


HSTC 1801 History of Engineering and Technology: From the Industrial Age to the Cybernetic Age

Winter 2015

A. Course Overview

We have come a long way since the mechanization of the textile industry and the first steam engines. In less than 200 years, wireless telegraphy and Internet, cars, planes, and the Space Shuttle, nuclear energy, wind power, bioengineering, cybernetics, and nanotechnology have profoundly changed our societies, our environment, and our ethical responsibilities towards both. This course explores the reciprocal influences of technology and social, political, and economic institutions from the First Industrial Revolution to the present, and the new social and ethical roles engineers are asked to play in our technological world.

No pre-requisite in engineering, the humanities or the sciences is necessary: just curiosity about the world surrounding us. A good understanding of English grammar is necessary to do well in the course. While HSTC 1800 is not a pre-requisite for HSTC 1801, students enrolled in HSTC 1801 are expected to have the basic knowledge of academic writing covered in the previous course (citation styles, library research skills, reading skills, basic essay writing, etc.).

 Taken together HSTC 1800 and HSTC 1801 fulfill **Dalhousie's Writing Requirement**

B. Meetings and Teaching Team

Course Mondays and Wednesdays: 9:35-10:25am
Potter Auditorium (Kenneth C. Rowe Management Building, RM 1028)

Tutorials For times and location, see:
https://dalonline.dal.ca/PROD/fysktime.P_DisplaySchedule?s_term=201510,201520&s_subj=HSTC&s_district=All

Extra (optional) Writing Tutorial Wednesdays, 10:30-11:30 AM
First tutorial: January 14, 2015
Location: *Killam 2616* (contact Mr. Hardman at paul.hardman@dal.ca)

Teaching team:

Instructor: Benjamin Mitchell (Benjamin.Mitchell@ukings.ca)
Office: Basement of the King's A&A building. Room 257. Beside Seminar 7.
tel: 422 1271 x 139
Office Hours: 1) Wednesdays: 10:25-10:55 am
(*after* lecture **OUTSIDE** the Potter auditorium),
2) Tuesdays 1:30-2:30 pm (in my office),
3) By appointment (lots of time available)

C. Required Material

C.1 Reading/Writing Material

1. Readings are available online. It is your responsibility to download and/or print them in order to have constant access to them. Unless otherwise noted, **you are responsible for all the readings, even if they are not discussed in class or tutorial.**

You should also make sure you have access to the following additional reference works.

1. A good dictionary (e.g. Webster's Dictionary (unabridged) or *Oxford English Dictionary*)
2. A thesaurus
3. A comprehensive English grammar (e.g. Sidney Greenbaum, *Oxford English Grammar* (Oxford: Oxford University Press, 1996))

D. Website and email

The class has an OWL website. You can access the website either through your my.dal account or directly at: <https://dalhousie.blackboard.com/>. On the website, you'll find the assigned readings, calendar, assignments, grades, etc. This is also where you must submit work electronically and where announcements and extra material are posted. Visit it often!

General inquiries should be posted on the course website. Email us with personal questions, but remember that we may not be able to answer you in less than three (3) business days. We also reserve the right not to answer emails concerning information readily available online (e.g. questions like "Who is my TA?" or "Where should I submit my paper?"). Because of legal reasons, **emails will be sent ONLY to your DAL e-mail account. To help us with this, please email us using your DAL account.** If you are using a different email account, it is your responsibility to have your DAL account emails forwarded to your other address. Please check this account often for important notices.

E. Evaluations

Writing exercises¹ 5% Ongoing

Essay (4 pages)² 20%

Student chooses one:

1. Reading an artefact (Assigned: Jan. 19; Due: February 9, 2015)
2. The History of Engineering Ethics Codes (Assigned February 11; Due March 11, 2015)

Research project

1. Prospectus³ (350 words + ref.) 10% (due date: tutorial week of Jan. 25, 2015)
2. Draft⁴ (700, 800 or 1,100 words) 5% (due date: tutorial week of March 8, 2015)
3. Peer review⁵ (650 words) 10% (due date: tutorial week of March 15, 2015)
4. Final Project⁶ (700, 1,250 or 1,750 words) 25% (due dates: Presentations: tutorial week of

¹ **Writing exercises:** During the whole semester, students will complete formative writing exercises in lectures and in tutorials. Full marks will be given to activities that are *satisfactorily* completed by the students. There may be more than one writing activity per class and some activities may be worth more than others. You may be asked to bring material from home to complete these activities. It will be possible to earn bonus marks to compensate for missed activities. This is the reason why no excuse are accepted for missed writing exercises, unless you have a valid reason to miss two complete weeks of class or more.

