

Eastern Illinois University
New Course Proposal
EIU 4131G, Modern Biomedical Science: Promise and Problems

1. Catalog description

- a. EIU 4131G
- b. Modern Biomedical Science: Promise and Problems
- c. 3-0-3
- d. On demand
- e. Biomedicine
- f. An examination of selected advances in modern biomedical science. The unforeseen consequences to society will be emphasized along with the science behind medical techniques and treatments. Majors in Biological Sciences are excluded. WI
- g. Completion of 75 semester hours
- h. Summer 2004

2. Student Learning Objectives and Evaluation

a. Learning Objectives

In accordance with the goals of general education, students will develop their ability to

- formulate and express reasoned opinions based on reading a variety of material (critical thinking, writing, speaking)
- effectively participate in group discussions involving people from diverse backgrounds (speaking, critical thinking)
- conduct library research over a narrowly defined topic and synthesize the information into an informative work (writing, critical thinking, citizenship)
- make a formal, in-depth oral presentation to a group (speaking)
- write short “essays” on command in response to questions posed by a supervisor (writing, critical thinking, citizenship)
- analyze information from the popular press for quality of scientific work and potential impact on society (critical thinking, citizenship)
- understand how modern biomedical science works, its potential for ethical lapses, and that every biomedical advance has unforeseen consequences (critical thinking, citizenship)

b. Evaluating student performance:

- (1) Writing skills will be evaluated through several writing assignments. Students will write two, integrative reaction papers based on the course material and library research. The first of the two papers (approximately 10 typed pages each) will be returned to the student after a preliminary evaluation for revision and expansion if necessary. In addition, students will be advised to consult with the instructor during the writing process. Students also will have approximately 10-12 short, “in-class” writing opportunities (10-15 minutes in length) that cover major themes and concepts covered that day. Speaking skills will be evaluated based on the class discussions and oral presentation of one of the term papers. Critical thinking

and understanding of the material will be continuously evaluated in the grading of the content and quality of written and oral work.

(2) 75% of the course grade will be based on written assignments as indicated below:

Attendance and class participation	15%
Two synthesis-reaction papers @20% each	40%
Oral presentation	10%
In class writings (drop 2 lowest)	20%
Current journal briefs (8 per semester)	<u>15%</u>
TOTAL	100%

(3) Assessment: Student achievement of the stated objectives will be assessed and grades earned based on the following activities

	(daily) class participation	S/R paper (2)	Oral presentation (1)	In-class writing (10-12)	(8) Current journal briefs
formulate/express reasoned opinions	X	X	X	X	X
group discussions	X				X
research, synthesis & expression		X			
impromptu writing				X	
Analyze biomedical news	X				X
Oral presentation			X		
understanding biomedical science	X	X	X	X	X

- c. Not technology delivered
- d. Not a graduate-level course
- e. Writing intensive - several writing activities required (2 synthesis reaction papers, approx. 12 in class writings, and 8 current journal briefs); one paper to be revised after evaluation by instructor; no less than 35% of final course grade based on student's writing (75% of the course grade based on written assignments).

3. Outline of the Course

- a. Course outline is based on one 150 minute (or two-75 minute) class meeting(s) per week for 15 weeks. The first week is devoted to introducing terms, themes and reading material. The twelfth week will be used for university mandated assessment activities, and the last week spent mainly on oral presentations.

Week 1--Introduction to the Course, the scientific method, and the ways of "Big Science"

- Scientific method: a rational way to solve problems
- Where do biomedical scientists work, who pays them, how is their success measured
- Scientific misconduct and its consequences

- Assigned reading: Caplan - Chapter 4, “The Ethics of Research”
- Assigned journal brief on experimental design, ethical problems with research

Week 2—Ethical Responsibilities of Biomedical Scientists and Research Institutions

- Discussion of Caplan - chapter 4, “The Ethics of Research” - 12 essays
- Presentation and discussion of Journal Briefs
- In-class writing assignment on research ethics

Week 3—Human Genetics, Genetic Engineering, Genetic Testing, and Gene Therapy

- Presentation and discussion of journal briefs
- Lecture-discussion: Introduction to DNA and genetics
- View “The Immortal Thread” PBS program on genetics and gene technology
- In-class writing assignment on the relationship of DNA to human genetic traits
- Assign reading: *Scientific American* article “Grading the gene tests”

Week 4—Human Genetics, Genetic Engineering, Genetic Testing, and Gene Therapy

- Discussion of genetic testing article
- Discuss relevant journal briefs
- In-class writing assignment on the benefits and problems of genetic testing

