



ARIZONA STATE UNIVERSITY

GENERAL STUDIES COURSE PROPOSAL COVER FORM

Course information:

Copy and paste current course information from Class Search/Course Catalog.

The School for the Future of Innovation in Society

College/School (Select One) Department
Prefix FIS Number 201 Title Innovation in Society Units: 3

Is this a cross-listed course? No If yes, please identify course(s)
Is this a shared course? No If so, list all academic units offering this course

Note- For courses that are crosslisted and/or shared, a letter of support from the chair/director of each department that offers the course is required for each designation requested.

Is this a permanent numbered course with topics? No
If yes, all topics under this permanent numbered course must be taught in a manner that meets the criteria for the approved designation(s). Chair/Director Initials (Required)

Course description: See attached

Requested designation: Historical Awareness-H Mandatory Review: (Choose one)

Note- a separate proposal is required for each designation.

Eligibility:

Permanent numbered courses must have completed the university's review and approval process. For the rules governing approval of omnibus courses, contact Phyllis.Lucie@asu.edu.

Submission deadlines dates are as follow:

For Fall 2016 Effective Date: October 1, 2015

For Spring 2017 Effective Date: March 10, 2016

Area(s) proposed course will serve:

A single course may be proposed for more than one core or awareness area. A course may satisfy a core area requirement and more than one awareness area requirements concurrently, but may not satisfy requirements in two core areas simultaneously, even if approved for those areas.

Checklists for general studies designations:

Complete and attach the appropriate checklist

- Literacy and Critical Inquiry core courses (L)
Mathematics core courses (MA)
Computer/statistics/quantitative applications core courses (CS)
Humanities, Arts and Design core courses (HU)
Social-Behavioral Sciences core courses (SB)
Natural Sciences core courses (SQ/SG)
Cultural Diversity in the United States courses (C)
Global Awareness courses (G)
Historical Awareness courses (H)

A complete proposal should include:

- Signed course proposal cover form
Criteria checklist for General Studies designation(s) being requested
Course catalog description
Sample syllabus for the course
Copy of table of contents from the textbook and list of required readings/books

It is respectfully requested that proposals are submitted electronically with all files compiled into one PDF.

Contact information:

Name Jameson Wetmore E-mail Jameson.Wetmore@asu.edu Phone 480-727-0750

Department Chair/Director approval: (Required)

Chair/Director name (Typed): David Guston Date: March 4, 2016

Chair/Director (Signature): [Handwritten Signature]

Arizona State University Criteria Checklist for

HISTORICAL AWARENESS [H]

Rationale and Objectives

Recent trends in higher education have called for the creation and development of historical consciousness in undergraduates now and in the future. History studies the growth and development of human society from a number of perspectives such as—political, social, economic and/or cultural. From one perspective, historical awareness is a valuable aid in the analysis of present-day problems because historical forces and traditions have created modern life and lie just beneath its surface. From a second perspective, the historical past is an indispensable source of identity and of values, which facilitate social harmony and cooperative effort. Along with this observation, it should be noted that historical study can produce intercultural understanding by tracing cultural differences to their origins in the past. A third perspective on the need for historical awareness is that knowledge of history helps us to learn from the past to make better, more well-informed decisions in the present and the future.

The requirement of a course that is historical in method and content presumes that "history" designates a sequence of past events or a narrative whose intent or effect is to represent both the relationship between events and change over time. The requirement also presumes that these are human events and that history includes all that has been felt, thought, imagined, said, and done by human beings. The opportunities for nurturing historical consciousness are nearly unlimited. History is present in the languages, art, music, literatures, philosophy, religion, and the natural sciences, as well as in the social science traditionally called History.

The justifications for how the course fits each of the criteria need to be clear both in the application tables and the course materials. The Historical Awareness designation requires consistent analysis of the broader historical context of past events and persons, of cause and effect, and of change over time. Providing intermittent, anecdotal historical context of people and events usually will not suffice to meet the Historical Awareness criteria. A Historical Awareness course will instead embed systematic historical analysis in the core of the syllabus, including readings and assignments. For courses focusing on the history of a field of study, the applicant needs to show both how the field of study is affected by political, social, economic, and/or cultural conditions AND how political, social, economic, and/or cultural conditions are affected by the field of study.

