Dr. Dean Taciuch  
George Mason University  
Fall 2018

Honors 353: 005  
Technology in Contemporary Society

Those of us who have contributed to the new science of cybernetics thus stand in a moral position which is, to say the least, not very comfortable. We have contributed to the initiation of a science which, as I have said, embraces technical developments with great possibilities for good and for evil. We can only hand it over to the world that exists about us, and this is the world of Belsen and Hiroshima. We do not even have the choice of suppressing these new technical developments. They belong to the age, and the most any of us can do by suppression is to put the development of the subject into the hands of the most irresponsible and the most venal of our engineers.

The best we can do is to see that a large public understands the trend and the bearing of the present work, and to confine our personal efforts to those fields, such as physiology and psychology, most remote from war and exploitation. As we have seen, there are those who hope that the good of a better understanding of man and society which is offered by this new field of work may anticipate and outweigh the incidental contribution we are making to the concentration of power (which is always concentrated, by its very conditions of existence, in the hands of the most unscrupulous). I write in 1947, and I am compelled to say that it is a very slight hope.

Norbert Wiener, Introduction to Cybernetics (39)

Course Description

The course will begin with the concept of Cybernetics, popularized by Norbert Wiener’s Human Use of Human Beings, a book he wrote (in 1950) specifically to explain cybernetics to the interested non-expert. Cybernetics, as Wiener and the first generation of computer engineers defined it, is the science of control and communication in machines, animals, and human beings. Cybernetics gave us the concepts of cyberspace and the cybernetic organism — the cyborg.

Throughout this course, we will address technology, in particular the idea of cybernetics and AI, from the perspectives of of a wide range of disciplines including engineering, statistical mechanics, mathematics, linguistics, sociology, psychology, neuroscience, biology, and philosophy. The field of cybernetics (the topic of our first text) is inherently interdisciplinary, born as it was from the fields of engineering and mathematics combined with biology, neuroscience, and sociology to form what today would be called information theory.

Course Goals

Honors 353 is a Mason Core Synthesis course.

The purpose of the synthesis course is to provide students with the opportunity to synthesize the knowledge, skills and values gained from the Mason Core curriculum. Synthesis courses strive to expand students’ ability to master new content, think critically, and develop life-long learning skills across the disciplines...
Upon completing a synthesis course, students will be able to:

1. Communicate effectively in both oral and written forms, applying appropriate rhetorical standards (e.g., audience adaptation, language, argument, organization, evidence, etc.)
2. Using perspectives from two or more disciplines, connect issues in a given field to wider intellectual, community or societal concerns
3. Apply critical thinking skills to
   1. Evaluate the quality, credibility and limitations of an argument or a solution using appropriate evidence or resources, OR,
   2. Judge the quality or value of an idea, work, or principle based on appropriate analytics and standards.

(http://masoncore.gmu.edu/synthesis/)

The essays, discussions, and presentations in this course are designed to meet these goals. You will be required to read, evaluate, analyze, and synthesize material from several disciplines and present your analysis in essays and oral presentations.

Texts:

Print:
Norbert Wiener. *The Human Use of Human Beings.* ($15.00)
Nick Bostrom. *Superintelligence: Paths, Dangers, Strategies.* ($15.95)
Prices as of August 2018. If you are charged more at the bookstore, let me know.
Both texts are available as e-books as well, but the Wiener e-book is of poor quality.

Online:
Vernor Vinge, "Technological Singularity"
Ray Kurzweil, *The Ray Kurzweil Reader*
Heidi Ledford "CRISPR, The Disruptor"
Bill Joy "Why the Future Doesn't Need Us"
Robin Hanson, "The Great Filter"
Nick Bostrom, "Are You Living in a Computer Simulation?"

Course Site:

We will use Blackboard for online discussions and essay submissions.

Assignments:

The assignments in this course consist of three essays, weekly reading responses, and a final presentation. The first essay will be an analysis of some complex system in light of Norbert Wiener’s concept of cybernetics. The system may be biological, social, mechanical, digital, or any combination of these. The second essay will be on the concepts introduced in the online readings and the Bostrom text (Singularity, AI). The third essay will will present your research on a specific technology or a specific issue related to technology.

The weekly responses will be posted to Blackboard. The weekly responses will be on a specific question which I will post, and they will be due before class most weeks (if there is an essay due that week, there will no weekly response). You may add to your posts after class, of course. I will also ask you to comment on the posts of other students. To earn full credit for the responses, you must post 10 weekly responses, and comment on at least five of your fellow students’ posts.

The final presentations will be based on the final research papers. Present your research findings and conclusions in a short 5-8 minute presentation.
Essay 1  due Sept 30  20%
Essay 2  due Nov 4  20%
Essay 3  Dec 18  25%
Weekly reading responses  most weeks before class  15%
Final Presentations  Dec 4–6  20%

COURSE POLICIES

Grading: Grades on the essays will be based primarily on the quality of the writing. I value clear, focused writing with plenty of examples. Grades on the research essay will be based on the quality of the research as well: I expect you to use the GMU Library databases as well as the Internet.

