INSTRUCTOR
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Welcome.

1. **Introduction**

Scientific and mathematic information, such as formulas, equations, statistics, and quantitative data is presented frequently to learners as dense bodies of text and numbers. The connectedness of information is often unrecognizable, which encourages learners to memorize details and remember them for only a short period of time. For example, have you ever memorized information for a test without understanding how each component related to one another or why you needed to learn it in the first place? As part of this senior project, we will study the emphasis of patterns (repetitions and similarities) inherent and often hidden in traditional representations of scientific and mathematic information as a means of explaining the connectedness and importance of information. Through interaction with patterns, learners will be encouraged to qualitatively compare, critically analyze, and evaluate information. We will explore the characteristics of digital media—specifically the layering of visuals, sound, and motion—as tools for representing information patterns in a manner that engages learners in enjoyable and effective learning experiences. Working in small groups, our goal is to create digital learning tools that enable learners to use multiple senses to understand information. They will experience information through interaction and exploration. During this process, we will discuss how our findings may be applied to other areas of design and education.

The teaching of math and science concepts becomes increasingly abstract as students move through middle school. Therefore, we will observe course content, teaching methods, and tools used to teach math and science concepts at Falk, a local laboratory school. Falk utilizes both conventional and unconventional modes of teachings, recognizing that not all students prefer to learn the same way. This school will provide insight into the needs and desires of students. We will also examine existing educational tools such as videos, conduct readings, and participate in discussions with experts in education and cognitive science as part of our research.

The combination of visuals, sound, and motion enhances the communication of content by engaging students in experiences that enable them to use multiple senses to discover the meaning of information. This becomes increasing difficult to achieve on paper when a large amount of information needs to be conveyed. Print often forces a mass of complex information to be presented at one time. As a result, students are commonly inundated with detailed data which requires careful concentration for them to grasp. The same is true for the majority of educational computer programs being produced for middle school students. They are largely text-based, using imagery, sound, and motion as an entertainment layer as opposed to a vehicle for delivering content. We will discuss and compare current print and digital learning tools, asking the question, 'Can learning be both fun and informative without overwhelming students?' Some students perceive and process information adequately by reading books and doing equations. However, many do not. To respond to natural modes of learning, which engages multiple senses, there is an increasing need for research that explores the educational value of representing information by utilizing interactive digital media. And although our investigation may apply to non-digital learning tools, computers provide a great place to start.

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2. **Course Objectives**
   ▪ To assess current learning tools and determine where opportunities for improvements lie.
   ▪ To gain an understanding of learner assumptions, needs, and expectations.
   ▪ To utilize research findings in the design of digital learning tools.
   ▪ To explore the use of linear and non-linear information structures as a means of communication.
   ▪ To use visuals, sound, and motion as a means of engaging learners in concrete experiences while encouraging critical thinking.
   ▪ To work effectively within a group of students.
   ▪ To receive constructive criticism and revise designs accordingly.
   ▪ To have fun.

3. **Project Goals**
   ▪ To enhance classroom learning and/or provide reinforcement and remediation via interactive digital programs.
   ▪ To enable the learning of large concepts as opposed to the temporary memorization of details.
   ▪ To present information in a manner that encourages exploration and discovery via multiple modalities.
   ▪ To provide opportunities for expansion and application of concepts that relate to students' experiences.
   ▪ To create activities that encourage individual and group interaction as a means of learning.

4. **Course Deliverables**
   ▪ Analysis boards (one per team), communicating the key points of research conducted (current tools, methods, content, etc.)
   ▪ A set of scenarios (one per team), describing the use and benefit of the proposed interactive, digital learning tools
   ▪ A set of interactive, digital learning tools (one per team) in prototype form (not fully functional)
   ▪ A process book (one per team), documenting the work conducted through out the semester

5. **Course Structure**
   This is a studio course which means that much of the class time will be spent working *in* studio. I place a great deal of importance on student/teacher interaction during the design process. Therefore, I will often meet with you to discuss the direction of your group. As a class, we will frequently discuss relevant topics and conduct in-progress critiques throughout the semester. Please keep in mind that critiques are not beauty contests. They give us the opportunity to articulate our ideas, assess where we are in the project, ask questions, and accept constructive criticism from our peers. Your verbal contributions will be expected and are always welcome.

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6. **Suggested Reading**
    I will distribute a list of readings that will I believe will help you in the work you conduct throughout the semester. Please don't hesitate to ask me to suggest titles that will be most helpful for your team's specific design direction.