Revised October 2015

Proposer: Please complete the following section and attach appropriate documentation.

ASU--[H] CRITERIA			
THE HISTORICAL AWARENESS [H] COURSE MUST MEET THE FOLLOWING CRITERIA:			
YES	NO		Identify Documentation Submitted
<input checked="" type="checkbox"/>	<input type="checkbox"/>	1. History is a major focus of the course.	Syllabus
<input checked="" type="checkbox"/>	<input type="checkbox"/>	2. The course examines and explains human development as a sequence of events influenced by a variety of factors.	Syllabus
<input checked="" type="checkbox"/>	<input type="checkbox"/>	3. There is a disciplined systematic examination of human institutions as they change over time.	Syllabus
<input checked="" type="checkbox"/>	<input type="checkbox"/>	4. The course examines the relationship among events, ideas, and artifacts and the broad social, political and economic context.	Syllabus
		THE FOLLOWING ARE NOT ACCEPTABLE:	
		• Courses that are merely organized chronologically.	
		• Courses which are exclusively the history of a field of study or of a field of artistic or professional endeavor.	
		• Courses whose subject areas merely occurred in the past.	

Course Prefix	Number	Title	General Studies Designation
FIS	201	Innovation in Society	H

Explain in detail which student activities correspond to the **specific** designation criteria. Please use the following organizer to explain how the criteria are being met.

Criteria (from checklist)	How course meets spirit (contextualize specific examples in next column)	Please provide detailed evidence of how course meets criteria (i.e., where in syllabus)
1.	In this course students will learn the basics of innovation through exploring fundamental questions that people of all walks of life ask every day. These questions will be examined through historical case studies and examples drawn from domains that long have been transformed by techno-scientific innovation: farming and food; national security and war; health and bio-medicine; trade and migration; land, natural resources and the environment.	The course readings are largely drawn from prominent historians including political historians like Eric Hobsbawm; environmental historians like Linda Lear, economic historians like Paul David; historians of technology like Paul Ceruzzi, and historians of science like Thomas Kuhn.
2.	This course examines a key facet of human development: episodes of innovation. It will explore the variety of factors that influence when, why, and how innovation happens.	Each week of the course will explore a different factor that has had a marked influence on the development of innovation: government policies (week 2); economics (week 3); geography (week 4), scientific research (week 5); charismatic leaders (week 6); war (week 7); system builders (week 8); failure (week 9); risk (week 10); hope for the developing world (week 11); resistance (week 12); and communication (week 13).
3.	Innovation happens in many ways and in many places and it is influenced by a number of key institutions.	The course will examine a number of these institutions including law (weeks 7 and 10), universities (weeks 2, 5, and 10), finance (weeks 2 and 3), the State (weeks 2, 4, 7, 9, and 11), and corporations (weeks 4, 6, 8, 9, and 13).

4.	The key myth this course strives to debunk is the idea that innovation happens automatically. Rather, government, private enterprise, and civil society each promote innovation agendas. These agendas are constrained and shaped by other agendas as well as the social, political, and economic contexts in which they are deployed.	Students will be introduced to the diverse contexts that impact technology and innovation throughout the course. They will be forced to reckon with them directly in two of the course assignments. For instance in the "Team Project," students will prototype and build a plan for a technology of their own choosing. The success or failure of their proposal will largely be based on whether they developed a robust plan that takes into account the variety of forces that can shape, promote, or destroy the technology they are advocating. In the "Innovation in Action" assignment, students will study the Metro Light Rail to examine the forces that shape it – including ridership, government policies, and individual and local economic considerations – as well as the ways that the Light Rail shapes its local surroundings.
----	--	--

FIS 201 Innovation in Society Course description: In the modern age, governments, multinational corporations and civil society movements have rallied around the idea that innovation is necessary for the maintenance of health, prosperity and the good life in general. Examines the vast implications of this promise, the reasons why it is so powerful and explanations for why it falls short. Also examines what innovation is, who funds it and why some innovations succeed while others fail. Links innovation with society to see how change happens differently in different places and how diverse populations are impacted.

