



# Senior Seminar Manual

## 2023-2024



Science Department  
Iadarola Center for Science, Education, and Technology  
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Subject to change.

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## Introduction to Senior Seminar

The capstone course for all of the science majors' programs is Senior Seminar (BIO 444/ CHE 444), which meets during the fall and spring semesters of your senior year. All science majors attend the same course. Senior Seminar aims to meet several important objectives:

1. Providing a culminating experience that integrates the undergraduate academic program with future career endeavors.
2. Encouraging students to take advantage of available services and strategies for career planning and post-baccalaureate educational opportunities.
3. Encouraging students to use their knowledge of science to explore and develop a topic of their own choice in depth.
4. Providing students with opportunities for written, spoken, and graphic presentations of research materials.
5. Encouraging collegial interactions among students and faculty through mentoring, poster presentation, and oral defense
6. Participating in a peer-review process to facilitate constructive feedback from peers with the aim of providing articulation and clarity to the senior thesis.

In previous courses that you have taken, the subject matter was chosen by the instructor, but in this course, you will choose the subject matter. You will develop knowledge and understanding of the subject and you will share your knowledge and problems with your peers.

The course instructors (Mentors) will serve as a guide, a resource, and if necessary, a trouble shooter. The Mentors will also assist students with reading the literature and understanding the scientific methodology employed to support research claims made in journal articles.

In the beginning, you will undoubtedly feel as if the Senior Thesis is an impossible and intimidating task, and that you will never be able to get it done. By the time you are finished, you will realize that you have become an expert in something and that you can represent it in any of a variety of forms.

The sense of accomplishment and confidence comes from knowing that it is an important contribution to science and that you *did something extraordinary*! The sharing of the experience becomes the bond with classmates and faculty mentors.

## **Preparing for Senior Seminar**

Before the start of your senior year, you should be thinking about the topic you'd like to choose for your senior thesis. Think about the areas of your discipline which interest you – this will lead you to topics which could be the basis of your thesis work. In the Fall semester, soon after you return from your summer break, you will be reading primary peer-reviewed sources related to your chosen topic, so it is helpful to begin reading the literature and seeking out relevant articles.

The Senior Thesis may take one of two forms: a library investigation project (literary review) or a laboratory-based project (original research). If you choose the literary review, you can consider possible topics by reviewing your previous course work, particularly those areas which interested you most. Also, talk to faculty members in the Science Department to explore possible areas which you might have overlooked but are possibly of interest and importance to you.

If you would like to become involved in a laboratory-based investigation, it is important that you make plans with a faculty member this spring or during the summer at the latest. This will allow you to plan your project in a timely fashion so that the actual research can be accomplished in the most efficient manner. (Please note that students may reference work already submitted for BIO/CHE 488 or RBIO/RCHE 444 in the "Background" of their Senior Thesis, but the "Current Investigation" section is expected to be original and never submitted previously for evaluation in the Science Department.)

As you think about possible senior thesis topics, you should look at senior theses available to students in the Iadarola Center, Room 212, which were completed by past students, to give you an idea of what will be expected and the types of topics that are appropriate for a senior thesis.

Once you have a possible topic in mind, start by doing some general background reading about your topic, perhaps in a course textbook. Your next step is to look for more advanced texts and articles using the library catalog and databases. Use interlibrary loan to order materials that are not available through the Holy Spirit Library. Review articles are a perfect place to begin! These will provide a summary of the general state of knowledge on your topic (at the time the review was written) and also provide ample references to relevant primary peer-reviewed articles that you can use for your research.

Be sure that you note the complete reference for each source in APA format, and copy the entire bibliography at the end of the article because you may need to refer to the reference list later.

Science Department faculty members are available to you for discussion as you begin to choose your thesis topic. Final approval of topics rests with the instructor of the course. Advice on how to use Medline, Internet sources, databases, other libraries, will be covered in further class discussions early in the fall semester, but you can obtain assistance with advanced searches at any time by contacting the staff at the Holy Spirit Library.

## Overview of Senior Seminar Activities

In addition to a number of smaller assignments along the way, the primary products of senior seminar are:

- **The senior thesis paper**, a 20- to 25-page paper citing at least 10 Primary Peer-Reviewed scientific papers (PPR's) and at least one review article. Some sections of the paper are due in the Fall, and a complete final paper is due in the Spring (see below).
- A **“lightning talk”** (brief presentation) in the Fall and a “progress report” (full presentation) in the Spring.
- A **research poster**, to be presented at the Cabrini University Annual Undergraduate Arts, Research and Scholarship Symposium in the Spring.
- An **oral presentation** of this poster to faculty members at the end of the academic year.

