

Grading rubric for spring semester Junior Paper

Total length 10-12 pages:

Abstract	(200 word limit)
Background & Significance	(3-4 pages)
Specific Aims	(1/2-1 page)
Preliminary Results	(1-3 pages)
Research Plan	(4-5 pages)
Bibliography	(at least 10 primary sources)

Format: Arial 11 or Times New Roman 12 point font, double-spaced (except for bibliography), 1 inch margins. There is no limit on figures and tables.

Faculty advisers will read and comment on no more than one draft of the JP.

Abstract (200 words):

The abstract should accurately summarize the contents of the JP. Abstracts typically do not contain references. The key aspects of an excellent abstract include:

- a) a brief summary of the problem/question under investigation and its relevance
- b) a brief statement regarding the approach
- c) a concise summary of preliminary findings
- d) a summary of the interpretations and/or conclusions

Evaluation

1 – The abstract contains all of the key aspects listed above. It is well written and concise, without scientific inaccuracies or grammatical errors.

2 – The abstract contains all of the key aspects listed above, but is not concise and/or clearly written and/or qualitatively is not an outstanding abstract. However, it does not contain scientific inaccuracies or grammatical errors.

3 – The abstract contains all or most of the key aspects listed above, but is not concise and/or is not clearly written and/or contains scientific inaccuracies or grammatical errors. Abstract with inaccuracies or errors should not score above a 3.

4 – The abstract is missing more than one of the key components listed above and/or it is poorly written and/or contains many inaccuracies and grammatical errors.

5 – This does not resemble a scientific abstract in that it is missing many of the key components listed above, and/or is poorly written, and/or contains numerous inaccuracies and grammatical errors.

Background & Significance (2-4 pages)

The Background & Significance section should establish the context of the work being proposed. This section must answer the questions, "What do I plan to study? Why is it an important problem/question? How does work published by other investigators motivate the proposed research – what has been done, what gaps remain in our understanding? How will my study, if successful, advance our knowledge about the specific problem and the field more generally?"

The key elements to an excellent Background & Significance section are:

- a) a concise summary of the relevant primary literature that frames the proposed question/study
- b) the purpose of the work in the form of a hypothesis or question
- c) the rationale for the approach to testing the hypothesis or answering the question
- d) a brief statement as to how the field would be advanced by successfully testing the hypothesis

Evaluation

1 – The Background & Significance includes all four elements listed above. It is well written and concise without any scientific inaccuracies or grammatical errors. It does not contain extraneous information or material better suited for the Preliminary Results or Research Plan.

2 – The Background & Significance includes all four elements listed above, but has one or more of the following deficits: a) not well written; b) not concise; c) contains extraneous information; d) contains information better suited to the Preliminary Results or Research Plan; e) has one or two scientific inaccuracies or grammatical errors.

3 – The Background & Significance is missing one of the four elements listed above and/or has one or more of the following deficits: a) not well written; b) not concise; c) contains extraneous information; d) contains information better suited to the Preliminary Results or Research Plan; e) has multiple scientific inaccuracies or grammatical errors.

4 – The Background & Significance is missing more than one of the four elements listed above and/or has one or more of the following deficits: a) not well written; b) not concise; c) contains extraneous information; d) contains information better suited to the Preliminary Results or Research Plan; e) has multiple scientific inaccuracies or grammatical errors.

5 – The Background & Significance is missing more than one of the four elements and is poorly written. It may contain extraneous information and/or information that is better suited to the Preliminary Results or Research Plan. It may include multiple scientific inaccuracies or grammatical errors and reads like a rushed draft.

Specific Aims (1/2 to 1 page)

The Specific Aims section is the "master plan" for your proposal. If the Background & Significance section has set up the question well, the Specific Aims section should easily transition into what you will do for your thesis work. You do not need to restate the background information in this section but it should

state the problem you are studying, the central hypothesis you are testing, and the "to do" list of objectives - the Aims - for addressing the hypothesis. A senior thesis proposal should have at least two specific aims, but these should be reasonable for the year you have to complete the work. List each aim as a bold header. Under the header state the experimental approaches you will take and, briefly, how the aim will help prove your hypothesis. Each aim can have its own hypothesis if warranted.

Evaluation

1 – The specific aims are clear and concise. They are reasonable and designed to test the stated hypothesis. The rationale and approach to the Aims are clear.

2 – The specific aims are reasonable and designed to test the stated hypothesis. However, the section is lacking in clarity and/or lacks suitable details of the rationale or approach.

3 – The specific aims are reasonable but are not clear in how they test the hypothesis, and/or the section is unclear and lacking in details of the rationale and approach.

