

Proposal to the University Curriculum Committee/Freshman Inquiry Course
Cyborg Millenium

I. Cover Sheet

Course title **Entering the Cyborg Millenium: Transforming Technology and Human Society**

Date first offered Fall 1999

Sections per year 3-4

Statement of theme We will explore the dynamic interrelationships of technological change and human experience.

Signatures of participating faculty:

Yves Labissiere Yves Labissiere^{mw} 5/20/99
Name Signature (on leave) Date

Paul Latiolais Paul Latiolais 5/19/99
Name Signature Date

Margot White Margot White 5/19/99
Name Signature Date

Unnamed Faculty _____ _____
Name Signature Date

Contact Faculty:

Margot White UNST 5-3304 (w) 239-5642 (h) whiteml@irn.pdx.edu
Name Mail code Telephone (work, home) Email

II Course Narrative

A. Statement of theme/topical area:

20th century revolutions in quantum physics, information technology, and genetics will profoundly alter human experience in the 21st Century. This course explores the impact of computers, genetic engineering, particle physics and new imaging technologies on, among other things, concepts of humanity, society, privacy and cultural identity. We will look at changes underway in social relations,

Proposal to the University Curriculum Committee/Freshman Inquiry Course Cyborg Millenium

legal doctrines, political values, and environmental consciousness. From workplace surveillance to email retrieval, from pre-natal genetic screening to cloning, from human consciousness to artificial intelligence – students will consider the dangers, opportunities and ethical ambiguities inherent in new technologies. Through stories, films, case studies, field research, art, books and original projects, students will have a wide range of outlets through which to explore and express their own questions and ideas, and to mediate among differing viewpoints.

B. Learning objectives specific to this theme:

By the end of this course, students should be able to:

- Explain and discuss basic genetic structures and functions
- Identify the scientific and philosophical underpinnings of various genetic theories and technologies
- Articulate their own visions of family and community in the next century
- Identify the ethical dimensions of various scientific and technological developments
- Mediate among conflicting perceptions, needs and interests concerning workplace or environmental changes
- Discuss the legal and political issues embedded in information technologies and imaging equipment
- Present the results of independent and group research to peers
- Imagine and describe the experiences of indigenous cultures with information technologies
- Evaluate their own expectations and responsibilities towards fellow humans, nature, culture and society

C. Assessment of student learning (specific to theme):

Assessment of student learning in this theme will be based on weekly written journal submissions; graded research projects and essays; observed development of skills in articulating and mediating different viewpoints; measured evaluation of theme-specific knowledge, such as genetics; various assignments requiring organization of visual, graphic and other materials to illustrate or interpret subject matter. Over the year, students' grades will be apportioned as follows: group projects 25%; term papers 25%; journals and portfolios 25%; class participation 25%.

D. Description of methods to ensure coherence of theme across participating faculty.

The "Cyborg Millenium" team will meet weekly during the year to exchange ideas and experiences, share new projects or materials to enrich the ongoing class experience, and deepen faculty interactions. The team will utilize a common core of readings and assignments and each team member will visit the others' classes regularly. In addition to the weekly meetings, a longer meeting will be scheduled at the end of each term to share and refresh experiences, review goals, and assess perceptions of student needs and progress.

E. Interdisciplinarity of theme:

The "Cyborg Millenium" team consists of one mathematician (Latiolais), one psychologist (Labissiere), one attorney/bioethicist (White) and an unknown, whom we hope will be from the arts. We include two mediators (White and Labissiere) and, as a team, are of varied cultural backgrounds and multinational living experiences.

F. Relation of course to other University Studies offerings (cohesion, ties to future learning):

The theme grew, in part, out of a SING course entitled "Freedom, Privacy and Technology", and would lead to other offerings in the cluster of the same name, although it is not tied formally to it. Several clusters presently exist that would enable students to deepen and expand interests in science and society ("Science and the Humanities"), biology ("Natural Science Inquiry"), ethics and social responsibility ("Freedom, Privacy and Technology" and "Professions").

