Design Principles and Practices

SPDA 4980
Mon and Wed, 11-12:20 pm
Spring 2021

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Office hours
By appointment

This course surveys over 100 design principles applicable to nearly every design profession. You will gain a foundational understanding of universal laws of design, human factors and design methodologies that you may use throughout your education and career pursuits.

Learning Objectives
Upon successful completion of this course, you will:

- Identify principles of design in digital and analog objects
- Explain and execute a design process and prepare materials related to and around the process
- Critique designs using principles rather than notions or vaguely-formed opinions

Course Materials
In addition to an open mind, you will need:

- An unlined sketchbook
- A set of
- An ultra fine point marker

You will need the following books for this course:

William Holden
ISBN 1592535879

Design Basics Index
Jim Krause
ISBN 1581805012

Philosophy
Good design expresses insight into human behavior, psychology, perception and meaning making. This course balances a scholarly understanding of design with a practical execution of design.

Course Requirements and Grading
A list of assigned readings and materials is attached. Supplemental materials are posted electronically. Advance preparation and enthusiastic participation is an important part of the learning experience and critical to in-class discussions.

15% Class participation
15 Weekly sketchnotes
15 Principles in Practice
45 Design Challenges
10 Final Portfolio
Semester Schedule
The following week-by-week breakdown explains the structure of the course. Complete explanations of what is due, additional reading materials, quizzes and assignment submissions are on Canvas, canvas.unt.edu.

Week 1
Jan 11, 13

Introduction: What is Design?
We define what we mean by ‘design’ and explore the difference between art and design. The following sentence by John Heskitt should seem less esoteric by the end of class: Design is to design a design to produce a design.

Read
Garrett: User Experience and Why It Matters
Rutledge: Creativity is Not Design
Rolston: The Politics of Moving Minds
Brown: Learning is Misunderstood
The Less is More set of principles

Week 2
Jan 18, 20

Less is More
“The more stuff in it, the busier the work of art, the worse it is. More is less. Less is more.” – Ad Reinhart

Principles We Will Review in Class: Less is More
Form Follows Function – beauty is purity of function
Ockham’s Razor – choose simplest of functionally equivalent designs
80/20 Rule – 80% of products use involves 20% of its features
Flexibility-Usability Tradeoff – as flexibility increases, usability decreases
Horror Vacui – tendency to fill blank spaces
Propositional Density – relationship between design elements and meaning they convey
Signal-to-Noise Ratio – choose design that has high signal-to-noise ratio

In-Class Design Challenge
Be dense: Calculate the propositional density of a logo
Design Process

We examine a design process that allows you to interpret and intentionally address a problem. A problem should be approachable, understandable, actionable, and clearly scoped—not too big nor too small, not too vague nor too simple.

Principles We Will Review in Class: Design Process

- **Accessibility**: objects should be usable by as many people as possible
- **Design by Committee**: design process based on group consensus
- **Development Cycle**: heuristic steps of discovery
- **Garbage-In-Garbage-Out**: quality output depends on quality info in
- **Iteration**: repeated operations to reach desired result
- **Life Cycle**: stages of product existence
- **Most Advanced Yet Acceptable**: finding most commercially viable design aesthetic
- **Personas**: use archetypes to guide decision making in design process
- **Prototyping**: simplified models to explore ideas
- **Satisficing**: settle for satisfactory rather than optimal solution
- **Scaling Fallacy**: tendency to assume system will also work at different scale
- **Storytelling**: create imagery, emotions and understanding

Aesthetic Bias

We examine our natural bias toward beauty and order.

Principles We Will Review in Class: Aesthetic Bias

- **Aesthetic-Usability Effect**: aesthetic design perceived to be easy to use
- **Attractiveness Bias**: why beautiful people excel
- **Baby-Face Bias**: attraction to all things cute
- **Closure**: seeing groups of design elements as one large design element
- **Constancy**: perception of constancy in spite of actual expression
- **Fibonacci Sequence**: sequence of numbers that are sum of two preceding
- **Golden Ratio**: geometric theorem for balance in design
- **Good Continuation**: Gestalt of perceived connectivity of elements
- **Law of Prägnanz**: tendency to interpret ambiguous info
- **Picture Superiority Effect**: remember pictures better than words
- **Prospect-Refuge**: tendency to prefer unobstructed views and areas of concealment
- **Savanna Preference**: aboriginal preference for open spaces
- **Wabi-Sabi**: objects that embody nature and simplicity are more meaningful

Dimensional Perception Preferences

We examine how we perceive the three-dimensional world around us.

