INT 161: Science, Technology and Society
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The purpose of this course is to explore the interactions between science, technology and society. You will ultimately use this knowledge in two ways. First, you'll write a paper examining the relationship between science, technology and society. Second, you'll develop an idea that will use science and technology to make the world a better place. This course is also a First Year Writing course, so we will also spend time learning how to write successfully in college. Specifically, this course will help prepare you to:

- read critically
- understand writing as a continuous process
- learn how to write appropriately for a given audience
- develop a thesis and sustain an argument with evidence
- evaluate, cite, and document sources appropriately
- incorporate feedback and learn how to revise papers

Educational outcomes: Knowledge, reasoning, communication, citizenship
Your readings and research will help expand your knowledge of the material. By learning how to construct a clear argument, you will learn how to reason. You will learn how to communicate in both your written essays and presentations. And you will demonstrate citizenship both in the writing workshops in this course, as well as playing an active role in determining the best ways that science and technology can help make this world a better place.

Texts for the course:

The Upstarts Brad Stone (2017)
Move Fast and Break Things Jonathan Taplin (2017)
They Say, I Say Gerald Graff and Cathy Birkenstein (4th Edition) (2018)
Technology Review, Sept/Oct 2018 Issue

There are two main books we'll use to examine the interaction between science, technology, and society: *The Upstarts* by Brad Stone (I'll refer to this as "Upstarts") and *Move Fast and Break Things* by Jonathan Taplin (I'll refer to this as "MFBT"). Both of these books are available in the Cornell and online bookstores.

We'll also read some some articles on Technology and Society in the September/October issue of *Technology Review* magazine. These are not easy to obtain online so I have purchased a number of these for use in this class. Additional articles may be posted on Moodle.

A brief word about the readings and assignments. Some students think that Professors choose the readings to reflect their own views. Furthermore, students often expect that they'll be rewarded for writing papers that reflect the opinions of the professor rather than their own. Nothing could be further from the truth in this course. I have selected books and articles that I find interesting: I agree with some parts of the texts, but disagree with others. In any case, I'm more interested in your observations of the text and the arguments you make: I'm most excited when students can teach me something new, or change my perspective on a particular topic. I will favor papers with views that oppose my own if

they have strong arguments over papers with views that reflect my own but have weak arguments.

The Graff and Birkenstein book (which I'll refer to as “TSIS”) is available in the Cornell and online bookstores. This book is useful for explaining how to write academic papers. This book pertains to the “Writing'” part of the course.

Class is held 9-11 AM and 1-3 PM in West Science Room 002.

Office: West Science Room 021
Office phone: 895-4354
Home phone: 365-1836
E-mail: dsherman@cornellcollege.edu

I am usually available outside of normal class hours. When I'm not in meetings (which is most of the time) I am in my office. Please feel free to drop by.

In addition to myself, if you need detailed help with the assignments, please contact Jennifer Ferrell (writing consultant for first-year students), Amy Gullen (Science Librarian) or an appropriate staff member of the Center for Teaching and Learning in the library.

The schedule page indicates the reading assigned for this class as well as movies that we might watch, although we may watch some additional movie clips not listed in the schedule. For example, on the first day, we will watch two episodes of the James Burke TV series *Connections.* Before the second day of class, you should read the Introduction and first two chapters of *Upstarts* as well as the article “From 2008 to 2020” from *Technology Review*(on pages 28-31). Before the 2nd day's class, you should have written and submitted on Moodle a short chapter paper on the reading for the *Upstarts*. Incidentally, for every day’s reading assignments for both Upstarts and MFBT, you will need to turn in a short writing assignment that will be described below.

Assignments:
I will often assign short writing assignments. These may be general in nature, or may relate to a specific activity we did in class. These assignments will be placed on Moodle along with a short description of the assignment and a due date. You can also find a short description of these assignments on this syllabus. *Please consult Moodle if you are not sure of an assignment's requirements or due date. Papers not submitted on time without an authorized excuse will not receive full credit.*

You can access Moodle at http://moodle.cornellcollege.edu/ The assignments should be submitted in either Microsoft Word (DOC) or Adobe Portable Document Format (PDF) formats. If you have trouble submitting the document via Moodle, you may sent it to me via an email attachment. However, if you submit it as an email attachment, you should not assume that it has been submitted until you receive an acknowledgment from me. If you do not have Microsoft Word installed on your computer, you can download the free OpenOffice program and save your files in Word format. If you do not have a computer, you can use any of the computers available to students on campus in one of the computer labs (Cole Library, Law Hall, West Science computer labs).

