**I. Cover sheet**

Course title: Design and Society

Date first offered: Fall, 2004

Sections per year: 4

Statement of theme: Designers influence the environments surrounding us and act to solve problems facing their communities by developing pragmatic, creative and innovative solutions. This course will use designers' activities as an analogy for individuals in all disciplines, and will use hands-on activities, case studies, and historical investigations to explore techniques for design, visualization, and creative problem solving.

Signatures of participating faculty:

| Carol Hasenberg | | November 1, 2004 |
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| Name | signature | date |

| Sukhwant Jhaj | | November 1, 2004 |
|---|---|---|
| Name | signature | date |

| Betsy Natter | | November 1, 2004 |
|---|---|---|
| Name | signature | date |

| Mark Trowbridge | | November 1, 2004 |
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## II. Course Narrative

A. Statement of theme/topic area:

Designers influence the creation of products, images, infrastructure and environments surrounding us, both virtual and real. Acting in a deliberate manner, designers engage with the problems facing their communities, and act to solve them by developing pragmatic, creative and innovative solutions. This course will use designers' activities as an analogy for individuals in other disciplines; in the end, everyone is a designer as they determine the context and direction of their life. Using design as our focus, we will explore individual responsibilities toward society: How can we act to bridge the gap between design and ecological sustainability? How can individuals acting locally compete within the global economy? Using hands-on activities, case studies, and historical investigations, we will explore techniques for design, visualization, and creative problem solving, and share our visions for a future where designing, and by extension all activity, occurs in harmony with natural systems.

B. Learning objectives (specific to theme)

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

- Apply the steps in the design process to create original designs.
- Understand the interdisciplinary nature of the design process.
- Understand how designers acting locally can compete in the global marketplace.
- Describe how design can improve social and physical systems and explain the societal responsibilities of the designer in areas such as sustainable development and social justice.
- Demonstrate mathematics skills, including application of basic physical laws to contextual problems, testing the functionality of designs, setting and meeting benchmark requirements.
- Analyze a design in terms of the context of the systems in which it operates - human interaction with the design, cultural context, natural harmony, and technical functionality
- Design and solve problems in a team-based culture using effective communication, cooperation, trust and respect. Take advantage of individual thinking styles and cultural diversity to strengthen a team.

C. Assessment of student learning (specific to theme)

Assessment learning for this theme will be based on reflection papers covering assigned readings, discussions, and teamwork; research papers and essays; participation in individual and team-based design projects; design project products; oral presentations; and individual portfolios.

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

The "Design and Society" has been meeting weekly since the summer of 2004. Weekly planning meetings will continue throughout the academic year. Required textbooks are chosen jointly. Handouts, projects, schedules, and assignments are distributed electronically. Visiting presentations from other team members are given in every section of the course

E. Interdisciplinarity of theme

Our faculty team has expertise in architecture and architectural history, art history, landscape design, structural engineering, studio art, theater history, electrical engineering, and semiconductor physics. Other disciplines represented in the course materials (see Section IV) include social history, film, economics, business ethics, ecology, product design, and industrial design.

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

"Design and Society" is not formally tied to other University Studies offerings. The course focuses intently on the activities of the designer, but it does not attempt to isolate itself solely within that (or any single) discipline. As such it might connect well with any of the Clusters. Some that might merit special mention are: Environmental Sustainability, Medieval Studies, Nineteenth Century Studies, Professions and Power, and Renaissance Studies. In addition, students interested in pursuing this direction further may choose courses in engineering, architecture, graphic design, or art history.

G. How this theme will address the University Studies Goals

"Design and Society" will specifically address the question of how students construct their knowledge through their education, and the impact this activity has on the communities they inhabit and/or affect by their actions. Design becomes a metaphor for education: students are designing their futures, and the course uses the activities of the designer to show how students' decisions have implications.

