

## Course Outline

### 1. COURSE INFORMATION

<b>Session Offered</b>	Winter 2017	
<b>Course Name</b>	Technology & Society	
<b>Course Code</b>	GENTECH 4TS3	
<b>Date(s) and Time(s) of lectures</b>	C01: TU: 9:30-11:20am TH: 9:30-10:20am  C02: TU: 12:30-2:20pm TH: 10:30-11:20am	C03: TU: 2:30-3:20pm TH: 12:30 -2:20pm
<b>Program Name</b>	One of the following: Automotive and Vehicle Technology / Biotechnology / Process Automation Technology	
<b>Calendar Description</b>	A study of the diverse and often contradictory impact of technology on society. The consequences of current technological changes and those of the recent past are explored to illustrate the complexities of technological-societal interrelationships.	
<b>Instructor(s)</b>	G. Zilberbrant	Email: zilberg@mcmaster.ca Office: ETB/209 Office Hours: By advance appointment only

### 2. COURSE SPECIFICS

<b>Course Description</b>	<p>In this course, attention will be given to different aspects of the relationship between technology and society and directions for the future. The nature of technology and the process of innovation are driven by social influences and pressures; technology helps shape our social worlds and we help shape our technologies.</p> <p>The readings and multimedia material presented to the class will help us form questions about the many roles technology plays in our lives, provide a theoretical background for our ideas, and give us a springboard for developing effective written and oral communication skills.</p>		
<b>Instruction Type</b>	<b>Code</b>	<b>Type</b>	<b>Hours per term</b>
	C	Classroom instruction	39
	L	Laboratory, workshop or fieldwork	
	T	Tutorial	
	DE	Distance education	
	<b>Total Hours</b>		<b>39</b>
<b>Resources</b>	<b>ISBN</b>	<b>Textbook Title &amp; Edition</b>	<b>Author &amp; Publisher</b>
	ISBN:	None	None
	<b>Other Supplies</b>	<b>Source</b>	
		PowerPoint slides and supporting material will be provided via electronic files on the course A2L site	
<b>Prerequisite(s)</b>	Registration in Level 4 of Automotive and Vehicle Technology, Biotechnology or Process Automation Technology		
<b>Corequisite(s)</b>	None		
<b>Antirequisite(s)</b>	None		

**Course Specific Policies**

All assignments submitted for evaluation are completely word processed. Presentations associated with the case study are done in PowerPoint. Students are expected to actively participate during class sessions offering insight, comment, reinforcement, argument, contrary views and underscoring examples.

**Switching Classes:** You are required to attend the class days/times for the section in which you are registered. It is possible to attend another class day/time occasionally for specific conflicts that are both urgent and important in nature, such as a job interview – **however you must get prior approval from the instructor.**

**TECHNOLOGY ELIMINATION ASSIGNMENT (15%)**

Consider an object that you use in your everyday life - every minute, once an hour, or several times per day. This object can be as technologically simple or complex as you want (but make it interesting). For a period of time that is relevant - eliminate that object from your life and the world as if it had never been invented.

Each student will research the chosen technology's history and the ways in which it is incorporated into everyday life today. Each student will then eliminate that technology for a reasonable period of time and produce a report reflecting on the experience.

- Report is due on **March 19**
- **In-class presentations (pre-elimination) will be done by each student on Week 4 and 5.**

**ASSIGNMENTS (25%)**

Each student will complete three (3) assignments throughout the term focused on the topics and examples presented in class. The assignments will focus on the application of technology evaluation tools as may be applied within a technology assessment. The assignments will require each student to apply the lecture and in-class exercise knowledge to complete a simplified Life Cycle Assessment (LCA), an analysis and Sankey Diagram, and a Financial Analysis related to a specific technology or technological process.

Each assignment has equal weighting (~8.33% or final grade).

- **Assignment 1 due February 12**
- **Assignment 2 due February 19**
- **Assignment 3 due March 12**

**GROUP CASE STUDY (20%)**

Each groups of students (max 6 per group) will be given a topic to research and present to the class. The focus of the topic will reflect the major technological changes that have significantly impacted the economic, social, and environmental aspects of society.

Each group will present their research, interpretation, and conclusions to the class during weeks 8, 9, 11, 12 and 13 as assigned by the instructor.

Each presentation will be 30-40 minutes with 15 minutes for discussion.

