

***Psych 401: 04 & 05 Capstone in Psychology  
Understanding the Influence of Visual Media on Thinking***

*Professor Neil H. Schwartz, Ph.D.*

Office: Modoc Room 202

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**Class Meetings:**

**Section 04: 2:00-3:15 TR Modoc 221**

**Section 05: 3:30-4:45 TR Modoc 222**

**Office Hours:**

Tuesdays and Thursdays  
10:30 PM -12:30 PM  
or by appointment

Email [nschwartz@csuchico.edu](mailto:nschwartz@csuchico.edu)

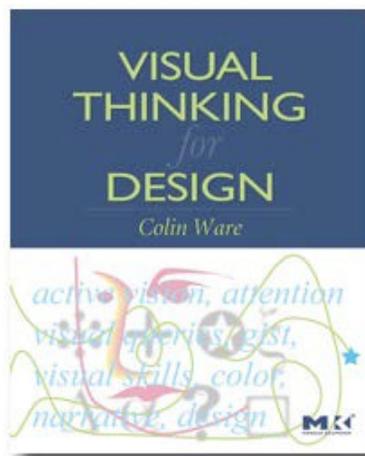
URL <http://www.csuchico.edu/~nschwartz>

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**Required Textbook**

Ware, C. (2008). *Visual Thinking for Design*. New York, NY: Morgan Kaufmann.

ISBN: 9780123708960



## **Course Description**

This course is designed to teach students about the power of visualizations as tools with which to think, reason, and problem solve. Visualizations refer to the 2D and 3D static and animated visual displays that depict conditions, situations, processes, places or events as they appear in maps, diagrams, graphs, pictures, or schematics. Visualization media and tools are ubiquitous. Students study graphs, charts, timelines, and formulae to learn concepts in school. Executives make graphics presentations to corporate boards for high stakes contracts; mechanical and electrical engineers examine schematics to build bridges and design cars; medical students use interactive visualization tools to learn delicate surgical procedures. Litigators convince jurors with animated and static visual displays. Finally, Internet-based commercial vendors, news agencies, and textbook editors rely on graphs, pictures, illustrations, and animations to emotionally and cognitively arouse—to stimulate interest, ensure comprehension, incur purchases, persuade and inspire—in short, to connect with the human mind. And yet, the editors, executives, engineers, litigators, educators, journalists, and other consumers who rely on the visualizations, often have little or no understanding of how, or if, the visualizations really work. That is, it is not always clear how to go about designing visualizations beyond the idiosyncratic preferences of the designer and the user. Typically, outcomes are judged as metrics of success—Did sales go up? Was the contract signed? Did the jury come back with a preferred verdict? The problem with these metrics is that they are time-consuming and expensive to reveal, and the feedback loop from design to outcome is long, typically incomplete, and often fraught with complexity between mind, display, context, use, and purpose. Thus, this course is aimed at providing students with an understanding of the way the human mind processes visual graphics and the principles for designing them to meet commercial and educational goals.

## **Course Format and Evaluation Procedures**

**Instructional methods.** This course will be delivered via three principles methods of instruction: a) lecture & class discussion, b) project development, and c) classroom presentation of your project. Lecture is designed to teach you the underlying theories and models of cognition, instructional design, and visualization processing necessary for appreciating the power of visual displays. Class discussions are incorporated to allow you to actively process information-- to be able to interact with information in terms of your own experiences as well as the experience of others. Interactive discussions make content more comprehensible and more memorable at the same time. Secondly, there is no teacher like direct experience. Consequently, you will have the opportunity to contribute to a shared project. Thus, you will read a selection of research articles you choose targeting a topic where visualizations (in the form of 2D static or animated graphics) influence a subject of Psychology you and your team find fascinating. In your project, you will: (a) select the topic, (b) join a team (b) find research articles, (c) integrate those articles, and (d) work with your team to design an integrated synthesized explanatory presentation using PowerPoint or Prezi to teach the class about the topic.

