Critical Thinking in Science  
Summer 2018  
9:30-11:00 AM Tuesday, GSBS Schissler Library (S3.8351)

Faculty:
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Course Goals:
Encourage a constructively critical approach to the evaluation of science research papers, proposals and other presentations.

Improve student awareness of the how to incorporate a critical approach in designing experiments.

Familiarize students with the peer review process and its importance.

Provide an opportunity for interactions between students that will increase awareness of differing viewpoints and priorities in the research community.

Format:
Class discussion of assigned reading and writing assignments. Some sessions will include lecture material from the instructors.
Grading: (Pass/Fail)

Because the success of this class depends on active student participation, the grading system is intended to encourage students to regularly contribute to discussions and to complete in-class exercises.

**Preparation for and participation in class discussions (12 points total)**
Participation in each class session is worth 1 point. Active participation requires that the student complete any pre-class assignments and meaningfully participate in discussions.

**Written exercises and assignments (15 points total)**
Five short written exercises (< 2 pages each) are planned for the class. The course instructors will grade each these exercises on a 0-3 pt scale. In general, full credit will be given in all cases where students complete these assignments in a thoughtful manner directed at the intended objective.

**Final Grade:** A passing grade requires that students earn at least 23 points total during the semester.

**Missed Classes:** Students who are unable to attend one class can earn credit for one missed session during the semester by contacting the instructor and satisfactorily completing a short written assignment. Credit will not be given for additional missed sessions.

**Canvas Access:** All registered students should regularly check the course website on Canvas where assignments will be posted.
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May 22   What is "Critical Thinking" - Mattox

May 29   Hypothesis, Bias and Dogma - Mattox  
          Reading assignment to be discussed in class

June  5   Data reproducibility – Mattox  
          Reading assignment to be discussed in class

June 12  Evaluating data and conclusions – Broaddus  
          Written assignment #1 due in class: Identifying assumptions

June 19  The peer review process - Broaddus  
          Reading for discussion at this class: Research papers from Dr. Broaddus

June 26  Discussion of student manuscript reviews – Broaddus  
          Written assignment #2 due in class: Review of assigned article

July  3   No Class – Independence Day

July 10  Origins and impact of a science controversy - Krahe  
          Reading Assignment to be discussed in class

July 17  Q&A with a scientific editor -Cullinan/Mattox

July 24  Identifying unanswered questions – Mattox

July 31  Project planning – Mattox/Krahe  
          Written Assignment #3 Due in Class: Outline a research project and 
          identify one key experiment

Aug  7   Experimental design - Mattox/Krahe  
          Written Assignment#4 Due in class: Rationale and design of an experiment

Aug 14  Discussion and review of research projects – Krahe  
          Written assignment #5 due before class: Final proposal and assigned reviews.