

**Learning is hard!** Meaningful learning—the kind that lasts well beyond the test—is really hard. You have to struggle through complex ideas, reconcile misconceptions, take risks, and continually practice the skills you learn. Thankfully, neuroscientists, cognitive scientists, and educational psychologists have done a lot of hard work to figure out how the brain learns best. In this course, we will explore the brain, how it learns, how it’s motivated, what captures its attention, and why it shuts down, can’t remember, and fails to multitask. Along the way, you will develop a concrete learning plan to help you successfully navigate even the most complex learning environments.

**Course**

*Science of Learning*  
USEM 1580  
Wed & Fri, 11:00-11:50 AM  
Pavilion VIII, 108

**Instructor**

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You can learn more about me here:  
<http://trc.virginia.edu/bios/michael-palmer/>

**Office Hours**

Mon, 11:00-11:50 AM

**A Few Resources**

*The New Science of Learning* (2013)

*How Learning Works* (2010)

*Now you See it* (2011)

*Why Don't Students Like School* (2010)

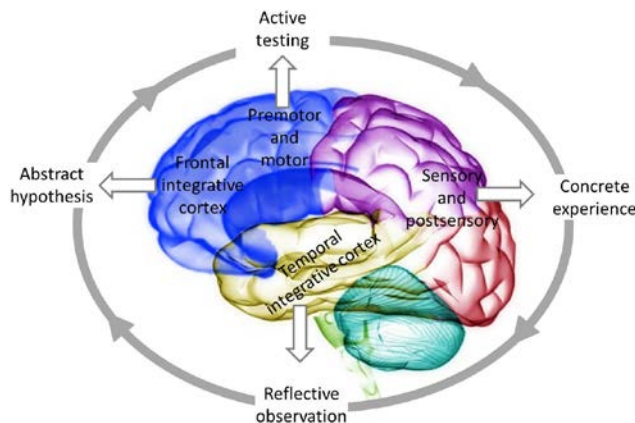
*The Art of Changing the Brain* (2002)



This is a highly interactive and participatory seminar where we will explore the current literature on how the brain learns. Topics will range from the biology of the brain to memory, motivation, mindsets, attention, and metacognition. (Although you may not yet fully understand what each of these is, they all impact how you learn!) By the end of the course, you will...

- be able to explain the biological basis for learning;
- reflect on and recognize personal habits that affect your learning;
- develop a personalized learning plan using evidence-based approaches to improving learning;
- develop skills to monitor your own learning;
- advocate to others to use science to improve learning.

Each topic will be introduced through Kolb’s Experiential Learning Cycle. This evidence-based learning cycle involves four stages: 1) concrete experience, 2) personal reflection, 3) hypothesis formation, and 4) active experimentation. Believe it or not, these stages map onto your brain and looks kind of like this:



## Feedback

Throughout the course, you will receive feedback from me (your instructor), your classmates, yourself, and even the world (through YouTube). This feedback will generally be framed in the form of questions that will help you move to deeper understanding. Think of this feedback more as a guide than a commentary on rightness or wrongness.

## Evaluation

The following activities will contribute to your overall grade in *Science of Learning*:

Class Participation	20%
Reflection Portfolio	40%
Learning Plan	20%
Learning Infomercial	20%

Keep in mind, your final grade is a reflection of how well you meet the learning objectives, not a comment on effort or self-worth.

## Attendance

Because *Science of Learning* is a discussion-based course and many of the foundational ideas will be introduced and explored in class, attendance is required. There is no penalty for one unexcused absence, but each unexcused absence thereafter will lower your overall grade 3% points.

With each pass through the cycle, you will develop different aspects of a personalized learning plan, which you can then implement throughout your academic career and beyond.



Throughout the course, you will have multiple opportunities to engage with the ideas we explore, play with them, reflect on them, and share your insights with your fellow classmates. The following activities will help guide you in this process *and* help you measure your progress as you move toward deeper understanding.



**Class Participation:** *Learning to Learn* is discussion-based course. Its success relies on everyone preparing for class – reading and thoughtfully considering all assigned course materials, jotting down discussion questions, and completing assignments on time – and actively participating in discussions. Class participation can take on many forms; one is not necessarily talking a lot. When you ask thoughtful questions, offer insightful comments, note relevant passages in texts, point out connections between ideas, listen with an open mind, and share personal experiences, you contribute to a healthy, productive discussion. Guidelines and a rubric for how participation is assessed will be provided.



**Reflection Portfolio:** You will keep an electronic reflection portfolio throughout the course, adding 1-2 entries per week. The entries, which will help you explore the course materials or the in-class discussions in more depth, provide a means for you to track your understanding of learning, document your experiments, record your questions, and pose your answers. For a few of your journal entries, you'll have choice in the topics you explore as well as the direction you take in discussing those topics. For the majority, you will be given small tasks to complete beforehand and then asked to reflect on the tasks. While generally private, you will at times share entries with your classmates. Guidelines and a rubric for how the reflective portfolio is assessed will be provided.