Innovation in Society

FIS 201

Prof. Gregg Pascal Zachary

Gregg.zachary@asu.edu

Office: PEBW 112D

Office Hours: MTWHF 0:00-0:00 or by appointment

Course Description:

Science and technology are powerful forces in the modern world, driving innovations across every realm of civilization. Technological innovations have been hailed as a way to cure everything from world hunger to cancer. Even problems caused by innovation are viewed as reasons for more innovations. As a global society, technological innovation is, if not a secular religion, then an approach to sustainability and growth that is based on human knowledge and ingenuity, mediated by enterprise and complex socio-technical systems.

Innovation does not, however, happen automatically. Government, private enterprise and civil society each promotes a somewhat different innovation agenda, while often subscribing to the same core values and goals. In this course students will learn the basics of innovation through exploring fundamental questions that people of all walks of life ask every day. How did we get the technologies we have? Why did innovations reinforce power relations, while others destroy or disrupt them? How does our economic system spawn innovations and absorb them? What is the role of science, geography, culture and the university in the innovation process? Is there a system of innovation that can be described and engineered through policies and politics?

These questions will be examined through historical case studies and examples drawn from domains that long have been transformed by techno-scientific innovation: farming and food; national security and war; health and bio-medicine; trade and migration; land, natural resources and the environment.

In this class, we will learn about what innovation is, who funds it; why some innovations succeed and others fail; where innovation happens; who innovates and who benefits from innovation and who doesn't; what's the role of culture, values and history in fostering innovation; how do science and technology influence innovation; why has war, fear of war, and impending existential crises seem to stimulate breakthrough innovations; and finally what roles do government, private capital, civil society and scientists and engineers play in building, sustaining and revising the innovation system? We will study these questions through identifying and examining broader theoretical and thematic approaches as well as through historical case studies of innovation set in the U.S. and around the world.

All innovations are not equal. Sometimes, innovations that are inferior, technically, become standards; other times potentially valuable innovations are strangled by powerful actors in a society who wish to protect the position of existing ones. In understanding which innovations stick and why, and why change occurs or doesn't, we will learn that location, culture, capital and politics influence the birth, life and death of innovations and the socio-technical systems they exist in. We will learn how to ask questions about the quality of innovations? Do they promote equity? Are they consistent with human values? Do they solve urgent problems? We will also look at emergent innovations "paradoxes," such as how

advances in medical technology can lead to higher cost and reduced access to care; or why innovations in mobile phones and digital electronics seem to be accelerating, while innovations in energy and transport systems seem rare, costly and difficult.

To assist us in our task, we will adopt key concepts such as “the social construction of technological systems,” “path dependence,” “creative destruction,” and “unintended consequences” in order to make sense of complex transformations in human life. In the modern age, governments, multinational corporations and civil society movements have rallied around the idea that science and technology are necessary for the maintenance of health, prosperity and the good life generally. Studying the historical genesis of these ideas will help us to understand the assumptions that underlie them so that we can consider possible ways forward.

Learning Outcomes:

1. Students will become fluent in conversing about the fundamental questions regarding innovation and business, society and culture.
2. Students will learn how to analyze and evaluate emerging innovations in local, national and global contexts. They will gain sense for why some innovations “win,” while others “lose.”
3. Students will develop the ability to better understand contemporary issues through the analysis of historical case studies.
4. Students will gain an appreciation for the importance of critical approaches to technological innovations, policies, practices and societal outcomes.

Required Books

Ceruzzi, Paul, *Computing: A Concise History* (2012)
Dodgson & Gann, *Innovation: a very short introduction* (2010)
Watson, James, *The Double Helix* (1968)

All other assigned readings supplied in digital form from instructor or available through ASU library

Assignments (and percentages of final grade)

1. **Short Reflections:** Five times during the semester students will be asked to write a short reflection [no more than 250 words] in response to a prompt from the professor. [15 percent of grade]
2. **Team Project:** Each student will participate in a team project. Each team, consisting of four or five students, will conceive, specify and evaluate an innovation they develop in one of five areas: food, health, security, information or energy. Each team should draw on the history of one of these areas and analyze the current status of one aspect of one of those areas. The students will summarize their findings in a written memo, a short presentation in class, and a short video of 90 seconds. [15 percent of grade].
3. **Exam:** About a third of the way through the semester, students will have one in-class “fluency” exam that tests student command of basic concepts and issues in innovation. [15 percent of grade]

4. **Charismatic Leadership Paper:** Each student will choose from one of three charismatic leaders from science and technology: Steve Jobs, Rachel Carson, or Vannevar Bush. Students will read excerpts of biographies of their lives and then analyze the role that charisma played in the development of new technologies and scientific ideas. [20 percent of grade]
5. **Innovation in action:** Students will be asked to ride the Metro light rail and, through a series of photographs, illustrate the contours of this technological system and its effects on its surroundings at the level of the individual station. [15 percent of grade]
6. **Final Paper:** A final “creative” paper of 1,250 words that applies the lessons of the class to a problem in innovation studies [20 percent of grade].

