Critical Thinking in Science
Summer 2016
10-11:30 AM Mondays, 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.

50% Preparation for and participation in class discussions (11 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.

50% Written exercises and assignments (12 points total)
Four 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 19 points total during the semester.

Missed Classes: Students who are unable to attend a class can earn credit for one missed session by contacting the instructor and satisfactorily completing a short written assignment.

Canvas Access: All registered students should regularly check the course website on Canvas where assignments will be posted.
Critical Thinking in Science 2016
All classes will start promptly at 10:00 AM in the GSBS Schissler Library (S3.8351)

May 23  Bias and dogma in science - Mattox

May 30  No Class- Memorial Day

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

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

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

June 27 Q&A with a scientific editor

July 4  No Class – Independence Day

July 11 Identifying unanswered questions – Mattox

July 18 Data reproducibility – Krahe/Mattox
Reading assignment for discussion at this class:
To be determined

July 25 Origins and impact of a science controversy - Krahe
Reading Assignment for discussion at this class:
Articles about whether p53 acts as a tumor suppressor or oncogene.

Aug 1  Critical thinking and project planning – Mattox
Pre-class preparation: Outline a research project and identify one key experiment

Aug 8 Critical elements of experimental design - Mattox
Written Assignment due in class: Rationale and design of an experiment

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