This course explores the human context of science and technology. It asks such questions as: how is science done? What role does intention play in technological invention? What values do science and technology represent? And, what are the ethical implications of advances in scientific and technical fields?

The course will open with a reading of C.P. Snow's classic statement of the problem posed by the separation of humanistic from scientific and technical learning. It will then consider case studies of important examples of scientific discovery and technological innovation. This course carries Arts/Humanities GFR credit.

Instructors for the HCST 100 Core: Dr. Joseph N. Tatarewicz (History) and Mr. Eric Brown (Interdisciplinary Studies)

Instructors for Case Studies: Dr. Kevin E. Omland (Field Biology); Dr. Jessica Pfeifer (Philosophy of Science); Dr. Linda Lear (History); Ms. Patricia LaNoue (Interdisciplinary Studies); Dr. Laszlo Takacs (Physics); Mr. John Fritz (Office of Information Technology); Dr. Joseph Tatarewicz (History) and Dr. Ted Foster (Engineering); Dr. Thomas Robinson (Evolutionary Psychology). Dr. Sandra Herbert (History); Dr. Philip Sokolove (Biological Sciences); Dr. Mark Henriksen (Joint Center for Astrophysics); Dr. G. Rickey Welch (Biological Sciences & Dean, College of Arts and Sciences)

Library Resources: Mr. Drew Alfgren (x 53608)

Books Available for purchase at the UMBC Bookstore:


Harry Collins and Trevor Pinch, *The Golem: What You Should Know about Science.* (Recommended)


C.P. Snow, *The Two Cultures.*

Aldous Huxley, *Brave New World.* (Honors)

Other required readings are posted on the Blackboard Site, “Documents” section.

Assignments
Students will be required to write 6 short papers, and will be given a choice of questions for their essays. For HCST 100 two hard copies of papers should be brought to class on the date that the assignment is due. For HCST 100H one copy of the assignment should be brought to class on the day that it is due. Late papers will be penalized.

**Attendance**

Attendance, which is mandatory, will be taken at the beginning of each class period. Punctuality is expected, and to be marked as present students must be in the classroom when roll is called. Unexcused absences in excess of three during the course of the semester will lower the student's final grade.

**Academic Integrity**

In their papers for the course students are expected to cite all work by other authors in footnotes and to enclose verbatim passages in quotation marks. This would include material from the Web as well as from printed material. The UMBC Academic Conduct Policy (http://www.umbc.edu/integrity/students.html) will be the expected code of conduct.

**Schedule of Classes**

**Topic I  Science, Technology, and Culture**

Reading for Topic I: C. P. Snow, *The Two Cultures*.

**Wed 9/01**  Introductory lecture by Profs. Tatarewicz & Brown: Science, Technology, and Culture

**Mon 9/06**  Labor Day holiday

**Wed 9/08**  Discussion led by Profs. Tatarewicz & Brown of Snow's "The Two Cultures"

**First Assignment:** A one page paper (250 words) on Snow's essay. Due in class on Monday September 13.

**Topic II  Creativity in Science: Some Examples from Biology**


**Mon 9/13**  Discovering Evolution: Charles Darwin's work on the Galápagos Islands Lecture by Dr. Herbert. Reading by Darwin.
Wed 9/15  Film on the Galápagos Islands  
Discussion led by Dr. Herbert

Mon 9/20  Arguing Evolution: natural selection and the argument for evolution  
Lecture by Dr. Pfeifer

Wed 9/22  Evolution in the Field 2004  
Lecture by Dr. Kevin Omland. Readings by Omland.  
*Field Trip directly following the class (optional for HCST 100 students but required for HCST 100H students).*

Mon 9/27  Evolution in action: antibiotic resistance  
Lecture by Dr. Sokolove. Readings by Freeman and by Nesse and Williams.

Wed 9/29  Evolution and skin color  
Lecture by Dr. Sokolove. Reading by Jablonski and Chaplin.

**Second Assignment: A 3 page essay (750 words). Due in Class on Monday October 4.**

**Topic III  The Ethics of Science: Cases from Biology**

Reading for Topic III: Lear, *Lost Woods* Chapters 3, 7, 9, 14, 26, 28, 30; Stevens, "Want a Room with a View? Idea May Be in the Genes"

Mon 10/04  Humans Shaping Nature: Ethical uses of chemicals: pesticides from World War II to *Silent Spring*.  
Lecture by Dr. Lear  Reading: chapters 26, 28, 30 of Lear

Wed 10/06  PBS Video "The Silent Spring of Rachel Carson"  
Discussion by Dr. Herbert  
*Special Lecture by Dr. Lear on Beatrix Potter and Environmentalism  4:00 pm Kuhn Library & Gallery*