## Tips for Success

**#1** As already mentioned, learning is hard work and often frustrating. To do well in this course, you'll need to dedicate yourself to struggling through some difficult concepts and new ways of thinking. If you do this, and I keep up my end of the bargain — to create an interesting, engaging and challenging learning environment — then the work you put in will pay off and you will likely earn an A.

**#2** The more you read prior to class, the more you think about and experiment with ideas, and the more you write in your reflective portfolio, the better off you'll be. Between classes, keep all this information in the back of your mind, asking questions like, "How does what I'm doing in my life (personal and academic) relate to the main ideas of the reading material and classroom discussions?"

**#3** Have fun! Evolutionarily, we would be in big trouble if learning wasn't fun. It turns out the act of learning taps pleasure centers in our brain, which encourages us to solve complex and creative problems rather than always run in fear!



**Learning Plan:** As you move through the course, you will learn the reasons behind why some learning strategies you use are effective and others less so. These observations, coupled with the evidence explored in the course, will form the basis of your personalized learning plan. This plan will help guide your decisions in how to learn throughout your academic career and beyond.



**Learning Infomercial:** Working collaboratively with 1-2 of your classmates, you will create a high quality infomercial "selling" some aspect of the science of learning. Your objective is to convince other undergraduates to adopt one of the evidence-based learning strategies you found particularly helpful to your own learning. To reach a broader audience, we will post these to YouTube and track views. Guidelines and a rubric for how the infomercial is assessed will be provided.



**Schedule:** A tentative schedule of topics, reading assignments, and due dates is shown below. Nothing will be made due earlier than indicated but some things may be pushed back or eliminated altogether, depending on time. All changes will be announced in class and on the course Collab site and posted on the course WordPress site.



### Week 1 - 2: What is learning and why is it so hard?

Reading Assignment: Excerpts from *The Art of Changing the Brain* (chpts 1 & 2) & *Why Don't Students Like School?* (chpt 4)

Reflective Portfolio Entry #1: Reflect on one of your own learning experiences, one that you might describe as powerful. Why was it powerful and what did *you* do to make it so? Likewise, reflect on one of your less memorable learning experience. Why was it ineffective and what did *you* do to make it so?

## A Note About Honor

I trust every student in this course to fully comply with all of the provisions of the UVa Honor System.

With that said, you will often work with others in the course. While the experience should be collaborative in nature, the final version of all graded assignments must be entirely the work (and writing) of each individual student. Also, be sure to cite all sources using APA format. Here's a handy website which details how to do this:

<https://owl.english.purdue.edu/owl/resource/560/01/>

### **Week 3 - 4:** What is memory and why can I remember everything I see on TV but not what my instructors say?

Reading Assignment: Excerpts from *The New Science of Learning* (chpt 6), *Why Don't Students Like School?* (chpt 3), & *How Learning Works* (chpt 2)

Reflective Portfolio Entry #2: TBD

Learning Plan: Update your Learning Plan to reflect our exploration of memory.

### **Week 5 - 6:** Why can I [insert activity of choice] for hours but have difficulty studying for 30 minutes?

Reading Assignment: Excerpts from *How Learning Works* (chpt 2) & *The Art of Changing the Brain* (chpt 5)

Reflective Portfolio Entry #3: TBD

Learning Plan: Update your Learning Plan to reflect our exploration of motivation.

Learning Infomercial: Identify topic, select team, and begin research.

### **Week 7 - 8:** Can anyone—even I—be a rocket scientist?

Reading Assignment: Excerpts from *The New Science of Learning* (chpt 7) & *Mindsets* (TBD)

Reflective Portfolio Entry #4: TBD

Learning Plan: Update your Learning Plan to reflect our exploration of mindsets.

### **Week 9 - 10:** Does technology help or hinder my learning?

Reading Assignment: Excerpts from *The New Science of Learning* (chpt 8) & *Now You See it* (TBD)

Reflective Portfolio Entry #5: TBD

Learning Plan: Update your Learning Plan to reflect our exploration of attention.

Learning Infomercial: Draft storyboard due.

**Week 11 - 12: How do I know when I know something?**

Reading Assignment: Excerpts from *How Learning Works* (chpt 7)

Reflective Portfolio Entry #6: TBD

Learning Plan: Update your Learning Plan to reflect our exploration of metacognition.

**Week 13 - 14: What do my instructors do (or not do) that affect my learning?**

Reading Assignment: Excerpts from *What the Best College Teachers Do* (TBD)

Reflective Portfolio Entry #7: TBD

Learning Plan: Finalize learning plan.

Learning Infomercial: 60-second demo due.

**Week 15: What is learning now that I know about learning?**

Reading Assignment: Excerpts from *TBD*

Learning Infomercials: Presentations