Guidelines for Writing and Submitting the 4th Year Thesis

Due to the nature of some theses, the below formatting guidelines may need to be adjusted. You should see your mentor and the director of the program for help in formatting if you are having trouble presenting your work in an appropriate manner.

Submission Format (Style)

The thesis must be typed or printed on a high-quality printer (NOT dot-matrix) that has an ink cartridge that actually has ink (if you are running out of ink and the type is beginning to skip, please get a new cartridge). Hand-written theses or theses that are difficult to read because of poor print quality will not be accepted. Similarly, any figures, graphs or other graphic material must be of the highest print quality.

With the exception of the references, abstract/summary, tables, and figure legends (which should all be single-spaced), the text should be double-spaced. Only standard fonts such as Helvetica, Courier or Times should be used. Do NOT use display fonts anywhere in the manuscript. Text should be 12 point with 1” margins all around (1.25” may be left on the left margin for binding purposes). Major headings should be 16 point bold, subheadings should be 14 point bold. Each single-sided page should be numbered consecutively beginning with the Abstract page. The thesis should run between 20 and 50/60 pages in its major context (end material, such as references, appendices, etc. may be over this limit).

You need to submit 4 copies of your thesis by the deadline given, one of which should be officially bound for archiving (see the UVA Copy Center, Kinkos or other commercial copy centers). One copy each should go to your mentors. Copies must be submitted to the director of the program by 5:00 p.m. on the last day of classes spring semester. The deadline given will be strictly enforced! No late submissions will be accepted for any reasons! University policy dictates that no incompletes or extensions can be granted to degree-candidate students and so it is imperative that you complete your thesis on time. Your thesis will be reviewed by the director of the Human Biology program and at least two other faculty members from the advisory committee in addition to your mentors.

Structural Format

The thesis should be organized essentially as indicated below, with modifications as necessary depending on the work being presented. Each section MUST begin on a new page.
Title/Cover Page/Pledge
Abstract
Table of Contents
List of Abbreviations and/or Glossary of Terms
Major Portion of the Paper (Body):
  Introduction / Background section
  Results
  Discussion
  Methodology
Acknowledgements
References
Figures w/ Figure Legends, Tables, Graphical Material*
Appendices (if any)

*Figures with legends, Tables, and any other graphical materials (charts, pictures, etc.) can be presented either at the end of the thesis as indicated or they may be incorporated directly into the section in which they are cited.

It is suggested that you do not actually write your thesis in the order of presentation. Rather, you should do the results first along with figures/figure legends, then the discussion, abstract, methodology, introduction, and references. The title/cover page, list of abbreviations, acknowledgements, and table of contents should be written last of all. Furthermore, it is probably a good idea to work on more than one section at any one time, just in case you get stuck somewhere along the way.

Help/Input From Your Mentors

It is appropriate and recommended that you show an early draft of your thesis to your research mentors to solicit their comments, and then, if necessary, to show your mentors a nearly-finished version at a later date. Some advisors prefer to see preliminary drafts section by section while others prefer to see only a more “mature” draft of your thesis in its entirety. Find out your advisor’s preference well in advance. If you present your thesis in sections, remember that you cannot expect to receive informed criticism of the Results section unless it is accompanied by at least a rough version (e.g., a photocopy of a figure or image) of the data you intend to report and a brief figure legend. Remember, your mentors have other responsibilities and in most cases will not be able to drop everything to read your thesis on short notice. Typically, one to two weeks should be given for “turn around time”.

The role of your advisor is to advise, but not to act as a “ghost writer” or editorial proofreader. Therefore, if you are consistently making the same mistake (e.g., using which for that; effect for affect; mutant for mutation), don’t expect your advisor to find every instance of a particular error. It should be sufficient that if one or two instances are identified, you will be able to find and correct all the other errors. Likewise, don’t expect your advisor to correct every spelling mistake. Do NOT rely on your word processor’s spell check program to find all of your errors! YOU must proofread your own work to make sure you find all errors. Finally, most problems with syntax, grammar and clarity can often be discerned by merely reading the problematic sentence(s) out loud. Do not hesitate to consult exceptionally useful guides such as Strunk & White’s The Elements of Style or Hacker’s The Bedford Handbook for Writers. Poorly presented papers in terms of spelling errors, poor grammar, and lack of clarity will NOT score well in the review process and may affect your final standing in the Distinguished Majors Program.