**Evaluation procedures.** This course is divided into four principal

areas of student responsibility, with 600 total points possible for the course.

<i>Performance Measure</i>	<i>#</i>	<i>Point Value Each</i>	<i>Total Points</i>	<i>Percent of Grade</i>
<b>Reactive/Reflective Margin Notes &amp; Underlining</b>	<b>5</b>	<b>30</b>	<b>150</b>	<b>25%</b>
<b>Class Attendance</b>	<b>22</b>	<b>5</b>	<b>110</b>	<b>18%</b>
<b>Individual Integration Paper</b>	<b>1</b>	<b>120</b>	<b>120</b>	<b>20%</b>
<b>Group Visual Media Class Presentation</b>	<b>1</b>	<b>220</b>	<b>220</b>	<b>37%</b>
<b>Total</b>			<b>600</b>	<b>100%</b>

**Media Project and Extra Credit.**

Media Project. Since this course is designed to teach you about the influence of visual media on thinking, you will have the opportunity to produce a multimedia product. That product will be a culminating multimedia presentation to the class on one of the topics listed below. Over the course of the semester, you will be preparing for that presentation. The entire course has been structured so that you will be able to learn the theories, models, and research necessary for that big event. In order to make your culminating project excellent, you will need to do the following:

1. Attend lectures on a regular basis. The lectures are designed to teach you about the way people think; understanding thinking is essential for understanding how people make sense of visual media.
2. Become a member of a group of four other students in class. Your group will build your culminating multimedia presentation together following the principles of Kosselyn, Kievit, Russell and Shephard (2012). (see <http://nschwartz.yourweb.csuchico.edu/Kosslyn%20PP%20Presentations-Flaws%20&%20Failures.pdf>). This article is required reading for each student in class at the beginning of the semester. It will set the stage for what will be expected of each of you in your final presentation. You will no doubt end up reading that article more than once over the semester.
3. Work with your group to select one of the topics below to which you will become expert over the semester.
4. Select five articles related to your topic (for which there is no overlap with your other group members).
5. Once you have selected your four articles, you will:
  - Underline those articles and write reflective/reactive notes in the margins as you read. You will make a copy of those

articles (with your margin notes) and turn each into your instructor to obtain the points assigned to them as you finish each one.

- Independently write a brief paper that integrates only your four articles. Your paper is not to exceed five pages.
  - Work with your group to integrate the facts that you have learned from your five articles into your group's culminating multimedia presentation.
6. Build an integrated synthesized explanatory presentation using PowerPoint or Prezi to teach the class about your group's topic according to the principles of Kosslyn et al. (2012).

The topics from which you will choose are:

1. Influence on Comprehension of Visualizations in Textbooks
2. Influence of Multimedia in Education (e.g. PowerPoint; Prezi, etc)
3. Influence of Social Media
4. Influence of Headlines and Pictures in News
5. Influence of Multimedia in Advertising
6. Influence of Courtroom Multimedia in Litigation Law
7. Cognitive Processing and Learning from Diagrams
8. Cognitive Processing and Learning from Text and Pictures
9. Cognitive Processing of Visualizations
10. Measuring Graphic Influence: Eye Tracking Technology
11. Human Face Processing
12. Cognition and Emotions Underlying Aesthetics
13. Neurological Evidence for Aesthetics
14. Emotional Design in Multimedia Learning
15. Other by Permission

Extra credit. There is no extra credit option integral to this course. However, you may participate in the conduction of research as a research participant for a total of 5 extra points that will be added to your semester point total. One point can be earned for each hour you spend as an actual research participant. For example, if you spend ½ hour, the point value is .5; for three hours, the point value is 3. All participation must be obtained from official research conducted in the Department of Psychology.

### Examinations

There are no examinations in this course.

