

MICR5029 – fall, 2016

Building Scientific Thinking Skills

Directed by Dr. Zhong

Location: 5.063V (room confirmed by Kay).

Time: Wednesday and Friday from 2:00pm – 4:00pm (different time and location for the first class since part of the first class is to attend a journal club meeting presented by a senior student. The tentative date for 2016 is September 6 as arranged below)

Instructor: Dr. Zhong (zhongg@uthscsa.edu). Please note that other faculty members will also attend your presentation, participate in the discussions and critique your proposals. The time spent on these activities by these instructors will be counted as teaching/service hours.

Goals:

1. Learn how to summarize research progresses, critically analyze research results
2. Learn how to identify scientific questions, develop working models and write mini-grant proposals
3. Learn how to orally defend proposals

Grade: 50% from presentation/discussion and 50% from mini grant writing and orally defending respectively. Full attendance is mandatory. Please note that letter grades (A, B, C or F) will be provided for this class.

The following is a tentative schedule:

September 6 (3:30pm-5pm, Room 444B): class orientation, paper assignment and model presentation by a senior student. The paper to be presented will be forwarded to you one week before the presentation).

September 14--- paper#1 (student 1); faculty:

September 16--- paper#2 (student 2); faculty:

September 21--- paper#3 (student 3); faculty:

September 23--- paper#4 (student 4); faculty:

(The rest of the schedule may change depending on the number of students to be enrolled)

September 28---Discussion about grant writing

- a. MI track Qualifying exam requirements by III COGS chair
- b. Steps required for developing an idea into a defensible proposal
- c. Review an example minigrant from a previous student
- d. NIH grant writing (sharing with students a real NIH grant) and/or going over individual ideas from students

October 5 to 28: Proposal writing, critique by students, submission of the final version

October 14---- mini grant due. Give the grant to your colleagues (four students/grant). Also email a copy to Dr. Zhong.

October 21--- student critique due. Please give your critiques to the appropriate student. Also forward a copy to Dr. Zhong. Please provide the name of the student and title of the mini-grant that you reviewed. After getting the critique, modify the mini-grant according to the suggestions provided by your colleagues. You have to respond to each comment and to justify your responses even if you don't think that it is necessary for make the suggested changes.

October 28 --- final mini-grant due. The final grant will be forwarded to the faculty for review. Submit final version. Please e-mail Dr. Zhong the following documents:

- a) The revised mini-grant
- b) Critiques of all the students
- c) Your response/statement on how you have responded to the critiques and address the concerns in the revised mini-grant.

November 2 to November 4 ---- mini-grant oral defense.

1. November 2---Student 1 & 2; Faculty:
2. November 4 ---Student 3 & 4; Faculty:

Class requirements:

1. **Paper presentation and discussion** - Prepare a 45 min power-point presentation on the paper to be discussed. The papers will be assigned on the first day of the introduction class. Your presentation should include a thorough relevant background information, introduction on the related subject (rationale for the hypothesis), a clear description of the hypotheses tested and experimental approaches used for testing the hypotheses. Please note that each student is expected to read all the papers and prepare for an in-depth discussion of each paper. Following the 45 min presentation, students will be randomly asked to explain each figure/results in details, critically analyze the results, identify potential problems and propose alternative experiments (if the original experiments failed to adequately address the authors' conclusions). These activities will help the students to develop the skills for identifying potential pitfalls of a given experimental approach and proposing alternative strategies to logically address the pitfalls during their mini-grant writing.

2. **Mini-grant** - Prepare a mini-grant either based on your paper presentation or any relevant topic. However, the topic has to be approved by Dr. Zhong. Mini-grant details are as follows:
- a. Mini grant proposal should consist of specific aims (1/2 page), background and significance (1-2 pages) and research design (2-4 pages) sections. Ask your colleagues to review your proposal.
 - b. Review the proposals of three other members of the class. Please provide a ½ - 1 page written critique for each proposal.
 - c. Revise your proposal based on the written critiques from your classmates and faculty members. You need to summarize your responses to the critiques on a cover page. If you choose not to take your classmates' advice, please provide justification.

- d. Submit a final revised version of your proposal together with reviewers' comments and your responses to reviewers' comments.

3. Orally defend your mini-grant proposal

- a. Prepare a 15min presentation to summarize your proposal. The proposal should include the suggestions provided in the critiques.
- b. We will go around the table for each student to ask the speaker questions related to the proposals.
- c. Faculty will periodically comments on both the questions and answers and examines the presenter and the class on related issues (this practice may help you to prepare for the Ph.D. candidacy qualifying exam).

List of students registered for the course:

To be announced on September 6

List of articles for 2016 class

To be announced on September 6