them as early as possible this semester to receive a letter to present to me so that we can discuss how potential accommodations can be provided and implemented for this course. If you have received an accommodation letter, please provide me with that information privately so that we can review your accommodations together and discuss how best to help you achieve equal access in this course this semester.

The Fairfield University Writing Center is a free resource available to all Fairfield University

students. At the Writing Center, a writing tutor will work with you at any point in the writing process, from brainstorming to editing. The tutoring conference is collaborative; please come prepared to be an active participant in the session, and review the website for suggestions to help you prepare for your appointment. For more information or to make an appointment, visit the Writing Center website at www.fairfield.edu/writingcenter, email the Writing Center at writingcenter@fairfield.edu or stop by the DiMenna-Nyselius Library, Lower Level.

Please note: Plagiarism is the appropriation of ideas, data, work, or language of others and submitting them as one's own to satisfy the requirements of a course. Plagiarism constitutes theft and deceit. Students are often confused by just what constitutes plagiarism. When the ideas or writings of others are presented in assignments, these ideas or writings should be attributed to that source. Special care should be taken, when cutting and pasting materials or when paraphrasing, to cite sources correctly and to use quotation marks around exact words from source materials. Actions that result in plagiarism may be intentional or unintentional. Consequently, students must understand the concept of plagiarism. When reading, processing, or using materials from any source, appropriate documentation is always essential.

Course Calendar

Thursday, January 22	**What is Evolution? Introduction** (Dr. Byun)
Monday, January 26	**Evolution: Activity I** (Dr. Byun)
Thursday, January 29	**Genetics** (Dr. Byun)
Monday, February 2	**Genetics/Hardy-Weinberg Equilibrium** (Dr. Byun)
Thursday, February 5	**Hardy-Weinberg Equilibrium** (Dr. Byun) *Activity I due*
Monday, February 9	**Mechanisms of Evolution—Natural Selection** (Dr. Byun)
Thursday, February 12	**Mechanisms of Evolution—Natural Selection** (Dr. Byun)
Monday, February 16	University Holiday—President's Day
Tuesday, February 17	**Typological and Population Thinking** (Dr. Keenan) Darwin, "Natural Selection" (from *The Origin of Species*) Sober, "Evolution, Population Thinking, and Essentialism"
Thursday, February 19	**Typological and Population Thinking** (Dr. Keenan)
Monday, February 23	EXAMINATION I

Thursday, February 26	**Evolution as Tinkering** (Dr. Keenan) Gould, "The Panda's Thumb" and "Exapting the Rich and Inevitable Spandrels of History" Nietzsche, *On the Genealogy of Morals* (Second Essay, Section 12)
Monday, March 2	**Evolution as Tinkering** (Dr. Keenan)
Thursday, March 5	**Mechanisms of Evolution—Genetic Drift** (Dr. Byun)
Monday, March 9	Spring Break
Thursday, March 12	Spring Break
Monday, March 16	**Evolution of Conflict and Cooperation** (Dr. Byun)
Thursday, March 19	**Evolution of Conflict and Cooperation** (Dr. Byun)
Monday, March 23	**The Promise and Limitations of Evolutionary Psychology** (Dr. Keenan) McKinnon, *Neo-Liberal Genetics*
Thursday, March 26	**The Promise and Limitations of Evolutionary Psychology** (Dr. Keenan)
Monday, March 30	EXAMINATION II
Thursday, April 2	**Classification and Phylogenetics: Activity II** (Dr. Byun)
Monday, April 6	Easter Recess
Thursday, April 9	**Species/Speciation** (Dr. Byun)
Monday, April 13	**Developmental Systems Theory** (Dr. Keenan) Gray, "Death of the Gene: Developmental Systems Strike Back" *Activity II due*
Thursday, April 16	**Developmental Systems Theory** (Dr. Keenan)
Monday, April 20	**Developmental Systems Theory** (Dr. Keenan)

Thursday, April 23	**Deconstructing the Gene and Reconstructing Molecular Developmental Systems** (Dr. Keenan) Moss, "Deconstructing the Gene and Reconstructing Molecular Developmental Systems"
Monday, April 27	**Deconstructing the Gene and Reconstructing Molecular Developmental Systems** (Dr. Keenan)
Thursday, April 30	**Conclusion** (Drs. Byun and Keenan) *Paper due*
Monday, May 4	FINAL EXAMINATION (8:00 a.m.)