Absence from class and late assignments:
You may be absent from class due to a few reasons. Your absence is excused if either 1) you obtain permission from your instructor in advance of the absence or 2) the absence is of an emergency or medical nature. If your absence is excused, you will need to make up the material that you missed, but

there will be no other penalty. If your absence is not excused then you will not be allowed to make up the work. If you turn in an assignment late, then you will not receive full credit.

As a practical matter, missing one or two days of class (provided you let me know what is going on) is not a major problem, but missing three or more days is a cause for concern.

Academic Integrity:
Unless otherwise stated, these assignments are for you to complete on your own. In some cases, they will be based on group work done in class. In these cases, please provide proper attribution to other's ideas. Failure to properly reference other people's ideas may result in a failing grade. Cornell College expects all members of the Cornell community to act with academic integrity. An important aspect of academic integrity is respecting the work of others. A student is expected to explicitly acknowledge ideas, claims, observations, or data of others, unless generally known. When a piece of work is submitted for credit, a student is asserting that the submission is her or his work unless there is a citation of a specific source. If there is no appropriate acknowledgement of sources, whether intended or not, this may constitute a violation of the College's requirement for honesty in academic work and may be treated as a case of academic dishonesty. The procedures regarding how the College deals with cases of academic dishonesty appear in The Compass, our student handbook, under the heading "Academic Policies – Honesty in Academic Work."
http://www.cornellcollege.edu/student-affairs/compass/academic-policies/honesty-in-academic-work.shtml

Students with disabilities:
Students who need accommodations for learning disabilities must provide documentation from a professional qualified to diagnose learning disabilities. For more information see http://cornellcollege.edu/disabilities/documentation/index.shtml

Class Schedule:

Table 1 Daily Schedule

Date	Text	Topic and Activities	Assignments due
Day 1	Video: *Connections* Episodes 2, 10	Discussion: How does technological change happen? How does technology influence society?	
Day 2	Movie: *12 Angry Men* *Upstarts* Introduction, Ch 1-2 Tech. Rev: "From 2008 to 2020" (pp.28-31)	Evaluating web sites and scientific sources. Discuss Upstarts - 1st day's reading.	Short chapter paper: Upstarts - 1st day (due AM)
Day 3	*Upstarts* Ch 3-4 Tech. Rev: "Fake America Great Again" (pp.37-41)	Discuss Upstarts - 2nd day's reading. Evaluation websites – group	**Letter to the editor** rough draft due. Short chapter paper:

		verdict.	Upstarts - 2nd day (due AM)
Day 4	*Upstarts* Ch 5-6 Tech. Rev: "Data Lord of Lobbying" (pp.58-61) TSIS: Ch 1-3, 14	Letter to the editor – discussion. Discuss Upstarts - 3rd day's reading.	**Science Idea** proposal due. TSIS Exercise 2 on p. 42 Short chapter paper: Upstarts - 3rd day (due AM)
Day 5	*Upstarts* Ch 7-8 Tech. Rev: "Neuropolitics" (pp.65-69) TSIS: Ch 4	Discuss Upstarts - 4th day's reading.	**Letter to the editor** final draft due. Main project idea due. Short chapter paper: Upstarts - 4th day (due AM)
Day 6		Group meetings	**Technology Review** paper 1st draft
Day 7	*Upstarts* Ch 9-10 TSIS: Ch 5	Discuss Upstarts - 5th day's reading.	**Science idea** presentations Short chapter paper: Upstarts - 5th day (due AM)
Day 8	*Upstarts* Ch 11-End TSIS: Ch 6	Discuss Upstarts - 6th day's reading.	Short chapter paper: Upstarts - 6th day (due AM)
Day 9	MFBT Introduction, Ch 1-2 TSIS: Ch 7	Discuss MFBT - 1st day's reading.	Short chapter paper: MFBT - 1st day (due AM)
Day 10	MFBT Ch 3-5 TSIS: Ch 8	Discuss MFBT - 2nd day's reading.	Main Project - 1st draft Short chapter paper: MFBT - 2nd day (due AM)
Day 11		Group meetings	**Technology Review** paper ffinal draft
Day 12	MFBT Ch 6-7 TSIS: Ch 9	Discuss MFBT - 3rd day's reading.	Short chapter paper: MFBT - 3rd day (due AM)
Day 13	MFBT Ch 8-9 TSIS: Ch 10	Discuss Upstarts - 4th day's reading	1st **Science News** paper due Short chapter paper: MFBT - 4th day (due AM)
Day 14	MFBT Ch 10-11 TSIS: Ch 11	Discuss Upstarts - 5th day's reading. Paper workshop	Short chapter paper: MFBT - 5th day (due AM)

