

The point of the case study and course project is to allow student groups to explore the area of the computational life sciences covered in our course that most interests them. The course project should therefore be a challenging and an enjoyable undertaking. The project has two components:

- Case study presentation
- Project paper

GUIDELINES FOR CASE STUDY PRESENTATION:

- **Identify EITHER**
 - A paper from the research literature OR
 - A topic in current research by yourself or your research group
- ...on which to base your course project (see list of suggestions and more info on website).
- For the case study, each group of 3 or more students will give a brief in-class presentation of a paper that applies the modeling and computational techniques we have learned in the course. These studies will then be developed into course projects.
- For your case study presentation,
 - Prepare about 5 slides (powerpoint, or other software), including: (1) intro to topic, (2) mathematical or computational model used in paper, (3) conclusions / insight from this model. If there are many different conclusions, summarize or pick one or a few key conclusions. (4) Sketch of your plans for asking your own question based on the model.
 - Prepare and **practice** a presentation of the main ideas. One group member, or several / all, can give the presentation – it doesn't matter, but of course all will contribute to its preparation. **YOUR PRESENTATION MUST FIT IN EIGHT MINUTES. TWO ADDITIONAL MINUTES WILL BE ALLOCATED FOR QUESTIONS.** Time yourself as you practice – it is difficult to give a summary of anything in a few minutes! But this is exactly what happens in spotlight sessions of many research conferences.

Evaluation of these presentations will be based on the aspects listed above. Did you clearly introduce the topic and define, in an understandable way to a typical class member, the computational model used in paper (it's OK to simplify, the goal is to be understandable and clear)? Did you clearly describe at least one conclusion? Did you clearly describe YOUR plans for a next step? Finally, were your slides and plots legible, and did your presentation fit in eight minutes? These criteria will be used to assign the points for your presentation.

GUIDELINES FOR NEXT STEPS / COURSE PROJECT:

- Write MATLAB code that implements one of the central models in the paper (or the central model, if there is only one). Reproduce one or several of the associated figures in the paper, or at the very least some of the model results behind one of these figures. (See guidelines below.)
- Identify an interesting new question that can be asked about the model and topic of the paper.
- Extend or modify the MATLAB code to answer this question.

GUIDELINES FOR PREPARATION OF YOUR PROJECT PAPER:

NOTE: The paper is due as posted on the website.

- Prepare a paper describing your findings. **This paper should have the following sections.**
 - Introduction. Discuss the biological problem that is solved in the paper.
 - Detailed description of model equations, including definitions in of all variables, written in prose as text.
 - Reproduction of results in paper – figures, captions, text discussion.
 - Novel results – figures, captions, text discussion.
 - Conclusion – text
 - Appendix – code.

You MUST have all sections to receive full credit.

- In the introduction and / or discussion, cite at least one OTHER article (beyond the one you are focussing on) that are on a related theme, and comment on how the article you based your work on and / or your results fit in.
- Please attach the article you based your project on to the back of your paper.
- Figures should appear throughout as part of the main text, as you go along, and should be high-quality – large enough, with large enough text, clear line types, all symbols and axes defined, and well-written captions. The appendix should include all MATLAB code used to reproduce figures in the paper and to extend them to answer your research question.
- As a guideline, your paper should include at least 10 pages of double-spaced text to accomplish the above.

GUIDELINES FOR PROJECT PRESENTATION

- Prepare about 5-7 slides (powerpoint, or other software), including: (1) intro to topic and review of the work done by original authors, (2) the novel question you asked, (3) your results, and (4) your conclusions, interpretations, and (optional) interesting directions for further work.
- Prepare and **practice** a presentation of the main ideas. One group member, or several / all, can give the presentation – it doesn't matter, but of course all will contribute to its preparation. **YOUR PRESENTATION MUST FIT IN EIGHT MINUTES. TWO ADDITIONAL MINUTES WILL BE ALLOCATED FOR QUESTIONS.**

Evaluation of course project presentations will be similar to that for the case study presentations described above.