

**STS 2150 :**  
*A Critical Approach to  
Scientific and Technological Revolutions*

**Section 001  
Fall 2014  
9:05 MWF  
303 Edwards Hall**

**Instructor:**

Thomas Oberdan

[oberdat@clermson.edu](mailto:oberdat@clermson.edu)

305 Strode Tower

**Course Description:**

Everyone knows how important science and technology have become in contemporary society. And everyone also knows that both have yielded rich benefits which have changed society in countless ways. But few have thought critically about science and technology as social institutions, with their own hierarchical social structures, interacting with each other as well as the groups which make up society at large. And even fewer have contemplated the dramatic challenges which the revolutionary developments in science and technology have brought. It is the purpose of this course to develop the analytic tools to understand dramatic, revolutionary developments in science and technology. Topics include

- the processes of scientific and technological revolution,
- the relations between science and technology, and
- the causal interactions of scientific and technological revolutions with contemporary society and culture.

The discussion of these topics leads to important questions about the control of science and technology in a democratic society.

The course objectives, learning outcomes, and strategies of this course conform to the guidelines of a *Critical Thinking (CT<sup>2</sup>)* course as well as a *Science and Technology in Society* course. The principal prerequisite of critical thinking is the awareness or self-consciousness of one's own reasoning patterns, as well as those in the works of others. Once attention is directed towards the thinking processes in an argument or explanation – whether it is under construction or subject to examination- the types of

reasoning (causal, deductive, inductive) which are employed in the argument may be identified. Then, the argument may be assessed by reference to the appropriate standards of correctness for the particular type of reasoning employed.

**CT<sup>2</sup> Course Assessment:** CT<sup>2</sup> courses are assessed on the basis of their achievement of their learning outcomes, as measured by student improvement on CAT tests. The test will be administered at the beginning of the course (Friday, August 23<sup>rd</sup>) and at the end (December 4<sup>th</sup>).

**STS and CT<sup>2</sup> Course Objectives:**

- **STS:** to *acquire* and *learn to further develop* a wide-ranging, humanistic perspective comprehending the significance of the historical interaction of science and technology with society,
- **STS and CT<sup>2</sup>:** to acquire the tools to *analyze* multifaceted choices and *synthesize* the complex factors involved in judging critically issues related to the adoption of new technology or the support of scientific initiatives,
- **STS and CT<sup>2</sup> :** to *master* the logical and rhetorical skills required for the construction and evaluation of arguments involving diverse subjects, like science, technology, and society.

**STS and Student Learning**

**Outcomes:**

It is an important goal of to teach students the strategies and tactics required to think critically about any subject-matter whatsoever. Upon completion of the course, students will be able to

- *Identify* types of arguments presented and analyze their structure,
- *Analyze* arguments of all types and *evaluate* it according to criteria appropriate to that specific type of argument,
- *Extrapolate* from one conceptual context to others and *synthesize* distinct aspects of problems to solve multi-dimensional challenges,
- Effectively *communicate* complex ideas and arguments, using valid/correct arguments and explanations.

**Resources:** The following resources are linked to the ‘Resources’ button in the Taskbar on the Blackboard Homepage for the course:

- Problem Papers: The Basics
- Constructing Causal Arguments
- References in Problem Papers

**Text:**

Thomas Oberdan. *Science, Technology, and the Texture of Our Lives*. Third edition. (Anderson: Tavenner, 2013). (Referred to as ‘*Texture*’ in the Schedule of Topics & Readings below.)

Additional readings will be linked to the 'Schedule of Topics and Readings' (below).

**Office Hours:** MWF 8:00 - 9:00 am and by appointment.

### **Requirements**

**Quizzes** contain questions pertaining only to the material which has been assigned in the syllabus, to determine your grasp of its essentials. Quizzes will be available from 8:00 a.m. to 10:00 p.m. in the “ Quizzes” folder linked to the Taskbar. Your computer skills and the condition of your equipment are your responsibility. To maximize your grade in such cases, *save each answer as soon as you enter it*. Quizzes will remain open for only 15 minutes. Missed quizzes may not be made up. For further hints which will help you maintain your Quiz grade, see “Tips for Quizzes” on the Taskbar. (Quizzes are worth 20% of the final grade).

**Problem-Papers** are short argument essays which provide an opportunity to exercise *analytical critical thinking skills* in the assessment of the significance of some scientific development or technological innovation as well as *synthetic critical thinking skills* in relating it to social matters. A successful Problem-Paper will satisfy the following requirements:

- An accurate grasp of complex causal sequences between developments (whether in science, technology, or society) and their effects (whether in science, technology, or society). (See ‘Constructing Causal Arguments’ linked to ‘Resources’ button in Taskbar on the Blackboard Homepage for the course.)
- An assessment of which connections are genuinely causal rather than merely sequential or correlational.
- The ability to synthesize and unify ideas by transferring the understanding developed in one context to matters in a remote, unrelated situation. Assignments will be announced (on the course “Homepage” in Blackboard) and accessible (in the “Problem Papers” folder in the Taskbar). Your essay must be submitted as a (double-spaced) Word document (no more than 500 words), uploaded on the response page for the Assignment in Blackboard.
- The guidelines for Problem papers are explained in the “Tips for Assignments”, linked to the Taskbar. The Blackboard Learn system will not accept submissions after the deadline has passed.