Day 15 MFBT Ch 12-End	Discuss Upstarts - 6th day's reading.	Main paper 2nd draft due Short chapter paper: MFBT - 6th day (due AM)
Day 16	Group meetings	**2nd Science News** paper due
Day 17	Class presentations	
Day 18	Class presentations	Main paper Final draft due

Course grade

35% of the grade is based on classroom participation and quizzes.
35% of the grade is based on written assignments and homework.
30% is based on the final presentation and main project paper.

The following guide is used to determine your grade.

A grade: Students receiving an A attend class regularly and usually contribute useful ideas to classroom discussion and the online electronic class notes. Not only do they read the assigned material in advance, but supplemental material as well. The ideas expressed in their papers indicate that they have fully understood both the class discussion as well as the reading assignments, and have integrated their knowledge into their work. These students will often do independent research on this topic examining works not discussed in class. Their papers are academically enjoyable to read and have been carefully proof-read. Their papers contain new ideas and clearly show original thinking. Their papers and presentations contain many clearly documented citations to other works. Their presentations are clear, concise, well-rehearsed, and present new ideas. These students are able to answer most questions put to them.
B grade: Students receiving a B attend class regularly, but may not always contribute useful ideas. The ideas expressed in their papers indicate that they have understood most of the class discussion and reading assignments. Their papers are enjoyable to read, but may contain a few errors. Citations to other works are clearly documented. Their presentations are clear and concise, but may not be well-rehearsed, and they may not be able to answer all questions.
C grade: Students receiving a C do not contribute much that is useful to class discussion and may miss a few classes. The ideas expresses in their papers indicate that they have understood some of the class discussion and reading assignments. Their papers may be difficult to read and contain several errors. Often, the papers will look like they were written in haste. Citations are poorly documented. Their presentations are not well organized but still present their ideas clearly. Often these students are not able to clearly answer questions.
D grade: Students receiving a D do not contribute anything useful to class discussion and may miss several classes. They may often not read the assigned reading material. The ideas in their papers indicate a poor understanding of the class discussion and reading assignments. Their papers are poorly organized and contain several errors. These papers often look like they were hand scribbled a few minutes before class. Citations are missing. Their presentations appear to have been prepared the night

before, and are disorganized.
F grade: This is a rare grade in this class, but students who do not turn in major assignments, do not show up to class, and students who plagiarize can fail the course.

Shorter assignments (and intermediate drafts) are graded using a plus/check/minus grade. A "check" grade means that your work is at about the stage I would expect it to be. Most grades are checks. A "plus" grade means that the work is well above the standard I would expect. This does not mean that a rough draft receiving a "plus" grade would receive a grade of "A" if it was submitted as a final paper, but it does mean that your work is superior to other rough drafts. A "minus" grade means the work is significantly below the class standard. You should meet with me to discuss why the work is below par and to see what you can do to bring it up to an acceptable level.

Summary of Assignments:

Major assignments are listed in bold, minor assignments are in regular font.

Main project: your **Science Idea**
During the first week of the block, you will choose a scientific topic to research with the ultimate goal of writing a paper and presenting your findings to the class. The purpose in writing academic papers is to engage in an academic conversation, so your paper will ultimately be posted online. I will help you to develop this topic, as well as assisting you in refining your paper.

The topic should be about how to use science to make the world a better place (more about this shortly). I'll supply you with a list of paper topics which should give you some ideas to pursue. You need not confine yourself to this list, but if you choose a different topic, let me know just in case the topic is too difficult or the science too easy. I am available to help assist you on the choice of research topic. Your idea need not be original: you could take someone else's idea and improve on it. Regardless, it should be something that involves science, something that you find interesting, and something you could actually do over the course of a year (given sufficient funds). For example, "Finding a cure for cancer," is probably not a good topic because you can't get that done in the space of one year. You should demonstrate that your idea is useful, practical, and meaningful: "Making a better wheelchair" is probably a better idea than, "Making a better yo-yo." In your paper, you'll probably need to provide enough background research so that people can understand both how your project works as well as why it is important. You should also critically analyze your idea: what are its strengths and weaknesses? There will be a separate handout explaining the main paper in more detail. This handout, like all the class handouts, will be available via Moodle. By the end of the first Friday, you should submit (at least) a general idea of your topic to me. You will meet with me at the start of the second week to refine your topic. During the last week of class, you will give the class a short presentation on your idea and submit a final paper (about 8 single-spaced pages) on your presentation topic, together with a complete annotated bibliography. The presentation should be about 15-20 minutes long.

