IMSA
Illinois Mathematics and Science Academy

Spring 2020

Comprehensive Course Syllabus

History of Technology and Culture

Instructor: Eric R. Smith, Ph.D.
Email address: esmith@imsa.edu
Office Hours: By appointment
Class Meeting Times: Mod 4 and Mod 6 (A, C, D)
Class Location: A149

Course Description
The History of Technology course explores the origins, driving forces, and consequences of technological change. Using several thematic cases, the class explores why innovation happens, how the technologies work, and how the innovations reach out into every facet of society, politics, and economics. Students write several short essays on the origins and impact of the technologies in question.

Student Expectations
Assessment Practices, Procedures, and Processes
Each quarter there will be several short formative assessments (e.g. reading quizzes, short paper), and two longer assessments (e.g. a paper, presentation or project). In addition there will be one longer summative semester project (e.g. a research paper). The two major papers will be an analysis of a secondary source's interpretation of events or phenomena using primary sources and a research papers on a topic in part of the students' choosing.

Attendance: Attendance policy in this class is consistent with that contained in your Student Handbook. It is the individual student's responsibility to make up any work missed during an absence.

Respect Accorded Students and Faculty: Courtesy and respect to each other and to the instructor should be maintained at all times in both e-mail correspondence and in class. The right to dissent shall not be stifled, but the need to reflect and articulate intelligently is also demanded. Questions should be directed toward the instructor. Class debates should address the issue at hand and its supporting evidence, not differences in student personalities.

Grading
Grades will be calculated as follows:
Essays 40
Participation 20
Projects and Presentations 20
Quizzes 20

Essays: All essays will be submitted with appropriate fully developed citations. If you don't know what that means see my Chicago Style website. Other formats will be entertained provided that they are: 1) appropriate and 2) include page numbers. No cover page is necessary nor header because Turnitin.com provides that automatically.

Participation: Students are expected to participate in class by asking questions, answer questions, and offering assessments of documents. Students are required to log their participation each time they contribute. This should be done in separate Word documents for each class day that they contribute. Each log entry should then be submitted to the designated courseware upload space. These entries should be short and concise. For example, consider an entry that reads: "We were discussing the subject of Darwin, and I asked the question about the size of Noah's Ark to accommodate the dinosaurs." The more of these you have the better.

Essays
Innovative Integration
Mechanical Age (Engine Design Project)
Pathological Technology

Energy Presentations
Students express both written and oral opinions clearly and elegantly and defend them with the use of primary evidence by writing papers that defend a given position or argument with the use of primary evidence. Students evaluate data and primary sources in both printed and electronic media by developing facility with the resources of a research library and displaying the ability to use printed and electronic sources in their arguments while crediting those sources appropriately. [This project addresses SSLs I B,C & D; II A & B; III A,B & C; IV A & B; and V B.]

Planned Group Projects
Innovative Integration
Energy Diversion
Telegraph
Supercomputer
Rockets: https://www.grc.nasa.gov/www/k-12/rocket/rktparts.html

STUDENT EXPECTATIONS
My expectation is that, at least once per class, you voluntarily respond to a question or comment from your teacher or another student. I want this class to be based on your questions and discussions about them. As to why participation in class is important beyond your grade, consider these statements from some of today's business leaders:

"We are routinely surprised at the difficulty some young people have in communicating: verbal skills, written skills, presentation skills. They have difficulty being clear and concise; it's hard for them to create focus, energy, and passion around the points they want to make."
-- Mike Summers, VP for Global Talent Management at Dell

"I want people who can engage in good discussion—who can look me in the eye and have a give and take. All of our work is done in teams. You have to know how to work well with others. But you also have to know how to engage customers—to find out what their needs are. If you can't engage others, then you won't learn what you need to know."
-- Clay Parker, engineer and president of the Chemical Management Division of BOC Edwards

"People who've learned to ask great questions and have learned to be inquisitive are the ones who move the fastest in our environment because they solve the biggest problems in ways that have the most impact on innovation."
-- Mike Summers, VP for Global Talent Management at Dell

All quotations taken from Tony Wagner, *Rigor Redefined* (2008).

