



BISC 494
Biology Honors Thesis
Units: 2
Spring 2025, Wed, Time: 12-12:50PM
Section 13494D

Location: RRI (Ray R. Irani Hall), room 221

Instructor: John Tower, PhD

Office: RRI 219C

Office Hours: by appointment

Contact Info: Email (preferred method for contact)

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Emails typically returned within 48hrs.

Phone 213-740-5384

Course Description

The goal of this course is to support, stimulate and evaluate the honors student writing their thesis. BISC494 students are expected to participate in the weekly honors seminar as a means of maintaining communication between the thesis student and the faculty and other honors students, and to provide leadership and mentoring by asking questions and exchanging ideas about the oral presentations made by BISC493 students.

Learning Objectives

Students are expected to gain practical experience in writing a thesis, including background research, as well as gain experience in giving a presentation of their thesis.

Prerequisites: BISC 493

Course Notes

Copies of presentation schedules and other class information will be posted on Blackboard and/or Google Drive.

Required Readings and Supplementary Materials

Required readings for this course are background reading and research for the thesis. Any supplementary class materials will be posted on Blackboard.

Examples of previous Honors thesis are posted on Blackboard for reference.

Description and Assessment of Assignments

Class participation (15%): is based on asking questions and participating in discussion during presentations. Thesis Outline (10%): will be graded on submission by due date, clarity and organization. Final written thesis (45%): will be graded based on Introduction/literature review, Methods, Results, Discussion, and Future Directions. Final exam (30%): students will present their Thesis to the class during the regular final exam period. Presentations will be graded based on clarity of presentation, including content and clarity of slides, and ability of student to answer questions from the class.

Grading Breakdown

<u>Assignment</u>	<u>Points</u>	<u>% of Grade</u>
Class participation	15	15
Thesis outline	10	10
Final thesis	45	45
Thesis presentation	30	30
Total	100	100

Grading Scale (Example)

Course final grades will be determined using the following scale

A	95-100
A-	90-94
B+	87-89
B	83-86
B-	80-82
C+	77-79
C	73-76
C-	70-72
D+	67-69
D	63-66
D-	60-62
F	59 and below

Assignment Submission Policy

Thesis outline, thesis updates and final written Thesis must be submitted to the instructors via email by the due dates below.

Grading Timeline

Grades for Thesis outline and Thesis updates will be available on Blackboard by the next class meeting.

Additional Policies

Attendance at each class is expected. Missed classes will result in loss of class participation points for that class meeting.

Course Schedule: A Weekly Breakdown

	Topics/Daily Activities	Readings and Homework	Deliverable/ Due Dates
Week 1 Jan 15	Sign up for presentation dates. Prepare draft thesis outline	Name and email of Mentor due by class time	Name and email of Mentor due by class time
Week 2 Jan 22	Prepare draft thesis outline	None	None
Week 3 Jan 29	Prepare draft thesis outline	None	None
Week 4 Feb 5	Draft thesis outline due to committee before class time	Submit draft of thesis outline to committee for comments and edits. Thesis outline must include list of Tables and Figures.	None
Week 5 Feb 12	Get comments on thesis outline draft from committee and revise your thesis outline draft accordingly	Get comments on thesis outline draft from committee and revise your thesis outline draft accordingly	None
Week 6 Feb 19	Thesis outline approved by committee is due Wed before class	Submit thesis outline that has been approved by your committee by class time. Thesis outline must include list of Tables and Figures.	Approved thesis outline due by class time Wed week 6
Week 7 Feb 26	Prepare thesis methods, results and Figures	None	None
Week 8 Mar 5	Prepare thesis methods, results and Figures	None	None
Week 9 Mar 12	Draft of methods, results and figures due Wed by class time	Draft of methods, results and figures due by class time Wed week 9 (approval by committee is not REQUIRED for this step, but yes you can and should get their help and advice as needed!)	Draft of methods, results and figures due by class time Wed week 9
Week 10 Mar 19	*Spring Break*	None	None

Week 11 Mar 26	Revise Methods, Results and Figure per any comments from JT. Prepare thesis draft	Prepare thesis draft	None
Week 12 April 2	Thesis draft due to committee by class time on Wed	Draft of thesis due by class time Wed Week 12.	Draft of thesis due by class time Wed Week 12
Week 13 April 9	Meet with committee to get their comments and edits on the thesis draft	Meet with committee to get their comments and edits on the thesis draft. Meeting can be via email, or in person if needed. Edit thesis per committee's comments.	Meet with committee to get their comments and edits on the thesis draft
Week 14 April 16	Edit thesis per committee's comments.	Edit thesis per committee's comments.	None
Week 15 April 23	Final thesis approved by committee is due Wed by class time	Final thesis approved by committee is due Wed by class time	Final thesis approved by committee is due Wed by class time
Friday May 9, 11-1 PM	Final exam	Honors Thesis Students will give oral/slide presentation of thesis research to class for grade	Friday May 9, 11-1 PM