### Grading

Grades in this course are based exclusively on the number of points

earned from the performance measures designated above. They will be assigned either according to the percent of points obtained to the total number of points possible, or the student's class standing—whichever is higher. The cutoff scores are identified below:

<i>Grade</i>	<i>Percent to Total</i>	<i>Class Standing</i>
<b>A</b>	93% & up	
<b>A-</b>	90% - 92%	<b>Above 75<sup>th</sup> Percentile</b>
<b>B+</b>	88% - 89%	
<b>B</b>	83% - 87%	
<b>B-</b>	80% - 82%	<b>50<sup>th</sup> – 74<sup>th</sup> Percentile</b>
<b>C+</b>	78% - 79%	
<b>C</b>	73% - 77%	
<b>C-</b>	70% - 72%	<b>25<sup>th</sup> – 49<sup>th</sup> Percentile</b>
<b>D+</b>	68% - 69%	
<b>D</b>	63% - 67%	
<b>D-</b>	60% - 62%	<b>15<sup>th</sup> – 24<sup>th</sup> Percentile</b>
<b>F</b>	59% & down	<b>Below 15<sup>th</sup> Percentile</b>

### Expectations of Scholastic Behavior

From time to time, a few students elect not to purchase the textbook required for this course. I am acutely aware that textbooks have become increasingly expensive—as has higher education in general. This is a terribly unfortunate condition in the United States. However, please note that the textbook **is required** for this course, and students are expected to purchase the text and read required chapters **prior to coming to class**. Class lectures and discussions are significantly richer and more intellectually stimulating when students are prepared. Indeed, students experience a deeper understanding of the concepts, principles and issues explained in class when they have read textbook material. Thus, students are expected to be scholastically prepared when there.

Attendance: When students miss a class, they lose the cognitive thread of the lecture. As a result, their comprehension in subsequent classes precipitously declines. This has a deleterious effect on performance. It also has an additive effect if a student misses a number of classes, or worse, is habitually absent. In effect, frequently absent students become conceptually lost which affects their ability to develop a rich cognitive model of the way

children develop. In addition, regular attendees notice students who are missing or who come irregularly. As a result, the continuity and community of the class suffers since ill-prepared and frequently absent students make little substantive contributions in class and often bring up issues that have already been addressed and discussed. Thus, regular classroom attendance in this course is expected and required for course completion. And, of course, please note that once you are seated, do not get up to leave for a moment in the middle of class.

Electronic Devices: Students are encouraged to use laptops or tablets to take notes (and audio record lectures, if they wish). However, it is important to note that taking notes by writing is significantly more valuable in the encoding process of information into memory—far better than typing—leading to more enduring retention and deeper comprehension. In addition, laptops and tablets do put strain on behavioral self-regulation—that is, the tendency to be pulled to non-academic browsing during class. Of course, this behavior is antithetical to learning. Thus, please note that if a student is on any website or using any app at any time during class, regardless of the circumstances, the student will be dropped from the course. Finally, cell phones are not permitted in class. If you have one, it is required to be turned OFF—not on vibrate—OFF. If a cell phone vibrates during class, the student will be immediately asked to leave.

### University Policies and Campus Resources

Diversity Statement: I value diversity and I am committed to fostering and maintaining an educational environment that appreciates individual differences in all areas of instruction. To this end, I will not tolerate or condone any actions, practices, or processes that discriminate against or are prejudicial toward any person or group based on race, gender, age, religion, ethnicity, nationality, disability, sexual orientation, or socioeconomic status.

Academic integrity: Students are expected to be familiar with the University's Academic Integrity Policy. Your own commitment to learning, as evidenced by your enrollment at California State University, Chico, and the University's Academic Integrity Policy requires you to be honest in all your academic course work. Faculty members are required to report all infractions to the Office of Student Judicial Affairs. The policy on academic integrity and other resources related to student conduct can be found at: <http://www.csuchico.edu/sjd/integrity.shtml>.

Campus Policy in Compliance with the American Disabilities Act: If you need course adaptations or accommodations because of a disability, or if you need to make special arrangements in case the building must be evacuated, please make an appointment with me as soon as possible, or see me during

office hours. Students with disabilities requesting accommodations must register with ARC (Accessibility Resource Center) to establish a record of their disability. Special accommodations for exams require ample notice to the testing office and must be submitted to the instructor well in advance of the exam date.