	<p>The topic that will be assigned are as follows:</p> <ol style="list-style-type: none"> <li>1. Dinosaurs - Coal</li> <li>2. Liquid Dinosaurs - Oil &amp; Derivatives</li> <li>3. Solar Income – Biofuels &amp; Derivatives</li> <li>4. Solar Revenue – Renewable Energy</li> <li>5. C squared - Cement and Concrete</li> <li>6. Coalbrookdale - Steel</li> <li>7. From Manchester to Detroit - Moving People</li> <li>8. Farm to Table - Feeding People</li> <li>9. Wasted Resources – Circular Economy/Waste</li> <li>10. Fracks and Nukes - Transitional Power</li> </ol> <p><b>ACTIVE LEARNING/PARTICIPATION (10%)</b> In-class assignments, discussions, debated and group work will be considered as part of the participation mark.</p> <p><b>FINAL EXAM (30%)</b> A cumulative final exam will be booked during the examination period. <b>Note: Students must achieve a passing grade on the final exam assessment to pass the course.</b></p> <p><b><u>Assignment Penalties (individual or group)</u></b> Late submissions will receive an immediate 10% deduction from the assignment mark; plus a further 10% late penalty per day will be applied and deducted from the assignment mark. Assignments that have not been submitted within three (3) days after the due date will not be graded and will receive a mark of ZERO.</p>	
<b>Departmental Policies</b>	<p>Students must maintain a GPA of 3.5/12 to continue in the program.</p> <p>In order to achieve the required learning objectives, on average, B.Tech. students can expect to do at least 3 hours of “out-of-class” work for every scheduled hour in class. “Out-of-class” work includes reading, research, assignments and preparation for tests and examinations.</p> <p>Where group work is indicated in the course outline, such collaborative work is mandatory.</p> <p>The use of cell phones, iPods, laptops and other personal electronic devices are prohibited from the classroom during the class time, unless the instructor makes an explicit exception.</p> <p>Announcements made in class or placed on Avenue are considered to have been communicated to all students including those individuals that are not in class.</p> <p>Instructor has the right to submit work to software to identify plagiarism.</p>	
<b>3. SUB TOPIC(S)</b>		
Week 1 January 4 – 8	<p><b>Introduction</b></p> <ul style="list-style-type: none"> <li>• Course Introduction and Overview</li> </ul>	
Week 2 January 9 – 15	<p><b>Historical Overview of Technology</b></p> <ul style="list-style-type: none"> <li>• Ancient Engineering</li> <li>• Renaissance Engineering</li> </ul>	
Week 3 January 16 – 22	<p><b>Historical Overview of Technology</b></p> <ul style="list-style-type: none"> <li>• The Industrial Revolution</li> <li>• The Information Society</li> </ul>	<p><b>Elimination Assignment Class Presentations</b></p>

Week 4 January 23 - 29	<b>Elimination Assignment Class Presentations</b>	<b>Elimination Assignment Class Presentations</b>
Week 5 January 30 – Feb. 5	<b>Design and Society</b> <ul style="list-style-type: none"> <li>• Innovation</li> <li>• Where good ideas come from?</li> </ul>	
Week 6 February 6 – 12	<b>Adoption and Diffusion of Technology</b> <ul style="list-style-type: none"> <li>• Technical Innovation</li> <li>• Classic Model of Diffusion</li> <li>• Early Adopters</li> </ul>	<b>Assignment 1 Due</b>
Week 7 February 13 - 19	<b>Preventive Engineering</b> <ul style="list-style-type: none"> <li>• The Precautionary Principle</li> <li>• Industrial Ecology</li> </ul>	<b>Assignment 2 Due</b>
Mid-term Recess: Monday, February 20 to Sunday, February 26, 2017		
Week 8 February 27 – March 5	<b>Social Control of Technology (1)</b> <ul style="list-style-type: none"> <li>• Power Relations in Society</li> <li>• Public Policy</li> <li>• <i>Case Studies: Dinosaurs (1) and Liquid Dinosaurs (2)</i></li> </ul>	Case Study: Groups 1 and 2 <b>Assignment 3 Due</b>
Week 9 March 5 – 12	<b>Social Control of Technology (2)</b> <ul style="list-style-type: none"> <li>• Power Relations in Society</li> <li>• Corporate Policy</li> <li>• <i>Case Studies: Solar Income (3) and Solar Revenue (4)</i></li> </ul>	Case Study: Groups 3 and 4 <b>Technology Elimination Assignment Due</b>
Week 10 March 13 - 19	Assignment Review Week	
Week 11 March 20 – 26	<b>Social Capital</b> <ul style="list-style-type: none"> <li>• Defining Social Capital</li> <li>• Relevance of Community</li> <li>• How is Technology Transforming the Public Sphere?</li> <li>• <i>Case Studies: C-squared (5) and Coalbrookdale (6)</i></li> </ul>	Case Study: Groups 5 and 6
Week 12 March 27 – April 2	<b>The Nature of Being an Expert</b> <ul style="list-style-type: none"> <li>• The Role of Experts</li> <li>• What Happens When Experts Disagree?</li> <li>• <i>Case Studies: From Manchester to Detroit (7) and Farm to Table (8)</i></li> </ul>	Case Study: Groups 7 and 8
Week 13 April 3 - 6	<b>Final Week</b> <ul style="list-style-type: none"> <li>• Exam Review (lecture)</li> <li>• <i>Case Studies: Waste Resources (9) and Fracks &amp; Nukes (10)</i></li> </ul>	Case Study: Groups 9 and 10
<p>Classes end: Thursday, April 6, 2017</p> <p>Final examination period: Tuesday, April 11 to Thursday, April 27, 2017</p> <p>All examinations MUST be written during the scheduled examination period.</p>		
<p>Note that this structure represents a plan and is subject to adjustment term by term.</p> <p>The instructor and the University reserve the right to modify elements of the course during the term. The University may change the dates and deadlines for any or all courses in extreme circumstances. If either type of modification becomes necessary, reasonable notice and communication with the students will be given with explanation and the opportunity to comment on changes.</p>		

