**Course Description**

This course provides an introduction to the study and analysis of emerging technologies and how this influences practical process. Students will examine how technologies have evolved historically as well as develop perspectives on they would best be used in the future. Major topics will include computing history, human-computer interaction, computers and culture, and the ethical and social implications of new technologies. In the lab component of the course, students will learn to employ methods of documentation currently in use at research institutions and in private industry in order to place research being done in a wider context.

ONLINE Bibliography

**\*EMERGING TECHNOLOGIES**

(how they develop and what they are)

Wikipedia list of emerging technologies

<http://en.wikipedia.org/wiki/List_of_emerging_technologies>

Innovative Approaches to Developing Technologies, Grant Example

<http://grants.nih.gov/grants/guide/pa-files/PAR-98-047.html>

New DNA Sequencing Tech Promises Cheaper Genetic Testing

<http://www.medgadget.com/2008/11/smrt_new_high_speed_dna_sequencing_technology_promises_cheaper_genetic_testing.html>

New Harvest: in vitro meat

<http://en.wikipedia.org/wiki/New_Harvest>

Prosthetics in Fiction

<http://en.wikipedia.org/wiki/Prosthetics_in_fiction>

Superfund Collaborates with States in Developing New Cleanup Technologies

<http://www.epa.gov/superfund/accomp/news/state_collab.htm>

# 27 Science Fictions That Became Science Facts In 2012

<http://myscienceacademy.org/2013/01/03/27-science-fictions-that-became-science-facts-in-2012/>

10 inventions inspired by science fiction

<http://www.smithsonianmag.com/science-nature/Ten-Inventions-Inspired-by-Science-Fiction.html>

Center for Digital Education: The Higher Education Short List of Emerging Technology

<http://www.centerdigitaled.com/news/The-Higher-Education-Short-List-of-Emerging-Technology.html>

Prosthetics, Design, Technology

<http://www.bespokeinnovations.com/content/gallery>

Bacteria Can Talk

<http://agora.forwomeninscience.com/index.php/2012/03/bacteria-can-talk-yes-talk/>

**\*RESEARCH METHODOLOGIES**

(how to find out things, search engine structure, etc., rules of/ info about methods of scientific experimentation-methodologies for how new inventions/technologies emerge.)

Link to the book Advancing Research Methods with New Technologies

<http://www.gale.cengage.com/servlet/ItemDetailServlet?region=9&imprint=000&cf=e&titleCode=IGI260&type=4&id=16100712>

Mobile Research Methods: chart of various methods

<http://www.mobilecommunitydesign.com/research/comparison/mobile_research_method_review.html>

Do New Technologies Change Methods of Research?

<http://en.ejo.ch/2162/new_media/do-new-technologies-change-methods-of-research>

Prezi Presentation: New fields and methods for research in urban design: digital technology

<http://prezi.com/agzfnfueeflw/new-fields-and-methods-for-research-in-urban-design-digital-technology/>

Grant Overview for New Methods for Assessment of Pollution Prevention Technologies

<http://cfpub.epa.gov/ncer_abstracts/index.cfm/fuseaction/display.abstractDetail/abstract/955/report/0>

Website for Emerging Technologies

<http://www.popularmechanics.com/technology/>

Website for New Technologies

<http://www.scidev.net/en/new-technologies/>

Website for New Technologies

<http://www.gizmag.com/>

**GENERAL RESOURCES**

Slashdot, News for Geeks

<http://hardware.slashdot.org>

Make Magazine

<http://www.makezine.com/>

BoingBoing?: A Directory of Wonderful Things

http://www.boingboing.net/

Stumble Upon- very useful for stumbling upon website that match your interests.

