

## SYLLABUS

### Biology 1120-Spring-2011 PRIBOR

Journey Course Statement by Roundtable Implementation Committee

In the UT academic journey the elements of your UT education – from the first year beginnings to the capstone experience – link together as related stages of learning UT core and major courses, opportunities for research, community engagement, and ongoing assessment mark the unique path you are taking and are touchstones along the way. Through guided reflection and engagement, you will see these varied learning experiences in their connections to your own life and to broader social challenges. This “Journey Course” is an intersection and connecting point for themes and paths in your UT academic journey.

#### FIVE OVERALL THEMES OF BIOLOGY 1120-Spring-2011

Theme One: Present the narrative of evolution of animal consciousness of ancestor apes to the emergence of hominids and then humans with group-ego that evolved to humans with the sequential emergence of body ego and Mind to produce *metaphorical, conceptual knowing*. This kind of knowing led to the emergence of the first civilizations that further evolved in stages to the emergence of Enlightenment science in Europe in the 17<sup>th</sup> century.

Theme Two: *Metaphorical, Conceptual Knowing* is a major driving force of human creativity. The cognitive psychological theory of metaphorical, concepts, as described by George Lakoff, indicates how it guides creativity. Measurement, which is the core of modern science, involves metaphorical, conceptual knowing and Newton’s theory of gravity exemplifies how metaphorical, conceptual knowing is essential for creating scientific theories. The various other theories described in this course also illustrate the above statement.

Theme Three: The science that evolved from Enlightenment science involves rejection of natural law and liberal education. It affirms nominalism, constructivism, systematic experimentation, and the scientific method defined by four characteristics. This transformation from medieval philosophy-religion to Enlightenment science was driven by a critical mass of humans committing to constructivism. This historical process involved: religious diversity in Europe, Renaissance humanism, the intellectual diversity problem, Newton’s constructivism theory of motion, positivism, and the radical opposition between science and religion. The description of thermodynamics associated with the theory of machines provides the foundation for understanding many aspects of life. It also facilitates the transformation of scientific constructivism to *narrative, scientific constructivism*. This plus systems science leads to a universal theory of creative evolution that integrates all the subdivisions of biology.

Theme Four: Present core ideas of biology by means of and as an example of *student-teacher constructivism* that promotes creative learning. This theme is one way to define the UT mission statement of a “student-centered university.” It also is consistent with the mission statement of the Judith Herb College of Education, which is [*we facilitate*] *Individuals at the center of their own learning within a rich intellectual environment characterized by choice*. This course interprets these mission statements to mean that college education should promote collaboration between subjective engagement involving individual insights and free choices and objective conceptual

understanding of validated knowledge. Thus, student-teacher constructivism avoids two extremes. One extreme is subjective opinion not based on objective knowledge or the choice to define relevance only in terms of one's personal, e.g., getting a job, goals to the exclusion of humans' innate desire for knowledge and for meaning and moral right action. The other extreme is objective knowing consisting of memorization of facts or blindly submitting to an ideology such as the patriarchal, philosophic perspective of liberal education or scientific positivism.

Theme Five: Present and organize course content by means of *postmodern, scientific positivism*, which promotes diversity and exclusiveness. On the one hand, it allows coexistence and possible collaboration among diverse scientific ideologies (that can be converted into narratives) and associated paradigms. On the other hand, it excludes any ideology not associated with a paradigm that can solve a type of empirical problem that satisfies the requirements of systematic experimentation and the scientific method. For example, it rejects creationism or any ideology that includes the idea of a Creator God or other ideas that cannot be operationally defined. Sometimes it may be possible for a scientific ideology to collaborate with a non-scientific ideology. The collaboration becomes possible when each ideology (logical, conceptual model) is converted to a narrative. After the collaboration of narratives, each component narrative must be reduced to a logical, conceptual model that generates a paradigm for solving a particular type of problem. For example, science by itself cannot deal with human self-consciousness because this idea cannot be operationally defined. Some types of human psychology, such as integral psychology (Wilber) can deal with human self-consciousness. Then the narratives associated with animal behavior and neuroscience can collaborate with narratives associated with human psychology. This course will exemplify this collaboration. This same approach applies to transcending the opposition between science and religion.