4. ASSESSMENT OF LEARNING *including dates*	Weight
Assignments	25%
Technology Elimination	15%
Case Study (Group)	20%
Active Learning	10%
Final examination	30%
<b>TOTAL</b>	<b>100%</b>

Percentage grades will be converted to letter grades and grade points per the University calendar.

#### 5. LEARNING OUTCOMES

1. Define the features of engineering creativity and design, and explain the similarities and differences between engineering and science.
2. Identify critical developments in the mutual shaping of technology and society from a historical perspective.
3. Distinguish the constraints and alternatives involved with a complex technological issue in contemporary society in both written and oral formats.
4. Compare and critically examine a wide range of theories on the complex interrelationship between society and technology.
5. Utilize technology assessment tools in order to predict potential consequences of introducing new technologies into society.

#### 6. POLICIES

##### Anti-Discrimination

The Faculty of Engineering is concerned with ensuring an environment that is free of all discrimination. If there is a problem, individuals are reminded that they should contact the Department Chair, the Sexual Harassment Officer or the Human Rights Consultant, as soon as possible.

[http://www.mcmaster.ca/policy/General/HR/Discrimination\\_Harassment\\_Sexual\\_Harassment-Prevention&Response.pdf](http://www.mcmaster.ca/policy/General/HR/Discrimination_Harassment_Sexual_Harassment-Prevention&Response.pdf)

##### Academic Integrity

You are required to exhibit honestly and use ethical behaviour in all aspects of the learning process. Academic credentials you earn are rooted in principles of honesty and academic integrity.

Academic dishonesty is to knowingly act or fail to act in a way that results or could result in unearned academic credit or advantage. This behaviour can result in serious consequences e.g. the grade of zero on an assignment, loss of credit with a notation on the transcript (notation reads: "Grade of F assigned for academic dishonesty"), and/or suspension or expulsion from the university.

It is your responsibility to understand what constitutes academic dishonesty. For information on the various kinds of academic dishonesty please refer to the Academic Integrity Policy, located at: <http://www.mcmaster.ca/policy/Students-AcademicStudies/AcademicIntegrity.pdf>.

The following illustrates only three forms of academic dishonesty:

1. Plagiarism. E.g. the submission of work that is not own or for which other credit has been obtained
2. Improper collaboration in group work
3. Copying or using unauthorized aids in tests and examinations.

##### Requests for Relief for Missed Academic Term Work (Assignments, Mid-Terms, etc.)

The McMaster Student Absence Form is an on-line self-reporting tool for **Undergraduate Students** to report absences for:

- 1) Relief for missed academic work worth less than 25% of the final grade resulting from medical or personal situations lasting up to three calendar days:
  - Students may submit a maximum of one academic work missed request per term. It is the responsibility of the student to follow up with instructors immediately (within the 3 day period that is specified in the MSAF) regarding the nature of the accommodation. All work due in that

time period however can be covered by one MSAF.

