EDPX 2300: Systems

Fall 2015

MW 1:00—3:50 @ Sturm 434

Dan Wilcox, Shwayder 215, danomatika.com

Contact: Daniel.Wilcox@du.edu

303 871—3206 (office) 412 980—7081 (cell)

Office hours: M 4—6pm & by appointment

Description

NASA was able to land Apollo 11 on the Moon thanks to systems engineering, imagine what it can do for your art work! This course will cover “systems” from the abstract to the immensely practical and examine how they shape both our lives and our thinking. We will be exploring the underlying protocols that make our ENIACS click and our Apple Watches tick and then apply this knowledge to A->B->-C->sometimes “why” problem solving. We live in a “plug and play” world, so let’s get cracking.

Course Overview

This course provides the fundamental concepts of digital systems, including the study of digital components (hardware and firmware) and networks, how they function to solve problems and share information. Students will understand how electronics and software from the simple to the complex work together as a system. Students will understand how the computer, the internet, and digital interfaces have been developed and shaped

through history.

Aesthetic and technical reinforcement of this conceptual base will explore systems architectures, simulation, abstraction, design development and experimentation; utilization; distribution; stability and sustainability.

Technology used in this course will include various systems simulation tools, software authoring/coding; hardware and electronics system development environments.

Course Objectives

Theory

⇒ Introduce and expand the theoretical concepts that form the historical, technical and cultural foundations of systems;

⇒ Build an evolving vocabulary and language for the definition, description, critical dialogue and analysis of systems, systems theory, and systems;

Context

⇒ Build insight into the cultural context that allows a perspective on the ubiquity of and interpretation of systems:

Technique

⇒ Establish a progressing base of digital tools and technique for the design, architecture, simulation and implementation

creative systems works;

Critical Dialogue

⇒ Foster a collective diversity of criticism that promotes experimentation, research, and affirmation of new creative thought, identity, and possibilities.

⇒ Charge this environment with an atmosphere that challenges the dualistic assumptions of art and non-art as vectors for risk taking;

Network

⇒ Cultivate a symbiotic educational relationship among class participants which includes internal mentoring, bottom-up input, and collaborative materialization of work;

⇒ Develop an inclusive group environment for the questioning, discussion, and exploration of the potential directions and fate of contemporary new media artists and their work for the near future;

Resource

⇒ Provide utilitarian resources as survival tools for the continuation of future creative making endeavors from this group network, and

⇒ Establish a process for identification, description, search and recovery for technical problem solving, exploration,

assistance, collaboration and resolution resources.

Course Policies

In order to meet course objectives the following requirements are critical to the attainment of an inclusive environment that is supportive to all participants:

Attendance

Attendance is mandatory. 3 unexcused absences constitutes the drop of 1 letter grade (3 lates = 1 absence). An unexcused absence from any critique or portion of a critique will constitute the drop of 1 letter grade. An unexcused absence from the final critique will constitute a failure (F) for the quarter.

Participation

This class will include a number of in class discussions, presentations, and critiques. As such, I expect everyone to participate and feel free to engage with topics they are interested in. Frankly, you don't want to come and listen to be ad-lib for 2.5 hours. I recognize some students may be shy or arrive at interesting ideas *after* class, in that case feel free to contact me and we can arrange a time for a one-on-one discussion.

Quality of Work

All creative work under consideration for critique or

discussion under this course should be of a completed/finished quality that warrants the attention and respect of your cohorts. No excuses, or explanations.

Grading

Work will be graded on the basis of fulfillment of course requirements combined with an assessment of assigned work. This assessment will be weighed in terms of degree of effort, creativity, risk, participation and individual growth through the session. Grades will be assigned according to the University Policy as follows:

A superior/excellent
B good/better than average
C competent/average
D minimum passing
F failing

If you're feeling like you're in the C and lower area, please *reach out and talk to me*.

Cookie Policy

If your cell phone rings or buzzes, you will bring cookies for everyone next class. If I catch you texting, the same. This also flies for gratuitous, non-class social media usage.

