

Dr. Don Salisbury

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Global Science,
Technology, & Society
Spring 2011

Fulfills Non-Lab Science Requirement

Only Required Course for GSTS Minor

SCOPE & CONTENT

Generally, this course will address, in a global context, insights emerging from the physical and natural sciences, humanities, and social sciences. It will explore the societal and historical forces that shape, and are shaped by, science and technology. Attention will be given to issues surrounding ethical and policy questions derived from multicultural and international approaches to how science is practiced and technology implemented. Inquiry will be directed toward how science and technology advance, decline, and reappear as cultures encounter and influence each other. Ideas will be illustrated using specific historical and contemporary examples. Readings and lectures will also address theories of technology, philosophies of science, the dynamics of knowledge development, and interactions of literature with technology and science.

We will structure our exploration of these issues around three broad themes of perennial human concern. In Unit I we focus on the effort of our species to satisfy our basic consumption needs. We look at technological innovations and their wider social and knowledge implications in the area of agriculture, energy, industry, and commerce. In Unit II we will address evolving notions of time, looking on the one hand at societal interests that have motivated these developments, and on the other hand at some of technological and knowledge resources that have emerged. Ultimately we wish to know how all of this has influenced human culture. Unit III examines this question in greater generality. We study the extent to which technology and science has altered our conception of what it means to be human.

The two of us will bring a perspective to these discussions that is born in part in our respective academic disciplines. Specifically, **Professor Nuckols'** Unit I lectures will address early—pre-19th century—global technologies, with emphasis on China and the British, so-called, Industrial Revolution. He will also delve into the insights emanating from literature that pertain to what some label the “Rationalism of the Enlightenment.”

In Unit II Professor Nuckols will initiate a conversation on topics coming from the philosophy of science. A sample of such questions includes: What are the aims of science? What factors led to the birth of the Social Sciences? How do the historical and cultural settings in which scientific work occurs affect the content and quality of such work? In Unit III, Professor Nuckols will address the philosophy of technology. In the last unit he will introduce some of the background ethical concepts necessary for assessing questions of technology and values, survey different ways of looking at technology, and discuss the various ways that humans have evaluated technology (and how our assessments may have failed us). Special attention will be given to how science and technology has affected the production and consumption of food over the last century.

The primary focus throughout **Professor Salisbury's** lectures will be on understanding the nature of scientific change. He will demonstrate through three case studies that this change can only be properly understood when one takes into account not only the scientific, but also the cultural, economic, political, and even artistic context in which discoveries are spawned. He begins in Unit 1 with ancient Chinese and Islamic science, and then turns to technological and scientific activities in early Renaissance Italy that prepared the ground for the emergence of modern science in Italy in the 16th and 17th century. In the second unit he briefly returns to ancient civilizations, focusing on astronomy and calendars. This will permit us to understand Galileo's astronomical discoveries in the context of the dominant Aristotelian worldview. Continuing with this theme in Unit II he will address Einstein's revolutionary alterations in the notion of time. He will show that Einstein was indeed a bright young man, but more was at play than a single intellect in bringing about the revolution that is associated with his name. Finally, in the Unit III he will look more closely at the role of the state in Germany in promoting and exploiting scientific and technical knowledge, focusing on state-sponsored war research during World War I, and then the errant science that served as a cover for genocide during the Nazi era. He will conclude with some perhaps more up-lifting musings on the place of human beings in the 21st century cosmos.

All course lectures will be held from 11:00 to 11:50 MWF in Room 201 in the Administration Building. **The student is expected to bring to class the readings for that day; and all reading assignments should be completed for the class for which they are assigned.**

TEXTS. You must have the listed ISBN of these books.

The Time Machine by H.G. Wells
ISBN 10:0-141-43997-1
Penguin Classics

Dr. Jekyll and Mr. Hyde by Robert Louis Stevenson
ISBN 978-0-451-52895-7
Signet Classic, A Division of Penguin Group

Human-Built World: How to Think About Technology & Culture by Thomas P. Hughes
 ISBN 0-226-35934-4
 University of Chicago Press

Technology and the Future, 11th edition, by Albert H. Teich
 ISBN-13: 9780-495-57052-3
 Walworth's Press

The Unsettling of America: Culture & Agriculture by Wendell Berry
 ISBN 0-87156-877-2

The Pentagon of Power: The Myth of The Machine, Volume Two by Lewis Mumford
 ISBN 0-15-671610-0
 Harcourt Brace Javonovich Press

Civilization and Its Discontents by Sigmund Freud
 ISBN 0-393-05995-2
 W.W. Norton Press

OTHER READINGS. Students will be expected to access some readings in various electronic versions. Hard copies of other readings may occasionally be distributed in class—material that the professor unexpectedly uncovers and feels appropriate for the course. Matters related to this course frequently show up in the news, for example.