<http://www.stumbleupon.com>

R&D Magazine
<http://www.rdmag.com/>

Engadget
<http://www.engadget.com/>

Gizmodo, the Gadget Guide
<http://gizmodo.com/>

Popular Science online
<http://www.popsci.com/>

**\*INFORMATION LITERACY AND DESIGN**

(forms of technical documentation)

Scientists Develop 'Weather Maps' for Disease (visual graphing)

<http://www.smartplanet.com/blog/pure-genius/scientists-develop-8216weather-maps-for-disease/3263>

Supramaps (like the one above)

<http://supramap.osu.edu/>

Make your own Supramap (registration needed)

<http://supramap.osu.edu/login/login>

Periodic table of visualization methods

<http://www.visual-literacy.org/periodic_table/periodic_table.html>

Martin Wattenberg – A Net Art Idea Line
<http://artport.whitney.org/commissions/idealine.shtml>

Visual Dictionary

<http://www.visuwords.com/>

Visual Thesaurus

<http://www.visualthesaurus.com/>

**\*JOURNALISM AND TECHNOLOGY**

(subtopic: Citizen Journalism)

Twitter: The New Frontier of Journalism

<http://blogs.msdn.com/b/stevecla01/archive/2009/01/18/twitter-the-new-frontline-of-journalism.aspx>

On Real Player Site:

<http://www.real.com/resources/citizen-journalism-sites>

Citizen Journalism: Tips and Tricks for Capturing and Sharing Video News<http://www.real.com/resources/citizen-journalism>

Real Time Citizen Journalism in Mumbai Terrorist Attacks
<http://www.flickr.com/photos/gauravonomics/sets/72157610357499942/>

Link to Mashables articles on Citizen Journalism

<http://mashable.com/category/citizen-journalism/>

Articles vary from how to use the "face blur tool" on youtube, to Instagram gaining on Twitter for c.j. after/during Sandy, and how severe weather reporters are looking to c.j. for 'ground truths.'

Journalist Deaths, Technology And Citizen Journalism — The Times They Are A Changing

<http://www.mintpress.net/journalist-deaths-technology-and-citizen-journalism-the-times-they-are-a-changing/>

How Stuff Works: Citizen Journalism

<http://people.howstuffworks.com/citizen-journalism.htm>

**\*BIO/ARTIFICIAL INTELLIGENCE**

(cyborgs, The ethical, political, and philosophical questions that are being raised by rapid advances in biotechnology)

Kurzweilai: Accelerating intelligence

<http://www.kurzweilai.net/>

A Framework for Thinking Ethically About Human Biotechnology

<http://www.scu.edu/ethics/publications/submitted/mclean/biotechframework.html>

Biotechnology Ethics Blog

<http://biotechethicsblog.com/>

New APPS: Art, Political, Philosophy, and Science Blog

<http://www.newappsblog.com/2013/01/rig-hughes.html>

Cyborgology Blog

<http://thesocietypages.org/cyborgology/>

Focuses on both the promise and perils of life's ever increasing interaction/inseparability with tech

RSS Feed for Cyborgs

[http://blogs.discovermagazine.com/sciencenotfiction/category/cyborgs/ - .UPmeVqHBMec](http://blogs.discovermagazine.com/sciencenotfiction/category/cyborgs/#.UPmeVqHBMec)

What Sorts of People Blog

<http://whatsortsofpeople.wordpress.com/>

Blog concerning human variation, normalcy, and enhancement.

Scientists Engineer a Cyborg Jellyfish

<http://io9.com/5928117/scientists-engineer-a-cyborg-jellyfish-from-rat-cells-and-silicone>

PACE: Programmable Artificial Cell Evolution <http://www.istpace.org/Web_Final_Report/the_pace_report/index.html>

Bioart: Eduardo Kac Transgenic works and other living pieces <http://www.ekac.org/transgenicindex.html>

Living camera uses bacteria to capture image

<http://www.newscientist.com/article/dn8365-living-camera-uses-bacteria-to-capture-image.html>