Five Short Reflections	15%
Exam	15%
Charismatic Leadership Paper	20%
Innovation in Action Project	15%
Team Project	15%
<u>Final Creative Paper</u>	<u>20%</u>
Total	= 100%

Barrett students interested in adding an **honors contract** to the class should contact the instructor in the first week of classes.

Grading Scale:

A-/ A/ A+	90.0-92.4/ 92.5-97.9/ 98-100	Excellent
B- /B/ B+	80.0-82.4/ 82.5-87.4/ 87.5-89.9	Good
C/ C+	70.0-77.4/ 77.5-79.9	Average
D	60.0-69.9	Passing
E	<60	Failure
XE		Failure due to Academic

Course Calendar

Week One: Understanding Technological Change in Economic, Historical and Cultural Contexts

- Heibroner, “Do Machines Make History,” from *Technology & Culture* (1967)
- Ceruzzi, “The Digital Age,” from *Computing*, c1
- Paul David, “Clio and the Economics of QWERTY,” from *American Economic Review* (1985)

Week Two: Complexity and the Pillars of National Innovation Systems

- Ceruzzi, “The First Computers” and “The Stored Program Principle,” from *Computing*, c2-3

- Dodgson-Gann, “Josiah Wedgwood: the world’s greatest innovator,” from *Innovation*, ch 1
- Excerpts from Vannevar Bush introduction to *Science – the Endless Frontier* (1945)
- **Short Reflection 1 Due**

Week Three: Economics and Innovation

- Rosenberg, N., “The historiography of technical progress” (1982)
- Schumpeter, J., excerpt from “The Process of Creative Destruction” (1950)
- Dodgson-Gann, “The process of creative destruction,” from *Innovation*, ch 2
- **Short Reflection 2 Due**

Week Four: Places: Geography, Culture and Innovation

- Ceruzzi, “The Chip and Silicon Valley,” from *Computing*, c 4
- Richard Florida, “Leading Nations for Innovation,” *The Atlantic*, 2011
- G. P. Zachary, “The Global Geography of Innovation,” U.S. Department of State <http://iipdigital.usembassy.gov/st/english/publication/2009/11/20091106113945ebypassed0.1115381.html#axzz40quD5mpl>
- **Short Reflection 3 Due**

Week Five: Science and Innovation

- Watson, James, *The Double Helix* (first half)
- Kuhn, T., “The Function of Dogma in Scientific Research”
- **Exam**

Week Six: Innovation and the Charismatic Leader

- Ceruzzi, “The Microprocessor,” from *Computing*, chapter 5
- Watson, *The Double Helix* (second half)
- Wolfe, Tom, “The Tinkerings of Robert Noyce: how the sun rose on Silicon Valley,” *Esquire* (1983)
- **Short Reflection 4 Due**

Week Seven: War, Environmental Crises and Innovation

- Kaempffert, W., “War and Technology,” *American Journal of Sociology* (1941)
- Lear, L., “Rachel Carson’s ‘Silent Spring,’” *Environmental History Review* (1993)
- Weart, S., “Global Warming, Cold War and the Evolution of Research Plans,” *Historical Studies in the Physical and Biological Science* (1997)
- **Short Reflection 5 Due**

Week Eight: Innovation and Systems Builders

- Hughes, “The Electrification of America: the Systems Builders,” from *Technology & Culture* (1979)
- Saxenian, A., *Silicon Valley’s New Immigrant Entrepreneurs* (Public Policy Institute of California, 1999)
- **Charismatic Leadership Paper Due**