### **GUIDELINES FOR STUDENT PAPERS FOR BIOLOGY 1120-Sp-11**

Required Paper, due April 9. The systems science theory of universal creativity, as presented in this course, describes the individuation of various non-human systems as the collaboration between Eros-chaos and Eros-order that generates Order, Chaos, hierarchal New Order. Each civilized human also may individuate to a higher level of self-consciousness by Eros-chaos bringing the stabilized ego into some degree of Chaos. If the person chooses to endure this chaos, he/she eventually will see new possibilities to produce a higher level of self-consciousness that includes a modified previous level of self-consciousness. This model applied to a human may be represented as Life, Death, Rebirth. What many people, especially young persons, do not realize is that as life goes to irreversible Chaos, that is not the end of one's story; rather, it is a beginning of a new phase of that story. Typical types of Chaos for young people are transforming from high school mentality to young, rational, adult mentality, breaking up of a romantic relationship, or various challenges to one's athletic, emotional, or intellectual capabilities. It is important for young people to see that Chaos can provide new potentials for a rebirth to a new level of self-consciousness.

For example, Order (Life) for me in the fall semester, 2009, included: 1) teaching two sections of Biology 1120 Tuesday and Thursday each week (the other days were spent on making up exams, modifying notes, etc. for this course, work on Biology 1140 to be taught in the spring semester, 2010, and creative work related to Biology 1120 and Biology 1140 and to papers and books I plan to write); 2) tolerable levels of a dysfunctional left knee and back pain; 3) a life style and perspective that included some addictions that nevertheless were sufficiently contained to prevent disruption of my life; 4) reorganized lecture notes – as of summer, 2009, that used

transparencies of the many figures I intended to present to my classes; 5) a happy marriage that included some dysfunctional aspects.

Chaos (Death) that began in the winter-spring semester, 2010, included: 1) increased teaching load involving a large section (175 students) of Biology 1120 taught in the Field House on Monday and Wednesday added to my usual load of two sections of Biology 1140; 2) standing and walking plus an increasingly dysfunctional left knee began to cause increased back pain. This necessitated my getting up 6:00 am Monday through Thursday in order to get a parking space that reduced the amount of walking I had to do; 3) I had to scan about 200 figures to a put on a flash drive because the Field House lecture hall did not have equipment for presenting transparencies. This was by design to force professors to use computer technology to a greater extent. This also forced me to reorganize my lectures to some extent; 4) surgery for total knee replacement plus partial kidney failure followed by 3½ weeks in the hospital (most of this time was spent in the physical therapy rehabilitation section) produced great pain and anguish. At the same time of my hospital stay my wife came down with an infection in the blood that lodged in her right shoulder. A week after I came home, she spent a week in the hospital involving intravenous antibiotics and surgery to remove the pus, which saved her shoulder. All this produced great pain and anguish but led her to undergo a complex life, death, rebirth process.

New Order (Rebirth) included: 1) a much more efficient way of presenting my lectures using my flash drive with figures, which I can use in future courses that I teach, such as B1120/F/09 & Sp/10, F/11, Sp/11 and B 1140/Sp/10 and Sp/11. As judged by the optional papers that most students were allowed to write at the end of the Biology 1120 course instead of taking the final exam, the student response to my lecture-dialogues was much more positive than in the recent past. 2) Healing is ongoing and the back pain is less than before the surgery. 3) The pain and anguish beginning in the spring semester and extending to the knee surgery plus the patience to endure lying in a hospital bed for 3½ weeks provided the occasion to have many new insights. These, in turn, enabled me to transcend one life-long addiction and two minor addictions. The insights also enabled me to remove some of the dysfunctional aspects of my marriage.

*In a 2-3 typed paper present reasons why you agree or disagree with this course's description of human individuation. You may use your own life experiences or someone else's experience that you know about to exemplify your agreement or disagreement with this idea. I will not grade your paper; you will receive automatically an A+. The paper is due before or on **Saturday, April 9, in my office, BO 2015.***

Final Exam Required Paper, due Sat. April 30. Theme four for this course interprets the mission statements of UT and the Judith Herb College of Education in terms of student-teacher constructivism that promotes collaboration between subjective engagement involving individual insights and free choices and objective conceptual understanding of validated knowledge.