Late Assignments: Late papers will lose 5% per day unless you make prior arrangements with me.

Revision Policy: The essays may be revised for a higher grade, but they must be substantially revised. You cannot lose a grade by revising, but a higher grade is not guaranteed. I have found that B papers (or higher) are often more difficult to revise, since serious revision requires thoroughly changing the essay's structure, and B papers usually have a fairly good structure. C papers (or lower) often respond more dramatically to revision, since the major changes they require are often more straightforward. I recommend revising C papers or lower only. If you plan to revise a B paper, please see me beforehand so we can discuss a revision strategy.

All revisions must be turned in by Nov 25

Plagiarism: Plagiarism means using the exact words, opinions, or factual information from another source without giving that source credit. Writers give credit through the use of accepted documentation styles, such as parenthetical citation, footnotes, or end notes; a simple listing of books, articles, and websites is not sufficient.

Writers must include a Works Cited or References list at the end of their essay, providing full bibliographic information for every source cited in their essay, including the course textbooks.

Instructors at George Mason University are bound to uphold the George Mason Honor Code, which requires us to report any suspected instances of plagiarism to the Honor Committee. All judgments about plagiarism are made after careful review by the Honor Committee, which may issue penalties ranging from grade-deductions to course failure to expulsion from GMU.

Important Dates

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<tr>
<th>Event</th>
<th>Date</th>
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<tr>
<td>First day of classes</td>
<td>Aug 27</td>
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<tr>
<td>Last day to add classes</td>
<td>Sept 4</td>
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<td>Final Drop Deadline (no tuition penalty)</td>
<td>Sept 9</td>
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<td>Web Withdrawal Period (100% liability)</td>
<td>Sept 10 – Sept 30</td>
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<td>Selective Withdrawal Period (undergraduate students only)</td>
<td>Oct 1 – Oct 28</td>
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<td>Fall Break (Monday classes/labs meet Tuesday. Tuesday classes do not meet this week)</td>
<td>Oct 8</td>
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<td>Incomplete work from Fall/Summer 2018 due to instructor</td>
<td>Oct 26</td>
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<td>Thanksgiving Recess</td>
<td>Nov 21 – 25</td>
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<td>Last day of classes</td>
<td>Dec 8</td>
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<tr>
<td>Reading Days</td>
<td>Dec 10 – 11</td>
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<tr>
<td>Exam Period</td>
<td>Dec 12 – 19</td>
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Course Schedule

The schedule of readings will almost certainly change during the course of the semester, depending on the interests in the class. We may not discuss all readings in class, but you should be prepared to discuss the readings if and when they come up in class discussions.

Week 1 (Aug 28 – 30): Course Introduction and Concepts
Cybernetics, communication, codes, and control.
HUHB Preface, Ch 1

Week 2 (Sept 4 – 6): Feedback
HUHB chapters ch 2 - 3
Response 1 (on negative feedback)

Week 3 (Sept 11 – 13): Homeostasis
HUHB chapters 4-8
Response 2 (on homeostasis)

Week 4 (Sept 18 – 20): The 2nd Industrial Revolution
HUHB chapters 9-11
Response 3 (on 2nd Industrial Revolution)

Week 5 (Sept 25 – 27): Technological Singularity
Vernor Vinge, "Technological Singularity"
Ray Kurzweil: "After the Singularity," "Will Machines Become Conscious?" and other selections from Kurzweil Reader
Essay 1 due Sept 30

Week 6 (Oct 2 – 4): AI
Bostrom SI ch 1-2
Heidi Ledford "CRISPR, The Disruptor"
Response 4 (AI)

Week 7 (Oct 11): SI
Bostrom SI ch 3-4
Response 5 (types of SI)
Columbus Day: Monday classes meet Tuesday. Tuesday classes do not meet)

Week 8 (Oct 16 – 18): SI Will
Bostrom SI ch 5-7
Response 6 (What Would an AI Want?)

Week 9 (Oct 23 – 25): Control
Bostrom SI ch 8-10
Response 7: The Control Problem

Week 10 (Oct 30 – Nov 1): Values
Bostrom SI ch 11-15 and Afterword
**WEEK 11 (NOV 6 – 8): RESEARCH AND TECHNOLOGY**
GMU Library Databases
Future of Life Institute & KurzweilAI.net
Synthesis: Using & Citing Sources
Response 8 (Research Topics)

**WEEK 12 (NOV 13 – 15): ON THE OTHER HAND**
Kurzweil Reader: "Are We Becoming an Endangered Species?"
Bill Joy: "Why the Future Doesn't Need Us"
Response 9 (Relinquishment)

**WEEK 13 (NOV 20): RELATED ARGUMENTS**
Robin Hanson, "The Great Filter"
Bostrom "Are You Living in a Computer Simulation?" and various responses
Response 10 (Related Arguments)

*Thanksgiving Recess Nov 21 – 25*
All revisions due by Nov 25

**WEEK 14 (NOV 27 – 29): FINAL PRESENTATIONS**
Begin Final Presentations

**WEEK 15 (DEC 4 – 6): FINAL PRESENTATIONS**
Finish Final Presentations

Research Paper due Dec 18

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