Rubric for Faculty Feedback and Final Thesis Approval (pgs 11-19)

Please use each section as needed for review of drafts. The entire rubric will be used for final thesis approval. This rubric is based on the Duke University BioTap Biology Thesis Assessment Protocol developed in 2007 by Dr. Julie Reynolds (http://www.biology.duke.edu/undergrad/documents/thesisrubric.pdf), and was modified to emphasize scientific writing characteristics and abilities emphasized in the CBS Writing-Enriched Curriculum writing plan.

Introduction (1): Does the introduction make a comprehensive argument for the significance of the student's research within the context of the current literature?

Characteristics of the Introduction:

- Includes a substantive literature review that places the student's research within its appropriate scientific context, *and*
- Describes what is known about the topic, *and*
- Identifies the specific gaps in knowledge that the student's project intends to address, *and*
- Makes an argument for the broader significance of his/her research when addressing these gaps.

Excellent	Acceptable	Requires major revision
The thesis reviews and accurately summarizes the relevant literature, demonstrates how the student's research fills a gap, and presents a compelling argument for the broader significance or scientific value of the student's research.	The thesis presents a literature review, but does not sufficiently or effectively place the student's research within the context of current/past scientific research. The thesis may fail to explicitly present an argument for the broader significance and/or scientific value of the student's research.	Either the thesis does not present an adequate review of the literature, OR the thesis does not make sufficient connections between the published literature and the student's own research project to explain its significance.

Comments:

Introduction (2): Does the introduction clearly articulate the student's hypothesis and research goals?

Characteristics of the Introduction:

- Includes a research question or the goals of the project, *and*
- May also include a hypothesis (if applicable) *and*
- An overview of the methodological approach

Excellent	Acceptable	Requires major revision
The student clearly and explicitly articulates a research question or the goals of the project.	The student articulates a research question or the goals of the project, but at times in an unclear, inconsistent, or disorganized manner.	The student does not explicitly articulate a research question of the goals of the project.

Comments:

Materials and Methods: Are the experimental methods adequately described and referenced?

Characteristics of the Materials & Methods:

- Provides sufficient details so that readers can judge the appropriateness of the experimental methods, *and*
- Would allow someone to repeat the student's experiment.

Excellent	Acceptable	Requires major revision
The student clearly describes and references experimental methods used in the thesis work.	The student describes the experimental methods, but some may not be at an appropriate level of detail (too much or too little).	The student does not clearly describe his/her experimental methods or does so incompletely or superficially.

Comments:

Results (1): Does the thesis provide a comprehensive, understandable description of the results (or lack of results)? Results should be described in text and figures.

Characteristics of Results:

- Describes the experimental rationale, approach and findings.
- Interprets the results within the specific scientific context constructed in the Introduction (in relation to a hypothesis, if applicable).

Excellent	Acceptable	Requires major revision
Results are clearly and completely described in the text and figures. Data analysis is accurate and unbiased. The interpretation of results is insightful and the thesis explains the implications of inconsistencies, ambiguities, alternatives and/or limitations.	The thesis presents a reasonable description and interpretation of results, and mentions inconsistencies, ambiguities, limitations, but may not explain the implications of these potential problems.	There is no interpretation of the results (e.g. a simple restatement of the results) or the interpretation is superficial. Results may be minimally (incompletely) described, or described inappropriately.
For theses with inconclusive results: The thesis provides an insightful explanation of the reasons underlying the lack of clear results.	For theses with inconclusive results: The thesis provides some explanation of the reasons underlying clear results and makes an attempt to interpret the results that were obtained.	For theses with inconclusive results: There is little or no attempt to explain the reasons underlying the lack of clear results.

Comments:

Results (2): Are the tables, graphs, and figures clear, effective, and informative?

Characteristics of Results:

- Written results should refer explicitly to each table or figure, *and*
- The visual elements of all tables and figures should be clear and easy to read or interpret, *and*
- The legends should provide a clear description of each table or figure and not duplicate information that is in the materials and methods.
- Appropriate choices should be made regarding how to display data (when to use a figure, what kind of figure to use, and how to organize evidence within the figure or table), *and*
- Figures, and tables should include appropriately descriptive titles.