RepRap?, Replicating Rapid-prototyper

<http://www.reprap.org/wiki/Main_Page>

**\*ROBOTICS AND NEW TECHNOLOGIES**

Trends in Robotics News

<http://www.roboticstrends.com/>

NYT: New Breed of Robotics Aims to Help People Walk Again

<http://www.nytimes.com/2012/09/12/technology/wearable-robots-that-can-help-people-walk-again.html?_r=0>

NASA space elevator

<http://science.nasa.gov/science-news/science-at-nasa/2000/ast07sep_1/>

Intro to Nanotechnology

<http://inventors.about.com/od/nstartinventions/a/Nanotechnology.htm>

Cornell researchers build a robot that can reproduce
<http://www.youtube.com/watch?v=VyzVtTiax80>

<http://www.boingboing.net/2005/05/11/selfreplicating_robo.html>
<http://botropolis.com/?p=4321>

<http://www.engadget.com/2005/05/11/self-replicating-robots-the-end-is-near/>

NASA and Self-Replicating Systems <http://www.zyvex.com/nanotech/selfRepNASA.html>

The Machine that Can Copy Anything <http://www.cnn.com/2005/TECH/06/02/tech.reprap/index.html>

Machines: Visual images in nanotechnology
<http://www.zyvex.com/nanotech/visuals.html>

Architectural Considerations for Self-replicating Manufacturing Systems Foresight Nanotech Institute

<http://www.foresight.org/Conferences/MNT6/Papers/Hall/index.html>

Self-Replication and Pathways to Molecular Nanotechnology <http://www.imm.org/Reports/Rep021.html>

"Extreme Textiles: Designing for High Performance", an exhibit that was shown at the Cooper-Hewitt National Museum of Design in 2005:

<http://ndm.si.edu/EXHIBITIONS/extreme_textiles/index.asp>

The Website of Robert A. Freitas Jr. (includes a number of links to books on nanotechnology, self-replication, etc)

<http://www.rfreitas.com/>

Terraforming Mars and Venus Using Machine Self-Replicating Systems (SRS)

<http://www.rfreitas.com/Astro/TerraformSRS1983.htm>

Island One Society (links to off-Earth colonization topics):

<http://www.islandone.org/>

NASA’s short history of robots:

<http://prime.jsc.nasa.gov/ROV/history.html>

Orion's Arm (or "OA" for short) is an online science fiction world-building project:

[http://en.wikipedia.org/wiki/Orion's\_Arm](http://en.wikipedia.org/wiki/Orion%27s_Arm)<http://www.orionsarm.com/>

Shear Thickening Fluid (Fabric technology that hardens on impact) <http://www.ccm.udel.edu/STF/pubs1.html>

SwarmBot?: Self-Assembling Robots for Planetary Precolonization <http://www.physorg.com/news91372110.html>

Jump Rope Robot

<http://www.engadget.com/2007/03/28/omnizero-4-bot-performs-amazing-feats-of-strength-rope-jumping/>

SuperBot? (Reconfigurable robot made out of identical links) <http://www.isi.edu/news/news.php?story=160>

Wikipedia: Philosophy of AI

<http://en.wikipedia.org/wiki/Philosophy_of_artificial_intelligence>

Podcast on Robots and Philosophy of Robotics

<http://www.robotspodcast.com/podcast/2008/02/talking-robots-philosophy-robotics/>

**\*HISTORY OF INTERNET**

Animated Documentary: History of the Internet

<http://www.youtube.com/watch?v=9hIQjrMHTv4>

History of the Internet

<http://walthowe.com/navnet/history.html>

Hobbes' Internet Timeline v8.2
<http://www.zakon.org/robert/internet/timeline/>

Simile Timeline
<http://code.google.com/p/simile-widgets/wiki/Timeline>

Short History of the Internet by Bruce Sterling (free ebook download)
<http://ebookbrowse.com/bruce-sterling-a-short-history-of-the-internet-pdf-d14603487>

Brief History of the Internet

<http://www.internetsociety.org/internet/what-internet/history-internet/brief-history-internet>

**\*HISTORY OF THE WWW**

Evolution of the web: Inforgraphic!