*In 3 typed pages or more state reasons why you agree or disagree with the idea of this theme for this course. Your answer may include reasons why you liked or disliked the way this course integrated student-teacher constructivism that leads to creative learning with the traditional teacher-centered (university-centered) conveyer-type of teaching I will not grade your paper; you will receive automatically an A+, which is worth 15 pts. **The paper is due before or on Saturday, April 30, in my office, BO 2015. If I am not there, slide your paper under my office door.***

## OUTLINE OF BIOLOGY 1120-Sp-11: CONTENT

I.. Homeostasis: Fundamental Characteristics of Life, **Ch.4, pp. 83-88.**

### NARRATIVE OF ANCESTOR APES EVOLVING TO CIVILIZED HUMANS

- I. Analogical understanding of animal consciousness, see “Animal Conscious Communicative Action” **Ch.5, pp. 256-257.**
- II. Mammal homeostatic body plan, **Ch.7, pp.181-184 and figures 7.1 and 7.2**
- III. Feelings are conscious emotions, **Ch.9, pp. 257-261.**
- IV. Evolution to the patriarchal, nuclear family and to the polar mind self, **handout #1.**
- V. Evolution to becoming civilized, see **Ch.3, pp.55-61.**
- VI. Judaeo-Christian, metaphorical, conceptual thinking generated the patriarchal perspective, **Ch.3, pp.62-64 and Tables 3.1 and 3.2(p.65).**

### CREATIVITY OF METAPHORICAL CONCEPTUAL THINKING

- I. OVERVIEW: Metaphorical, conceptual knowing generated the first civilizations and was the *creative drive* to the further evolution of humans including the emergence of scientific, mechanistic knowing that emerged in the 17<sup>th</sup> century Enlightenment. This type of knowing enables the seven to eight year old child to become civilized. Enlightenment science combined metaphorical, conceptual knowing with *constructivism* to produce mechanistic science, but then *positivism* glorified logical, conceptual knowing, which was mathematics, to the exclusion of participatory, subjective engagement with nature. Metaphorical, conceptual thinking still was used to produce theories, but then once these theories were empirically validated, the subjective engagement was disregarded. Thus, the *creativity of metaphorical, conceptual knowing* always has been expressed by humans even in their constructing scientific theories, but because of positivism, its creativity has been systematically ignored.
- II. Measurement, see **handout #2.**
- III. Newton’s metaphorical, mathematical theory of gravity, see **handout #2.**

### PATRIARCHAL IDEOLOGY BECOMES SCIENTIFIC CONSTRUCTIVISM

- I. Partial breaking from Catholic, patriarchal thinking, **Ch, 3, pp.64-67 and lecture.**
- II. Partial Enlightenment: “The scientific revolution,” **Ch. 3, pp.67-71.**
- III. Ethic of scientific objectivity, **Ch.3, pp.71-73.**
- IV. The irony and paradox of mechanistic science, **Ch.3, pp. 73-74.**
- V. NOTE: The *full Enlightenment* came with the liberal, constitutional democracy in the independent (since July 4, 1776) American colonies in the late 1700s, see lecture.

### SCIENTIFIC CONSTRUCTIVISM TRANSCENDS MECHANISTIC SCIENCE

- I. Core concepts of physics for understanding thermodynamics, see **handout #2.**
- II. Mechanistic cosmology: first law of thermodynamics, **Ch.1, pp.28-29 and handout #2.**
- III. *Break from Mechanistic Knowing*, **Ch.1, p.28 and handout #2.**

## THEORY OF MACHINES: SCIENTIFIC CONSTRUCTIVISM BECOMES NARRATIVE, SCIENTIFIC CONSTRUCTIVISM

- I. Characteristics of any machine, **Ch.1, pp.17-18.**
- II. Fundamental energy limitation of any machine, **Ch.1, p.18.**
- III. Ideal heat machine, **you will not be tested on this.**
- IV. Seven generalizations about the functioning of an ideal heat machine, **Ch.1, pp.19-27.**