Religious Accommodations

DU students are granted excused absences from class if needed

for observance of religious holy days but should contact instructors to make alternate arrangements during the first week of class. Visit DU's religious accommodations policy for information and a list of religious holidays.

Student Athletes

DU sponsors National Collegiate Athletic Association (NCAA) student-athletes at the undergraduate level in seventeen different sports. Student-Athlete Support Services are in place to assist these students in their academic work.

According to their policies:

> Student-athletes are responsible for informing their instructors of any class days to be missed due to DU sponsored varsity athletic events in which s/he are participating. Student-athletes are provided with a schedule of travel dates that coincide with class dates and an absence policy to present to instructors. This must be signed by the instructor and is the student-athletes responsibility to return the signed forms to an assigned athletics adviser. In the event that a team reaches post-season play (i.e. Conference or NCAA Tournament), letters will be sent to instructors informing them of additional missed class dates. It is the responsibility of the student-athlete to make arrangements with instructors regarding any missed lectures, assignments, and/or exams.

Stuff You Need For Class

Analog Sketchbook

A real, paper sketchbook for brainstorming, notes, todo lists, and working out ideas *before* making anything. Use it, bring it to class, and be prepared to produce it during discussions and presentations.

Personally, I prefer small notebooks with an “engineering grid” for drawing, but you can select whatever size and ruling etc works best for you. The main thing is that it is something you will be more likely to carry with you and use, oftentimes in tandem with a smartphone notes app and browser.

Digital Sketchbook

This is an online blog where you’ll post your systems analyses and project documentation. You can use a free service like wordpress.com, tumblr.com, etc or setup an equivalent on your own website if you have hosting. No Facebook or Twitter because 1. I don’t have a Facebook account (gasp!) and 2. Twitter is too terse a medium for the kind of work I’m looking for.[1] The main point is to get into the practice of presenting your ideas and your work online. As an addendum, you’ll probably want to open a [Youtube](http://youtube.com] and/or [Vimeo] (http://vimeo.com] account for your project documentation videos.

Provide me with the link to your digital sketchbook by class on

Monday Sep 21st.

Cultural Events

Attendance and corresponding write up for 3 cultural events over the course of the quarter is required. Submission of write up can be by e-mail or print copy. Forms for write up submission are available from the resources page of the course web site. Note: synopsis of each cultural event should be e-mailed to instructor o posted on your online sketchbook within 2 weeks of attendance. A final record of the cumulative events will be compiled and submitted with Final Deliverables for the quarter.

The event can be anything *you* deem “cultural” but you must be prepared to justify it’s worthiness to me. I encourage you to find things that are both interesting and challenging, sometimes you don;t know until you go. If you’re having trouble finding something, I can provide some suggestions.

Projects

Design Exercises

Design exercises will be conducted throughout the quarter. The emphasis on these exercises is on rapid, intuitive aesthetic response and experimentation. Design exercises will be described and debriefed in class in terms of theory and potential techniques for materialization. 4 potential exercises will be carried out thru the quarter on exploratory topics.

Results, documentation and comments will be posted on your media blog .

Major Projects

Projects preliminary to the final (projects 1, 2) will be experimental connections on your path to the realization of the full-scale final network mediated/online project. These preliminary projects may be relied upon as meta data elements for the development and assembly of your final work and yield supporting documentation of the underlying process involved in realizing the final project. project breakdown is as follows:

Project 1 — Systems survey — a system a day (20% of grade).

This project will assign a system from a specific domain each day of class for the first 3 weeks of the course. Each surveyed system will identify the following as key parts to each system you will survey:

1 elements
2 interconnections
3 control/feedback
4 function/purpose

You will “draw”, discuss and post a discussion of these parts, connections and functions to your media blogs. The expectation of this survey is that it will be experimental and media enriched and build upon layered approach to system documentation and definition. At the end of 3 weeks you will

have a survey of 6 systems.

For Critique #1 (week 4 to 5) you will present 2 systems to the class. Emphasis in this critique/presentation is on creative use of media for system representation and dialogue. Your output may be a stop motion video, interactive work, video work, sound work, etc.

The URL of your media blog will be distributed to the EDPX2300 class cohort by the second week of class so they may keep up w/ your ongoing survey.

