

MATH 7875-009
Mathematical Biology Journal Club (1 credit)
Spring 2017

Ben Fogelson
Office: LCB 301
Email: ben@math.utah.edu

Gregory Handy
Office: LCB 326
Email: handy@math.utah.edu

COURSE DESCRIPTION: Journal Club is a 1-hour weekly course designed to aid students in their transition from undergrad to graduate school. This course will provide students with the opportunity to develop their skills in the reading, discussing, and presentation of mathematics papers in the area of mathematical biology. It will also serve as a place where students can discuss their concerns regarding graduate school or teaching with their peers.

FORMAT: Each week one student will give a 50 minute presentation of a mathematical biology paper.

- First year students will give a “chalk talk” format presentation and second year students will give a beamer/powerpoint format presentation.

This presentation should be structured as follows:

- 10 minutes introduction/background,
- 15 minutes of methods,
- 15 minutes of results,
- 5 minutes of discussion, and
- a brief (5 min) recap of your presentation.

EXPECTATIONS:

- Presentation:
 - Each student will be expected to prepare a 50 minute presentation of a Math Bio Journal Article using the provided guidelines.
 - Each student (**first and second year**) will also prepare for a pre-presentation meeting with either Ben or Greg to discuss their presentation content and the paper content as needed. **This meeting should take place about one week prior to your presentation and each student is expected to bring their presentation notes to their pre-presentation meeting.**
 - Second year students are expected to discuss paper content with a faculty member and first year students are encouraged to do so.

- After presenting, each student will debrief with Ben and Greg and will **submit their presentation notes**.
- Participation:
 - On the days you are not presenting you will be expected to come prepared for discussion, by reading the article to be presented and preparing an article summary, **focusing specifically on the following:** abstract, figures and key equations. Focusing on these components, submit a brief summary addressing the following questions:
 - * What are the main question(s)/hypotheses addressed by the article?
 - * What techniques did the authors use to address them?
 - * What are the main results of the paper?

Summaries may be handwritten or typed. Content may be in paragraph form or complete sentence bullets. In addition to the questions required for the article summary you may want to consider one or more of the following questions to help you come *prepared* for discussion:

- * What assumptions did the author(s) make in constructing their model?
- * According to the author(s), do the results answer the question(s)/support their hypothesis? Why or why not?
- * Do you agree with the author(s)? Do you feel that the results support the author(s) conclusions?
- * Do you have any additional questions/comments about the paper content?
- Each student will be expected to be an *active participant* in Journal Club discussions.

IMPORTANT DATES

- Wednesday, January 25 – Paper Selections Due

Reading a Journal Article

We will be reading and discussing a broad range of articles this semester and covering many types of mathematics and biology in our discussions. Each of you has your own academic background and experience and you may find some articles easy to understand while your classmates find them challenging (and vice versa). This is completely normal. Reading academic papers is very different from other types of reading. It is a very rare paper that makes complete sense the first time through. You should plan on reading each paper at least twice and perhaps three times if you find the content particularly challenging.

As you read you will probably not understand everything in the paper. That's okay – this is why we will be discussing and listening to presentations each week. Instead of making it your goal to understand each paper 100% your goal should be able to describe the following to someone who has not read the paper:

- What biological questions or hypothesis are posed by the author(s) of the paper? (There may be one or several and they may be explicitly stated or implied.)
- What type of mathematics did the author use to address the question(s).
- What assumptions did the author make when constructing their model?
- What were the results of the calculations/simulations? (Note: “Results” are the factual observations without interpretation.)
- Can you give a one-sentence description of what is being depicted in each figure? If the paper is challenging your description may be general, but if you have taken the time to formulate description you will have an easier time participating in the discussion.

Presenting a Journal Article

As you prepare your presentation it is important to keep in mind that your classmates come from a broad range of backgrounds and experience. Some of you have extensive biology background and limited applied math experience. Others have significant math experience but haven't seen a biology course since their freshman year of undergrad (or high school). Your goal as a presenter is to communicate an organized, self-contained "story" that communicates the biology and math in your article to a broad audience.

Each presentation should be divided into 5 parts:

- Introduction/Background (10min)
 - A quick overview in which you talk us through the outline of your talk. (Outline should be written on the board)
 - Biology Background: Begin broad (why do we care?) and narrow down into the specifics needed to understand the model. You should not assume any prior knowledge from your audience. Use figures as needed - sometimes the papers will include diagrams that you can reproduce on the board, other times you will need to create your own.
 - Statement of the questions/hypothesis presented by the author(s).
 - Statement of the type of math that is going to be used to address these questions.
 - Statement of the assumptions made by the author(s).
- Explanation of the Math Model/Calculations/Analysis (15 min) If your paper is long you may need to pick and choose which calculations to demonstrate explicitly. We will discuss this in your pre-presentation meeting.
- Results (15 min) If the paper has a lot of figures you may need to choose the key results to present. We will discuss this in your pre-presentation meeting.
- Discussion of Results (5min)
 - What conclusions did the author(s) come to?
 - Do you agree with their conclusions?
 - What further directions could you take this research? What further directions did the author(s) suggest.
- Recap – Briefly summarize your presentation: what was the question, how was it addressed, what were the results and what was the conclusion. (5 min)

As you present your goal should be to face your audience as much as possible and ask for questions as needed. We will pause for questions and discussion after each section of your presentation.

Suggested Presenter Schedule:

- Three weeks prior to your presentation date: Learn and reproduce the paper content
 - Begin working through your article to be sure you understand the content and calculations.
 - Work on reproducing the figures in your article.
- Two weeks prior to your presentation date: Prepare for your pre-presentation meeting
 - Prepare a draft of your presentation notes or beamer presentation
 - Prepare a list of questions to discuss with Ben or Greg (and a faculty member)
- One week prior to your presentation date:
(Presentation dates will be posted on the course webpage)
 - First year students will meet with Ben or Greg to discuss their paper and presentation outline, and to go through any questions they may have about the paper content.
 - All students are also strongly encouraged to meet with a faculty member to discuss the content of their paper.
- **Each student is expected to bring their presentation notes to their pre-presentation meeting.**
- Following your presentation – Each student will meet briefly with Ben and Greg for a presentation debrief.