Proposal to the University Curriculum Committee/Freshman Inquiry Course
Cyborg Millenium

G. How this theme will address the University Studies Goals:

University Studies Goal	Representative Assignments	Assessment Plan/Type
Communication: Writing	Each term: weekly journals; One creative writing piece; One 7-8 pp research paper; additional written work	UNST writing assessment; Theme-specific pre- and post-course evaluations graded writing on a 5-point rubric
Graphics	1 st term: graphic comparisons of data on biotech patents; in biodiversity; and populations of indigenous cultures over 20 th century; projects to illustrate how graphics can convey or distort information with graphics;	Assess organization and clarity of data and written interpretation; also 1 st experience of peer evaluation
Oral Communication	All terms, presentations to class of work results; role playing in mediation; class discussions; a class-wide newsletter, assembled and published by students, chronicling their ongoing learning experiences	Organization, ability to connect to others, eye contact, articulation of main points, ability to crystallize concepts
Numeracy	Each term: media use and misuse of statistics; stories with mathematics; particles & very small numbers; cosmology & very large numbers; project analyzing use of DNA statistics in criminal trials..	Evaluate critical reasoning in interpretations of statistics; assess creativity in using very large and very small numbers
Visual Communication	Each term: selection of images of computers from popular media, analysis of underlying values, contextual meaning, ideological significance; critical analysis of art, film, graphics, advertising and other images used to illustrate text or stand alone	Assess creativity, reflection, self-expression, ability to interpret and articulate value content, bias, agenda
Group Process	Group projects: 1 st term set up a biotech corporation with bylaws, R&D, budget, bd of dirs, rules on use of computers, security and surveillance. 2nd term role play the	Students assess each other within the group and submit evaluations; follow up is provided to improve contributions and skills

Proposal to the University Curriculum Committee/Freshman Inquiry Course
Cyborg Millenium

	<p>cultural dimensions of environmental decision making the story of the "killer robot"; student newsletter is an ongoing group process; 3rd term dramatize the story of the "killer robot"; student newsletter is an ongoing group process</p>	<p>(mentors will be trained in group process as well)</p>
<p>Computer literacy</p>	<p>Each term: progressing over the year from basic skills training web searches, email, excel, to power point and web pages; projects for class presentations will require use of these programs.</p> <p>All students will write one paper on their predictions re: Y2K, with well supported arguments and justification for their views; all will write one post Y2K paper about what actually happened.</p>	<p>Class presentations; observations of peer mentors; evidence from use of skills in written work and special projects.</p>
<p>Inquiry and Critical Thinking</p>	<p>Use of text on critical thinking to guide acquisition of skills throughout course; specific units for class debate: security and privacy at work; choice and coercion in reproduction; violence and values; teaching quantum to a sixth grader</p>	<p>Assess students' flexibility, inquisitiveness, openness to new ways of thinking, ability to view different perspectives, trust in a reasoning process, and progression from bias to reasoned inquiry and opinion</p>
<p>Diversity and Human Experience</p>	<p>Each term, groups of 3-4 will be assigned one indigenous population to study and research in terms of its experience with technologies; e.g. the Ogoni of Nigeria; the Inuit of Alaska; Indians of Peru; the Internet in Sub-Saharan Africa; cell phones in India; Native American burial grounds and nuclear waste;</p>	<p>Assess ability to engage in and convey to others the depth and richness of diverse experiences, appreciate the interaction of resistance and survival; readiness to acknowledge the priority of other values;</p>
<p>Ethics and Social Responsibility</p>	<p>Enactment of real life cases involving ethical choices and conflicting interests; role playing and mediation of complex decisions involving ethical issues; dramatization of fictionalized cases such as "The Killer Robot," illustrating the ethics of software engineering; each term will highlight the life story of a morally courageous individual</p>	<p>Students will enact and role play issues from contrasting viewpoints; assessment will focus on ability to identify key ethical dimensions, highlight alternatives, refer to established codes or guiding principles, reason through choices, recognize stages in decision making, develop flexible and</p>

Proposal to the University Curriculum Committee/Freshman Inquiry Course
Cyborg Millenium

	(Challenger engineer) or ethically charged project, (mapping the DNA of Iceland)	creative strategies for resolution.
--	--	-------------------------------------