<http://www.evolutionoftheweb.com/>

A Little History of the World Wide Web
<http://www.w3.org/History.html>

Overview of Berners-Lee's "Weaving the Web"

<http://www.w3.org/People/Berners-Lee/Weaving/Overview.html>

History of Internet and WWW: The Roads and Crossroads of Internet History
<http://netvalley.com/intval1.html>

History of the web

<http://www.webfoundation.org/vision/history-of-the-web/>

World Wide Web - Origins and Beyond

<http://zeltser.com/web-history/>

**\*HISTORY OF COMPUTING**

*For this one, there are lots of timelines, we can pick three of those, but Im more interested in essays in the context of the relationship of military technology to civilian use, NASA, ARPA, i.e, computing from ARPA through personal computing and future of ever shrinking devices.*

Tracking Military tech to civilian use

<http://www.aeragon.com/>

Military Inventions hit Consumer Markets

<http://www.csmonitor.com/Innovation/Tech-Culture/2008/0619/built-for-battle-but-perfect-in-peacetime>

The Military-Consumer Complex

<http://www.economist.com/node/15065709>

The Widening Gap Between Military and Society

<http://www.theatlantic.com/magazine/archive/1997/07/the-widening-gap-between-military-and-society/306158/>

Military, Brain Research, and National Defense, an interview with Jonathan Moreno, director of Center for Biomedical Ethics and author of *Mind Wars*

<http://neurophilosophy.wordpress.com/2006/11/23/podcast-jonathan-moreno-on-mind-wars/>

Stanford Encyclopedia of Philosophy: Computing History

<http://plato.stanford.edu/entries/computing-history/>

Alan Turing archives

<http://www.alanturing.net/turing_archive/archive/index/aceindex.html>

Technologies coming to your ever shrinking microchop

<http://globaltechnologyfutures.com/future-technologies-coming-to-your-ever-shrinking-microchip/>

Nanophotonics

<http://www.almaden.ibm.com/st/past_projects/nanophotonics/>

The Incredible Shrinking Chip Industry

<http://spectrum.ieee.org/tech-talk/semiconductors/devices/the-incredible-shrinking-chip-industry>

Nanowires and the Shrinking Microchip

<http://www.pbs.org/wgbh/nova/education/tech/nanowires.html>

**\*HISTORY OF GUI (Graphical User Interface) AND FUTURE OF HUMAN/COMPUTER INTERACTION**

(i.e, new “GUIs." w/ regard to History of the GUI, PARC: The Palo Alto Research Center of Xerox, Past and Present Alternatives to the Desktop Metaphor)

Future of GUI is Demoed

<http://techhaze.com/2010/06/the-future-of-our-gui-is-demod/>

Future of GUI Is Near

<http://www.slideshare.net/joebaf/wpf-future-of-gui-is-near>

GUI: Time for a Change?

<http://www.sensomatic.com/chz/gui/Alternative.html>

Farewell Desktop Metaphor

<http://matthieu.yiptong.ca/2012/03/04/farewell-desktop-metaphor/>

Overview of Book: Beyond the Desktop Metaphor

<http://mitpress.mit.edu/books/beyond-desktop-metaphor>

Lifestreams: An Alternative to the Desktop Metaphor (Overview of Concept)

<http://www.sigchi.org/chi96/proceedings/videos/Fertig/etf.htm>

Mini Documentary on PARC

<http://www.youtube.com/watch?v=AF6fragPwVY>

Xerox PARC: A Brief Nod to the Minds Behind Laser Printing, Ethernet, the GUI and More

<http://www.techspot.com/guides/477-xerox-parc-tech-contributions/>

**\*ETHICS, LAW, ETC.**

(Intellectual property, Censorship, Cybercrime US law and International Internet related Conventions and Treaties. Electronic Privacy, Medical Privacy, Privacy Laws, Surveillance, Profiling, Data Mining, The Patriot Act)