### CELL AS A HOMEOSTATIC MACHINE

- I. The cellular perspective, **Ch. 5, pp.95-97.**
- II. Scientific method in terms of the cell theory, **Ch. 5, pp.98-104.**
- III. The chemical makeup of cells, **Ch.5, pp.104-115.**
- IV. Idealized eukaryotic cell, **Ch.5, pp.120-121.**
- V. Cell as a machine, **Ch.6, pp.141-143 and figure 6.3.**
- VI. Overview of cellular oxidation, **Ch.6, pp. 143-145.**
- VII. Cell maintaining homeostasis. **Ch. 5, p.103 and Ch. 6, pp.151-155**

### CELL AS THE FUNDAMENTAL UNIT FOR BIOLOGICAL EVOLUTION

- I. Regulation of intracellular chemical reactions, **Ch.6, pp.155-156.**
- II. Quest for the secret of life, **Ch.6, pp.156-157.**
- III. Watson-Crick model of DNA, **Ch.6, pp. 158-163 and figures 6.21, 6.22, 6.23a, and 6.23b.**
- IV. DNA duplication (involving DNA replication) exemplifying molecular information communication, **Ch.6, pp.164-165 and figure 6.24 BUT especially figure 6.25.**
- V. Protein synthesis, **Ch.6, pp.165-170.**

### SYSTEMS THEORY OF EVOLUTION FOR THE EMERGENCE OF LIFE

- I. Origin of life: a *uroboric* puzzle, **Ch.2, pp.44-45.**
- II. General solution to uroboric puzzles: emergent properties, **Ch.2, pp.45-46.**
- III. Systems theory of creativity, **Ch.2, pp.46-50.**

### METAPHORICAL, CONCEPTUAL MUTUALITIES OF THE SYSTEMS THEORY OF CREATIVITY

- I. Law 1: No event is autonomous; Newton's break with Aristotle and Thomas Aquinas, **Ch.1, 29-30.**
- II. Law 2: Mutuality of Order and Chaos; all isolated systems in the universe tend to change, **Ch.1, pp.30-31.**
- III. Law 3: Mutuality of Chaos and machine creativity, **Ch.1, pp.31-33.**
- IV. Law 4: Hierarchical mutuality of Chaos and non-machine creativity, **Ch. 1, pp.33-34**
- V. Law 5: Physical individuation is an Order, Chaos, New Order process, **Ch.1, pp.34-35.**

### HUMAN HOMEOSTATIC BODY SYSTEMS

- I. Homeostatic body plan and the circulatory system, **Ch.7, pp.181-189.**

- II. Regulation of the amount tissue fluid, **Ch.7, pp.193-194.**
- III. Nerve cell communication and the nervous system, **Ch.7, pp.194-204.**
- IV. Human endocrine system, **Ch. 7, pp.204-211 .**
- V. Human neuroendocrine system, **Ch.7, pp.211-213.**
- VI. Neuroendocrine-immune system, **Ch.8, pp.219-237.**
- VII. Neuropsychic homeostasis, **Ch.9, pp. 243-270.**

#### MENDEL'S THEORY OF GENETICS EXEMPLIFYING SCIENTIFIC CONSTRUCTIVISM

- I. Mendel's insights, **Ch.11, pp.295-297.**
- II. Mendel's first law, **Ch.11, pp.207-210.**
- III. Cellular basis of Mendel's theory, **Ch.11, pp.299-307.**
- IV. Mendel's first law in terms of meiosis, **Ch.11, pp.305-307.**
- V. Examples of Mendel's first law, **Ch.11, pp.307-316.**
- VI. Epistemology of chromosomal theory of inheritance, **Ch.11, pp.310-312.**

#### EPIGENESIS: DEVELOPMENTAL INDIVIDUATION

- I. Development of animals, **Ch.12, pp.339-348.**
- II. Human embryonic development, **Ch.12, pp.348-353.**
- III. The human reproductive system, **Ch.12, pp.354-358.**
- IV. Epigenesis of the human reproductive system, **Ch.12, pp.358-370.**
- V. Seven stages of biological sexuality, **see Table 12.2.**