Week 5—Human Genetics, Genetic Engineering, Genetic Testing, and Gene Therapy

- Presentation and discussion of journal briefs
- Lecture-discussion: Introduction to genetic engineering
- View “The Mouse that Laid the Golden Egg” PBS program on genetic engineering
- Assign reading: Three essays from 3 different viewpoints on animal rights
- In-class writing assignment on use of genetically modified organisms

Week 6—Human Genetics, Genetic Engineering, Genetic Testing, and Gene Therapy

- Presentation and discussion of journal briefs
- Discussion of genetic engineering and animal rights
- Assign reading: *Scientific American* article: “Overcoming the Obstacles” - genetic therapy review
- In-class writing assignment on animal rights and the use of animals in research
- Assign current journal brief on reproductive technology

Week 7—Reproductive Technology: Science Aimed at Preventing or Enhancing Reproduction

- Presentation and discussion of journal briefs
- Lecture-discussion: Human reproductive physiology - methods to prevent pregnancy
- In-class writing assignment on contraceptive choice and rationale
- Hand in first synthesis-reaction paper

Week 8—Reproductive Technology: Science Aimed at Preventing or Enhancing Reproduction

- Presentation and discussion of journal briefs
- View Nova video: “Hi Tech Babies”
- Begin discussion on enhancing reproduction
- Assign reading: Caplan, chapter 3- “Technological Reproduction”
- Student presentations

Week 9–Reproductive Technology: Science Aimed at Preventing or Enhancing Reproduction

- Presentation and discussion of journal briefs
- Discussion of readings in Caplan: “Technological Reproduction”
- In-class writing assignment on enhancing reproduction
- Student presentations

Week 10–Extraordinary Medical Technology for the Extension of Life

- Presentation and discussion of journal briefs
- Discussion of the use of modern technology for the detection and curing of disease
- In-class writing on choosing technology and how to pay for it
- Assign reading: Lamb, “Policies for Allocating and Procuring Organs” - allocation
- Student presentations

Week 11–Extraordinary Medical Technology for the Extension of Life

- Presentation and discussion of journal briefs
- Discussion of Allocating organs for transplantation
- In-class writing on allocating organs for transplant
- Assign reading: Lamb, “Policies for Allocating and Procuring Organs” - procurement
- Student Presentations

Week 12--Assessment Week**Week 13–Extraordinary Medical Technology for the Extension of Life**

- Presentation and discussion of journal briefs
- Discussion of procuring organs for transplantation
- In-class writing on procuring organs for transplant
- Assign reading: Lamb, “Organ Transplants and Criteria for Death”
- Student Presentations

Week 14–Extraordinary Medical Technology for the Extension of Life

- Presentation and discussion of journal briefs
- Discussion of transplants and criteria for death
- In-class writing on criteria for death
- Student Presentations

Week 15–Student Presentations and Course Evaluation

- b. Not technology-delivered

4. Rationale

- a. Purpose and need: Senior seminars are designed to be a cross-disciplinary, culminating experience based on a topic of major importance. Studying the unforeseen consequences brought about by recent developments in biomedical science offers students an opportunity to gain understanding of highly technical “advancements” and to consider the impact of these developments on many aspects of their own lives. Because the students enrolled in senior seminar represent diverse academic backgrounds, they learn as much from each other as they do from the instructor. Examination of senior seminar offerings leaves the impression that there is room for a course that deals with the interface between biomedical

science and society.

- b. Course level and prerequisites: Senior level. Senior seminar may be taken after a student has completed 75 semester hours.
- c. Similarity to existing courses: This course is not similar in subject content to any other senior seminar in the catalog.
- d. Impact on program(s): This course will not be required in any majors or programs other than general education senior seminar requirement.

5. Implementation

- a. Initial instructor and departmental contact: Charles J. Costa (cfcjc@eiu.edu - 581-2520) .
This course may be taught by other qualified faculty in Biological Sciences.
- b. Additional costs: None
- c. Text: Arthur Caplan. 1998. *Due Consideration-Controversy in the Age of Medical Miracles*. John Wiley & Sons, New York.
Supplementary materials from a variety of sources including review literature sources (e.g., *Scientific American*, *American Scientist*) and popular literature (e.g., *Discover*, *Newsweek*, *Time*, etc.).

6. Community College Transfer

A community college course will not be judged equivalent to this course.

7. Date approved by the Biological Sciences curriculum committee: December 5, 2003

8. Date approved by COS curriculum committee: January 23, 2004

9. Date approved by CAA: February 20, 2004