Cyberprofiling: Darker side of data analytics

<http://www.smartplanet.com/blog/business-brains/the-darker-side-of-data-analytics-cyber-8216profiling/24919>

Profiling and Categorizing Cybercriminals

<http://www.techrepublic.com/blog/security/profiling-and-categorizing-cybercriminals/4069>

Cyber Profiling Pros and Cons

<http://blogs.csoonline.com/cyber_profiling_benefits_and_pitfalls>

Medical Privacy for the Royal and the Rest

<http://www.thehastingscenter.org/Bioethicsforum/Post.aspx?id=6135&blogid=140>

Privacy in Genome Sequencing

<http://www.bioethics.gov/cms/sites/default/files/PrivacyProgress508.pdf>

Bioethics Topics: Privacy

<http://www.bioethics.net/topics/privacy-2/>

Internet Censorship: China Digital Times

<http://chinadigitaltimes.net/china/internet-censorship/>

Google Battles UN Internet Proposal, Censorship

<http://www.theepochtimes.com/n2/technology/google-un-itu-internet-censorship-december-china-russia-317195.html>

News, censorship and defiance on Internet Freedom Day

<http://www.zdnet.com/news-censorship-and-defiance-on-internet-freedom-day-7000010020/>

How Stuff Works: Internet Censorship

<http://computer.howstuffworks.com/internet-censorship.htm>

Neuroethics and Law Blog

<http://kolber.typepad.com/>

A Fair(y) Use
<http://www.youtube.com/watch?v=CJn_jC4FNDo>

**TECHNOLOGY AND ART**

(contemporary artists providing critical commentary on the intersections of art, technology, theory, and politics)

The Art and Films of Lynn Leeson Hershman

<http://www.lynnhershman.com/>

Critical Art Ensemble web site

<http://www.critical-art.net/>

Critical Art Ensemble Defense Fund

<http://www.caedefensefund.org/>

**\*VIRTUAL WORLDS and GAMING**

(Massively Multiplayer Games (MMOs) - Second Life, Virtual Economies, Virtual Violence, virtual worlds and face-to-face culture)

Carnegie Mellon Entertainment Technology Center
<http://www.etc.cmu.edu/>

Game Studies
<http://gamestudies.org/>

Games for Change
<http://www.gamesforchange.org/>

*GREAT* Podcast on the End of Sims Online (like Second Life)

<http://www.voicebase.com/voice_file/public_detail/50292>

Finally, a First Person Game Without a Gun

<http://moreintelligentlife.com/story/finally-first-person-game-without-gun>

News, research and discussion on virtual goods, currencies and economies globally

<http://virtual-economy.org/>

Opinion: Tacit Knowledge in Virtual World

<http://virtualcultures.typepad.com/virtualcultures/2007/09/tacit-knowledge.html>

Virtual Worlds as a Means to Promote Inter-cultural Communications

<http://voices.yahoo.com/virtual-worlds-as-means-promote-inter-cultural-8517479.html>

**\*GLOBAL COMMUNITY and COMMUNICATION, TELEPRESENCE**

(wikis, discussion boards, blogs, web sites; how technology transfers into cultures with different values, language and traditions, bounded, geographical communities vs public networked communities)

Amor Mundi Blog

<http://amormundi.blogspot.com/>

Again, more generally on technology and democracy, which I find relevant to cultural and political values. The tagline is " Using Technology to Deepen Democracy, Using Democracy to Ensure Technology Benefits Us All." It can be a bit depressing and inflammatory, but most of his arguments are really good, and, frankly, he's a good grounding force when talking realistically about techno-progressivism.

Institute for Ethics and Emerging Technologies, Blog

<http://ieet.org/index.php/IEET/IEETblog>

Though a general blog on technology, ethics, and emerging technologies, they often focus on sensitive implications. There's also a lot on human enhancement.

