November 8, 2010

Request Type:	New Course

Degree Program	INFORMATION SCIENCE (INSC)
Course Title	Design Methods in Information Science
Course Number	INSC 573
Credit Hours	5
Grade Type	Graded
Prerequisites	None
Total Hours	20 (Lecture/Studio **5,** Student Prep **15)**

Justification for this request:
[Section identifies the purpose for this course as it relates to the program (or across programs)].

Students acquire theory, methods, and skills for design thinking and knowledge for design-based inquiry. The focus is on making artifacts – technical, informational, managerial, or organizational – and devising courses of action for changing current conditions into preferred ones. Students examine modern theories of design; practice design thinking by applying methods, by reflecting, and by critical discourse; develop skills for critiquing design-based inquiry in Information Science; and develop a position on the application of design for advancing Information Science and a specific area of research or scholarship.

With this course, three goals are met: 1) To establish a course in design-based inquiry and methods with an intellectual and practice-based rigor, and with a focus on Information Science, comparable to the quantitative (INSC 571) and qualitative (INSC 572) research methods courses; 2) To frame the course so that the School's faculty are able to position their scholarship in design, design science, taking action in political spheres, and similar topics within the Ph.D. program; and 3) To regularize the vocabulary of design across the School's four programs (course revisions in the other three programs are underway).

Catalog Description: (limit 50 words)
Acquire theory, methods, and skills for design-based inquiry, focused on making artifacts – technical, informational, managerial, or organizational – and devising courses of action. Students develop knowledge for design in Information Science through practical application of design methods and scholarly investigation of selected literatures.

Course Goals/Objectives:
On the successful completion of this course, students should be able to:

1. Approach vague, open-ended problems, as well as bounded settings, with a design sensibility, showing the ability to shift from divergent and convergent thinking, to ideate and sketch, to reason abductively, to work with ambiguity, to give and receive critiques, and so on.

2. Develop solutions to vague, open-ended problems by selecting appropriate design methods and employing methods with discipline and rigor.

3. Apply design methods to create information processes that enable organizations and people to create new things and take action.

4. Propose methodologies that integrate both scientific and design-based modes of inquiry, giving rationale for the choices made, and showing an ability to adapt methods as conditions warrant.

5. Critically discuss the merits of design theories and methodologies, using the language of design fluently.

6. Critically discuss the distinctions and connections between design and science, drawing on empirical and philosophical sources of evidence.

7. Propose how design-based inquiry might be used be used to advance Information Science or to address one of its enduring problems.

Outline of Course Topics:

Possible topics include:

• *Being a Designer:* Introduces the major questions, controversies, and positions for Design and Information Science. What is designed (things, policies, organizations, information systems, research studies, etc.)? How is design related to "making" and "action?" How do scholars and researchers in Information Science link design and scientific modes of inquiry?

• *Scientific and Conceptual Studies of Design:* Examines scientific and philosophic discourse on design, the study of design, theories of design, and the scientific and practice-based evidence for design as a distinguished form of inquiry.

• *Analytic, Creative and Social Orientations of Design:* Examines the modes of thinking and discourse related to design, including such things as envisioning, ideation, critique, judgment, rationale, persuasion, and so on.

• *Design Methods I:* Technical Rationality. Introduces systematic, technical methods for design, such as mean-ends analysis, cost-benefit analysis, threat analysis, stakeholder analysis, work and process modeling, and so on.

• *Design Methods II:* Empathy, Perspective Taking and Experience. Introduces narrative and mythic approaches, including personas, scenarios, role playing, conceptual metaphor, and so on.

• *Design Methods III:* Infrastructure, Policies, and Societal Perspectives. Introduces systemic, larger scale approaches, including evolving infrastructure, policy, longer-term plans, temporal considerations, geographic boundaries, and cultural systems.

• *Design Methodologies:* Selecting methodologies and methods for purposes, customizing and inventing methods, controlling design processes as they unfold, and so on.

• *Practical Design Knowledge.* Examines the questions related to knowledge for making, for taking action, and for the natural world, and the use of information systems for representing, building and using design knowledge in organizations.