Principles We Will Review in Class: Dimensional Perception Preferences

- **Common Fate**: objects in the same direction are related
- **Defensible Space**: space that indicate territory and ownership
- **Figure-Ground Relationship**: perceived objects in front of a field
- **Orientation Sensitivity**: discrimination of directional elements
- **Three-Dimensional Projection**: tendency to perceive world in 3-D
- **Top-Down Lighting Bias**: tendency to understand source of lighting
- **Visibility**: spatial cognitive understanding
- **Wayfinding**: special information to enhance navigation
Aesthetic Toolbox

Week 6  Feb 16, 18

We examine principles that can be used in composing designs, displaying information and creating interfaces.

Principles We Will Review in Class: Aesthetic Toolbox

Alignment – design elements align along hidden lines
Color – symbolic meanings in color to manipulate and emphasize
Consistency – usability improved when similar parts expressed in similar ways
Convergence – synonym for stability in designed solutions
Highlighting – bringing visual attention to design elements
Iconic Representation – icons improve recognition and recall
Modularity – complex system divided into smaller compatible parts
Normal Distribution – symmetrical data, bell-curve
Proximity – info close together perceived to be related
Rule of Thirds – composition technique for balance
Similarity – elements of similar nature seem related
Symmetry – visual equivalence among elements

Psychology and Aesthetics

Week 7  Feb 22, 25

We examine our psychology and the limits of our ability to perceive.

Principles We Will Review in Class: Psychology and Aesthetics

Biophilia Effect – nature views enhance focus and concentration
Cathedral Effect – high ceilings for creativity; low ceilings for detail-oriented thinking
Cognitive Dissonance – tendency to seek consistency in thinking
Depth of Processing – deeply analyzed information is quickly recalled
Framing – manipulating how information is presented
Hierarchy of Needs – stratification of aesthetic needs based on Maslow
Inattentinal Blindness – inability to process something in plain view
Mnemonic Device – organize information to make it memorable
Nudge – alter behavior with little changes
Operant Conditioning – perceptual modification via range of stimuli
Priming – activating concepts in memory to influence subsequent behaviors
Threat Detection – natural abhorrence to negative imagery
von Restorff Effect – well placed discontinuity to engage memory

Human Factors

Week 8  Mar 2, 4

We examine how to optimize how we as humans interact and perform within a system.

Principles We Will Review in Class: Human Factors

Affordance – physical design telegraphs use and function
Desire Line – traces of use that indicate preferred methods of interaction
Entry Point – obvious point of entry into a design i.e., front door
Expectation Effect – leading the audience to an expected result
Forgiveness – help users avoid and minimize of consequences of errors
Freeze–Flight–Fight–Forfeit – ordered sequence of responses to acute stress
Interference Effects – conflicting cognitive processes slow down thinking
Mapping – cognitive understanding to initiate actions
Mental Models – cognitive understanding based on experience
Mimicry – transferring understood properties to new things
Performance Load – greater the effort, greater chance of failure
Performance vs. Preference – optimum gives way to preference
Progressive Disclosure – sequentially disclosed information
Readability – quick understandability
Recognition Over Recall – memory for recognizing things better than for recalling
Serial Position Effects – info at ends more memorable than middle

SPDA 49 Design Principles
**Information Architecture**

We examine how to organize, label and otherwise architect information within complex information systems.