EXAMS and GRADING POLICY. The exams will include questions of varying format: short answer, identification, and brief discussion. Most of the focus of the exams will be on a student's ability to understand the material, rather than solely his or her ability to memorize information, though important facts must be mastered to do well on the exams. In an effort to prepare the student for course exams and discussion periods, the professors will provide, as class handouts and/or posted material, some topics to be considered in order to better understand lectures and assigned readings. Approximately one week before each exam—corresponding with the small group discussions—the professors will provide test preparation material.

Grades will be dependent upon *Participation* (19%) and *Exams* (81%). The Participation grade will be based upon class attendance and active involvement in class discussions, as well as some possible short written work during the small group sessions. There will be three scheduled exams during the semester. In addition, there will be an **optional** *Cumulative Final Exam* administered during final exam week. Every student must take all three semester exams, but each student also has the option of taking the *Cumulative Final Exam* for purposes of replacing a prior exam score, or for taking the place of an exam that the student missed. This last option assumes that the student has missed an exam for an acceptable reason, a reason determined to be legitimate by the professors. If the professors rule that the student has missed an exam for a legitimate reason, then the missed exam will count as the dropped score and the student will be permitted to take the

Comprehensive Final in order to replace the zero. **However, if the student misses an exam for an unacceptable reason, an automatic grade of zero will be recorded for that exam, with no opportunity to take the *Comprehensive Final Exam* to replace the zero.** Barring a missed exam without an acceptable reason, this leaves the student with three scored exams, weighted 27% each. **The student should note that there are NO Make-Up Exams administered in this course for ANY REASON!** Examples of acceptable reasons for missing an exam and earning the right to replace it with the comprehensive final exam include: absence for college-approved activities (choir tour, athletic events, MUN), documented contagious or serious illness, or documented legal obligations. **Unless an emergency makes it impossible, the student MUST notify Professor Nuckols ahead of the exam that he or she is unable to take it as scheduled.**

In summary:

Class Participation:	19%
Three Recorded Exam Scores @ 27% each =	81%
	100%

The grades will be computed by using your three highest test grades along with your Participation grade.

Use of the 11:00 – 11:50 Class Period. The vast majority of the course will be made up of lectures and discussion periods. All classes will be held in Administration 201. Other smaller class rooms may be used for exam reviews and discussion. These smaller exam review sessions will allow for more focused discussions, questions, and some review, and they may cover certain material in more depth. They will enable students to more fully exhibit their understanding of course material, generating an enhanced opportunity to score well on the *Participation* grade, which is weighted as 19% of the course grade. There will be at least some written assignments as part of the discussion group work; this, too, counts as part of the *Participation* grade.

ATTENDANCE. Regular attendance is expected at all scheduled class meetings (both lecture and discussions) and will be recorded at the beginning of each meeting. It is your responsibility to ensure that your attendance is accurately recorded. If you miss class, or know you are going to miss a future class, do not offer the instructors an explanation or excuse; we trust you have a good reason. However, if you must be away from class for an extended period (more than three consecutive classes), please inform us well in advance.

1-5 Missed Classes: No Penalty

After five absences, five points will be deducted from the student's Final Grade for **EACH** missed class.

Note: The first five absences are in a sense “free,” i.e. there is no grade reduction for them, though they may cause you to do less well on an exam. “Spend” your “free” absences however you need to, e.g., school field trips, school team trips, job interviews, funerals, recovering from an illness, etc. Course rules do not distinguish between “excused” and “unexcused” absences except in determining whether you can take the

comprehensive final in place of a missed exam. In that particular case, your reason for missing the exam must be “acceptable.” For other absences above five, the reason does not matter; the number does. If you miss five classes in the first five weeks of the term because you would rather do something else than come to class, and then you become ill, you are in the penalty zone not for being ill but for already having “spent” your penalty-free absences. Please note that you are not, obviously, required to spend five absences just because you have them. It is in your best interest not to miss any classes, given the importance of the grade you receive for participation, though that is not always possible. You may inquire about your number of recorded absences at any time during the course. There will be no alteration of our attendance records at the end of the course.

TAPE RECORDINGS OF LECTURES. Tape recordings of lectures will not be provided, nor are students permitted to tape lectures.

