Visual-Spatial Ability (Spring 2012) Syllabus

Instructor: Andrew Knauft aknauft@uci.edu
Faculty Mentor: Michael Martinez
Fridays 2-2:30pm in RH 192
Final Date:

Course Description: "Spatial ability" is the ability to create, maintain, and manipulate non-verbal information. Cognitive science has been studying spatial ability as an aspect of intelligence since the 1920s, and more recently courses have appeared which support the theory that spatial intelligence can be increased through direct instruction. This class will focus on exposing students to current theories regarding spatial-ability theory, and give students experience applying their own spatial skills to solve problems, both scholastic and mundane. It is not necessary for students to have prior exposure to either cognitive theory or spatial ability to gain from this course.

Goals: The course will strive to present answers for the following questions:
1. What is spatial ability?
2. How does our brain do it?
3. Where are applications for spatial ability in the classroom?
4. Where are applications for spatial ability in real life?
5. How effective are particular visual-spatial strategies?

Student Expectations: Students are expected to attend each of the ten seminar meetings and participate in the class activity. Students will also be expected to participate in class discussions regarding the activity. In addition, each student will be responsible for a final project, which will be presented to the rest of the class during the tenth week.

Final Project: During each seminar, students will be introduced to a variety of aspects to visual-spatial ability, and several applications for this skill. As a final project, students will identify an area of interest that can benefit from the techniques discussed during the quarter and present this application to the class. Further details will be given during fifth week.

Grading: This class is offered P/NP – to earn a P, a student must:
- Have regular attendance,
- Participate during activities and discussions,
- Complete and present a Final Project.

Additional Reading: Periodically students will be directed to optional readings to supplement the weekly seminar. For students interested in a broad overview of Spatial Ability, the following are excellent resources:

Bogue, B., and R. Marra, eds. "Overview: Visual Spatial Skills." AWE Research Overview Suite (2005). Visual Spatial Skills. (2003). In B. Bogue & R. Marra (Eds.), *AWE Research Overview Suit.* <http://www.engr.psu.edu/AWE/ARPresources.aspx>

Lohman, David F. "Human Intelligence: An Introduction to Advances in Theory and Research." Review of Educational Research 59.4 (1989): 333-66.

Mohler, James L. "A Review of Spatial Ability Research." Engineering Design Graphics Journal 72.3 (2008): 19-28.

Anticipated Schedule

Week 1 *April 6*	Course Introduction *Activity: Blind Lego*
Week 2 *April 13*	Cognitive Science and Baddeley's Working Memory *Activity: Pre-Test*
Week 3 *April 20*	Piaget and his Stages *Activity: Image Recall 1*
Week 4 *April 27*	Language *Activity: Image Reacll 2*
Week 5 *May 4*	Projective Representations ***Final Project Assigned***
Week 6 *May 11*	Natural Predispositions and Gender Differences
Week 7 *May 18*	Inter-Dimensional Explorations *Activity: Inter-Dimensional Stations*
Week 8 *May 25*	Paper skills: folding and cutting
Week 9 *June 1*	*No class meeting*
Week 10 *June 8*	Measurement / Real-World Integration *Activity: Robot Navigation / Post-Test*
Finals Week June 14 @ 10:30 – 12:30 (same place)	Final Presentations