Critical Thinking in Science GS21 1061
Summer 2017
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 23    What is "Critical Thinking" - Mattox

May 30    Hypothesis, Bias and Dogma - Mattox
               Reading assignment to be discussed in class

June 6    Evaluating data and conclusions – Broaddus
               Written assignment #1 due in class: Identifying assumptions

June 13 The peer review process - Broaddus
               Reading for discussion at this class: Research papers from Dr. Broaddus

June 20 Discussion of student manuscript reviews – Broaddus
               Written assignment #2 due in class: Review of assigned article

June 27 Origins and impact of a science controversy – Krahe
               Reading Assignment to be discussed in class

July 4   No Class – Independence Day

July 11 Data reproducibility – Krahe/Mattox
               Reading assignment to be discussed in class

July 18 Q&A with a scientific editor

July 25 Identifying unanswered questions – Mattox

Aug  1  Project planning – Mattox
               Written Assignment #3 Due in Class:
                   Outline a research project and identify one key experiment

Aug  8  Experimental design - Mattox
               Written Assignment#4  Due in class: Rationale and design of an experiment

Aug 15 Discussion and review of research projects – Mattox
               Written assignment #5  due before class: Final proposal and assigned reviews.