**Overall Course Goals**

* **Improve your knowledge base in psychology.** By the end of this course you should be able to recognize and discuss the major theories, findings, and issues in various areas of cognitive psychology (learning, memory, expertise, neurological basis for cognition, etc.). This outcome will be assessed through exams, discussions, and assignments.
* **Applications of psychology to daily living.** By the end of this course you should be able to apply this understanding to everyday life (e.g., How can I study less and remember more?). This outcome will be assessed through discussions and assignments.
* **Ability to synthesize evidence.** By the end of this course you should have a better understanding of our knowledge of psychology is obtained and evaluated, assessing the conclusions drawn from empirical studies (e.g., How do psychologists investigate “learning” and how do we identify the neurological basis for cognitive processes?). This outcome will be assessed through the final project.

**Assessment plan:**

Module discussion boards: 15%

Experiment lab activities: 10%

3 experiment assignment write ups: 10%

3 essay exams: 40%

3 research lineage trace write ups: 25%

Module discussion boards:

Students will post answers to questions posted on the discussion board (one for each module, select from several questions). You may also comment on other student’s comments. Comments need to be: clear, related to fact/notes/theory, civil, and creative (i.e. don’t just post the notes). Opinions are welcome as long as they do not devolve into “I’m right, you’re wrong, end of story arguments”. Some topics may be related to religious/social morale issues, so any comments containing such information should be respectful of different lifestyles and beliefs.

*Grading*: Credit/no credit based on the above guidelines.

Experiment lab activities:

Students will take experiments posted on Blackboard, and post their results in designated places. These results will then be summarized and posted as a discussion board option for students to look at and interpret for write up assignments.

*Grading:* Credit/no credit based on submitting appropriate numbers.

Experiment lab write ups:

 For each assignment, answer the following questions:

1. Definition: What topic was the experiment over?  What is that phenomenon (please put this in your own words, I have my slides, do not cut and paste them)?
2. Results:  What were the results from your experiment?  (Your score, Classes score from the discussion board, what happened)
3. Interpretation: What did those results imply?  What do they mean?
4. Application: How might you see this topic in your everyday life?

*Grading:* You need to answer each question thoroughly and will be graded according to correctness, clarity, and appropriateness of your answers. There are many correct answers.

Essay exams:

For each module, I will provide a list of key terms and phrases (Terms to Know). These terms are designed to help you focus your study for the exam. The exam questions on each test will require you to demonstrate knowledge about an experiment or paradigm that we have discussed in the previous section. To perform well on the exams, you must have a deep understanding of the material, as the short answer and essay questions will be primarily conceptual and application questions, assessing your understanding of how the concepts in this course relate to one another. The exams will cover material since the last exam and will not be cumulative per se, but some topics build on information from earlier in the term and may be required to successfully answer a current question (i.e., questions about expertise, relate to theories of working memory). Concepts that continue to be relevant will be included on the list of terms for the upcoming exam.

*Grading*: You need to answer each question thoroughly and will be graded according to correctness, clarity, and appropriateness of your answers. There are many correct answers.

Lineage Trace Write ups:

**Goals:** Gain a general framework for research articles in cognitive psychology, learn how to use the PsycInfo system, etc.

**Description:** Sometimes the best way to understand research in psychology is to actually *read* the original research in a particular subject. This project is designed to show you how research inspires more research, which creates a “lineage” or set of papers that can be traced backwards in time.

**Rules:**

* Topic must be related to cognitive psychology. No clinical articles please.
* First article must be from a peer-reviewed journal. Not sure? Ask. Most of the works you’ll find on PsycInfo will be peer reviewed. See help guide for how to get started.
* First article must have been published in the last two years (2012-2014). If you give me your topic, and we can’t find something in the last couple years, I’ll let you go farther back.
* First article must be empirical (unless I give you special permission). Empirical works have experiments in them. The experiments may be correlational designs (they didn’t manipulate anything, survey research, etc.) or experimental designs, but you must have experiments in your paper. This restriction excludes summary papers, theory papers, but not quite meta-analyses. If you aren’t sure, ask or look for a Methods section in the article.
* You will need 3 article summaries in total for full credit. You should not wait until the end of the semester to get started or you will get stuck. Not all of the journals will be available online.
  + Hints: Try Google Scholar for journals the library does not have access to. You can try searching for a particular author’s website as well.
  + Ask me to help you find the articles.
* You will create an article flyer (see below) for each article and upload them on blackboard. The assignment is set up as a blog so that you can turn things in as you finish them (the assignment system is very messy for projects like this one). You will hit “create blog entry” at the top of the page. Then you can cut and paste your article flyer into the blog comments or attach a word document of the blog. This way you can put files online as you go, it’s easy for me to read and grade, and the assignment system doesn’t crash and explode. Additionally, you can look at other people’s postings of their projects.
* YOU CANNOT COPY ANY DIRECT QUOTES FROM THE ARTICLE.
  + You need to explain their experiments in your own terms. You can use their terms, but no quotes.
  + If you do, you will receive a zero for the project.