• *Information Science and Design:* Trajectories, Intersections and the Future. Revisits and expands upon the major questions for Information Science and Design.

Assessment Mechanisms:
(Evaluations and grading to address expectations for assignments, projects, exams, etc. Should reflect relative percentages for each area.)

Students' evaluation will be based a combination of reading, individual and group assignments, practice-based outcomes, and participation in studio and seminar meetings.

Suggested Readings, films, websites etc:

Alexander, C. (1979). *The Timeless Way of Building.* New York: Oxford University Press.

Bates, M. (1976). Rigorous systematic bibliography. *RQ*, *16*, 5-24.

Buchanan, R. (1985) Declaration by design: rhetoric, argument, and demonstration in design practice. *Design Issues, 2*(1), 4-22.

Buxton, B. (2007). *Sketching User Experiences: Getting the Design Right and the Right Design*. Boston, MA: Morgan Kaufmann.

Cross, N. (2007). *Designerly Ways of Knowing.* Boston, MA: Birkhauser Verlag.

Goel, V. & Pirolli, P. (1992). The structure of design problem spaces. *Cognitive Science, 16*(3), 395-429.

Feinberg, M. (2010) An integrative approach to the design of knowledge organization schemes. *ISKO Conference* 2010, Rome, Italy, Feb. 23-26.

Fidel, R. & Pejtersen, A.M. (2004) From information behaviour research to the design of information systems: the Cognitive Work Analysis framework. *Information Research, 10*(1) paper 210.

Floyd, C., W. Mehl, F. Reisin, G. Schmidt & G. Wolf (1989). Out of Scandinavia: Alternative approaches to software design and system development. *Human-Computer Interaction*, *4*(4), 253-349.

Friedman, B. (2004). Value sensitive design. *Encyclopedia of Human-Computer Interaction*. (pp. 769-774). Great Barrington, MA: Berkshire Publishing Group.

Hevner, A. R., March, S. T., Park, J. & Ram, S. (2004). Design science in information systems research. *MIS Quarterly, 28*(1), 75-105.

Lawson, B. (2006). *How Designers Think*. Boston, MA: Elsevier.

Löwgren, J. & Stolterman, E. (2004). *Thoughtful Interaction Design: A Design Perspective on Information Technology.* Cambridge, MA: MIT Press.

Martin, R. L. (2009). *The Design of Business: Why Design Thinking is the Next Competitive Advantage.* Boston, MA: Harvard University Press.

Nelson, H. & Stolterman, E. (2003*). The Design Way: Intentional Change in an Unpredictable World Jersey:* Educational Technology Publications.

Norman, D. A. (1988*). Psychology of Everyday Things.* New York: Doubleday.

Petroski, H. (1996). *Invention by Design: How Engineers Get from Thought to Thing.* Cambridge MA: Harvard University Press.

Schon, D. A. (1991). *Educating the Reflective Practitioner.* San Francisco, CA: Jossey-Bass Publishers.

Sein, M. K., Henfridsson, O., Purao, S., Rossi, M. & Lindgren, R. (in press). Action design research. To appear in *MIS Quarterly.*

Simon, H. A. (1996). *The Sciences of the Artificial*. Cambridge, MA: MIT Press.

Svenonius, E. (1992). *Classification: Prospects, problems, and possibilities*. In N.J. Williamson & M. Hudon (Eds.) *Classification Research for Knowledge Representation and Organization* (pp. 5-26). Boston, MA: Elsevier.

Vicente, K. (1999). *Cognitive Work Analysis: Toward Safe, Productive, and Healthy Computer-Based Work. Mahwah,* NJ: Lawrence Erlbaum.

Winograd, T. & Flores, F. (1986). *Understanding Computers and Cognition: A New Foundation for Design.* Reading, MA: Addison-Wesley.

Yoo, Y., Boland, R. K., Jr., & Lyytinen, K. (2006). From organization design to organization designing. *Organization Science, 17*(2), 215-229.