Problem Papers provide excellent artifacts for demonstrating satisfaction of **STS** and **Critical Thinking** competencies. (Problem Papers are worth 80% of the final grade.) The final problem paper will be due at the time assigned by the University for the Final Exam in this class. There will not be a separate Final Exam.

**Attendance:** Attendance is required but there are obviously times when absences are unavoidable. For such occurrences, three grace absences are allowed. After that, every two absences will decrease the final grade by one letter. Use of an electronic

device in class for any purpose unrelated to the class (text-messaging, checking scores on ESPN, etc.) constitutes an absence.

**Nota Bene:** Feel free to contact the instructor (through email) with any questions you may have about assignments, grading, etc. I will make my best effort to respond to emails received between Monday and Friday (9:00-5:00) within 24 hours. Be sure to follow up on questions pertaining to your quizzes and tests promptly, while the exercise is still fresh in our minds. To ensure that these matters are handled expeditiously, it is necessary to restrict discussions to *quizzes and tests which have been completed within the past week*.

**eportfolios:** Your Problem Papers would make a significant contribution to your eportfolios. Be sure to place each one in the *STS* folder or the *Critical Thinking* folder of the eportfolio. Be sure to include the question they address when submitting them.

**Academic Integrity:** All infractions of the University policy on Academic Integrity will be reported to the Dean of Curriculum, in accordance with University regulations. No exceptions. For details, see pp. 28-9 of the Undergraduate Announcements.

### Schedule of Topics and Readings

Week	Dates	Topics	Readings
1	8/20 – 8/22	Thinking about STS	<i>Friday 8/22: Laptops required!</i>
2	8/25 – 8/29	Basic Issues in STS Determinism in the Neolithic Agricultural Revolution	<i>Texture</i> , Ch. 1 <a href="#">Robin Wright, "The Great Experiment "Guns, Germs, and Steel"</a>
3	9/1 – 9/5	Determinism Fundamentals of STS	<a href="#">Langdon Winner, "Technologies as Forms of Life"</a> ♾ <i>Texture</i> , Ch. 2

			<a href="#">A. Rosenberg, "The Growing Role of Science in the Innovation Process, 1870-1914" ♾</a>
4	9/8 – 9/12	Technology and Progress Methods	<a href="#">Postman, "Technology" ♾</a> <a href="#">Marx, "Does Improved Technology Mean Progress?" ♾</a> <i>Texture</i> , Ch. 3
5	9/15 – 9/19	Popular Perceptions of Science and Technology	<a href="#">Handlin, "Science and Technology in Popular Culture"</a>
6	9/22 – 9/26	<a href="#">Globalization</a> ♾	<a href="#">Thomas Friedman: The World is Flat 3. The World is Flat (Summary)</a>
7	9/29 – 10/3	Hypothesis Testing <a href="#">The Industrialization</a> ♾  <a href="#">of Agriculture</a> ♾	<i>Texture</i> , Ch. 4  <a href="#">Michael Pollan, <i>The Omnivore's Dilemma</i></a>
8	10/6 – 10/10	Industrialization of Agriculture (cont.)	<a href="#">George Pyle, "The Industrialization of Agriculture is Killing the Land" "King Corn"</a>
9	10/13 – 10/17	<a href="#">The Dynamics of Change</a> ♾	<i>Texture</i> , Ch. 5  <a href="#">Thomas Kuhn, "Introduction" to <i>The Structure of Scientific Revolutions</i></a>
10	10/20 – 10/24	The Print Revolution	<a href="#">John Man, "Something in the Air", <i>The Gutenberg Revolution</i>, pp. 106-122. ♾</a>  <a href="#">The Spread of Printing Presses</a>  <a href="#">Johannes Gutenberg and the Printing Press</a>

11	10/27 – 10/31	<a href="#">Print and Electronic Media</a> ⚓	<a href="#">Neil Postman, "The Day Our Children Disappeared"</a> ⚓ <a href="#">Nicholas Carr, "Is Google Making Us Stupid?"</a> <a href="#">Andrew Blum, "What is the Internet Really?"</a>
12	11/3 – 11/7	<b>FALL BREAK!!!</b>	
13	11/10 – 11/14	Print and Electronic Media (cont.)	<a href="#">"Attached to Technology..."</a> <a href="#">Sherry Turkle, "Alone but Connected"</a>  <a href="#">Daphne Bavelier, "Your brain on video games"</a>  <a href="#">P. W. Singer, "Military Robots and the Future of War"</a>  <a href="#">Mark Bowden, "How to Think About Drones"</a>
14	11/17 – 11/21	Social Context	<i>Texture</i> , Ch. 6 <a href="#">"The Story of Stuff"</a>  <a href="#">J. Diamond, "Collapse"</a>  ⚓
15	11/24 – 11/28	<a href="#">The Industrial Revolution</a> ⚓  <b>THANKSGIVING BREAK!!!</b>	<a href="#">The Evolution of the Steam Engine</a> ⚓
16	12/1 –	The Future of Energy	Children of the Sun: Fusion

	12/5		(see "Articles" Folder) <a href="#">What's Cold Fusion?</a> <a href="#">More on Cold Fusion</a> <a href="#">The Race for Cold Fusion</a>
17	12/8 - 12/12	<b>EXAM WEEK</b>	<b>Due Date for Final Essay TBA</b>