**What to turn in:**

* You will create a “research flyer” for one of the experiments in the article. You can be as creative as you like, using graphics from the article (screen shots of the tables/figures that convey what happened in the experiment), with descriptions of the following:
  + Main hypothesis: what were the researchers trying to investigate in their project? What were they predicting?
  + Simplified experimental procedure: What did the participants do in the experiment?
  + Results: What happened in the study?
  + Application: Why should we be interested? How might this apply to something that would be relevant to our lives?
* You can create this flyer as an infographic, flyer like you might see on campus advertising, or other picture/text combinations that display the research you are presenting in a simplified way.
  + Do not fill up a page with text. Think about how you might display the results that would be posted on social media or website to catch people’s eyes. Science text is boring. How can we make it interesting?
  + Do assume people will know some of the basic terms – for example, you will not need to explain terms that we’ve covered in class.
  + These assignments will be graded on completeness of answering the four parts above, and trying to design a flyer. It is ok if the design is not the prettiest, as long as it follows the rules above.
* Websites to get started:
  + <http://infogr.am>
  + <http://piktochart.com>
  + <http://www.easel.ly>
  + <http://www.creativebloq.com/infographic/tools-2131971>

**Note:**

Due date listed online is for the final posting. You must make sure to follow the other two due dates for the first two traces.

Module 1 Name: Introductions to the Course, Professor, and Classmates

**Learning Goals/Outcomes:**

Upon completion of this module, the student will be able to:

* Navigate Blackboard and find learning modules, lectures, grades, and other materials
* Post discussion board threads and comments
* Discuss with your instructor and fellow classmates
* Discuss course policies, grading, and expectations

**Learning Resources:**

Required resources:

* Blackboard access
* Computer with updated browser
* Syllabus
* Watch Module 1 Video

Additional resources:

* Blackboard help experts page
* Link to help desk
* IT Help phone number

**Discussion Questions:**

* Start an about me thread on the discussion board
* Course policies

**Lesson Evaluation: Graded Assignments**

* Answer the about me thread on the discussion board (discussion board grade)

Module 2 Name: History of Cognitive Psychology, Experimental Methods

**Learning Goals/Outcomes:**

Upon completion of this module, the student will be able to:

* Identify the major players in the advancement of cognitive science
* Critique the major theories of cognitive psychology
* Analyze research abstracts for pieces of experimental design

**Learning Resources:**

Required resources:

* Read Smith and Kosslyn chapter 1
* Watch Module 2 lecture

Additional resources:

* The Logic Theorist – Newell & Simon Artificial Intelligence (<http://www.cs.swarthmore.edu/~eroberts/cs91/projects/ethics-of-ai/sec1_2.html>)
* More about Newell (<http://www.umsl.edu/~piccininig/Newell%205.htm>)
* More big names in the history of cognition (<http://www.muskingum.edu/~psych/psycweb/history/cognitiv.htm>)

**Learning Activities:**

Lab Activities for this lesson:

* Turing Test Experiment

**Discussion Questions:**

* What were the major advancements that led to the cognitive revolution? What could be the next technological advance that pushes the boundaries of what we can learn now?
* In thinking about your day-to-day interactions, how and when do we use artificial intelligence?
* Find an abstract using Google Scholar or PsycInfo (see handout). What are the independent variables? What is the dependent variable? What are the experimental hypotheses?

**Self-Assessment:**

* Test Terms Flash Cards
* Test Bank Questions

**Lesson Evaluation: Graded Assignments**

* Answer one discussion board question (discussion board grade)
* Turing test results (lab activities grade)
* Option (one for each exam block): Turing Test assignment write up (lab write up grade)

Module 3 Name: The Brain and Cognition

**Learning Goals/Outcomes:**

Upon completion of this module, the student will be able to:

* Outline brain communication from the cellular (neurons) to whole brain (corpus callosum) levels. This learning outcome includes basic knowledge of the cell parts, intra-internueron communication, lobes and processes of the brain, and brain parts.
* Apply brain functioning to everyday actions, such as hearing, seeing, and sensation.
* Critique behavioral and brain measurement tools for pros and cons related to experimental psychology.