IT Support Services: Computer labs for student use are located on the first and fourth floor of the Meriam Library, Room 116 and 450, Tehama Hall Room 131, and the Bell Memorial Union (BMU) basement. You can get help using your computer from IT Support Services; contact them through their website, <http://www.csuchico.edu/itss>. Additional labs may be available to students in your department or college.

Student Services: Student services are designed to assist students in the development of their full academic potential and to motivate them to become self-directed learners. Students can find support for services such as skills assessment, individual or group tutorials, subject advising, learning assistance, summer academic preparation and basic skills development. Student services information can be found at: <http://www.csuchico.edu/current-students>.

Americans with Disabilities Act: If you need course adaptations or accommodations because of a disability or chronic illness, or if you need to make special arrangements in case the building must be evacuated, please make an appointment with me as soon as possible, or see me during office hours. Please also contact Accessibility Resource Center (ARC) as they are the designated department responsible for approving and coordinating reasonable accommodations and services for students with disabilities. ARC will help you understand your rights and responsibilities under the Americans with Disabilities Act and provide you further assistance with requesting and arranging accommodations.

Accessibility Resource Center <http://www.csuchico.edu/arc>

530-898-5959 Student Services Center 170 [arcdept@csuchico.edu](mailto:arcdept@csuchico.edu)

Student Learning Center: The mission of the Student Learning Center (SLC) is to provide services that will assist CSU, Chico students to become independent learners.

The SLC prepares and supports students in their college course work by offering a variety of programs and resources to meet student needs. The SLC facilitates the academic transition and retention of students from high schools and community colleges by providing study strategy information, content subject tutoring, and supplemental instruction. The SLC is online at <http://www.csuchico.edu/slc>. The University Writing Center has been

combined with the Student Learning Center.

**Course Schedule**

DATE	TOPIC	RESEARCH ARTICLE	READING ASSIGNMENT	
January 21	Introduction to the Course			
JANUARY 23 <sup>rd</sup> through MARCH 10 <sup>TH</sup>	Human Cognitive Architecture	<b>FEB 11</b> Article 1 Reading <i>Deadline</i>	Suggested: Baddeley	
	Humans as Active Processors		Suggested: Alba & Hasher	
	Multimedia Learning Theory	<b>FEB 20</b> Article 2 Reading <i>Deadline</i>	Suggested: Mayer; Moreno	
	Cognitive Load Theory		Suggested: Sweller et al.	
	Visual Queries	<b>FEB 27</b> Article 3 Reading <i>Deadline</i>	Please read: Chap. 1	
	Theory of Vision		Please read: Chap. 2	
	Processing Color		Please read: Chap. 4	
	Understanding Visual Objects Words and Meaning	<b>MAR 10</b> Article 4 Reading <i>Deadline</i>	Please read: Chap. 6	
	Understanding Visual & Verbal Narrative		Please read: Chap. 7	
	March 12	<b>TEAM MEETING ASSIGNMENT OF ROLES AND PLANNING FOR POST SPRING BREAK WORK</b>		
	<b>SPRING BREAK MARCH 16 – 20</b>			
	March 24	<b>Project Development</b>		

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March 26	Project Development	<b>MAR 26</b> 4-Article Integrative Paper <b><u>Deadline!</u></b>	
March 31	Project Development		
April 2	Project Development	<b>APR 2</b> Kosslyn et al. Reading <b><u>Deadline</u></b>	
April 7	Project Development		
April 9	Project Development		
April 14	Project Development		
April 16	No Class Project Development outside of class		
April 21	No Class Project Development outside of class		
April 23	Project Development		
April 28	Project Development		
April 30	Project Development		
May 5	Project Presentations	<i>Multimedia presentations are to be professionally produced with design principles heeded.</i>  <i>Presentations MUST be 25-30 minutes.</i>	
May 7	Project Presentations		
Scheduled Final Day	Project Presentations		