² **Essay:** During the semester you need to complete **one** of the two essays. If you are unhappy with the grade you have received on your first assignment and have not plagiarized (part of) it, you can write a second writing assignment, in which case the second grade will be the one we will use toward your final grade (even if it is lower).

³ **Prospectus:** A prospectus is a short text that describes your research project for the semester. It must include 1) your research question, 2) its motivation and 3) a research bibliography. The prospectus enables us to make sure that your research question is, *prima facie*, an acceptable one for your term project.

⁴ **Draft (paper):** This is a draft of your final project. Two hard copies of the draft must be submitted at the start of your tutorial during the week of March 8, 2015. Late papers will not be given to another student for review.
Attendance to tutorial is mandatory for full marks.

⁵ **Peer review:** In this activity, students exchange drafts of their respective research project and write a report on them. Two hard copies of the peer review **MUST BE SUBMITTED AT THE BEGINNING OF YOUR TUTORIAL** (Week of March 15). **Attendance to tutorial is mandatory for full marks.**

⁶ **Final project:** Three options are possible.

Option A: The student writes a research paper (min. 1,750 words (approx. 7 pages) (paper=25% of the final grade).

Option B: The student writes a research *poster* and presents it. The poster must contain the kind of argument that would be contained in a 7-page-long research paper and must include a bibliography. (Poster = 15% of the final grade; 10-min. science-fair style presentation = 10% of the final grade).

Option C: The student makes a historical reproduction and presents it to the class (10-min. science-fair presentation). The student writes one research paper related to the historical reproduction (minimum 1,250 words (approx. 5 pages)) (Paper = 15%; reproduction+presentation =10% of the final grade). Two students can work on the same reproduction if it is a challenging one, but each of them must submit an original and personal research paper. It is the responsibility of the students to make sure that they are working on a different research topic than

March 22, 2015; Essays: Lecture, March 30, 2015)

*Final exam*⁷

25% (April Exam Period)

Bonus mark 2% Either a) attend extra writing tutorial 7 times during the semester, b) make 7 individual visits to the Writing Centre or c) write 4 one-page reflections on articles on the history of technology or engineering ethics.⁸

E.2 Course Work Completion

Students must submit all the assignments worth more than 10% of their final grade and write their final exam to pass the course.

E.3 Submission Guidelines

Unless otherwise noted, you must...

- a) submit your work to the anti-plagiarism web-based application SafeAssign⁹ (see course's website) BEFORE the assignment's due date, **and**
- b) submit a hard copy of your work in your tutorial, lecture, or at the HOST Office before 4pm on the due date.

If a **major problem** prevents you from submitting your work, email it to your TA before the assignment is due. You must submit your work on SafeAssign and to the HOST Office as soon as possible. Remember that you can be asked to document your excuse.

NEVER submit a paper in the instructor's or TAs' office. All work must be submitted in tutorial or lecture. Early or late work must be submitted to the HOST office (3rd floor NAB, King's).

E. 4 Late submissions/Missed in-class evaluations

Assignments will receive a 10% late penalty for each late business day (i.e. 5% late penalty for the hard copy and a 5% late penalty for the electronic copy). Note that the HOST office closes at 4 pm. Work submitted after 4pm on the due date will be considered late.

Extensions/excuses

- 1) If you are in the Faculty of Engineering, contact the Office of the Dean if you would like an

their teammate. People who want to work in teams of more than two people must obtain the instructor's permission.

⁷ **Final exam:** This cumulative exam (which will cover all lectures, tutorials, and readings) will be held during the April exam period. The date and time are decided by the Registrar and it is impossible for the instructor to change them. DO NOT MAKE TRAVEL or PERSONAL PLANS until the Registrar publishes the exam timetable.

⁸ Visits to the Writing Centre must be made by appointment. Visit the course's website for more information on the bonus mark.

⁹ Students may, without penalty, choose an alternative method to attest to the authenticity of their work. To do so, students must send an email no later than January 17, 2015 to both the instructor and their section's TA informing them of their decision. The email should clearly indicate which of the following two alternative methods the student would like to follow: a) Submitting copies of multiple drafts demonstrating development of each assignment or b) Submitting an annotated bibliography along with each assignment.

extension for an assignment or if you need permission to rewrite an exam.

- 2) If you are not in engineering contact the professor as soon as possible explaining your situation and submit as soon as possible required documentation (which will be kept in your academic file).