**Learning Resources:**

Required resources:

* Read Smith and Kosslyn chapter 1
* Watch Module 3.1 Lecture
* Watch Module 3.2 Lecture
* Use the brain sheet to help during lecture

Additional resources:

* Neurons and Brain Soup (<https://www.ted.com/talks/suzana_herculano_houzel_what_is_so_special_about_the_human_brain>)
* Ways to study the brain (<https://www.ted.com/talks/carl_schoonover_how_to_look_inside_the_brain>)
* Aphasia in the brain (<https://www.ted.com/talks/jill_bolte_taylor_s_powerful_stroke_of_insight>)

**Learning Activities:**

Activities for this lesson:

* Chimeric Faces experiment

**Discussion Questions:**

* The ancient Greeks believed that the heart—not the head—was the site of mental processes. What difference does it make that they were wrong?
* Say there is a new drug that will protect one part of your brain from stroke, but only a single part. Which part would you choose to preserve above all the others?
* What role, if any, would that part of your brain play in helping you in job interviews? Why?
* Think about an hour of your day yesterday. What did you do in that hour that shows that the 10 percent rule for brain functioning is a myth?
* What might be the best measurement for brain processes? Why do you think that measurement will be most useful for science?

**Self-Assessment:**

* Test Terms Flash Cards
* Test Bank Questions

**Lesson Evaluation: Graded Assignments**

* Answer one discussion board question (discussion board grade)
* Chimeric faces results (lab activities grade)
* Option (one for each exam block): Chimeric faces assignment write up (lab write up grade)

Module 4 Name: Perception and Illusions

**Learning Goals/Outcomes:**

Upon completion of this module, the student will be able to:

* Explain the process of sensation for the visual system from intake of light waves to occipital lobe
* Apply the differences in sensation and perception to illusions and basic perceptual tasks
* Assess differences in recognition theories to determine how recognition approaches explain perception

**Learning Resources:**

Required resources:

* Read Smith and Kosslyn chapter 2
* Watch Module 4.1 (powerpoint attached)
* Watch Module 4.2 (powerpoint attached)
* Watch Module 4.3 (powerpoint attached)
* Watch Module 4.4 (powerpoint attached)

Additional resources:

* Different ways of knowing – Synesthesia (<https://www.ted.com/talks/daniel_tammet_different_ways_of_knowing>)
* Illusions show us (mis)thinking (<https://www.ted.com/talks/al_seckel_says_our_brains_are_mis_wired>)
* Illusions show us perception (<https://www.ted.com/talks/beau_lotto_optical_illusions_show_how_we_see>)
* Michael Bach Illusions site (<http://michaelbach.de/ot/>)

**Learning Activities:**

Activities for this lesson:

* Illusion experiments (https://www.youtube.com/watch?v=sxwn1w7MJvk)

**Discussion Questions:**

* Do you think it is possible that aliens from another planet might have better perceptual systems than ours? Why or why not?
* Is what constitutes “too much” information always the same, from moment to moment, or does this depend on context? If the latter, how do perceptual systems alter their performance depending on context to take in more or less information?
* When is perception more or less demanding in everyday life? How might actions such as driving a car in traffic or reading in a noisy environment rely more or less on top-down processing?
* How might adults and children be different in their perception of common objects, such as bottles and faces? How about rare objects, such as a wing nut and a platypus?
* Why do we say that two things are “similar” or “dissimilar”? It has sometimes been said that in order to understand the nature of similarity we would need to understand most of visual perception. Why might this be true?
* Say you were magically transported to the planet Ziggatat in a different dimension and when you looked around you didn’t see any object you recognized. How would you describe what you saw? How could you tell where one object ended and another one started?
* How might people from different parts of the world perceive things differently? What types of surroundings would improve or impair recognition for different peoples?
* Back on the planet Ziggatat, say you’ve figured out what parts belong to what and have come up with names for the objects. What problems will remain as you learn this new environment?

**Self-Assessment:**

* Test Terms Flash Cards
* Test Bank Questions

**Lesson Evaluation: Graded Assignments**

* Answer one discussion board question (discussion board grade)
* Rubber Hand Illusion experiment results (lab activities grade)
* Option (one for each exam block): Rubber Hand Illusion assignment write up (lab write up grade)

Module 5 Name: Pay Attention! (to what and how it works)

**Learning Goals/Outcomes:**

Upon completion of this module, the student will be able to:

* Distinguish between different theories of attention for the problems and successes with attention
* Analyze if and when you miss changes in your visual field, and identify the potential cause of missing that change
* Identify the different tasks used for studying attention, such as visual search, dichotic listening and cueing paradigms

**Learning Resources:**

Required resources:

* Read Smith and Kosslyn chapter 3
* Watch Module 5.1 video (powerpoints attached)
* Watch Module 5.2 video (powerpoints attached)
* Watch Module 5.3 video (powerpoints attached)
* Watch Module 5.4 video (powerpoints attached)

Additional resources:

* Dichotic Listening task (<https://www.youtube.com/watch?v=NCIuZGsSmlI>)
* Five ways to listen better (https://www.ted.com/talks/julian\_treasure\_5\_ways\_to\_listen\_better)

**Learning Activities:**

Activities for this lesson:

* Pattern Recognition Experiment
* Change Blindness Experiment

**Discussion Questions:**

* Does studying in a noisy environment such as a coffee shop help you focus or does it distract you? Do the level of noise and the difficulty of the subject mat­ter or its type (verbal, pictorial) affect the suitability of a study location? How?
* What would it be like if you were equally aware of all the visual and auditory details of your environment at once? Would this be an advantage or a disadvantage?
* From knowledge of the different theories of attention, what advice would you give to advertising agencies for creating advertisements that are likely to be noticed and read? What advice would you give to Web masters who want to control the distractibility of Web advertisements on their pages?
* How can the idea that the information we are aware of is essentially the “winner” of competing information be used to inform laws about using cell phones while driving?