Mon 10/11  Humans Living in Nature: Greenway walk led by Ms. Patricia LaNoue  
Note: This class will run from 1:15 p.m. - 3:15 p.m.  
Students should meet at 1:15 p.m. in Academic IV 150 and be dressed for a hike in the woods.  
Reading: Stevens

Wed 10/13  Environmental choice  
Lecture by Dr. Herbert  
Reading: Lear, chapters 3,7,9,14

**Third Assignment: A 3 page essay (750 words) due in class on Monday**
October 18.

Topic IV  Humans Shaping Their Environment: Materials

Reading for Topic IV: Goffer, "Metals"; “Materials Science and Engineering”; Hosford and Duncan, "The Aluminum Beverage Can"

Mon 10/18  Materials in antiquity and today
Lecture by Dr. Takacs
Reading: Gaffer, “Materials Science and Engineering”

Wed 10/20  Why metals have the properties they do
Lecture by Dr. Takacs

Mon 10/25  Class visit to a materials laboratory

Wed 10/27  From ore to product: a case study
Reading: "The Aluminum Beverage Can"

Fourth Assignment: A 3 page essay (750 words) due in class on Monday Nov. 1.

Topic V Technologies

Readings for Topic V-a

"Seven Principles for Good Practice in Undergraduate Education" available at http://www.tltgroup.org/seven/Home.htm

David Noble, "Part IV: Rehearsal for the Revolution" from his "Digital Diploma Mills" available at http://www.communication.ucsd.edu/dl/

Readings for Topic V-b

Joseph N. Tatarewicz, Observatories (Collier’s Encyclopedia); Tatarewicz, Astronomy and Astrophysics (Collier’s Encyclopedia); concentrate on the 20th Century portions of these readings.

Readings for Topic V-c

**Topic V-a On the Nature of Technology**

Mon 11/01    Seven principles of learning  
             Lecture by Mr. Fritz  
             Reading: "Seven Principles"

Wed 11/03    New educational technology: distance learning  
             Lecture by Mr. Fritz  
             Reading: Noble

**Topic V-b Technology and Discovery**

Mon 11/08    Discovering the Universe: Telescopes and Light  
             Lecture by Dr. Henriksen  
             Reading: *Observatories; Astronomy and Astrophysics*

Wed 11/10    Discovering the Universe: Telescopes in Person  
             *Field Trip to UMBC Observatory. Meet at the First Floor Elevators, New Physics Building*

**Topic V-c Exploration and Risk**

Mon 11/15    Exploring the Universe: History of the Space Shuttle  
             Lecture and discussion by Dr. Tatarewicz  
             Reading: Collins & Pinch; Challenger & Columbia Accident Reports (read the Introductions to each report and browse the chapters).

Wed 11/17    Hazards of Exploration: Challenger and Columbia Accidents  
             Comparison of the Two Accidents by Dr. Tatarewicz  
             Challenger Launch Decision by Dr. Foster

Mon 11/22    Managing the Risks of Exploration: Challenger Launch Decision  
             Re-Enactment of Challenger Launch Decision organized by Dr. Foster  
             “Two Accidents Rooted in History and Culture” by Dr. Tatarewicz

**Topic V-d On the Nature of Technology**

Wed 11/24    On the Nature of Technology  
             Lecture by Prof. Brown  
             Reading: Volti; Collins & Pinch, “Introduction,” Chapters 1 & 7.

**Special Film Showing 11:00 am ITE Building 229:** Students are invited to join Professor Tatarewicz’s History of Science Antiquity to 1700 class for a special pre-Thanksgiving showing of the film, *William Harvey and the Circulation of the Blood.* **Warning:** This film re-creates Harvey’s classic experiments and includes
graphic scenes of human and animal dissection and vivisection.

Thanksgiving Holiday Thursday November 25

Fifth Assignment: A 4 page (1000 word) essay due in class on Monday November 29.

Topic VI Human Subjectivity and Experience


Mon 11/29 Humanity and the Culture of Technology
Introduction by Dr. Tatarewicz
Reading: Postman.

Wed 12/01 Humanity and the Culture of Technology
Discussion of Postman led by Dr. Welch

Mon 12/6 Humans and their Mental World: Evolutionary Psychology
Lecture: Dr. Robinson
Reading: DeKay and Buss, Kenrick

Wed 12/8 Film: *The Nature of Human Nature*
Discussion led by Dr. Robinson

Mon 12/13 Concluding Thoughts: the Human Context of Science & Technology
Discussion led by Profs. Tatarewicz & Brown

Sixth Assignment (750 words) due Monday December 15 in the History Office. (7th Floor, Administration Building)

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