Consumer Technology: Technology keeps Global Community in Touch

<http://www.interestalert.com/story/10190000aaa00b28.ar/consumer-technology/A1CONSTE/consumer_technology.html>

Connecting the Global Community in Micro and Nano Technology

<http://www.azonano.com/article.aspx?ArticleID=2614>

World Economics Forum: Technology and the Employment Challenge

<http://forumblog.org/2013/01/technology-and-the-employment-challenge/>

Social Networks and Social Capital: Rethinking Theory in Community Informatics

<http://www.ci-journal.net/index.php/ciej/article/view/465/430>

Stanford Encyclopedia of Philosophy: Tech and Moral Values

<http://plato.stanford.edu/entries/it-moral-values/>

Technology and Cultural Aspects: Blog

<http://translation-blog.trustedtranslations.com/technology-and-cultural-aspects-2010-08-30.html>

Paper: Evaluating Social and Cultural Implications

<http://www.ethicsandtechnology.eu/images/uploads/a1-brey.pdf>

Impact of information and communication technologies on indigenous cultures

<http://www.ethicsandtechnology.eu/images/uploads/a1-brey.pdf>

Ken Goldberg: Intro to “Robot in the Garden”
[http://ieor.berkeley.edu/%7Egoldberg/art/tele/intro.html](http://ieor.berkeley.edu/~goldberg/art/tele/intro.html)

**ARCHITECTURE**

Earthship Biotecture, self-sustaining and sustainable habitats that do not require prior infrastucture.

<http://www.earthship.org/>

Fab Tree Hab, A living habitat designed by MIT

<http://www.archinode.com/bienal.html>

Interactive Architecture

<http://www.interactivearchitecture.org/interactive-architecture-eyebeam-new-york.html>

The Salt Mines at Wieliczka, Poland <http://academic.emporia.edu/aberjame/ice/lec14/wielicz.htm>

<http://www.thesalmons.org/lynn/saltmine.html>

The Stanford Prison Experiment.

<http://www.prisonexp.org/index.html>

<http://www.prisonexp.org/epilogue.htm>

Translation of the play R.U.R. by Karel Čapek

<http://www.gutenberg.org/etext/13083>

**LABS, ORGANIZATIONS**

Artifical Intelligence Laboratory, University of Zurich
<http://ailab.ifi.uzh.ch/>

Fab Labs, educational outreach component for the Center for Bits and Atoms (CBA) at M.I.T.

<http://fab.cba.mit.edu/>

**THEATER**

Charles Mee: the (re)making project
<http://www.charlesmee.org/indexf.html>

3LeggedDog
<http://3leggeddog.org/mt/>

Troika Ranch
<http://www.troikaranch.org/>
<http://www.youtube.com/troikaranch>

Troikatornix
<http://troikatronix.com/>

Hamlet on the Holodeck by Janet Murray
<http://www.altx.com/ebr/ebr7/7mur.htm>
<http://portal.acm.org/citation.cfm?id=572887>

**HYPTERTEXT HYPERMEDIA**

SWITCHING- A feature film

<http://www.switching.dk/en/>

Electronic Literature Directory
<http://directory.eliterature.org/>

Eastgate (publishers)
<http://www.eastgate.com/>

Stuart Moulthrop’s Chronology of Hypertext
<http://iat.ubalt.edu/moulthrop/chrono.html>

Monks Helpdesk
<http://www.youtube.com/watch?v=4pyjRj3UMRM>

Remake in English: <http://www.youtube.com/watch?v=yUQRbqc2qtY&NR=1>

**ETC.**

Walter Benjamin, "The Work of Art in the Age of Mechanical Reproduction"

<http://frankfurtschool.wordpress.com/2008/02/28/summary-the-work-of-art-in-the-age-of-mechanical-reproduction/>

Camille Utterback, TEXT RAIN
<http://www.camilleutterback.com/textrain.html>