**Self-Assessment:**

* Test Terms Flash Cards
* Test Bank Questions

**Lesson Evaluation: Graded Assignments**

* Answer one discussion board question (discussion board grade)
* Pattern recognition results (lab activities grade)
* Change blindness results (lab activities grade)
* Option (one for each exam block): Pattern recognition or change blindness assignment write up (lab write up grade)

Module 6 Name: Imagery and Embodied Cognition

**Learning Goals/Outcomes:**

Upon completion of this module, the student will be able to:

* Analyze how actions are represented in the brain, mind, and everyday life
* Apply cognitive mapping to tasks such as video games, driving, and giving directions
* Analyze studies in imagery for their contribution to the literature (i.e. are they useful/good studies?)

**Learning Resources:**

Required resources:

* Read Smith and Kosslyn chapter 11
* Watch Module 6 video (powerpoints attached)

Additional resources:

* Sian Beilock’s website (<http://hpl.uchicago.edu>)
* Robots with soul (https://www.ted.com/talks/guy\_hoffman\_robots\_with\_soul)

**Learning Activities:**

Activities for this lesson:

* Fitt’s Law Experiment

**Discussion Questions:**

* What sorts of problems are best solved with mental simulations? What sorts of problems are likely to be difficult to solve with mental simulations?
* Does all motor cognition involve mental simulations? (*Hint:* We are aware of having mental images—are we aware of all motor cognition?)
* If you were temporarily paralyzed, do you think you could still perceive actions even if you couldn’t produce them? If so, would this disprove the idea that the motor system is involved when we perceive actions?
* How could you use dual coding theory to improve your study skills with imagery?
* Talk about the pros and cons of any of the motor cognition experiments. Do they make a convincing argument for embodied cognition?

**Self-Assessment:**

* Test Terms Flash Cards
* Test Bank Questions

**Lesson Evaluation: Graded Assignments**

* Answer one discussion board question (discussion board grade)
* Fitt’s law results (lab activities grade)
* Option (one for each exam block): Fitt’s law assignment write up (lab write up grade)

**Exam 1**

**Lesson Evaluation: Graded Assignments**

Make sure you've completed the following:

-       Complete Exam 1 (exam grades)

-       Complete one lab assignment write up (lab write up grade)

-       Complete one lineage trace write up (lineage grade)

Module 7 Name: All of the knowledge you have stored

**Learning Goals/Outcomes:**

Upon completion of this module, the student will be able to:

* Discuss representational theory for knowledge (delineate perceptual and amodal systems)
* Critique theories of category representation (feature comparison, prototype, exemplar) to denote key differences
* Explain the hierarchy of category membership, category structure, and categories schemas
* Discuss neural network models application to category structure.

**Learning Resources:**

Required resources:

* Read Smith and Kosslyn chapter 4
* Watch Module 7.1 video (powerpoints attached)
* Watch Module 7.2 video (powerpoints attached)

Additional resources:

* Creating Novel Categories (<http://www.jove.com/video/3358/creating-objects-object-categories-for-studying-perception-perceptual>)

**Learning Activities:**

Activities for this lesson:

* Category Features Experiment

**Discussion Questions:**

* If a camera had knowledge, how would its functionality change?
* Does knowledge play the same roles in nonhuman species of animals as in humans? What might some similarities and differences be?
* If a person really lost all knowledge, what sorts of social support systems would have to be implemented to help this person cope in the world?
* How does the representation of knowledge in computers (documents, photos, music files, etc.) differ from the representation of knowledge in humans? How are they similar?
* How could multiple formats of representation be implemented and combined in cameras and computers to make them more sophisticated?
* For many categories, no single feature is shared by all category members. How does the account of exemplar integration provided here explain the integration of exemplars for such categories?
* What constitutes an exemplar memory? Imagine seeing a particular member of a category, such as a chair in your living room. Is an exemplar an inte­grated representation of all the times you’ve perceived this chair or does each occasion produce a different exemplar? What defines the spatiotemporal boundaries of an exemplar?
* What types of information reside in background knowledge and schemata? Can you suggest any particular kinds of information that are likely to be included? Likely to be excluded? Also, how are these structures likely to be organized?