II. Course Schedule and Topics

TERM	TOPICAL OUTLINE	FACULTY
Fall Term	<p>Historical Background - :</p> <ul style="list-style-type: none"> ▪ Eugenics in US and Europe; postwar studies of DNA damage from radiation; discovery of double helix; origins of the Genome Project. ▪ 20th century physics in brief – from theory to applications (e=mc² to Hiroshima); ▪ Overview of codes of ethics in science, medicine, engineering, human experimentation. ▪ Ethics in science -- from Nuremberg to Dolly <p>Topics:</p> <ul style="list-style-type: none"> ▪ Science as a way of knowing ▪ Evolution of sciences; relationship of physical sciences and social sciences; where do social sciences fit? ▪ Science and ethics; from laboratories and research to social and political impact of applied science ▪ Concepts of indeterminacy, uncertainty; determinism and reductionism in science; what is meant by scientific method ▪ Myths we live by; personal and cultural myths ▪ Gender and race in 20th century science and medicine; Why do we keep statistics by race? ▪ Ethics cases from science and engineering: Milgram's experiment on obedience; Challenger engineer case ▪ Ideology of development; global perspectives ▪ Mapping the DNA of Iceland; biopiracy ▪ Law and ethics in bioethics: genetics; designer babies; cloning; patenting life ▪ Gene as cultural icon; genes as causes; genetic myths and facts ▪ Manipulating genes; engineering life ▪ Body parts: property, ownership and identity; body as machine ▪ Predicting Y2K – “What do you think will happen?” 	All
Winter Term	<p>Historical Background:</p> <ul style="list-style-type: none"> ▪ History of computers from Babbage to Turing to modern computers; role of women in development of computers ▪ Story behind the internet ▪ Overview of constitutional law ▪ History of right of privacy ▪ Relationship of humans and machines: overview of meanings and myths; ideology and image 	All

Proposal to the University Curriculum Committee/Freshman Inquiry Course
Cyborg Millenium

	<ul style="list-style-type: none"> ▪ What actually happened at Y2K? <p>Topics:</p> <ul style="list-style-type: none"> ▪ Encryption and the First Amendment ▪ Privacy and the internet; freedom of speech and the web – anti-abortion website case ▪ The Constitution in cyberspace ▪ Interactions of science and art: fractals and images from cyberia; Escher and images of non-Euclidean geometry, gravity, relativity ▪ DNA databases; law enforcement and social control; DNA in the courts; dealing with probabilities; ▪ Is Big Brother here? electronic search and seizure; wiretapping and the 4th Amendment ▪ Dangerous diagnostics: Testing in schools and the workplace – the social power of biology ▪ Computers and our connection with reality: film, video games and virtual reality; confusing image and reality ▪ Technology and indigenous peoples: Haves and have-nots in the Information Age; impact of the internet on non-western cultures ▪ Studies of visual images of violence and effect on propensities to commit violence; analysis of video game ideologies ▪ Computer ethics: role playing cases ▪ Changing concepts of personal identity and individuality 	
<p>Spring Term</p>	<p>Background:</p> <ul style="list-style-type: none"> ▪ 20th Century science fiction: utopias and dystopias ▪ Controversies in quantum theory; quanta and strings; neutrinos and chaos ▪ Is it the end of science? ▪ History of artificial intelligence projects ▪ The search for a theory of everything <p>Topics:</p> <ul style="list-style-type: none"> ▪ The surveillance society – security or social control? ▪ Global media: information or ideology? ▪ How simulation is affecting our notions of mind, body, self and machine ▪ Nature bites back: hunger, population and biodiversity ▪ Impact of global "bioprospecting" on indigenous populations ▪ Viruses and the coming plague ▪ Quantum physics and superstrings ▪ Mind and consciousness ▪ Exploring the universe ▪ Representations of technology in art and film <p>Concluding issues:</p> <ul style="list-style-type: none"> ▪ Remaining mysteries: life, consciousness, humor, love and a theory of it all ▪ Decision making and social responsibility: knowing what 	<p>All</p>

Proposal to the University Curriculum Committee/Freshman Inquiry Course
Cyborg Millenium

	you think <ul style="list-style-type: none">▪ Conflict resolution for the millenium▪ Future of human rights and indigenous peoples▪ Creating a new society – visions of a better world▪ Transformations: the future is now	
--	---	--