Project 2 — Systems simulation (20% of grade)

This project will be developed concurrently with Project 1 to abstract the conceptual and technical base of a system with a purpose. You will be doing software simulation of a system of your choice. Adding hardware is also open. This can be a presented overview of your intended work of for the quarter as a simulation. The systems simulation and architecture may be based on one of the systems from your survey work from your media blog. As a start we will be adapting Net.logo as a suggested simulation environment. Your choice of software environment is open. The resulting work must be minimally use software simulation to demonstrate a controlled system.

Final Project - System design and implementation (40% of grade)

The final project will implement and integrate a system of your design and architecture. The work can be software, hardware and/or digital/analog combined. The system should exhibit

inputs, outputs, control/feedback, and function &/or purpose. The venue or site for this work is of your choosing. It can be public, private, or online as a material or virtual system. Final submission of this project will include documentation of the architecture of the system (as a drawing), the final functioning system and support files as software and design materials.

Final Deliverables

Final submission of work will include the following materials:

- Submission final project documentation as a post on your online sketchbook
- Systems drawing & design architectures for Projects 1 & 2
- All software associated with Project 2 and final
- Documentation of Final project

To be e-mailed to instructor or posted on your online sketchbook:

Critiques/synopsis of 3 cultural events cumulative for the quarter. *Note: synopsis of each cultural event should be posted/emailed within 2 weeks of attendance.*

Texts & Readings

All required readings/viewings/listenings will be assigned from the course website schedule page. Required readings will be referenced from, online sources or as linked .pdf files on the course website. Readings will be assigned and referenced 2

class sessions previous to discussion and related presentations. Please refer to the schedule page for reading assignments and discussion dates.

The following texts are suggested additional sources for reference and consultation:

Systems Theory

Thinking in Systems: A Primer, Donella H. Meadows, 2008. Chelsea Green Publishing

The Systems View of Life: A Unifying Vision, Fritjof Capra, 2014, Cambridge Press

Complexity

Diversity and Complexity, Scott Page, Princeton Press, 2010

Additional reference will be made available via on-line sources from the course web site links under the resources page.

Class Schedule

Note: subject to adjustment

Week 1

9/14: Intro

Course introduction

Intro to systems and systems pre-history

System domain 1 assigned

9/16: Think

System domain presentations

Review of systems parts/characteristics/interactions

Week 2

9/21: Think/Make

Systems simulation software - Net.Logo

System domain 2 assigned

9/23: Think

System survey: biological, environmental, & ecological systems

System domain 3 assigned

Week 3

9/28: Make

Systems design exercise

System domain 4 assigned

9/30: Make

Systems survey: control/feedback

Studio work day, 1 on 1 project review *System domain 5 assigned*

Week 4

10/5: Think

System survey: industrial systems

System domain 6 assigned

10/7: Critique MIDTERM

Presentation/Critique Project 1 - systems survey

Week 5

10/12: Critique MIDTERM

Presentation/Critique Project 1 - systems survey

10/14: Think/Make

Systems survey: information systems

Systems design exercise

1 on 1 project review

Week 6

10/19: Make

Systems survey: network/computer systems

Studio work day, 1 on 1 project review

10/21: Critique

Presentation/Critique Project 2 - systems simulation

Week 7

10/26: Critique

Presentation/Critique Project 2 - systems simulation

10/28: Make

Electronics systems 1

Solder workshop

Systems design exercise

Studio work day, 1 on 1 project review

Week 8

11/2: Make

Electronics systems 2

11/4: Make

Integrated Systems/Networks

Week 9

11/9: Think/Make

Emergent/complex systems

Studio work day, 1 on 1 project review

11/11: Make

Studio work day, 1 on 1 project review

Week 10

11/16: Critique

Final Project Presentation/Critique

11/18: Critique FINAL MEETING

Final Project Presentation/Critique

Final Exam

11/20: 2 - 3:50pm Sturm 434

FINAL DELIVERABLES

1. If you *really really* want to use Twitter you'll have to propose how you intend for this to work. I'm open :D ↩