- MSAF cannot be used to meet religious obligation or celebration of an important religious holiday, for that has already been completed or attempted or to apply for relief for any final examination or its equivalent.
- 2) For medical or personal situations lasting more than three calendar days, and/or for missed academic work worth 25% or more of the final grade, and/or for any request for relief in a term where the MSAF has not been used previously in that term:
- Students must visit their Associate Dean's Office (Faculty Office) and provide supporting documentation.

### **E-Learning Policy**

Consistent with the Bachelor of Technology's policy to utilize e-learning as a complement to traditional classroom instruction, students are expected to obtain appropriate passwords and accounts to access Avenue To Learn for this course. Materials will be posted by class for student download. It is expected that students will avail themselves of these materials prior to class. Students should be aware that, when they access the electronic components of this course, private information such as first and last names, user names for the McMaster e-mail account, and program affiliation may become apparent to all other students in the course. The available information is dependent on the technology used. Continuation in this course will be deemed consent to this disclosure. If you have any questions or concerns about this disclosure please discuss this with the course instructor. Avenue can be accessed via <http://avenue.mcmaster.ca>.

### **Communications**

It is the student's responsibility to:

- Maintain current contact information with the University, including address, phone numbers, and emergency contact information.
- Use the University provided e-mail address or maintain a valid forwarding e-mail address.
- Regularly check the official University communications channels. Official University communications are considered received if sent by postal mail, by fax, or by e-mail to the student's designated primary e-mail account via their @mcmaster.ca alias.
- Accept that forwarded e-mails may be lost and that e-mail is considered received if sent via the student's @mcmaster.ca alias.
- Check the McMaster/Avenue email and course websites on a regular basis during the term.

### **Turnitin (Optional)**

This course will be using a web-based service (Turnitin.com) to reveal plagiarism. Students submit their assignment/work electronically to Turnitin.com where it is checked against the internet, published works and Turnitin's database for similar or identical work. If Turnitin finds similar or identical work that has not been properly cited, a report is sent to the instructor showing the student's work and the original source. The instructor reviews what Turnitin has found and then determines if he/she thinks there is a problem with the work. Students who do not wish to submit their work to Turnitin.com must still submit a copy to the instructor. No penalty will be assigned to a student who does not submit work to Turnitin.com. All submitted work is subject to normal verification that standards of academic integrity have been upheld (e.g., on-line search, etc.). To see the Turnitin.com Policy, please go to <http://www.mcmaster.ca/academicintegrity/turnitin/students/>

### **Protection of Privacy Act (FIPPA)**

The Freedom of Information and Protection of Privacy Act (FIPPA) applies to universities. Instructors should take care to protect student names, student numbers, grades and all other personal information at all times. For example, the submission and return of assignments and posting of grades must be done in a manner that ensures confidentiality.

<http://www.mcmaster.ca/univsec/fippa/fippa.cfm>

## Academic Accommodation of Students with Disabilities Policy

Students who require academic accommodation must contact Student Accessibility Services (SAS) to make arrangements with a Program Coordinator. Academic accommodations must be arranged for each term of study. Student Accessibility Services can be contacted by phone 905-525-9140 ext. 28652 or e-mail [sas@mcmaster.ca](mailto:sas@mcmaster.ca). For further information consult McMaster's policy for Academic Accommodation of Students with Disabilities

<http://www.mcmaster.ca/policy/Students-AcademicStudies/AcademicAccommodation-StudentsWithDisabilities.pdf>

Students must forward a copy of the SAS accommodation to the instructor of each course and to the Program Administrator of the B.Tech. Program immediately upon receipt. If a student with a disability chooses NOT to take advantage of a SAS accommodation and chooses to sit for a regular exam, a petition for relief may not be filed after the examination is complete. <http://sas.mcmaster.ca>

## Student Code of Conduct

The Student Code of Conduct (SCC) exists to promote the safety and security of all the students in the McMaster community and to encourage respect for others, their property and the laws of the land. McMaster University is a community which values mutual respect for the rights, responsibilities, dignity and well-being of others. The purpose of the Student Code of Conduct is to outline accepted standards of behavior that are harmonious with the goals and the well-being of the University community, and to define the procedures to be followed when students fail to meet the accepted standards of behavior. All students have the responsibility to familiarize themselves with the University regulations and the conduct expected of them while studying at McMaster University.

[http://studentconduct.mcmaster.ca/student\\_code\\_of\\_conduct.html](http://studentconduct.mcmaster.ca/student_code_of_conduct.html)