| **University Studies Goal** | **Representative Assignments** | **Assessment Plan/Type** |
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| **Communication**: Writing | Each term: reflection papers and online discussions.<br>1st term: 4-5 page research paper on Brunelleschi, innovation, and/or perspective.<br>2nd term: 6-7 page researched design proposal on individual project.<br>3rd term: 10 page design paper. | UNST writing assessment; theme-specific pre- and post-course writing assessment. |
| **Communication**: Oral Communication | Oral presentations of design project results for group projects 1st and 2nd term and for individual projects 3rd term.<br>Poster session on sustainable design 2nd term.<br>Frequent class discussions and group project work. | Assess content and organization, articulation of main points, eye contact, and effective use of visual aids.<br>Participation in class discussions is judged on preparation and contributions.<br>Peer assessment of presentation. |
| **Communication**: Numeracy | Applying renaissance surveying techniques to measurement of buildings.<br>Measuring and statistically modeling the strength of bridge components and applying the information to bridge design.<br>Designing and programming robots. | Assess application of appropriate quantitative reasoning to solve problem at hand.<br><br>Assess ability to analyze quantitative information. |
| **Communication:** Graphics | Analysis and graphical presentation of strength of materials used in bridge project. | Accurate numerical and graphical analysis of data. Correct application of statistical model in performing designs. |
| **Communication**: Visual Communication | Analyzing perspective in paintings and understanding its implications.<br>Using sketching and perspective drawing to communicate design ideas.<br>Communicating with collage. (Photoshop)<br>Deconstructing advertisements. | Assess creativity, reflection, self-expression, ability to interpret and articulate value content and agenda. |
| **Communication**: Computer Literacy | Robotics design and programming.<br>Use of Excel for data analysis and graphing, e.g. bridge component testing.<br>Creating collages using Photoshop.<br>Power Point presentations.<br>electronic text management<br>Web display of projects and portfolio. | Programming skills judged on robot performance. Other skills judged by mentor observations and evidence from the use of these skills in projects and portfolio. |
| **Communication:** Group Process | Frequent group projects such as bridge design 1st term, robot design 2nd term, and numerous smaller design exercises. Team processes and techniques studied and practiced. | Individual contributions to the group process assessed along with group results.<br>Reflections on group process and individual performance within the group.<br>Students assess each other on major group projects. |
| **Inquiry & Critical Thinking** | The ability to perform critical analysis is an essential part of the design process. Problem solving and judgment skills are critical to the creation of any good design. Students will study and apply problem solving techniques from different disciplines first quarter. They will explore design as a model of inquiry by | Effective use of problem solving techniques will be assessed by evaluating the end products as well as reflections on the process used to produce them.<br>Projects must include thoughtful and thorough analysis of problems and creative solutions to address those |

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| | identifying a problem and developing a solution through an open ended inquiry over winter and spring quarter. Key issues from texts and case studies will be analyzed. | problems. |
| **Diversity of Human Experience** | Historical designers (e.g. Brunelleschi) will be compared to modern designers (IDEO) to explore the cultural environment in which design and technology are developed both historically and in different societies today.<br><br>Students will deconstruct historical and/or contemporary design solutions to explore the ideas of class, gender, and ability. Multinational design projects also require skills in bridging cultural gaps and will be explored in class discussions. | Assess research paper on Brunelleschi. Assess assigned reflection papers. |
| **Ethics and Social Responsibility** | The responsibilities of designers will be studied through stakeholder analysis, product lifecycle analysis and design failures. Creative solutions to environmental challenges will be explored. Real cases will be studied involving individual designers and corporations faced with ethical challenges. Cases include the Narmada Sagar hydroelectric project in India and children's products and risks. | Reflections on case studies will be assessed by the ability to identify key ethical dimensions, highlight alternatives, reason through choices, and develop flexible and creative strategies for resolution. In addition to explaining how an existing design can affect users or entire communities, students must adequately address issues such as product lifecycle, environmental impact, and societal effects in their individual designs. |

**III. Course Schedule and Topics**

Each instructor will be covering all topics, however frequent guest lectures by other team members will be used to capitalize on the different area of expertise of each faculty member.

| TERM | TOPICAL OUTLINE |
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| First Term | Art of Innovation<br>▪ Applying the design process to create design solutions or solve problems.<br>▪ Observing people interacting with their environment to discover design opportunities or create design solutions.<br>▪ Contemporary design culture<br>▪ Improving group and individual creativity.<br>Historic perspective: A study of Filipo Brunelleschi's Santa Maria del Fiore.<br>▪ Historic and social context of design.<br>▪ Discovery of perspective and importance to painting, construction, surveying and society.<br>▪ History of design, designers and artist and design culture.<br>▪ Domes: forces, construction, and building techniques.<br>Bridges<br>▪ Bridge types and why they are selected. Portland bridges.<br>▪ Forces of tension and compression. Analyzing trusses.<br>▪ Using simulations to design bridges. Building and testing prototypes.<br>▪ Optimization and failure.<br>▪ Oral presentations of results. |
| Second Term | Sustainable Design<br>• Our imperiled planet.<br>• Characteristics of natural systems.<br>• Eco-Design; creative solutions to environmental challenges. |

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| | • Product lifecycle and assessing environmental impact.<br>Research Individual Design Project<br>• Introduction to technical writing.<br>• Strength, weakness, opportunity and threat analysis of a design solution.<br>• Defining goals, researching related topics including identifying stakeholders, understanding product lifecycle, evaluating existing products, and patent searches.<br>• Develop formal technical project proposal.<br>Robotics<br>• Understanding machines: forces, torque, gears, motors, etc.<br>• The ideology of machines and technology.<br>• Designing, building, and programming robots. |
| Spring | Ethical issues & Social Responsibility of the designer, a case study based approach<br>• Stakeholder analysis; Narmada Sagar hydroelectric project in India.<br>• Children's products and risks; The Playskool Travel-Lite Crib case.<br>• Design and Testing; Ford Pinto case.<br>• Designer's responsibility; "The Fifty-nine Story Crisis" Le Messurier and the Citicorp building<br>• Ethical Decisions; The Challenger Space Shuttle disaster.<br>Design Strategies that work in our own community<br>• Local architecture- Balfour Guthrie Building, Portland State University- Stephen Epler Hall, Brewery Block 4, People's Food Co-op.<br>• Local businesses - Energy, Water Efficiency/Stormwater Management, Waste Reduction/Pollution Prevention, Transportation Alternatives, Sustainable Food Systems Development, and Sustainable Product Development.<br>Complete Individual Projects<br>• Final design and documentation. |

**IV. Preliminary List of Readings and Course Materials**


Reyner Banham, "The Great Gizmo," Industrial Design 12 (September 1965): 48-59.

