

"How Students Learn" (Biology 455)

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Office Hours: 9-10 T & Th. Also by appointment.

Credits: One (*Biology elective credit, and thus not applicable to the major or minor. However, undergraduate biology majors or minors intending to become high school science teachers would be supported in a petition to the Committee on Degrees requesting major or minor credit.*)

Prerequisites: Two years of college science and/or mathematics **and** Permission of Instructor. This course is intended for students who are majoring in one of the sciences or mathematics and are at the level of juniors, seniors, or first semester M.Ed. students in the School of Education and pursuing secondary certification in science or mathematics.

Course Description: A practical review of research on the structure and function of brain areas involved in learning followed by practical methods to use this knowledge in teaching at the high school level. This course is designed to help prospective teachers understand the science of how people learn in order to help them learn as teachers, while also developing skills to help high school students learn to their best potential.

Description and Objectives:

The course will begin with an overview of the goals and methods of the course, and then move into readings, lectures, exercises, and discussion on the relationship between teaching and research on learning. This section will include lectures with exercises and discussion on material from current text on learning, memory, and attention from a biological/neuroscience perspective. Readings will come from the following:

- (1) **"Why Don't Students Like School: A Cognitive Scientist Answers Questions About How the Mind Works and What It Means for the Classroom"** (Daniel T. Willingham, Jossey Bass Press, 2009). ***You should purchase this book; approx. cost \$17.00.***
- (2) **"How People Learn"** (Committee on How People Learn). These readings will be provided for you.
- (3) **"Memory and Learning: A practical guide for students"** (Paul Heideman)
- (4) Possibly another short book by Daniel Willingham **"When can you trust the experts"**—we'll discuss this

Objectives: You should become aware of how current scientific understanding of learning and memory might and should affect how we teach. A course goal is to produce teachers who have the tools to be aware of new research on learning and to be intelligent and skeptical users of new research on pedagogy.

Grading: Grading will be based upon homework (50%), class participation (30%), and quizzes/exams (20%). Your grade will depend upon how much you learn, NOT what you already know.