THESIS CONTENT (please see example theses posted on BlackBoard):

Title

Abstract

Introduction – including literature review and hypothesis being tested – explain what was known before your study and the rationale for undertaking your experiments

Materials and methods

Results – including Figures and Tables

Discussion – discuss how your results relate to other studies, how your results have advanced the field, any limitations to your study, future directions

References

Helpful Hints for Oral Defense Presentations in BISC 494

Plan on giving a PowerPoint presentation lasting ~20 minutes, so there will be plenty of time for questions. Start by introducing yourself and giving your title and the name of your advisor.

1. **Keep your mind on the big picture!** Remember to give an overview at the beginning. Give a brief introduction to the topic, including why the question being investigated is interesting and important. This will help to pique the interest of your listeners at the start.
2. **Aim for a crisp, well-organized, succinct presentation. Include:** Introduction/background/hypothesis. Methods. Results. Conclusions. Future directions for the research.
3. **Frequently, speakers forget that people in the audience don't know much about the topic.** Unless you are presenting a talk at a specialized scientific conference, you should remember that you're explaining complicated material to people who don't already know much about it. Put yourself in the listeners' place and try to anticipate what will confuse them.
4. **Give at least 1 practice talk at least 1 day before your class presentation.** If possible, practice in the same room where you will be presenting your talk. Since you'll be using PowerPoint, it is important that you rehearse and work out any technical difficulties. We have created a forum for you to practice being professional, so please take advantage of it.
5. **Try not to read extensively from notes or to spend lots of time looking down;** people will be a lot more interested if you look up and make eye contact with the audience.
6. **Remember to take a giant step BACK at the end of your presentation and return to the big picture.** Ask yourself: what is the main take-home message I want to convey?
7. **It's a performance!** Even if you don't feel particularly energetic and confident, you have to **ACT AS IF YOU ARE**, just for 30 minutes.
8. **Try not to say "um" or "like" or "basically" multiple times during your talk.** If you fall into the habit of repeating such words, it can be a difficult habit to break. It is very distracting to the audience to hear multiple repetitions of a single word, especially one that has little or no informational content.
9. **The better you are at giving your 494 thesis presentation, the better you'll be at communicating in general, so this is great practice!** No matter what your career goals, the ability to communicate verbally, in both formal and informal settings, will be an important skill for your professional success. Good luck, and have fun!

Writing Tips

- **Include page numbers, even in your drafts.**
- **Standard abbreviations don't have to be defined and should be used throughout:** 37°C; min for minute or minutes; h or hr for hour or hours; s or sec for second or seconds; µL or µl, mL or ml; M for molar; DNA; bp; kb; Da for dalton.
- **A non-standard abbreviation must be introduced in parentheses on its first occurrence [e.g., "Wells were washed with phosphate-buffered saline (PBS)."]** After the abbreviation has been introduced, it then must be used thereafter [e.g., "Samples were diluted with PBS."].
- **An acronym is often composed of capital letters, but the spelled-out phrase does not contain capital letters, except for words that are always capitalized.**
RIGHT: based on fluorescence resonance energy transfer (FRET)
WRONG: based on Fluorescence Resonance Energy Transfer (FRET)
RIGHT: in the C-terminal domain (CTD) of RNA polymerase (RNAP)
- **# is not a standard (publishable) abbreviation for "number."** Use "no." or spell out "number," especially if you have room for it anyway.