**Self-Assessment:**

* Test Terms Flash Cards
* Test Bank Questions

**Lesson Evaluation: Graded Assignments**

* Answer one discussion board question (discussion board grade)
* Category feature results (lab activities grade)
* Option (one for each exam block): Category features assignment write up (lab write up grade)

Module 8 Name: How that knowledge is stored (memory)

**Learning Goals/Outcomes:**

Upon completion of this module, the student will be able to:

* Understand the types of memory systems and their interactions between systems
* Analyze working memory span for its relationship to other cognitive variables
* Compare processes of encoding for effective studying and memory retrieval

**Learning Resources:**

Required resources:

* Read Smith and Kosslyn chapter 5
* Watch Module 8.1 video (powerpoints attached)
* Watch Module 8.2 video (powerpoints attached)
* Watch Module 8.3 video (powerpoints attached)

Additional resources:

* Manipulating memory (<https://www.ted.com/talks/steve_ramirez_and_xu_liu_a_mouse_a_laser_beam_a_manipulated_memory>)
* Daniel Kahneman (<https://www.ted.com/talks/daniel_kahneman_the_riddle_of_experience_vs_memory>)
* Feats of Memory (<https://www.ted.com/talks/joshua_foer_feats_of_memory_anyone_can_do>)
* Working memory makes sense (https://www.ted.com/talks/peter\_doolittle\_how\_your\_working\_memory\_makes\_sense\_of\_the\_world)

**Learning Activities:**

Activities for this lesson:

* Brooks Scanning Experiment
* Levels of Processing Experiment
* Encoding Specificity Experiment

**Discussion Questions:**

* Imagine that your working memory was impaired. What aspects of your daily life do you think would be most disrupted?
* Do you think it is possible to “train” your working memory to be better? How might one go about doing this? Use the movie conversation as an ex­ample—how could you improve your performance in this kind of situation?
* Short-term storage is thought to be severely limited in both capacity and duration. Can you think of any advantages this limitation might confer? What might the world be like if both capacity and duration were unlimited?
* Working memory capacity predicts performance on tests such as the SAT and GRE. Thus, why not just replace the current standardized testing with a sim­ple measurement of an individual’s working memory capacity? What might be the possible advan­tages, disadvantages, and implications of such a decision?
* Imagine that a drug becomes available that has been proven to enhance working memory function in healthy young adults. Would it be ethical to allow this drug to be made widely available? If you were involved in making this policy decision, what factors would influence you?
* Try to imagine what life would be like without the ability to form new declarative memories. What aspects of your life would change?
* Although we are typically not aware of when our behavior is being influenced by nondeclarative memory, can you think of three examples across the course of today where your actions were likely affected by one form of nondeclarative memory?
* How should you study to improve your learning of course material and the likelihood that you will be able to retrieve this material when necessary?
* Consider a recent instance in which you failed to remember a prior event. Can you trace this memory failure to ineffective encoding? How might you have changed this memory outcome?
* What are the implications of nondeclarative memory for the perspective that humans have free will—that is, that we make conscious choices on how to think and act?

**Self-Assessment:**

* Test Terms Flash Cards
* Test Bank Questions

**Lesson Evaluation: Graded Assignments**

Be sure you’ve completed the following graded items:

* Answer one discussion board question (discussion board grade)
* Pick two:
  + Brooks Scanning results (lab activities grade)
  + Levels of Processing results (lab activities grade)
  + Encoding Specificity results (lab activities grade)
* Option (one for each exam block): Brooks scanning, levels of processing, encoding specificity assignment write up (lab write up grade)

Module 9 Name: Issues with memory

**Learning Goals/Outcomes:**

Upon completion of this module, the student will be able to:

* Understand the processes of forgetting
* Compare the relationship between older and newer theories of forgetting
* Analyze which theory best explains everyday forgetting / problems with memory you find during your normal routine

**Learning Resources:**

Required resources:

* Read Smith and Kosslyn chapter 6
* Watch Module 9.1 video (powerpoints attached)
* Watch Module 9.2 video (powerpoints attached)

Additional resources:

* Gary Wells bomber videos (https://www.psychology.iastate.edu/~glwells/homepage.htm)
* Loftus videos (<https://www.ted.com/talks/elizabeth_loftus_the_fiction_of_memory>)
* Why eyewitnesses get it wrong (https://www.ted.com/talks/scott\_fraser\_the\_problem\_with\_eyewitness\_testimony)

**Learning Activities:**

Activities for this lesson:

* The DRM Experiment
* Proactive Interference Experiment

**Discussion Questions:**

* In deciding whether or not a particular event happened just the way it was described to you by the sole eyewitness, what factors would you consider?
* Memory is critical for recording one’s life narrative and thus for generating a sense of self. How should the knowledge that memory is fallible influence our confidence in what we know about our past and our sense of self?
* Which memory sin do you feel you are most susceptible to? Why do you feel you have that issue?
* Often when we are having difficulties remembering something, a friend might try to lend a hand by suggesting possible answers. Although well intentioned, how might these efforts to be helpful result in the exact opposite outcome decreasing the probability of remembering the desired information?