ACADEMIC INTEGRITY POLICY. This course will adhere to the Austin College Academic Integrity Policies. Group studying is accepted and even encouraged. But all students are required to do their own work on exams and other assignments. By enrolling in this course, each student has agreed to abide by the Academic Integrity principles found in the most recent version of ENVIRONMENT or in other official college publications. All sources in the preparation of papers must be appropriately acknowledged. **(See attached for Academic Integrity General Definitions, Procedures, Penalties, and Faculty Responsibility.)**

STUDENTS WITH DISABILITIES. Austin College seeks to provide reasonable accommodations for all individuals with disabilities. Austin College will comply with all applicable federal, state, and local laws, regulations and guidelines, specifically Section 504 of the Rehabilitation Act of 1973 and the Americans with Disabilities Act (ADA), with respect to providing appropriate academic adjustments to afford equal educational opportunity. **It is the responsibility of the student to register with and provide verification of academic accommodation needs to the Director of Academic Skills Center as soon as possible. This verification/documentation must be handed to the student’s professors. The student also must contact the faculty member in a timely manner (at least one week before exam date) for reasonable academic accommodations. For further information regarding learning disability issues or to register for assistance, please contact the office at 903-813-2454 or visit the Academic Skills Center.**

CLASS ETIQUETTE & CONDUCT

- A. Do not bring tape recorders to class. Keep cell phones turned off and out of sight during class. Do not “text” during class. If you have an emergency situation, speak with one of the professors ahead of class for permission to keep your cell phone visible.
- B. Come to class on time: that is, be in your seat ready to start class no later than 11:00. Persistent lateness might affect your Participation grade. If, however, you on some occasion are going to be late, come to class anyway (and come in quietly). It is better to be in class for 30 minutes than not at all.
- C. Do not leave the classroom during lectures/discussions.

- D. Complete reading assignments before their discussion in class.
- E. Respect the rights of others by refraining from talking (unless recognized by the instructors) while class is in session. Do not read during class any material not under discussion in that class session.
- F. Get permission from one of the professors before bringing visitors to class.
- G. Do not eat during class. Beverages are permitted.
- H. Sit near the classroom door and be as quiet as possible in leaving, if it is necessary on some occasion for you to leave class early.

OUTLINE OF TOPICS

UNIT I

Professor Salisbury's Topics (Readings to be assigned)

- Chinese and Islamic agricultural innovation
- Chinese and Islamic water technology
- Early Italian Renaissance recovery and extension of industrial water power
- Early European Renaissance engineering and global commerce - the roots of modern science
- 19th century German chemistry and its relation to the industrial revolution
- Late 19th century German electrotechnical industry and the roots of 20th century physics

Professor Nuckols' Topics (Readings to be assigned):

- Early Advances in Technology from Around the Globe
- Literature, Science, & Technology
- The Gothic and Romanticism
- Science and the Unconscious
- *Dr. Jekyll and Mr. Hyde* by Robert Louis Stevenson
- Modeling the Future
- *The Time Machine* by H.G. Wells
- Human's Interpretation of the Natural World

EXAM I

UNIT II

Professor Salisbury's Topics (Readings to be assigned)

- Naked eye astronomy
- Mayan archaeoastronomy
- Chinese and Islamic astronomy
- Chinese, Roman, and Islamic calendar systems
- Galileo's astronomical discoveries
- Galileo's dispute with the church
- Einstein's revolution in time

Professor Nuckols' Topics (Readings to be assigned)

- Science and Its Affect on Invention
- The Philosophy of Science; Its Mission, Its Aim
- Key Figures and their ideas towards a Philosophy of Science, e.g., Descartes, Bacon, Hume, Locke, Comte, Hegel, Kant, Kierkegaard, Popper, Dewey, Pierce, Kuhn, and more.
- The Birth of the Social Sciences
- Darwin's Dangerous Idea
- *Civilization and its Discontents* by Sigmund Freud

EXAM II

UNIT III

Professor Salisbury's Topics: (Readings to be assigned)

- Chinese and Islamic military technology
- The beginnings of protein chemistry in Germany
- Fritz Haber and poison gas research and development

- Eugenics and German Nazi misuse of science
- The place of humans in modern cosmology

Professor Nuckols' Topics: (Reading to be assigned)

- Current Debates Surrounding the Philosophy of Technology
- Technological Determinism and Autonomous Technology
- Governing Technology
- Technology and Culture in General
- The Technological Culture of Cities
- The Technological Culture of Rural America
- Current Debates on the Roll Played by Technology and Science
In the Production and Consumption of Food
- *The Unsettling of America: Culture & Agriculture* by Wendell Berry

FINAL EXAM