The class meets once a week, and each week will be dedicated to one of the following:

1. Instruction related to searching the literature, writing the thesis, and developing talks and posters.
2. Other senior-year topics, such as career preparation, graduate and professional programs, etc.
3. Small group meetings with the Mentors to work directly on the thesis and presentations, and to address any questions and concerns. (Note that preparing in advance for these meetings, arriving on time, and participating fully is worth 50 points per meeting.)

The senior thesis paper consists of five sections:

- Background/Introduction
- First Subtopic
- Second Subtopic
- Third Subtopic
- Synthesis/Conclusion

Near the end of the Fall semester, you will hand in the Background/Introduction section and the First Subtopic section, along with prospective titles for the other two subtopic sections. In the Spring, you will revise these two sections and write the remaining three sections and submit them for peer-editing by a classmate. You will then have an opportunity to make changes based on your peer-editor's recommendations, and hand in the final draft to be evaluated by the faculty mentor.

The following pages contain a brief description, rationale, and grading rubric for each of the major assignments in Senior Seminar. Missing assignment components will receive zero points. Please see your syllabus for due dates and additional grading information.

## Assignments:

### Article Comprehension Questions

A Primary, Peer-Reviewed paper (PPR) is a scientific article published in a peer-reviewed journal that presents new research carried out by the paper's authors. You can confirm that a journal is peer-reviewed by going to the journal's website and reading about their submission and review process. You can typically distinguish a PPR from a review paper (which may also be published in a peer-reviewed journal) by looking for a Methods section, since a PPR is focused on a specific study or set of studies that its authors performed.

Reading PPRs is not easy – it takes practice to ask the right questions to extract the most important information from these papers, which are often written with convoluted syntax and lots of scientific jargon. The purpose of this assignment is to give you some practice looking for the specific types of information that scientists often look for when they're reviewing the literature on a particular topic.

Find one PPR related to your thesis topic, and answer the following questions, using full sentences:

1. What is the title of the article?
2. Authors
  - a. List all authors.
  - b. Who is the corresponding author, and what does this mean?
  - c. Where is the corresponding author listed in the order of authors?
  - d. What does the order mean?
  - e. What is the affiliation of the authors? Is it the same for all authors?
3. Journal information
  - a. In what journal is the article published (make sure this is correct. Not database)?
  - b. What is the impact factor of the journal (can be googled)?
  - c. What does impact factor mean?
  - d. From what years was the impact factor calculated?
4. What is the overall significance of the article?
  - a. Why should people care?
  - b. Why do you care?
  - c. Where did you find the significance, and is it stated more than once?
5. Hypothesis:
  - a. What is the hypothesis of the paper (in your own words)?
  - b. Where did the authors state their hypothesis?
  - c. If they did not explicitly state their hypothesis, were you able to discern the hypothesis from their overall goal?
6. List 3 topics discussed in the introduction that are familiar to you and explain how you learned about each of them.
7. List 3 words that are unfamiliar to you and define them. (Do not pick gene/protein proper names.)

### Article Comprehension Grading Rubric

	10 points	8 points	6 points	4 points
Article, Title, Authors, and Journal	Relevant PPR with accurate title, author, and journal information.	Not a relevant PPR, <u>or</u> missing one piece of accurate information.	Relevant PPR, but missing two or more pieces of accurate information.	Not a relevant PPR, <u>and</u> missing two or more pieces of accurate information; <u>or</u> missing three or more pieces of accurate information

Significance	Clear, concise, and compelling statement of the significance of the paper, along with its source.	Clear and concise statement of the significance of the paper, along with its source.	Statement of the significance of the paper is unclear, <u>or</u> source is missing.	Statement of the significance of the paper is unclear, <u>and</u> source is missing.
Hypothesis	Clear, concise, and accurate statement of the hypothesis, along with its source.	Accurate statement of the hypothesis, along with its source.	Statement of the hypothesis is inaccurate, <u>or</u> source is missing.	Statement of the hypothesis is inaccurate, <u>and</u> source is missing.
Familiar Topics	Three separate familiar topics, along with a clear explanation of where the student learned about each one.	Three separate familiar topics, with some explanation of where the student learned about each one.	Does not include three separate familiar topics, <u>or</u> does not explain where the student learned about each one.	Does not include three separate familiar topics, <u>and</u> does not explain where the student learned about each one.
Unfamiliar Terms	Student chose three distinct, important terms and defined each one clearly, concisely, and accurately.	Student chose three distinct terms and defined each one accurately.	Student failed to choose three distinct terms, <u>or</u> failed to define each one accurately.	Student failed to choose three distinct terms, <u>and</u> failed to define each one accurately.