The only acceptable excuses for late assignments, missed in-class activities¹⁰, and missed exams are the following ones (the necessary documentation you need to provide is given in parentheses):

- 1) **Medical reasons:** Please stay home if you are sick! (letter from medical doctor or counselor stating that you were unable to attend university on the day of the exam, in-class assignment, etc.)
- 2) **Weather (for hardcopies only, SafeAssign submissions will still be required).** After all, this is Nova Scotia. Don't risk your life on icy country roads during a snow storm! (road/weather forecast from a weather website or newspaper). However, submit your work on SafeAssign on time. If you can't (e.g. there is not internet service, phone the professor and leave a detailed message, including a phone number where you can be reached).
- 3) **Exceptional personal or family crisis.** (including attendance at a funeral, close family member with serious illness, military duty, etc.) (Note from a counselor, funeral announcement, etc.)
- 4) **Any religious holidays** (*not valid for assignment submission, but valid for even one missed in-class activity*): you may be asked for a letter from a religious official if I cannot find the holidays in a religious holidays calendar)

Without proper documentation, you will not be offered an extension for your assignment or a make-up exam.

E5. Keeping academic term

Examination dates cannot be changed to accommodate travel plans, work arrangements, personal activities, etc. It is the obligation of each student to ensure that his or her travel arrangements or other activities do not conflict with in-class activities or the end-of-term examinations. The keeping of academic term is the responsibility of every student.

E6. Accommodations

Students may request accommodation as a result of barriers related to disability, religious obligation, or any characteristic under the Nova Scotia Human Rights Act. Students who require academic accommodation for either classroom participation or the writing of tests, quizzes and exams should make their request to the Office of Student Accessibility & Accommodation (OSAA) prior to or at the outset of each academic term (with the exception of X/Y courses). Please see www.studentaccessibility.dal.ca for more information and to obtain Form A: Request for Accommodation.

E7. Students' Responsibilities - Evaluations

It is the students' responsibility to keep their assignments and their evaluations to protect themselves against possible lost grades or in case of grade revision (the original marked copy of the assignment will be demanded in such a case).

¹⁰ Given the fact that it is possible to make up for missed in-class activities with bonus marks, accommodations for missed in-class exercises will be given only if special circumstances prevent the student from attending lectures and tutorials for two weeks in a row or more.

In case of disagreement as to the actual submission date of an assignment by a student, the submission date registered by SafeAssign and, if relevant, by the HOST office, will be taken as the actual submission date.

Students who miss the final exam should try to reach the instructor as soon as possible (e.g. phone HOST office: 422-1271 ext 204 or, if possible, meet the instructor at the exam room as soon as possible).

E8. Grade Revision

Students who believe that a mistake has been made in the grading of one of their assignments should

- a) Re-submit the problematic assignment to their TAs along with a note explaining exactly why they believe their work should receive a higher grade (students should explicitly appeal to the assignment's grading scheme in their note).
- b) If after meeting with the TA the student still believes that there is a problem with the assignment's grade, the student should submit the original, marked assignment, along with an explicative note to the HOST Office or to the instructor.

Notes: a) No grade revision is possible until the assignment is submitted to SafeAssign; b) A grade can be lowered during the revision process if the TA or instructor believes the original grade was too high.

E9. Grading Scheme

During this course assignments will be graded using the %-system (out of 100), which will be converted to a letter grade/GPA for your final grade at the end of the year. The following table outlines the conversion scheme we will be adopting:

Grades	Numeric Range	GPA	Norm – Referenced	Criterion Referenced
A +	90-100	4.30	Excellent	Considerable evidence of original thinking; demonstrated outstanding capacity to analyze and synthesize; outstanding grasp of subject matter; evidence of extensive knowledge base.
A	85-89	4.00		
A-	80-84	3.70		
B +	77-79	3.30	Good	Evidence of grasp of subject matter; some evidence of critical capacity and analytical ability; reasonable understanding of relevant issues; evidence of familiarity with the literature.
B	73-76	3.00		
B -	70- 72	2.70		
C+	65-69	2.30	Satisfactory	Evidence of some understanding of the subject matter; ability to develop solutions to simple problems; benefiting from his/her university experience.
C	60-64	2.00		
C-	55-59	1.70		
D	50-54	1.00	Marginal Pass	Evidence of minimally acceptable (except in programs where a minimum grade of “C” is required) familiarity with subject matter, critical and analytical skills.
F	0-49	0.00	Inadequate	Insufficient evidence of understanding of the subject matter; weakness in critical and analytical skills, limited or irrelevant use of literature. In cases where a student does not complete the work and no other grade is appropriate, F should be reported.
INC	0.00		Incomplete	
W	Neutral and no credit obtained		Withdrew after deadline	
ILL	Neutral and no credit obtained		Compassionate reasons, illness	