***Technology Review* paper:** Before writing this paper, you will have read several articles from the *Technology Review* magazine. Your job is to take on the role of a reporter for *Technology Review* and write an article describing the interaction between science, technology, and society, based on the main books we have read in class (Upstarts, MFBT).

Web site evaluations: This is an activity that we'll do during the first day and the goal is to learn how to assess the reliability of scientific sources. You will be given a list of web sites and asked to evaluate

their scientific reliability. You should check each web site against a range of other, reputable sites to see if the original sites are factual, speculative, misinformed, and so on, using the criteria we discussed in class.

Incidentally, for every citation you make in this course, you should also provide an explanation as to why the source is reliable and how you know this. Furthermore, in every bibliography you write, you should briefly explain what you learned from each source. This is known as an annotated bibliography.

***Science News* papers:** *Science News* is a bi-weekly publication that informs people about the latest news in science. You will write a few papers in this class in the style of a *Science News* article. Some of these will be minor assignments while others will be major assignments. You will write both a minor and major assignment on your BoxCar2D cellular automata experiments.

Short chapter papers: For both the Upstarts and MFBT books, you should turn in the following short writing assignments.

1. In a few sentences, describe the main questions the author presents in the assigned reading for that night.
2. Do you agree with the author's answers to those questions? Why or why not?
3. In a few sentences, explain what you learned from each night's reading assignment.

For one of the chapters, take any of your sentences from items 2 and 3 (above) and expand your thoughts into a short paper. This paper is really just a way for you to solidify your ideas on the reading material and need not be carefully researched, although please feel free to back up your ideas with outside information.
This is a standing assignment that is due the morning that each chapter is due.

Letter to the Editor: Choose one of the companies (Uber, AirBnB) that we'll read about in the Upstarts book and write a letter to the editor describing how you think your community should deal with that company. The argument should be short (less than 500 words) but you should support the claims in your argument with annotated references. For each reference, explain why it is a reliable source. Note that your annotated references do not count as part of your 500 word limit.

Group meetings: During this block you will meet together with me and a small group of your peers to review your main paper. In preparation for these meetings, you will read the other papers in your group and come to the meeting prepared to comment on your colleagues papers. The purpose is two-fold. First, you will learn from your colleagues (and me) what we see as the weak points of your paper. Second, you will learn how to critically analyze other papers, and perhaps pick up some useful skills from them on how to improve your own papers.

There will also be some short assignments designed to teach you particular writing techniques, and possibly some activities designed to teach you a specific science concept.

Purpose of the assignments:

The purpose of the main assignment is to get you to use all that you have learned in this course to invent, revise, and describe an idea that will use science and technology to improve society. You will have to use your research and reasoning abilities to develop your idea, then use clear communication to construct both a written paper and presentation convincing others that your ideas are worth pursuing.

Finally, your creation will demonstrate that you are an active citizen who strives to improve the world in which we all live.

The purpose of the *Technology Review* paper is to write and revise an academic paper describing a specific question pertaining to science, technology and society. This paper will, roughly, mirror the structure of the articles you will read in the *Technology Review* magazine as part of your class assignments.

The purpose of the *Science News* paper is to write and revise a scientific lab report. This paper will, roughly, mirror the structure of the articles you will read in the *Science News* magazine.

The purpose of the short chapter assignments is to help encourage you to actively think about what the author is saying as well as how you want to respond to their ideas. This activity will also help prepare you for the next day's classroom discussion.

Useful (and free) software:

OpenOffice A program for both Windows and Macintosh that reproduces most of the functionality of Microsoft Office. Available at: http://www.openoffice.org/

BoxCar2D An online applet that uses a genetic algorithm to simulate the process of evolution applied to some simple 2-dimensional cars. Available for free and works on most browsers. http://www.boxcar2d.com/

Inkscape This is a freeware vector drawing program, similar to Adobe Illustrator. Inkscape can be used to create both 2D images as well as creating 3D image effects. Inkscape is available for both Mac and PC. Available at: http://inkscape.org/