## Concept Map

A concept map is a diagram that represents complex information in a simple, visual format. Most importantly, a concept map shows the relationship between concepts. Concept maps can be built in a variety of formats, but they all need to have nodes (terms or concepts), connected by arrows, and each arrow must be labelled with a linking phrase that briefly states the relationship between the two nodes that the arrow connects.

Your concept map should show how your main topic is related to each of your three subtopics, and then depict ideas within each of those subtopics and depict how the ideas are related to each other. Make sure to include a range of ideas within each subtopic. You can create your concept map in PowerPoint or another software program or draw it by hand and upload an image of it. However, you make it, make sure it is neat and clear.

### Concept Map Grading Rubric

	<b>10 points</b>	<b>8 points</b>	<b>6 points</b>	<b>4 points</b>
Relevant	All components are clearly linked to the main topic.	Nearly all components are clearly linked to the main topic.	Most components are clearly linked to the main topic.	Most components are <u>not</u> clearly linked to the main topic.
Extensive	Includes all of the primary ideas associated with the main topic.	Includes nearly all of the primary ideas associated with the main topic.	Includes most of the primary ideas associated with the main topic.	Many primary ideas associated with the main topic are missing.
Valid Relationships	Valid relationships between terms are clearly presented in all cases.	Valid relationships between terms are clearly presented in nearly all cases.	Valid relationships between terms are clearly presented in most cases.	Many relationships are invalid and/or unclear.
Useful Structure	Structure highlights important relationships and organizes sub-topics in a clear, useful way.	Structure organizes sub-topics in a clear, useful way, but fails to highlight important relationships.	Most sub-topics are organized in a clear, useful way.	Sub-topics are organized in a way that is unclear and/or not useful.
Visually Appealing	Designed so as to highlight terms, relationships, and structure in a clear and easily readable way.	Design is clear and easily readable.	Design is mostly clear and easily readable.	Design is unclear and/or difficult to read.



## Annotated Bibliographies

An annotated bibliography entry is a citation of a paper, followed by a brief description and evaluation of that paper. For each of your annotated bibliographies, you will choose one recent (within the past 5 years) Primary Peer-Reviewed paper (not a review paper), and list the following three types of APA-style citation for that paper:

- The full citation, as it would appear in your References section.
- The in-text citation appropriate for citing this paper in the text of your thesis.

You will then briefly summarize the entire paper in your own words. (Remember to paraphrase; don't use any direct quotes.) Make sure to explain what the researchers set out to do, how they did it, what they found, and what they concluded about those results. Next, you will critique the paper, pointing out strengths and drawbacks of the study, and open questions that still remain. Note that you are critiquing the study itself, not the paper, so do not include strengths and weaknesses of how the paper was written. Also, you want to highlight open questions that still require additional research to answer them, not ones that you could look up. Each annotated bibliography should be at least 1/3 page in length (17 lines, single-spaced, 12-point font, one-inch margins, Times New Roman font), with references appropriately cited in APA format.

For each pair of Annotated Bibliographies, you will also provide a clear and concrete statement of the connection between the two studies. Focus on interesting ways that the two studies compare and/or contrast, including any relationships between the methods or results of the studies.

### Annotated Bibliographies Grading Rubric

	<b>5 points</b>	<b>4 points</b>	<b>3 points</b>	<b>2 points</b>
PPR 1: Appropriate Source	Recent, primary peer-reviewed paper describing a relevant, well-conducted study.	Paper is missing one of the following: recent, primary, peer-reviewed, relevant, well-conducted study.	Paper is missing two of the following: recent, primary, peer-reviewed, relevant, well-conducted study.	Paper is missing three or more of the following: recent, primary, peer-reviewed, relevant, well-conducted study.
PPR 1: Summary of Methods	Clear, concise, complete summary of the study's methods.	Paper is missing one of the following: clear, concise, complete.	Paper is missing two of the following: clear, concise, complete.	Paper is missing all three of the following: clear, concise, complete.
PPR 1: Summary of Results	Clear, concise, complete summary of the study's main results.	Paper is missing one of the following: clear, concise, complete.	Paper is missing two of the following: clear, concise, complete.	Paper is missing all three of the following: clear, concise, complete.
PPR 1: Critique	Clearly highlights multiple strengths and/or drawbacks of the study, and clearly describes two or more open questions that remain after this study.	Highlights multiple strengths and/or drawbacks of the study, and clearly describes one open question that remains after this study.	Highlights at least one strength or drawback of the study, and describes one open question that remains after this study.	Fails to highlight strengths or drawbacks of the study, and/or fails to describe any open questions that remain after this study.