#### BIOLOGICAL THEORY OF EVOLUTION

- I. Two themes of biological evolution, **Ch.13, p.377.**
- II. Darwin's metaphorical, conceptual insights that led to the formation of his scientific constructivism theory of evolution, **Ch. 13, pp.378-380.**
- III. Overcoming Greek-medieval philosophy, **Ch.13, pp.380-381.**
- IV. Modern theory of the process of biological evolution, six statements, **Ch.13,p.381.**

#### NARRATIVE UNDERSTANDING OF EVOLUTION AND RELATED IDEAS

- I. Ethic of mutuality, **Ch.14, pp.389-390.**
- II. Mutualities of the biosphere, **Ch.14, pp.390-394.**
- III. Mutuality of evolution of life and ecology, **Ch.14, pp.392-394.**
- IV. Mutualities of biological evolution, **Ch.14, pp.394-395.**
- V. Universal harmony versus transformations, **Ch.14, p.396.**
- VI. Evolution as a creative process in terms of seven characteristics, **Ch.14, pp.399-402.**
- VII. Free market capitalism as a metaphor for understanding biological evolution, **see handout #3.**

**Biol. 1120: SURVEY OF BIOLOGY/Spring /2011 PRIBOR**  
**INFORMATION ABOUT THIS COURSE**

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**Class Meetings**: M. W. 12:30 – 1:45 pm .....F.H. 2100

**Textbook**: **UNIVERSAL CREATIVITY. INDIVIDUATION OF THE BIOSPHERE. A CONSTRUCTIVISM EPIC**, 1<sup>st</sup>.ed., 2004, by Donald B. Pribor. Kendall/Hunt Pub. Co. Can be purchased only at The Student Bookstore, 3059 W. Bancroft St. phone: 536-9154 and the main UT Bookstore, phone: 530-2516.

**Exam Schedule**

The grade for this course will be determined by: three multiple choice exams each consisting of 100 or more questions and two required papers; the second required paper will count as the final exam. The schedule for these exams and the required papers are listed below.

1. First exam worth 45/150 pts. = 30% of final grade.....[M] 2/14
2. Second exam worth 30/150 pts. = 20 % of final grade.....[W] 3/23
3. **Required paper worth 15/150 pts. = 10% of final grade due in my Office BO 2015 Due before or on Sat., April 9.** If I am not there slide paper under my door.
4. Third exam worth 45/150 pts. = 30% of final grade.....[M] 4/25
5. **Final Exam required paper worth 15/150 pts. = 10% of final grade Due before or on Sat., April 30 by 7:00 in my office, BO 2015**

**Points for second fourth of this course**

The second exam is worth 30pts, 20% of the final grade and the required paper is worth 15pts, 10% of the final grade; thus 20% + 10% = 30% and 30 pts. + 15 pts. = 45 pts. The required paper will not be graded; therefore, if one writes this 2-3 page paper on the assigned topic, then he/she will receive 15pts.

**Description of Required paper due 4/9 see Syllabus.**

**Description of Final exam required paper, see Syllabus.**

**Missed Exams.**

If one has a legitimate excuse for missing an exam, he/she can take a makeup exam. The makeup exam must be taken within a week after the missed exam was given. This will be strictly enforced. A student who has not taken the makeup exam after two weeks will receive a zero for that exam.

**Study Guidelines**

Each multiple choice exam will test for material in review sheets I will pass out in each of the three sections of the course. With the possibility of a few exceptions, the topics covered by the multiple choice questions are in the textbook and handouts for this course. The “lecture-dialogues” for this course are designed to facilitate students creating for themselves an understanding of the review topics for each exam. Thus, these lecture-dialogues will not give information that students are expected to copy and memorize for the exam. At the beginning of each section, a set of questions taken from the exam for that section will be passed out. Students are encouraged to relate sections in the textbook and handouts to the student selected answer to each of these sample questions. I will give answers to these sample questions during class lectures.