F. Syllabus/Reading Schedule Modifications

Modifications can be made to the syllabus or readings if special and unexpected circumstances arise. In this case, modifications will be announced as soon as possible. **If a modification causes you any major inconvenience, please let the instructor know as soon as possible to see what other arrangements can be made.**

G. Statement on Plagiarism and Academic Honesty

G1. General statement on academic honesty.

All students in this class are to read and understand the policies on academic integrity and plagiarism referenced in the Policies and Student Resources sections of the academicintegrity.dal.ca website. Ignorance of such policies is no excuse for violations.

Any paper submitted by a student at Dalhousie University may be checked for originality to confirm that the student has not plagiarized from other sources and is the author of the work. Plagiarism and non-authorized collaboration are considered a serious academic offence which may lead to loss of credit, suspension or expulsion from the University, or even to the revocation of a degree. It is essential that there be correct attribution of authorities from which facts and opinions have been derived. At Dalhousie there are University Regulations which deal with plagiarism and, prior to submitting any paper in a course, students should read the Policy on Intellectual Honesty contained in the Calendar or on the Online Dalhousie website. The Senate has affirmed the right of any instructor to require that student papers be submitted in both written and computer-readable format, and to submit any paper to be checked electronically for originality.

G2. Plagiarism

Plagiarism is a serious academic offense. King's College and Dalhousie University are serious about enforcing anti-plagiarism rules. Not only does plagiarism involve the inequitable use of another person's intellectual work, but it is not fair to the vast majority of fellow students who abide by the rules. Furthermore, plagiarists are themselves robbed of a good education and will be disadvantaged (by being ill-prepared) if they pursue graduate studies or any employment that involves original research and writing. It will also be difficult for an instructor to write a letter of reference or recommendation for a student who has been caught plagiarising and who has a notation indicating an academic penalties on his or her transcript.

All assignments must be *the sole work of the student whose name is given on the assignment.* **Collaborative writing is not allowed** either for take-home assignments or research essays (INCLUDING team projects: each student must make clear what part of the project is his or her own work). **All quotations and significant theses taken from any source (print or Internet) must be fully referenced** and presented as quotations with shorter quotations placed in quotation marks and longer quotations double indented. All sources cited, alluded to or in any way used in the production of your paper must be listed at the end of your paper in a separate bibliography. When alluding to (rather than directly quoting) the words of another author, that author's thoughts must be expressed in your own words and must also be cited. Placing the words of another author in your text without a clear indication (through the use of quotation marks or indentation in the case of longer quotations) is the most common form of plagiarism and must be avoided. **Students are also not permitted to re-submit their own essays** from other King's and Dalhousie courses without prior permission from the instructor (see "Self-plagiarism" below).

Every assignment and research paper in this course will be checked for plagiarism. **All suspected cases of plagiarism will be reported to the relevant officer.** The University has various means whereby it can identify plagiarism. The penalties for plagiarism can range from receiving a zero grade on the assignment and failing the course to expulsion from the University and even, in some circumstances, the revocation of a degree.

Students should be aware that no sympathy will be shown by the Senate Discipline Committee

towards those who claim that they did not know what plagiarism is, that they did not realise the penalties could be so harsh or that their plagiarised paper is merely an example of “sloppy citation techniques”.

G3. Self-plagiarism

Resubmitting work you have already submitted for a mark in another course is a different form of plagiarism known as self-plagiarism. Essays and other assignments that are self-plagiarised will at a bare minimum receive a zero grade. In certain circumstances it is possible to submit a paper on a theme similar to one treated in another paper for another course. However, the new work must be substantially different and in any case *prior permission must be sought* from the new instructor.

G4. Research Records

Students are encouraged to keep a record of their research for their essays, as this will sometimes be required as evidence in cases of suspected plagiarism. Papers that utilise sources that are not in the Novanet system and that a student cannot show how he or she had access to them will raise suspicions. If Internet sources are used, students should retain print-outs of web articles cited or alluded to in assignments and papers. Students are reminded, however, that papers that rely heavily or exclusively on web sources generally receive lower grades than papers that employ a wider range of sources, including traditional ones. You will also need to be able to account for all your sources and be able to show that you obtained them at King's, Dalhousie and/or through Novanet/Inter-Library Loans or present copies of any books that you own personally.