Week Nine: When Innovations Fail, Despite Support of State, Market, Society

- Dodgson-Gann, “London’s Wobbly Bridge: Learning from Failure,” from *Innovation*, c3
- Hacker, B, “Whoever Heard of Nuclear Ramjets: project Pluto, 1957-64,” from the International Committee for the History of Technology (1995)
- Kirsch, D, “The Electric Car and the Burden of History,” from *Business and Economic History* (1997)
- Wendt, G, “The First Atomic Airplane: a new era in aviation approaches as nuclear power for flying is closer than you think,” *Popular Science* (1951)

Week Ten: Innovation as Risk: how Law, Universities, Migration, and Finance Capital combine to reduce the risks of innovation and raise the chances of success

- Carr, N, “All Can Be Lost: the Risk of Putting Our Knowledge in the Hands of Machines,” *The Atlantic* (2013)
- Dodgson-Gann, “Stephanie Kwolek’s new polymer: from labs to riches,” from *Innovation*, c4
- Farah, M., “The Unknowns of Cognitive Enhancement,” *Science* (2015)
- **Innovation in Action Project Due**

Week 11: From Imitation to Innovation: one path for the “catch-up” in the Developing World

- “Lights Camera Africa: Movies are uniting a disparate continent, and dividing it too,” *The Economist* (2010)
- Lee, Keun, “How can Korea be a role model for catch-up development?” (United Nations, 2009)

Week 12: Resistance to Innovation as Invitation to Responsible Innovation

- Akst, D., “Automation Anxiety: what we can learn from the automation crisis of the 1960s and alarm over technology’s job-killing effects,” *The Wilson Quarterly* (2013)
- Bacigalupi, P. “The Fluted Girl” [fiction] <http://windupstories.com/books/pump-six-and-other-stories/the-fluted-girl/>

- Hobsbawm, E.J., “The Machine Breakers,” *Past and Present* (1952)
- **Team Project Due**

Week 13: Communicating Innovation

- Bisson, Terry, “Meat,” *Omni* [fiction]
<http://www.terrybisson.com/page6/page6.html>
- Ceruzzi, “Internet and World Wide Web,” *Computing*, c5 and conclusion
- Dodgson-Gann, “Thomas Edison’s Organizational Genius,” from *Innovation*, c5

Week 14: What is innovation for?

- Dodgson-Gann, “Building a smarter planet?,” from *Innovation*, c6
- Marx, L, “Does Improved Technology Mean Progress,” *Technology Review* (1987)
- Morozov, E., “The Perils of Perfection,” *New York Times* (2013)
- **Final Creative Paper Due**

Incompletes: A mark of "I" (incomplete) can be given by the instructor when you are otherwise doing acceptable work but are unable to complete the course because of illness or other conditions beyond your control. You are required to arrange with the instructor for the completion of the course requirements. The arrangement must be recorded using the form at <http://students.asu.edu/forms/incomplete-grade-request>. Students should be proactive and discuss this with their instructor and TA before the end of the semester. Students who do not complete this form before the end of the semester cannot be given an incomplete and will be awarded a grade based on the work they have completed.

Late Assignments: Late assignments will have 1/3rd of a letter grade deducted each day they are late. Advanced written or e-mailed notice that you will miss a class or have to turn in an assignment late could help your cause.

Grade Appeals: ASU has formal and informal channels to appeal a grade. If you wish to appeal any grading decisions, please see: <http://catalog.asu.edu/appeal>

Student Standards: Students are required to read and act in accordance with university and Arizona Board of Regents policies, including: The ABOR Code of Conduct: Arizona Board of Regents Policies 5-301 through 5-308:
<http://www.azregents.edu/policymanual/default.aspx>

Professionalism in the Classroom: While learning happens throughout ASU, the classroom is a particularly important focal point. Students are asked to contribute to a collegial atmosphere where ideas can be exchanged, discussed, and debated freely by avoiding disruptions through their own behavior and the distractions of their technology. Disruptive, threatening or violent behavior will be dealt with according to the policies in the Student Services Manual, [SSM 104–02](#). Students wishing to record lectures electronically must first get permission from the instructor.

It is impossible to learn from your fellow students when you or they are not there. As such attendance is required in this course. Should you have to miss a class, contact your instructor as far in advance as possible. Depending on the nature of the absence the instructor may elect to deduct points from your overall grade. Absences can be excused for religious observances or practices that are in accord with [ACD 304-04](#) or university sanctioned events/activities that are in accord with [ACD 304-02](#).