Excellent	Acceptable	Requires major revision
The student makes appropriate choices about how to present his/her data and presents a logical sequence of evidence to support the claims. The tables and figures are exceptionally well-constructed, and the legends and titles clearly describe the visual elements.	In general, the tables figures and legends are clear and appropriate, but one or more could benefit from revision.	Many of the tables or figures are misleading, incorrect, unclear or inappropriate, and/or the legends are incomplete or unclear

Comments:

Discussion: Does the discussion provide a logical argument about the implications of findings and possible future directions?

Characteristics of Discussion:

- Briefly highlights major findings, acknowledging complexities of the data, as well as inconsistencies, limitations and alternative explanations.
- Explicitly relates the implications of their research findings (results) within the scientific context constructed in the Introduction. The narrative should draw connections between the student's research findings and other published work.
- The implications of negative results should be discussed.
- Highlights how the project could lead to future research within the field, *and/or*
- Suggest additional experiments/alternative approaches*.
- If a student has inconclusive or incomplete results, the discussion should focus on the limitation of the results and possible explanations.

** Theses with largely inconclusive or incomplete results should focus on the latter.*

Excellent	Acceptable	Requires major revision
The thesis provides a compelling discussion of the implications of the findings (positive and negative), placing their importance within the context of current knowledge. When appropriate, the discussion recognizes that there may be multiple interpretations of the data. The thesis includes a thorough consideration of possible future studies.	The thesis makes some attempt to discuss the implications of the findings, but may not explain their significance. The thesis may mention possible future studies without explaining how they would contribute significant new knowledge to the field.	The thesis reiterates the findings from the results, but makes little or no attempt to discuss the implications of the findings or does not describe future directions for the project.

Comments:

References: Are the citations sufficient and presented consistently throughout the text and in the list of works cited?

Characteristics of the References:

- Scholarly sources are used to support thesis claims.
- The citation format should be consistent throughout the thesis, *and*
- References should be professionally presented.

Excellent	Acceptable	Requires major revision
The student makes excellent use of scholarly sources to back up his/her claims and contextualize the research project. The thesis uses a consistent and appropriate citation format and presents the list of works cited in a professional manner.	The thesis uses a citation format and presents the list of works cited in a professional manner, but there may be minor inconsistencies or errors. A few claims which should be referenced are not.	The thesis uses inconsistent citation format, is missing a number of citations, and/or presents the list of works cited in an unprofessional manner.

Comments:

Overall Writing Quality: Is the writing at an appropriate level for the target audience of upper division undergraduates and faculty in the general field of biological sciences? Does it demonstrate the characteristics of strong scientific writing outlined in the CBS Writing Enriched Curriculum Writing Plan?		
Excellent	**Acceptable**	**Requires major revision**
Arguments or descriptions are direct and to the point, employing no unnecessary words. Wording is unambiguous; scientific terminology is used appropriately, with specific terms defined as needed. The author does not assume an expert level of knowledge of the reader.	Arguments or descriptions are usually direct, precise and concise, but some areas may need improvement. Occasionally, terminology is used inappropriately, or in a manner that assumes too much knowledge on the part of the audience.	A significant amount of the terminology in the thesis is either used inappropriately or is not appropriate given the audience. A significant proportion of the prose is wordy and/or ambiguous.
Comments:		
Is the thesis free of writing errors (grammar, spelling, scientific conventions such as italicizing species names, etc.)?		
The thesis is virtually free of obvious errors.	The thesis contains some errors.	The thesis contains many errors or is presented in a manner that does not adhere to professional standards.
Comments:		

Organization: Does the thesis organization demonstrate communication abilities for CBS graduates that were outlined in the CBS Writing Enriched Curriculum Writing Plan? Is the thesis clearly and appropriately organized? Does each section contain appropriate information (e.g. possible implications of the results are in the discussion section, not the results section)? Is the information in each section cohesive and logically organized?		
The thesis adheres to the IMRD organization, and the writing within paragraphs is logical and easy to follow in most cases. The background, results and discussion build a logical and scientifically contextualized narrative.	The thesis adheres to the IMRD organization, and the writing within paragraphs is usually logical and easy to follow in most cases. The thread of the scientific narrative is generally easy to follow but at points could be improved.	The thesis does not adhere to the IMRD organization, or the writing within paragraphs is frequently difficult to follow. The background and data are presented but without a clear, logical or scientifically contextualized narrative.
Comments:		