7. **Process Documentation**
    You are required to document your process as a team in print form and I encourage you to do the same online. (Documenting your work in two forms provides greater presentation flexibility, should you decide to use this project as part of your portfolio in the future.) Your process booklet should include your team's research, analysis, sketches, ideas, inspirations, notations and steps taken to construct your final scenarios. This is not to be thought of as a chore but rather an opportunity to track your design process and progress throughout the semester. Keep in mind, your process booklet should be logical and clear. It should also reveal the breadth and depth of your ideas to people unfamiliar with the project and should be considered a valuable component of your portfolio. We will discuss the format in greater detail during class. Build enough time into your schedule to produce a booklet for each member of your team, one for Falk, and one for me. Process booklets will be collected and reviewed at the end of the semester prior to establishing your final grade.

8. **Project Submission**
    Your team's final scenario as well as all supporting digital files, such as your final presentation, images, videos, audio, etc. must be burned to a cd or dvd prior to the final course presentation. The files should be well organized, easily identifiable, and function properly. I will collect the cd/dvd at the final presentation and review them prior to establishing your final grade.

9. **Class Policy**
    Since this is a studio course everyone's contributions are vital to the success of the class. Please feel comfortable asking questions and helping each other when possible. This does not mean completing someone else's tasks for them but rather answering questions or conducting out-of-class critiques. Collaboration often spawns wonderful ideas which cannot be achieved in isolation. I too will help in any way I can.

    Although a large portion of class time will be spent working on the project, you will be expected to devote no less than an equal amount of time to the course outside of scheduled class meetings. This time should be spent completing readings, conducting research and analysis, making, making, and making, and learning any necessary software.

10. **Attendance**
    To utilize the studio environment your timely presence and participation are necessary. Studio meetings begin at 8:30 a.m. sharp and continue until 11:20 a.m. You must arrive on time and remain until the studio ends. Frequent absences and late arrivals are disruptive and inconsiderate to the rest of the class and will adversely affect your grade. If you can't attend class, inform me in advance either by e-mail or by calling the design office at 268-2828. After two unexcused absences your grade will begin to drop. Three late arrivals will count as one absence. You are responsible for information you miss through absences or lateness. Work that is incomplete or improperly done due to missed or misunderstood information will result in a lower grade. Work that is not turned in will be graded as failing.

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11. **Communication**

The questions and comments I receive from students are often relevant to the entire class. Therefore, I frequently use email as a means of distributing pertinent project information to all of you. It is your responsibility to check email often to obtain this information.

12. **Teamwork**

I realize working in teams is difficult since all of you do not work the same way. I encourage you to think of the diversity of your teams as an asset. Building on differences in approaches often lead to rich concepts. Also, much of your professional career will require you to work effectively with a range of people. Take advantage of this opportunity to improve your collaboration skills. Recognize and appreciate your strengths and weaknesses and those of your teammates. Conflicts will arise. I encourage you to discuss problems with your teammates immediately instead of letting them fester. Often times small issues grow into large problems, which hinders the progress of a project. Don't let this happen to your team!

13. **Professional Conduct and Attitude**

My commitment to your professional development will address much more than your creative processes and ability to make design artifacts. As a critical part of your design education, I also want you to establish a community of practice, with your classmates and teachers, based on relationships of mutual trust and respect. The way that you choose to conduct yourself will be considered an integral part of your professional development and will therefore affect the feedback and grades you receive. Please approach me if you have any concerns, problems, or questions. You may also contact me for a meeting outside of scheduled studio hours. Tuesday and Thursday afternoons are often the best opportunity to see me. I don't mind putting in the extra time, and I expect that you won't either, as long as it doesn't conflict with anyone's other scheduled courses or meetings. I am committed to offering you a good educational opportunity in the School of Design, and look forward to working with you this semester!

14. **Evaluation**

You will receive a mid-term and final grade for the course based on the following criteria (each counting 33%):

▪ Design Process: idea generation and exploration, evaluation of ideas, development and refinement of a selected idea, and verbal presentation of your work

▪ Your Work: the quality of your ideas, the extent of exploration and experimentation, and the craftsmanship employed on the final pieces

▪ Your attitude: attendance, meeting of deadlines, contribution to critiques, dealing constructively with criticism, working effectively within your team, and exhibiting a full sense of commitment to this class and your work

If at any point you'd like feedback on your performance please don't hesitate to contact me. You will also evaluate yourself and your teammates at the middle and end of the semester.