Reyner Banham, "Bricologues à la lanterne," New Society 37, no.717 (1 July 1976), 25-26.

Robin Bates, Robert Mark. The Mystery of the Master Builders, Northbrook IL: Coronet Film & Video (WGBH, Boston), 1988.

Michael Baxandall, Painting and Experience in Fifteenth Century Italy. New York / Oxford: Oxford UP, 1988 (1972).

Ralph Caplan, By Design: Why There Are No Locks on the Bathroom Doors in the Hotel Louis XIV and Other Object Lessons, New York: Fairchild, 2005 [1982].

Le Corbusier, Towards a New Architecture, trans. F. Etchells, New York: Dover, 1986 [1925].

Albrecht Dürer, The Painter's Manual [1525], ed. Walter Strauss, New York, 1977.

Marla Felcher, "Children's Products and Risks," Atlantic Monthly

Paolo Freire, "The Banking Concept of Education," Pedagogy of the Oppressed, 1976.

Richard Florida, "Cities and the Creative Class," City and Community 2.1 (2003): 3-19.

Richard Florida, The Rise of the Creative Class and How its Transforming Work, Leisure, Community, and Everyday Life, New York: Basic Books, 2002.

Jean Gimpel, The Medieval Machine. The Industrial Revolution of the Middle Ages, Penguin, 1977 [1976].

Ivor B. Hart, "Leonardo the Engineer and Master of Gadgetry," Ivor B. Hart, The World of Leonardo da Vinci, Man of Science, Engineer, and Dreamer of Flight, New York: Viking, 1961, 204-53.

Tom Kelley, with Jonathan Littman, The Art of Innovation. Lessons in Design from IDEO, America's Leading design Firm. New York: Currency Books, 2001.

Ross King, Brunelleschi's Dome. How a Renaissance Genius Reinvented Architecture. New York: Random House, 2000.

Fritz Lang, dir., Metropolis, Kino International, 2003 [1927].

Matthys Levy, and Mario Salvadori, Why Buildings Fall Down. How Structures Fail, New York: Norton, 1992.

Donella H. Meadows, et.al., Beyond the Limits: Confronting Global Collapse, Envisioning a Sustainable Future, Chelsea Green Publishing, 1993.
Maurice Merleau-Ponty, “Cezanne’s Doubt,” Galen A. Johnson ed., The Merleau-Ponty Aesthetics Reader: Philosophy and Painting, Evanston: Northwestern U.P., 1993, 59-75.
Errol Morris, dir., Fast, Cheap and Out of Control, Columbia/Tri-Star, 2002 [1997].
David W. Orr, The Nature of Design: Ecology, Culture, and Human Intention, Oxford: Oxford UP, 2002.
Salvatore Di Pasquale, “Leonardo, Brunelleschi, and the Machinery of the Construction Site,” Paolo Galuzzi, ed., Leonardo da Vinci, Engineer and Architect, Montreal: Museum of Fine Arts, 1987, 163-81.
Neil Postman, “The Ideology of Machines” Technopoly: the Surrender of Culture to Technology, New York: Vintage, 1993.
Frank D. Prager, and Gustina Scaglia, Brunelleschi. Studies of His Technology and Inventions, Cambridge MA: Harvard U.P., 1970.
Sim van der Ryn and Stuart Cowan, Ecological Design, Washington: Island Press, 1996.
Mario Salvadori, Why Buildings Stand Up. The Strength of Architecture, New York: Norton, 1990.
Juliet Schor, and Betsy Taylor, eds., Sustainable Planet: Solutions for the Twenty-First Century, Beacon Press, 2003.
Mathis Wackernagel, and William Rees, Our Ecological Footprint. Reducing Human Impact on Earth, Gabriola Island, BC: New Society Publishers, 1996.
Nigel Whiteley, Design for Society, London : Reaktion Books, 1993.
Morton Winston, and Ralph Edelbach, eds., Society, Ethics, and Technology, Belmont CA: Wadsworth, 2000.
Frank Lloyd Wright, “In the Cause of Architecture,” Frederick Gutheim, ed., In the Cause of Architecture. Essays by Frank Lloyd Wright for Architectural Record, 1908-1952, New York: McGraw-Hill, 1975 [1908].
McDonough, William and, Braungart, , Michael, Cradle to Cradle: Remaking the Way We Make Things, 2002, North Point Press.