Academic Integrity: Academic honesty is expected of all students in all examinations, papers, laboratory work, academic transactions and records. The possible sanctions include, but are not limited to, appropriate grade penalties, course failure (indicated on the transcript as a grade of E), course failure due to academic dishonesty (indicated on the transcript as a grade of XE), loss of registration privileges, disqualification and dismissal. For more information, see <http://provost.asu.edu/academicintegrity>.

If you fail to meet the standards of academic integrity in any of the criteria listed on the university policy website, sanctions will be imposed by the instructor, school, and/or dean. Academic dishonesty includes borrowing ideas without proper citation, copying others' work (including information posted on the internet), and failing to turn in your own work for group projects. Please be aware that if you follow an argument closely, even if it is not directly quoted, you must provide a citation to the publication, including the author, date, and page number. If you directly quote a source, you must use quotation marks and provide the same sort of citation for each quoted sentence or phrase. You may discuss assignments with other students, however, all writing that you turn in must be done independently. If you have any doubt about whether the form of cooperation you contemplate is acceptable, ask the TA or the instructor in advance of turning in an assignment. Please be aware that the work of all students submitted electronically can be scanned using SafeAssignment, which compares them against everything posted on the internet, online article/paper databases, newspapers and magazines, and papers submitted by other students. Turning in an assignment (all or in part) that you completed for a previous class is considered self-plagiarism and falls under these guidelines. Any infractions of self-plagiarism are subject to the same penalties as copying someone else's work without proper citations. Students who have taken this class previously and would like to use the work from previous assignments should contact the instructor for permission to do so.

Prohibition of Commercial Note Taking Services: In accordance with [ACD 304-06 Commercial Note Taking Services](#), written permission must be secured from the official instructor of the class in order to sell the instructor's oral communication in the form of notes. Notes must have the note taker's name as well as the instructor's name, the course number, and the date.

Student Support and Disability Accommodations: In compliance with the Rehabilitation Act of 1973, Section 504, and the Americans with Disabilities Act of 1990, professional disability specialists and support staff at the Disability Resource Center (DRC) facilitate a comprehensive range of academic support services and accommodations for qualified students with disabilities. [Qualified students with disabilities may be eligible to receive academic support services and accommodations](#). Eligibility is based on qualifying disability documentation and assessment of individual need. Students who believe they have a current

and essential need for disability accommodations are [responsible for requesting accommodations and providing qualifying documentation](#) to the DRC. Every effort is made to provide reasonable accommodations for qualified students with disabilities. Qualified students who wish to request an accommodation for a disability should contact their campus DRC at: <http://www.asu.edu/studentaffairs/ed/drc/>. If you are a student in need of special arrangements we will do all we can to help, based on the recommendations of these services. For the sake of equity for all students, we cannot make any accommodations without formal guidance from these services.

Sexual Violence and Harassment: Title IX is a federal law that provides that no person be excluded on the basis of sex from participation in, be denied benefits of, or be subjected to discrimination under any education program or activity. Both Title IX and university policy make clear that sexual violence and harassment based on sex is prohibited. An individual who believes they have been subjected to sexual violence or harassed on the basis of sex can seek support, including counseling and academic support, from the university. If you or someone you know has been harassed on the basis of sex or sexually assaulted, you can find information and resources at <http://sexualviolenceprevention.asu.edu/faqs/students>.

Drop and Add Dates/Withdrawals: Please refer to the [academic calendar](#) on the deadlines to drop/withdraw from this course. Consult with your advisor and notify your instructor if you are going to drop/withdraw this course. If you are considering a withdrawal, review the following policies: [Withdrawal from Classes](#), [Medical/Compassionate Withdrawal](#).

Email Communications

All email communication for this class will be done through your ASU email account and the blackboard site. You should be in the habit of checking your ASU email regularly as you will not only receive important information about your class(es), but other important university updates and information. You are solely responsible for reading and responding if necessary to any information communicated via email. For help with your email go to: http://help.asu.edu/sims/selfhelp/SelfHelpHome.seam?dept_pk=822 and file a help desk ticket by clicking on “My Help Center.”

Campus Resources: As an ASU student you have access to many resources on campus. This includes tutoring, academic success coaching, counseling services, financial aid, disability resources, career and internship help and many opportunities to get involved in student clubs and organizations.