Guidelines for Individual Sections

Again, due to the nature of some theses, the following sections may need to be reworked, particularly body sections. All sections, however, should be represented in a form that most clearly presents the results of your work.

Title/Cover Page/Pledge: should include a descriptive title for the project that conveys the sense of the thesis, your name, and the name, title, and departmental affiliation of your research mentors. The pledge is required and you should physically write it out, in pen, and sign at the bottom of the cover page. Additionally, you should include the following disclaimer on the cover page: This thesis is submitted in partial fulfillment of the degree requirements for the Distinguished Majors Program in Human Biology

Abstract: represents a concise (no more than 1 page) summary of the problem you studied, what approaches (in general) you took to examine the problem, and the major findings that arose during your research/study. It should be perfectly clear from the abstract what you did, how you did it, and what you found. This means a specific statement that includes both the biological problem and the sociological implications of the problem. Avoid non-essential details, wordiness, or exaggerations. Be careful not to claim more than was actually achieved. The Abstract should be a “stand-alone” section, fully comprehensible to a non-expert even if they do not have the rest of your thesis in hand.

Table of Contents: presents a brief index of major and minor topics along with page numbers. Prepare the Table of Contents last so it accurately represents page assignments. Be
consistent in formatting throughout the thesis and in the Table of Contents (upper and lower case, bold-faced type, etc.).

**List of Abbreviations:** provides a list of topic specific abbreviations and definitions that are not common in your field of study or between disciplines. Use discipline accepted abbreviations only, not abbreviations you make up yourself to cut down on typing. Only abbreviate terms you are going to use frequently in the text; if you are only going to use a term once or twice, spell it out each time. Examples: 1) DNA is a commonly used term that should *not* be in the List of Abbreviations or spelled out in the text; 2) WMD (weapons of mass destruction) is not widely familiar and should go in the List of Abbreviations. If you believe a glossary of important terms is needed for your thesis, then include this section, single-spaced, immediately following your list of abbreviations.

**Body text,** including the sections described below, may take the form of chapters if necessary. Each chapter should in most cases then contain each of the body sections as they relate specifically to the chapter content. When integrating biology and society, you may find it easier to either do it as you go along or to discuss first biology and then societal issues. In the later case, then, you will want to probably add a section or chapter where you then blend the separate discussions back together.

**Introduction:** presents a peer-appropriate, concise review of the state of the field of your research, your question, and its relevance. If you break your overall thesis into chapters, you should do a general introduction to the paper and then chapter specific intros as needed. You may divide your introduction into subsections if it facilitates the flow of information. Assume your readers are generally knowledgeable about a given subject but may not have specific details. Your introduction needs to include the following in logical order: 1) The Question = what is it that you are investigating and what is the scope of your question (and why should we care about it?); 2) Background = what was known about your project before you started and what are you trying to contribute to the field; 3) Biological Relevance = what is the basic biology behind the project you are researching (ALL theses need to have an identifiable biological question associated with them); 4) Societal Relevance = how the problem relates to relevant and important aspects of human society (ALL theses need to have an identifiable societal question; this section deals with policy, ethical, legal or other social issues); 5) The general approach used to answer the question(s); and 6) One or two sentences maximum at the end of the introduction stating what was discovered.

**Results:** presents experimental or research results (not raw data) acquired during the course of experimentation or research presented in a logical order that may be different from the order in which you acquired the data/results in the first place. It is important to arrange the
results to tell the “story” of your research project from start to finish in a natural progression of ideas (rather than in a jumble or chronological order that does not tell a logical story). The results section is a composite of text and figures, tables, and/or pictures. Interview material, surveys, etc. should also be presented in this section in context of the questions they were used to answer. The points presented below should be relevant to both laboratory and non-laboratory research projects and if in doubt as to how to present something, see your advisor.