**Self-Assessment:**

* Test Terms Flash Cards
* Test Bank Questions

**Lesson Evaluation: Graded Assignments**

Be sure you’ve completed the following graded items:

* Answer one discussion board question (discussion board grade)
* DRM results (lab activities grade)
* Proactive interference results (lab activities grade)
* Option (one for each exam block): DRM or proactive interference assignment write up (lab write up grade)

Module 10 Name: Great amounts of memory (Expertise)

**Learning Goals/Outcomes:**

Upon completion of this module, the student will be able to:

* Determine what is necessary to develop an expertise
* Identify the stages of expertise
* Analyze the implications of gaining an expertise and how that improves abilities but lessens the ability to transfer skill

**Learning Resources:**

Required resources:

* Watch Module 10 video (powerpoints attached)

Additional resources:

* Video games expertise (https://www.youtube.com/watch?v=v8J-ocnJQ5c)
* Expert video gamers (http://journal.frontiersin.org/Journal/10.3389/fpsyg.2013.00941/full)

**Learning Activities:**

Activities for this lesson:

* No lab

**Discussion Questions:**

* What sort of expertise do you have? How long do you think it took you to develop that expertise?
* What are some expertises we have to have to function in our daily lives? What sorts of problems do you see when individuals do not have that particular skill?
* What might we do to improve the development of expertise?

**Self-Assessment:**

* Test Terms Flash Cards
* Test Bank Questions

**Lesson Evaluation: Graded Assignments**

Be sure you’ve completed the following graded items:

* Answer one discussion board question (discussion board grade)

Module 11 Name: Problem Solving

**Learning Goals/Outcomes:**

Upon completion of this module, the student will be able to:

* Delineate the types of problems and operators used to study problem solving
* Critique problem space theory as a explanation of problem solving
* Apply problem solving research to everyday problems by understanding how heuristics are useful in goal driven behavior

**Learning Resources:**

Required resources:

* Read Smith and Kosslyn chapter 10
* Watch Module 11.1 video (powerpoints attached)
* Watch Module 11.2 video (powerpoints attached)

Additional resources:

* Gamer problem solving is the solution (<https://www.ted.com/talks/jane_mcgonigal_gaming_can_make_a_better_world>)
* Luminosity train your brain to problem solve (<http://www.lumosity.com>)
* Insight problems (<http://www.indiana.edu/~bobweb/Handout/d4.ips.htm>)

**Learning Activities:**

Activities for this lesson:

* Tower of Hanoi Experiment

**Discussion Questions:**

* One of the most interesting findings about the brain and problem solving is that many regions of the brain that are involved in attention and memory are also involved in thinking and reasoning. Why is this the case?
* Can you think of an example when you used an analogy to solve a novel problem?
* Can analogies sometimes lead to faulty assumptions about the underlying nature of objects or events?
* Can you think of situations in which certain heuristics might lead a reasoner astray?
* Which heuristics might work better for solving a well-defined problem? An ill-defined problem?
* Are well-defined problems always easier to complete than ill-defined problems? Why or why not?
* Can the solution of all problems be characterized in terms of search in a problem space? Are there key aspects of solving a problem that this approach leaves out? For example, are the start state and set of operations necessarily specified completely from the outset?

**Self-Assessment:**

* Test Terms Flash Cards
* Test Bank Questions

**Lesson Evaluation: Graded Assignments**

Be sure you’ve completed the following graded items:

* Answer one discussion board question (discussion board grade)
* Tower of Hanoi results (lab activities grade)
* Option (one for each exam block): Tower of Hanoi assignment write up (lab write up grade)

**Exam 2**

**Lesson Evaluation: Graded Assignments**

Be sure you’ve completed the following graded items:

* Complete Exam 2 (exam grades)
* Complete one lab assignment write up (lab write up grade)
* Complete one lineage trace write up (lineage grade)

Module 12 Name: Reasoning

**Learning Goals/Outcomes:**

Upon completion of this module, the student will be able to:

* Explain the differences in inductive and deductive reasoning
* Outline the types of tasks used to study deductive reasoning, such as categorical and conditional syllogisms
* Apply the types of reasoning errors to logic used to reason about daily tasks

**Learning Resources:**

Required resources:

* Read Smith and Kosslyn chapter 10
* Watch Module 12 video (powerpoints attached)

Additional resources:

* Phillip Johnson-Laird how we reason (<http://vimeo.com/38590492>)

**Learning Activities:**

Activities for this lesson:

* Wason task experiment (http://www.philosophyexperiments.com/wason/)
* Mastermind experiment (http://www.web-games-online.com/mastermind/)

**Discussion Questions:**

* Can you think of specific scenarios that would demand both inductive and deductive reasoning?
* Can you imagine a situation in which deductive logic leads you to a valid conclusion but your knowledge of the world tells you that this conclusion is not true? What is the reason for this discrepancy?
* Why is the Wason task so hard? Which type of logic appears to be problematic?