IV. Preliminary reading list: (selections from the following may be assigned)

Agre, Philip and Rotenberg, Marc, *Technology and Privacy: The New Landscape*, MIT Press (1998)

Bender, Gretchen and Drucker, Timothy, eds., *Culture on the Brink: Ideologies of Technology*, Bay Press (1994)

Branscomb, Anne Wells, *Who Owns Information? From Privacy to Public Access*, Basic Books (1994)

Cook-Deegan, Robert, *The Gene Wars: Science, Politics and the Human Genome*, W.W. Norton (1994)

Davis, Jim, Hirschl, Thomas and Stack, Michael, eds., *Cutting Edge: Technology, Information, Capitalism and Social Revolution*, Verso 1997

DeCew, Judith Wagner, *In Pursuit of Privacy: Law, Ethics, and the Rise of Technology*, Cornell University Press (1997)

Diffie, Whitfield and Landau, Susan, *Privacy on the Line: The Politics of Wiretapping and Encryption*, MIT Press (1998)

Dyson, Freeman J, *Imagined Worlds*, Oxford University Press (1998)

Dyson, Freeman J., *The Sun, The Genome, & The Internet: Tools of Scientific Revolutions*, Oxford University Press (1999)

Dyson, George B., *Darwin Among the Machines: The Evolution of Global Intelligence*, Addison-Wesley (1997)

Gould, Stephen Jay, *The Mismeasure of Man*, W.W. Norton (1981)

Harding, Sandra, *The "Racial" Economy of Science: Toward a Democratic Future*, Indiana University Press (1991)

Herman, Ed, *The Global Media: The Missionaries of Global Capitalism*, Cassell (1997)

Hubbard, Ruth and Wald, Elijah, *Exploding the Gene Myth: How Genetic Information is Produced and Manipulated by Scientists, Physicians, Employers, Insurance Companies, Educators*, Farrar Strause & Geroux (1994)

Kaku, Michio *Visions: How Science Will Revolutionize the 21st Century*

Lyon, David., *The Electronic Eye: The Rise of Surveillance Society*, Univ. of Minnesota (1994)

Proposal to the University Curriculum Committee/Freshman Inquiry Course
Cyborg Millenium

Mander, Jerry, *In the Absence of the Sacred: The Failure of Technology and the Survival of the Indian Nations*, Sierra Club Books (1992)

Nelkin, Dorothy & Lindes, M. Susan, *The DNA Mystique: The Gene as Cultural Icon*, W.H. Freeman (1996)

Nelkin, Dorothy and Tancredi, Laurence, *Dangerous Diagnostics: The Social Power of Biological Information*, University of Chicago (1994)

Nelkin, Dorothy, *Selling Science: How the Press Covers Science and Technology*, W.H. Freeman (1995)

Paul, Gregory S. & Cox, Earl D., *Beyond Humanity: Cyberevolution and Future Mind*, Charles River Media (1996)

Postman, Neil, *Technopoly: The Surrender of Culture to Technology*

Rifkin, Jeremy, *The Biotech Century: Harnessing the Gene and Remaking the World*, Putnam (1998)

Ruggiero, Vincent Ryan, *The Art of Thinking: A Guide to Critical and Creative Thought*, 5th ed. Addison-Wesley (1998)

Shulman, Seth, *Owning the Future: Inside the Battles to Control the New Assets*, Houghton Mifflin Co. (1999)

Staples, William G., *The Culture of Surveillance: Discipline and Social Control in the US*, St. Martin's Press (1997)

Teich, Albert H., *Technology and the Future*, St. Martin's Press and AAAS (1997)

Tenner, Edward, *Why Things Bite Back: Technology and the Revenge of Unintended Consequences*, Alfred A. Knopf (1996)

Turkle, Sherry, *Life on the Screen*, Simon & Schuster (1995)

Van Dijck, Jose, *Imagination: Popular Images of Genetics*, NYU Press (1997)

Winner, Langdon, *The Whale and the Reactor: A Search for Limits in an Age of High Technology*, University of Chicago (1991)

Wresch, William, *Disconnected: Haves and Have-nots in the Information Age*, Rutgers University Press (1994)