4 – The specific aims do not test the hypothesis and/or are completely unclear.

5 – The specific aims are not clear, do not test the hypothesis, and lack needed details.

Preliminary Results (1-3 pages)

This section reports unpublished work only and may include data from others in the laboratory and/or your own results. Only unpublished work relevant to your hypothesis and specific aims should be included. You must indicate clearly whether you or another lab member obtained the results you present. Concisely explain the experiments/analysis that was done and why, and how the results inform your hypothesis.

If you are initiating a completely new project, there may be no preliminary results to report. In this case, please state that there are currently no preliminary results for the project.

Evaluation

1 – Preliminary results are professionally presented and establish the feasibility and/or support the rationale for the hypothesis and proposal. This section is clear, even to readers unfamiliar with the experimental system. There are no scientific inaccuracies or grammatical errors, and the section is particularly well written,

2 – Preliminary results are well presented and understandable. The relation of the preliminary results to the proposal is clear.

3 – Preliminary results are well presented, but the relation to the proposal and/or rationale and hypothesis is difficult to determine.

4 – Preliminary results are difficult to understand for a reader who is unfamiliar with the system and/or the relationship to the proposal is unclear.

5 – Preliminary results are presented, but they are difficult to understand and/or do not provide support for the rationale or hypothesis and/or contain numerous scientific inaccuracies or grammatical errors.

N/A – there are no preliminary results for this proposal.

Research Plan (4-5 pages)

This section should provide a detailed work plan for your thesis. This section should be organized by specific aim. Each experiment/approach in this section should include:

- a) A concise outline/description of the experiment, including controls
- b) Potential results and how these would relate to the hypothesis being tested
- c) Potential problems or pitfalls that may occur and how these would be addressed.

Evaluation

1 – The Research Plan is clearly and concisely presented. The experimental approach is understandable to an audience not familiar with the system. All three elements above are included for each experiment/approach and each is expertly addressed.

2 – The Research Plan is clear and concise. The approach is reasonably understandable and logical, and all three elements are included for each experiment/approach.

3 – The Research Plan is clear and the approach is understandable. However one or more elements are missing and/or not well explained or presented.

4 – The Research Plan is clear but the approach is not understandable and/or is not always logical and/or lacked multiple elements.

5 – The approach is not clear or the section is poorly written and lacks multiple elements.

The following two sections are scored by the adviser only.

Bibliography:

This is a comprehensive list of the sources used in developing your proposal. Please include full references, with titles, in your bibliography. You should format your references in the body of your paper with last name of the first author and date, for example (Gavis, 2015).

Evaluation

1 – Each factual statement is referenced to the appropriate primary source. The student identified and correctly cited relevant papers they found through their own reading of the literature that were not suggested by the advisor. The citations are completely accurate and properly formatted for a published journal. All articles cited in the text - and only those articles cited in the text – are listed completely in the Bibliography.

2 – Each factual statement was referenced to the appropriate primary source. The citations are completely accurate and properly formatted for a published journal. All articles cited in the text - and only those articles cited in the text – are listed completely in the Bibliography. However, the sources were mainly those suggested by the advisor.

3 – Most citations are accurate; however **one** of the following was true: a) a few key facts are not properly referenced; b) the student relied almost exclusively on non-peer reviewed Internet sources; c) references are missing from the Bibliography; d) references are listed in the Bibliography but not cited in the text; e) the references are not listed in an accepted scientific format.

4 – The citations and references are acceptable; however **two** of the following are true: a) a few key facts are not properly referenced; b) the student relied almost exclusively on non-peer reviewed Internet sources; c) references are missing from the Bibliography; d) references are listed in the Bibliography but not cited in the text; e) the references are not listed in an accepted scientific format.

5 – The citations are lacking; **three** of the following are true: a) a few key facts are not properly referenced; b) the student relied almost exclusively on non-peer reviewed Internet sources; c) references are missing from the Bibliography; d) references are listed in the Bibliography but not cited in the text; e) the references are not listed in an accepted scientific format.

Work Ethic and Independence

You should speak with your advisor about their expectations concerning your commitment and what you should accomplish for the JP.

Evaluation:

1 – The student worked consistently and made exceptional progress during the semester. S/he accomplished much more than I expected.

2 – The student worked consistently and made excellent progress during the semester. S/he accomplished what I expected.

3 – The student worked consistently and made minimal progress during the semester. S/he accomplished less than I expected.

4 – The student worked intermittently throughout the semester and made some progress. S/he accomplished less than I expected.

5 – The student put minimal effort into the JP, or waited until the very end of the semester to get started. S/he accomplished much less than I expected.