**Principles We Will Review in Class: Information Architecture**

- **Chunking** – clustering information & elements to make memorable
- **Comparison** – represent two or more variables in a controlled way
- **Confirmation** – designed barriers to take next steps
- **Constraint** – designed limitations to guide user
- **Control** – put user in the drivers seat according to expertise
- **Feedback Loop** – information return to modify future behavior
- **Fitts' Law** – time to move target is size and distance
- **Five Hat racks** – ways to organize information
- **Gutenberg Diagram** – general pattern of eyes reading information
- **Hierarchy** – complex information organized and structured visually
- **Layering** – organize info into related groups
- **Legibility** – visual clarity, contrast, spacing etc.

**Human Appeal**

We examine factors that contribute to our innate animal magnetism -- physical traits and psychological conditions.

**Principles We Will Review in Class: Human Appeal**

- **Classical Conditioning** – associate stimulus with physical or emotional response
- **Contour Bias** – preference for contours instead of sharp angles or points
- **Face-ism Ratio** – ratio of face to body influences perception
- **MAFA Effect** – tendency to prefer facial features close to average of population
- **Red Effect** – women wearing red more attractive; men more dominant
- **Uncanny Valley** – anthropomorphic forms unappealing when very similar to humans
- **Veblen Effect** – tendency to find product desirable because of high price
- **Waist-to-Hip Ratio** – preference for particular ratio of waist size to hip size

**Presentation: Project Update**

Present your cognitive teardown of the object you are redesigning to your classmates and obtain feedback.

**Prototype Explorations**

Explore various approaches to your redesign and obtain user feedback.

**High-Fidelity Prototyping**

Explore simple methods to create high-fidelity prototypes.

**Workshop**

Obtain feedback on your semester project before presenting.

**Final Presentations**

Present your semester redesign project.
Semester at a Glance

The first 10 weeks of the semester are devoted to learning, understanding and apply principles of design through readings, slides and challenges. In the remaining weeks, you apply the design process to your semester project.

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UNT Policies

Academic Integrity Standards and Consequences.

According to UNT Policy 06.003, Student Academic Integrity, academic dishonesty occurs when students engage in behaviors including, but not limited to cheating, fabrication, facilitating academic dishonesty, forgery, plagiarism, and sabotage. A finding of academic dishonesty may result in a range of academic penalties or sanctions ranging from admonition to expulsion from the University.

ADA Accommodation Statement. UNT makes reasonable academic accommodation for students with disabilities. Students seeking accommodation must first register with the Office of Disability Accommodation (ODA) to verify their eligibility. If a disability is verified, the ODA will provide a student with an accommodation letter to be delivered to faculty to begin a private discussion regarding one's specific course needs. Students may request accommodations at any time, however, ODA notices of accommodation should be provided as early as possible in the semester to avoid any delay in implementation. Note that students must obtain a new letter of accommodation for every semester and must meet with each faculty member prior to implementation in each class. For additional information see the ODA website at disability.unt.edu.

Course Safety Procedures (for Laboratory Courses). Students enrolled in [insert class name] are required to use proper safety procedures and guidelines as outlined in UNT Policy 06.038 Safety in Instructional Activities. While working in laboratory sessions, students are expected and required to identify and use proper safety guidelines in all activities requiring lifting, climbing, walking on slippery surfaces, using equipment and tools, handling chemical solutions and hot and cold products. Students should be aware that the UNT is not liable for injuries incurred while students are participating in class activities. All students are encouraged to secure adequate insurance coverage in the event of accidental injury. Students who do not have insurance coverage should consider obtaining Student Health Insurance. Brochures for student insurance are available in the UNT Student Health and Wellness Center. Students who are injured during class activities may seek medical attention at the Student Health and Wellness Center at rates that are reduced compared to other medical facilities. If students have an insurance plan other than Student Health Insurance at UNT, they should be sure that the plan covers treatment at this facility. If students choose not to go to the UNT Student Health and Wellness Center, they may be transported to an emergency room at a local hospital. Students are responsible for expenses incurred there.

Emergency Notification & Procedures. UNT uses a system called Eagle Alert to quickly notify students with critical information in the event of an emergency (i.e., severe weather, campus closing, and health and public safety emergencies like chemical spills, fires, or violence). In the event of a university closure, please refer to Blackboard for contingency plans for covering course materials.