Avoid presenting too many negative results. Summarized any failed research attempts and do not waste figures/tables/pictures on work that provides no useful information to the project. Partial failures or unexpected results/findings resulting in a redirection of the research should be shown and/or described. Repeated experiments showing the same results should be presented as “typical” or “representative” results with a statement indicating that the figure/picture is one example of many attempts. Results should be presented verbally in the text or physically in figures/ pictures/tables as appropriate. Everything does not have to be presented physically for people to “look at”. If, however, you think that your data doesn’t lend itself to any physical presentation at all, re-examine it. It may be that clarity can be achieved through text tables. Begin your Results section with a few brief sentences that lead into your research as a whole. Present each result with a verbal description of the “experiment”, what it tells you, and how it led to the next “experiment”. Walk the reader through your results; do NOT write your results simply as a list of figure captions without ties to other thoughts. Also, avoid speculating about what the results mean in the greater context of your overall thesis (such speculation goes into your discussion). You may divide the results into subsections to aid in clarity.

**Figures and Figure Legends:** all figures, pictures, and tables must be numbered in order of reference and accompanied by a descriptive legend. Figures, schematics, and pictures are referred to as “Figures”; tables are referred to as “Tables”. Legends should start with a title sentence. The title is then followed by a succinct description of the experimental conditions that tells the reader exactly what was done to derive the figure/table presented or a succinct description of what the picture or figure shows. Figure legends must be placed immediately below and on the same page as the figure itself. Table legends must be placed immediately above and on the same page as the table itself. Actual photographs must be photo quality printed directly on the sheet of paper or scanned and printed (anything taped or glued to a piece of paper is unacceptable). Laboratory results must be fully labeled as to lanes, markers, areas of interest/focus, etc. Crop photos so that only the experimental area is shown (on a gel blank areas can be cropped away) or so that extraneous background shots are removed (show the pollution killed tree, not the entire forest). Never “doctor” any image presented so it looks better or conforms more closely to what you want to find (this is fraud). For line graphs, make absolutely certain that axes are labeled to show not only the parameter being varied, but also the units in which that parameter is given. Keep your symbols consistent from one graph to another. There
are two ways of “labeling” different plots on the same graph. It can be done entirely within the legend, or curves can be labeled on the graph itself, if done neatly and unambiguously. Always make sure that figures/pictures/tables contribute to the results section and the clear presentation of information and do not detract from either because of poor presentation.

Discussion: presents a thoughtful, clear, well-worded analysis of the results section just presented in context of the original question posed. Begin the section with a very brief summation of your major conclusions and their supporting evidence. You should discuss how your results relate to previously published work, and to the ideas and models currently favored in the field. Beware of over-stating your results and claiming that you’ve established more than is the case. Speculation is permissible as long as it is realistic and clearly labeled as speculation. You should also indicate how, in hindsight, your methodologies might have been improved and/or better designed and/or executed. You should always finish by stating the future directions in which the work could proceed based on your findings. If it is best for your project to discuss your results as you present them, then you may merge your results and discussion sections.

Methodology: provides a reader with a concise block of information that describes how the work in the thesis was performed. This section should contain the minimal information necessary for someone to repeat your research. This section will be a bit different depending on whether you did laboratory research or non-laboratory research for your thesis. In both cases, however, you should present a rubric of how you conducted your research and interpreted your results.

For laboratory research projects: Standard protocols, manufacturer’s protocols, or standard reagent recipes should be cited with the indication that the protocol/recipe was followed as written. If you modified a given protocol/procedure/recipe in a specific and significant way, then briefly describe the pertinent modification. Avoid jargon, incorrect scientific nomenclature or imprecise references to solutions, etc. Look through the materials and methods sections of various research papers to see what is included and what is not.

For non-laboratory based projects: Provide specific information as to how information was collected (search engines, library research modalities, reference staff consulted, interviews), compiled and analyzed (computer assisted analysis, reading comparisons). Essentially you must list the methods by which you acquired the information used as the basis for analysis in your thesis without simply listing your references. Depending on the type of project you do, you may have then followed a specific set of guidelines for how to complete the analysis – this would be included in the methodology section.
Acknowledgements: list of any individuals who had a substantial input in your thesis either in terms of project assessment, analysis, proofreading, formatting, etc. and an indication of how they contributed to the work. This is a brief paragraph at the end of the thesis and before your reference section.

References: References cited within the text and the listing of references at the end of the paper should conform exactly to the style of the biology journal *Nature*. Please do NOT deviate from this format.

Appendices: any material that is designated appendix material should follow the references and should be single-spaced. Explanations of what the appendix contains should accompany all appendix material.