**Self-Assessment:**

* Test Terms Flash Cards
* Test Bank Questions

**Lesson Evaluation: Graded Assignments**

Be sure you’ve completed the following graded items:

* Answer one discussion board question (discussion board grade)
* Wason task results (lab activities grade)
* Mastermind results (lab activities grade)
* Option (one for each exam block): Wason Task or Mastermind assignment write up (lab write up grade)

Module 13 Name: Decision Making

**Learning Goals/Outcomes:**

Upon completion of this module, the student will be able to:

* Analyze the expected utility model’s ability to describe a decision making process
* Compared bounded rationality theories to the expected utility model
* Understand how decision making processes are assessed in participants
* Apply decision trees to a simple decision for your day

**Learning Resources:**

Required resources:

* Read Smith and Kosslyn chapter 9
* Watch Module 13 video (powerpoints attached)

Additional resources:

* Are we in control of our own decisions (<https://www.ted.com/talks/dan_ariely_asks_are_we_in_control_of_our_own_decisions>)
* Why we make bad decisions (<https://www.ted.com/talks/dan_gilbert_researches_happiness>)
* Decision fatigue (<http://www.nytimes.com/2011/08/21/magazine/do-you-suffer-from-decision-fatigue.html?pagewanted=all>)

**Learning Activities:**

Activities for this lesson:

* Iowa Gambling Task experiment (http://www.millisecond.com/download/library/v4/IowaGamblingTask/IowaGamblingTask.web)

**Discussion Questions:**

* Suppose you conduct an analysis of a personal decision and discover that the result of the analysis disagrees with your “gut feelings” about what you want to do. What should you do to reconcile the two conflicting conclusions?
* Is simply receiving an undesirable consequence sufficient to conclude that the decision process was flawed? What are the most convincing arguments that can be made to prove that an actual, nonlaboratory decision is a bad one?
* How would you evaluate the goals of a decision maker? Do you think it is possible to have “bad goals”?
* How do people predict the value of future consequences when they make decisions? How accurate do you think these predictions are?
* How would you increase the accuracy of your personal predictions of the value of future consequences?

**Self-Assessment:**

* Test Terms Flash Cards
* Test Bank Questions

**Lesson Evaluation: Graded Assignments**

Be sure you’ve completed the following graded items:

* Answer one discussion board question (discussion board grade)
* Iowa gambling results (lab activities grade)
* Option (one for each exam block): Iowa gambling assignment write up (lab write up grade)

Module 14 Name: Language And Cursing

**Learning Goals/Outcomes:**

Upon completion of this module, the student will be able to:

* Distinguish between the major theories of language acquisition and compare their strengths and weaknesses
* Identify the component parts of language and their interaction with comprehension
* Analyze ambiguous sentences and determine what the disambiguating region would be

**Learning Resources:**

Required resources:

* Read Smith and Kosslyn chapter 12
* Watch Module 14.1 video (powerpoints attached)
* Watch Module 14.2 video (powerpoints attached)
* Watch Module 14.3 video (powerpoints attached)

Additional resources:

* Broca’s Aphasia (<https://www.youtube.com/watch?v=f2IiMEbMnPM>
* Wernicke’s Aphasia (<https://www.youtube.com/watch?v=aVhYN7NTIKU>)
* Cursing across the country (<http://www.buzzfeed.com/ryanhatesthis/according-to-this-map-of-swearing-habits-people-in-ohio-curs>)
* QWERTY effect (<http://www.wired.com/2012/03/qwerty-effect-language/>)
* Small World of Words study (<http://www.smallworldofwords.com/new/en/>)
* Linguistic Genius of Babies (<https://www.ted.com/talks/patricia_kuhl_the_linguistic_genius_of_babies>)

**Learning Activities:**

Activities for this lesson:

* McGurk effect experiment (<https://www.youtube.com/watch?v=G-lN8vWm3m0>)