Study Habits: I expect you to take notes in this class. If I think a topic is important enough to put on the board, or to have groups research and present, it's probably important enough to be on an assessment and something I expect you to know. It would also be wise to take notes as you read and to review those notes after we have covered the material in class. You should recognize this by now.

Electronic Devices: Use of the electronic devices in class is forbidden unless the instructor explicitly indicates that they can be used. The recording of this class in either audio or video form is forbidden by the instructor except where the student has a documentable condition in which it would be necessary in which case the student can meet with instructor after class to discuss accommodations.

This means, from the moment class starts, unless I ask you to use it, I don't expect to see devices in use. Here's why:

> Researchers have repeatedly found that students who use laptops in class learn less than their "disconnected" peers (see Cornell's 2003 study "The Laptop and the Lecture"). Studies at Princeton and the University of California have found students who take notes on laptops performed worse on evaluations such as quizzes than those who took notes by hand "even when laptops are used solely to take notes, they may still be impairing learning because their use results in shallower processing"
> --"The Pen is Mightier than the Keyboard," 2014

But electronic device use in class harms more than just the user – it also negatively impacts students seated nearby. Sana, Weston, et al (2013) found that:

participants who multitasked on a laptop during a lecture scored lower on a test compared to those who did not multitask, and participants who were in direct view of a multitasking peer scored lower on a test compared to those who were not. The results demonstrate that multitasking on a laptop poses a significant distraction to both users and fellow students and can be detrimental to comprehension of lecture content.

Therefore, I require that you please keep your devices away during class unless you have been specifically asked to use it, and I would encourage you to keep it closed in other classes, as well. If you have a special need that requires accommodation in this area, please see me.

Attendance: Attendance is expected in this class. Athletes or students in activities will need to remind the instructor of upcoming events.

Respect Accorded Students and Faculty: Courtesy and respect to each other and to the instructor should be maintained at all times in both e-mail correspondence and in class. All written correspondence to me should follow the form it would if being sent to the head of a company you are working for. I expect your best grammar, punctuation, and language use.

The right to dissent shall not be stifled, but the need to reflect and articulate intelligently is also demanded. Questions should be directed toward the instructor. Class debates should address the issue at hand and its supporting evidence, not differences in student personalities or opinions. Although we are seeking informed opinions and an analytical bent to our discussions.

Please do not expect instant feedback on assignments or to inquiries. The instructor does not have an undergraduate sleep schedule in which texts are sent at 3:00 AM and responses come at 3:01 AM. Please be considerate of this and be patient. The instructor will offer the most timely feedback possible. Written work will require at least a week (at which point you should feel free to nag). Email inquiries have at least a 24-hour turnaround.

Late Work: Be on time, turn in assignments as scheduled, back up your files! Use a USB drive. Late assignments are otherwise penalized a half a grade per day except where otherwise indicated in the syllabus. All writing assignments must be submitted in order to pass the course.

ACADEMIC INTEGRITY AND PLAGIARISM
All of the work you turn in for this course should be your own. Claiming as your own the work of others, in whole *or in part,* will result in a referral to the appropriate campus office. Wayne C. Booth, Gregory G. Colomb, and Joseph M. Williams in their book *The Craft of Research*, 2d ed. (Chicago: University of Chicago Press, 2003) explain that:

> You plagiarize when, intentionally or not, you use someone else's words or ideas but fail to credit that person. . . . You plagiarize even when you do credit the source but use its exact words without using quotation marks or block indentation. . . .You [also] plagiarize when you paraphrase a source so closely that anyone putting your work next to it would see that you could not have written what you did without the source at your elbow.

Units:
I. Technology and Engineering in Context
II. The Mechanical Age
III. The Electronic Age
IV. Problems in the Study of Contemporary Technology
V. Energy and Sustainability
UNSDG study found that **water, energy**, and food are the top three and would advance all of the others