Tutoring: <https://tutoring.asu.edu/tutoring>

Counseling Services: <http://students.asu.edu/counseling>

Financial Aid: <http://students.asu.edu/financialaid>

Major/Career Exploration: <https://cls.asu.edu/majorexploration>

Career Services: <http://students.asu.edu/career>

Student Organizations: <http://www.asu.edu/studentaffairs/mu/clubs/>

FIS 201 Innovation in Society Reading List

- Ceruzzi, Paul, *Computing: A Concise History* (2012)

Table of Contents:

The digital age
The first computers, 1935-1945
The stored program principle
The chip and Silicon Valley
The microprocessor
The Internet and the World Wide Web
Conclusion.

- Dodgson & Gann, *Innovation: a very short introduction* (2010)

Table of Contents:

Prologue
Josiah Wedgwood: The world's greatest entrepreneur
2. Joseph Schumpeter's gales of creative destruction
3. London's wobbly bridge: learning from failure
4. Stephanie Kwolek's new polymer: from labs to riches
5. Thomas Edison's organizational genius
6. A smarter planet?
Further Reading

- Watson, James, *The Double Helix* (1968)
- Heibroner, "Do Machines Make History," from *Technology & Culture* (1967)
- Paul David, "Clio and the Economics of QWERTY," from *American Economic Review* (1985)
- Excerpts from Vannevar Bush introduction to *Science – the Endless Frontier* (1945)
- Rosenberg, N., "The historiography of technical progress" (1982)
- Schumpeter, J., excerpt from "The Process of Creative Destruction" (1950)
- Richard Florida, "Leading Nations for Innovation," *The Atlantic*, 2011
- G. P. Zachary, "The Global Geography of Innovation," U.S. Department of State <http://iipdigital.usembassy.gov/st/english/publication/2009/11/20091106113945ebyeessedo0.1115381.html#axzz40quD5mpl>
- Kuhn, T., "The Function of Dogma in Scientific Research"
- Wolfe, Tom, "The Tinkerings of Robert Noyce: how the sun rose on Silicon Valley," *Esquire* (1983)
- Kaempffert, W., "War and Technology," *American Journal of Sociology* (1941)
- Lear, L., "Rachel Carson's 'Silent Spring'," *Environmental History Review* (1993)
- Weart, S., "Global Warming, Cold War and the Evolution of Research Plans," *Historical Studies in the Physical and Biological Science* (1997)
- Hughes, "The Electrification of America: the Systems Builders," from *Technology & Culture* (1979)
- Saxenian, A., *Silicon Valley's New Immigrant Entrepreneurs* (Public Policy Institute of California, 1999)

- Hacker, B, “Whoever Heard of Nuclear Ramjets: project Pluto, 1957-64,” from the International Committee for the History of Technology (1995)
- Kirsch, D, “The Electric Car and the Burden of History,” from *Business and Economic History* (1997)
- Wendt, G, “The First Atomic Airplane: a new era in aviation approaches as nuclear power for flying is closer than you think,” *Popular Science* (1951)
- Carr, N, “All Can Be Lost: the Risk of Putting Our Knowledge in the Hands of Machines,” *The Atlantic* (2013)
- Farah, M., “The Unknowns of Cognitive Enhancement,” *Science* (2015)
- “Lights Camera Africa: Movies are uniting a disparate continent, and dividing it too,” *The Economist* (2010)
- Lee, Keun, “How can Korea be a role model for catch-up development?” (United Nations, 2009)
- Akst, D., “Automation Anxiety: what we can learn from the automation crisis of the 1960s and alarm over technology’s job-killing effects,” *The Wilson Quarterly* (2013)
- Bacigalupi, P. “The Fluted Girl” [fiction] <http://windupstories.com/books/pump-six-and-other-stories/the-fluted-girl/>
- Hobsbawm, E.J., “The Machine Breakers,” *Past and Present* (1952)
- Bisson, Terry, “Meat,” *Omni* [fiction] <http://www.terrybisson.com/page6/page6.html>
- Marx, L, “Does Improved Technology Mean Progress,” *Technology Review* (1987)
- Morozov, E., “The Perils of Perfection,” *New York Times* (2013)