**Discussion Questions:**

* Which theory of language acquisition do you believe is more accurate? Why?
* Broca’s aphasics have difficulty comprehending and producing function morphemes. Many European languages, such as Italian and Russian, have more bound function morphemes (appearing as suffixes on words) in a typical sentence than does a typical sentence in English. Might this difference in the rate of function morphemes affect the nature of Broca’s aphasia in the different languages?
* The generative capacity of language implies that we can produce literally a potentially infinite variety of sentences, and that any sentence could in principle be indefinitely long. In practice, however, even long sentences don’t go beyond a few dozen words in length. Why do we seem to use only this small fraction of our generative capacity? Does the limitation seem to be in our production ability, in our comprehension ability, and/or in other types of cognitive processing?
* We appear to be able to activate multiple meanings of ambiguous words. Is this finding another example of a cohort—activating many possible words that partially match the speech signal? If so, could there be a kind of neighborhood density effect (perhaps the number of alternative meanings) in the interpretation of ambiguous words?
* Some writing systems, including Chinese, do not put spaces between the words in writing. Do you think that reading in Chinese might be more similar to listening in Chinese than reading English is to listening to English?
* In the Groucho Marx joke that begins *I shot an elephant in my pajamas,* either the person doing the shooting is in the pajamas or the elephant is in the pajamas, but not both. Why do we generally interpret as the person in pajamas?

**Self-Assessment:**

* Test Terms Flash Cards
* Test Bank Questions

**Lesson Evaluation: Graded Assignments**

Be sure you’ve completed the following graded items:

* Answer one discussion board question (discussion board grade)
* McGurk effect results (lab activities grade)
* Option (one for each exam block): McGurk effect assignment write up (lab write up grade)

Module 15 Name: Reading

**Learning Goals/Outcomes:**

Upon completion of this module, the student will be able to:

* Analyze the relationship between reading, dyslexia, and learning to read with the dual route model
* Apply the situational model to reading both narrative and expository texts
* Critique different types of inferences in a narrative text
* Identify the signs and solutions to dyslexia

**Learning Resources:**

Required resources:

* Read Smith and Kosslyn chapter 12
* Watch Module 15.1 video (powerpoints attached)
* Watch Module 15.2 video (powerpoints attached)

Additional resources:

* Blind reading (<https://www.ted.com/talks/ron_mccallum_how_technology_allowed_me_to_read>)
* FreeSpeech App (<https://www.ted.com/talks/ajit_narayanan_a_word_game_to_communicate_in_any_language>)
* Learning disabilities rediagnosed (<https://www.ted.com/talks/aditi_shankardass_a_second_opinion_on_learning_disorders>)

**Learning Activities:**

Activities for this lesson:

* Voter ID experiment

**Discussion Questions:**

* Pick a section of text in something you are reading for fun. Outline how you created the situational model from that text.
* Pick a section of text in something you are reading for fun. Explain the types of inferences made in that section.
* Do you remember how you were taught to read? How does it match the whole word or code based approach?
* Have you ever had a “dyslexic” moment? What did that mean to you? How does that match up with the actual definition of dyslexia?

**Self-Assessment:**

* Test Terms Flash Cards
* Test Bank Questions

**Lesson Evaluation: Graded Assignments**

Be sure you’ve completed the following graded items:

* Answer one discussion board question (discussion board grade)
* Voter ID results (lab activities grade)
* Option (one for each exam block): Voter ID assignment write up (lab write up grade)

Module 16 Name: Intelligence

**Learning Goals/Outcomes:**

Upon completion of this module, the student will be able to:

* Compare the traditional single and multiple intelligence definitions to determine how we might define intelligence
* Understand how traditional intelligence tests measure IQ and analyze how these tests might be improved
* Analyze environmental impact on IQ for gender and ethnicity

**Learning Resources:**

Required resources:

* Watch Module 16 video (powerpoints attached)

Additional resources:

* New equation for intelligence (<https://www.ted.com/talks/alex_wissner_gross_a_new_equation_for_intelligence>)
* What constitutes IQ? (<http://science.howstuffworks.com/life/inside-the-mind/human-brain/question455.htm>)
* Nature versus nurture (<http://www.nytimes.com/2006/07/23/magazine/23wwln_idealab.html?pagewanted=all&_r=0>)
* Baby geniuses? (<http://www.wired.com/2013/07/genetics-of-iq/>)

**Learning Activities:**

Activities for this lesson:

* No lab

**Discussion Questions:**

* What might you do to design a culture fair test? How would you alter traditional IQ questions to reduce bias?
* What do you include in your definition of intelligence? Is it one intelligence or multiple intelligences?
* How should we be measuring intelligence?
* How much does environment play a role in intelligence? Is there a way to even the playing field for children from poorer socioeconomic areas?

**Self-Assessment:**

* Test Terms Flash Cards
* Test Bank Questions

**Lesson Evaluation: Graded Assignments**

Be sure you’ve completed the following graded items:

* Answer one discussion board question (discussion board grade)

**Exam 3**

**Lesson Evaluation: Graded Assignments**

Be sure you’ve completed the following graded items:

* Complete Exam 3 (exam grades)
* Complete one lab assignment write up (lab write up grade)
* Complete one lineage trace write up (lineage grade)