- Use Greek letters where appropriate. Don't spell out the Greek letter (use μ , not mu). Don't use u instead of μ
- Use correct chemical notation, including subscripts and superscripts: H_2O , Mg^{2+} (not Mg^{++} or $Mg+2$).
- Italicize the names of restriction enzymes and scientific names of organisms. You don't have to italicize *in vivo*, *in vitro*, e.g., i.e., or et al.
- Italicize genes and genotypes, but not proteins or phenotypes.
- Put a space between a numerical value and the unit of measure: 2 mM, 10 min, 125 bp. However, if you are creating an adjective, put a hyphen between the numerical value and the unit of measure: "... 2 ml of culture in a 5-ml tube."
- You don't have to double space within a table, but the rest of the thesis should be double-spaced.
- A table should not have empty boxes. Use "Merge cells" to remove unwanted grid lines.
- Every column in a table has a heading that applies to all of the entries in that column.
- If a table presents the results of an experiment, it is customary to use the leftmost column for the independent variable. The dependent variable goes in column(s) further to the right.
- Don't let a page break fall within a table.
- For titles and table headings, choose a capitalization rule and stick to it throughout your thesis. The two most common rules are: (i) capitalize only the first word and proper nouns; and (ii) capitalize nouns, verbs, pronouns, adjectives and adverbs, but not articles, prepositions or abbreviations that should not be capitalized (mtDNA, tRNA).
- Don't capitalize chemical or biochemical words such as guanine, sodium acetate, buffer, immunoglobulin, nuclease, or polymerase. This does not apply to defined abbreviations, such as IgG, RNase A, DNA, Buffer Q, or PolB.
- In American English, a comma or period comes before the end-quote symbol. All other punctuation follows the end-quote symbol. For examples, see any issue of The New York Times, Los Angeles Times, or People magazine.
- Use American, not British spelling (e.g., color, not colour).
- Judicious use of color and shading can enhance clarity and understanding. However, color and shading are not helpful when they make it difficult to read the words. If you use color in your document, print it with a color printer.
- Don't write a sentence that, standing on its own, is false.

Statement on Academic Conduct and Support Systems

Academic Conduct:

Plagiarism – presenting someone else's ideas as your own, either verbatim or recast in your own words – is a serious academic offense with serious consequences. Please familiarize yourself with the discussion of plagiarism in SCampus in Part B, Section 11, "Behavior Violating University Standards" policy.usc.edu/scampus-part-b. Other forms of academic dishonesty are equally unacceptable. See additional information in SCampus and university policies on scientific misconduct, policy.usc.edu/scientific-misconduct.

Support Systems:

Student Health Counseling Services - (213) 740-7711 – 24/7 on call
engemannshc.usc.edu/counseling

Free and confidential mental health treatment for students, including short-term psychotherapy, group counseling, stress fitness workshops, and crisis intervention.

National Suicide Prevention Lifeline - 1 (800) 273-8255 – 24/7 on call
suicidepreventionlifeline.org

Free and confidential emotional support to people in suicidal crisis or emotional distress 24 hours a day, 7 days a week.

Relationship and Sexual Violence Prevention Services (RSVP) - (213) 740-4900 – 24/7 on call
engemannshc.usc.edu/rsvp

Free and confidential therapy services, workshops, and training for situations related to gender-based harm.

Office of Equity and Diversity (OED) | Title IX - (213) 740-5086
equity.usc.edu, titleix.usc.edu

Information about how to get help or help a survivor of harassment or discrimination, rights of protected classes, reporting options, and additional resources for students, faculty, staff, visitors, and applicants. The university prohibits discrimination or harassment based on the following protected characteristics: race, color, national origin, ancestry, religion, sex, gender, gender identity, gender expression, sexual orientation, age, physical disability, medical condition, mental disability, marital status, pregnancy, veteran status, genetic information, and any other characteristic which may be specified in applicable laws and governmental regulations.

Bias Assessment Response and Support - (213) 740-2421
studentaffairs.usc.edu/bias-assessment-response-support

Avenue to report incidents of bias, hate crimes, and microaggressions for appropriate investigation and response.

The Office of Disability Services and Programs - (213) 740-0776
dsp.usc.edu

Support and accommodations for students with disabilities. Services include assistance in providing readers/notetakers/interpreters, special accommodations for test taking needs, assistance with architectural barriers, assistive technology, and support for individual needs.

USC Support and Advocacy - (213) 821-4710
studentaffairs.usc.edu/ssa

Assists students and families in resolving complex personal, financial, and academic issues adversely affecting their success as a student.

Diversity at USC - (213) 740-2101
diversity.usc.edu

Information on events, programs and training, the Provost's Diversity and Inclusion Council, Diversity Liaisons for each academic school, chronology, participation, and various resources for students.

USC Emergency - UPC: (213) 740-4321, HSC: (323) 442-1000 – 24/7 on call
dps.usc.edu, emergency.usc.edu

Emergency assistance and avenue to report a crime. Latest updates regarding safety, including ways in which instruction will be continued if an officially declared emergency makes travel to campus infeasible.

USC Department of Public Safety - UPC: (213) 740-6000, HSC: (323) 442-120 – 24/7 on call
dps.usc.edu

Non-emergency assistance or information.