G5. Examinations

The Dalhousie's Official Examination Regulations will be followed. Please consult them at: <http://ug.cal.dal.ca/UREG.htm#I2>

Monday, January 5

Introduction

Reading: No reading.

Wednesday, January 7

The Industrial Age

Reading: No reading.

Monday, January 12

Progress and the Railway

Reading: Keefer, Thomas C. 1850. *Philosophy of the Railroads*. Montreal: Armour and Ramsay. Excerpts.

Wednesday, January 14

Telegraphy, Telepathy, and the Media

Reading: Otis, Laura. 2001. *Networking: Communicating with Bodies and Machines in the Nineteenth Century*. Ann Arbor: The University of Michigan Press. Pg 180-188 and 194-201.

Monday, January 19

Scientific Management

Reading: Examine the Detroit Industry Murals by Diego Rivera.

Wednesday, January 21

The Wars of the Currents

Reading: Edison's Electric Light: Conflicting Statements As To Its Utility.

Monday, January 26

World War I, Licensing, and Professionalization

Reading: Engineers Canada. 2012. Guideline on the Code of Ethics.

Wednesday, January 28

A History of Engineering and Ethics, I

Reading: Moriarty, Gene. 2001. *Three Kinds of Ethics for Three Kinds of Engineering*. IEEE Technology and Society Magazine.

Monday, February 2

A History of Engineering and Ethics, II

Reading: See the previous reading.

Wednesday, February 4

Technology and Gender

Reading: Hopkins, Patrick. 1998. "Introduction: The intersection of Culture, Gender and Technology," in Hopkins Ed., *Sex/Machine: Readings in Culture, Gender and Technology*, 1-16. Bloomington: Indian University Press.

Monday, February 9

The Bicycle

Reading: No Reading.

Wednesday, February 11

Telegraphers, Printers, and Typewriters

Reading: No Reading.

February 16-20.

Study Break (no classes or tutorials)

Monday, February 23

The Manhattan Project

Reading: Memo from Henry Stimson to Harry S. Truman, July 31, 1945.

Wednesday, February 25

The Space Race

Reading: John F. Kennedy's Rice Stadium Moon Speech.

Monday, March 2

The Challenger Disaster

Reading: Roger Boisjoli: The Challenger Disaster.

Wednesday, March 4

The Green Revolution and Chemistry

Reading: Leland O. Howard, "The War Against Insects," in *DDT, Silent Spring, and the Rise of Environmentalism: Classic Texts*, ed. Thomas Dunlap (Seattle: University of Washington, 2008): 20-23. AND Excerpt from R. Carson (2002 [1962]). *Silent Spring*. New York: Mariner Books (pp. 1-3)

Monday, March 9

Green Revolution Chemistry: II Agent Orange

Reading: 1983 Herbicide Trial, selections. AND Agent Orange Product Liability Litigation, Judgment, MDL 381, pp. 41-42.

Wednesday, March 11

The Energy Crisis

Reading: No Reading.

Monday, March 16

Steampunk: Imagined Futures of the Imagined Past

Reading: Gross, Cory, "A History of Steampunk"

(<http://steampunkscholar.blogspot.ca/2010/08/history-of-steampunk-by-cory-gross.html>)

Wednesday, March 18

The Ocean Ranger Disaster

Reading: NASA: Case Study, Porthole to Failure.

Monday, March 23

Environmental Racism and Waste Management

Reading: No Reading.

Wednesday, March 25

**Computers, Law, Ethics, and Democracy:
The Case of Aaron Swartz**

Reading: Watch "The Internet's Own Boy: The Story of Aaron Swartz"

(<https://www.youtube.com/watch?v=vXr-2hwTk58>)

Monday, March 30

The Tar Sands, Energy East, and the Promise of Jobs

Reading: TBA

Wednesday, April 1

Ethics in/and Video Games: Portal 1 & 2

Reading: Play Portal 1 & 2. Or watch the playthroughs online: Portal 1

(<https://www.youtube.com/watch?v=UstZX Ae8LK0>) and Portal 2

(<https://www.youtube.com/watch?v=A0K5EXfgJnk>)

Monday April 6

Technology, Purpose, and the Trans-Human

Reading: Kurzweil, *Singularity Q&A* (<http://www.kurzweilai.net/singularity-q-a>)

Wednesday April 8

Review and Recapitulation