PPR 2: Appropriate Source	Recent, primary peer-reviewed paper describing a relevant, well-conducted study.	Paper is missing one of the following: recent, primary, peer-reviewed, relevant, well-conducted study.	Paper is missing two of the following: recent, primary, peer-reviewed, relevant, well-conducted study.	Paper is missing three or more of the following: recent, primary, peer-reviewed, relevant, well-conducted study.
PPR 2: Summary of Methods	Clear, concise, complete summary of the study's methods.	Paper is missing one of the following: clear, concise, complete.	Paper is missing two of the following: clear, concise, complete.	Paper is missing all three of the following: clear, concise, complete.
PPR 2: Summary of Results	Clear, concise, complete summary of the study's main results.	Paper is missing one of the following: clear, concise, complete.	Paper is missing two of the following: clear, concise, complete.	Paper is missing all three of the following: clear, concise, complete.
PPR 2: Critique	Clearly highlights multiple strengths and/or drawbacks of the study, and clearly describes two or more open questions that remain after this study.	Highlights multiple strengths and/or drawbacks of the study, and clearly describes one open question that remains after this study.	Highlights at least one strength or drawback of the study, and describes one open question that remains after this study.	Fails to highlight strengths or drawbacks of the study, and/or fails to describe any open questions that remain after this study.
Both Papers: APA Citation	The full Reference list citation and in-text citation are accurate for both papers with no errors.	The full Reference list citation and in-text citation are accurate for both papers with only a couple of errors.	The full Reference list citation and in-text citation are nearly accurate for both papers, with only a few errors.	The full Reference list citation and in-text citation are not accurate for one or both papers.
Connection Between Studies	At least one clear, insightful connection between the two studies.	At least one clear, connection between the two studies.	At least one connection between the two studies is mentioned.	No connection between the two studies is mentioned.

## Outline

An outline helps to organize ideas and information in preparation for writing an actual paper. Your outline should include all the topics you will address in your paper, organized in standard Roman numeral format:

I.

II.

A.

B.

1.

2.

a.

b.

You should include in-text citations (APA format) embedded in your outline (in parentheses, following the relevant section) to demonstrate where in your paper you plan to use each of your PPRs and review article(s). Include a reference list at the end with full citations (APA format) for all papers.

### Outline Grading Rubric

	<b>20 points</b>	<b>16 points</b>	<b>12 points</b>	<b>8 points</b>
Organization	Clear arrangement of headings and subheadings	Outline is mostly clear, a few headings/ subheadings are not properly arranged	Many headings and subheadings are not clearly arranged	Arrangement of headings/ subheadings is not clear
Structure	Important conclusions are highlighted, and flow of topics is clear	Most conclusions are highlighted with a few missing. Flow of topics is unclear for some subheadings	Few conclusions are highlighted. Flow of topics is unclear for many of the subheadings	Conclusions are not highlighted, and flow of topics is unclear
Accuracy	Scientific ideas presented are relevant to topic	Most scientific ideas presented are relevant to topic	Only a few scientific ideas presented are relevant to the topic	None of the scientific ideas presented are relevant to the topic
Comprehensive	Outline covers all the relevant topics of the current investigation	Outline covers many of the topics of the current investigations. Few topics are not relevant	Outline covers few of the topics of the current investigations. Many topics are not relevant	Outline does not cover the relevant topics of the current investigations
Well-written	References are properly cited in APA format. No grammatical errors	One of the sources is not properly cited in APA format or there are a few grammatical errors	Two of the sources are not properly cited in APA format or there are many grammatical errors	Many sources not properly cited in APA format and there are many grammatical errors

## Thesis Paper

Your final thesis paper will consist of the following sections:

- Title page
- Abstract (1/2 page maximum, single-spaced)
- Introduction
- First Subtopic
- Second Subtopic
- Third Subtopic
- Conclusion
- Figures and Tables
- References
- Acknowledgements

The paper should be written in 12-point Times New Roman font, double-spaced (except for the Abstract), with 1" margins on each side. Each paragraph should be indented, and do not insert any extra space between paragraphs. The main sections of the paper (Introduction, Subtopics, and Conclusion) should be between 20 and 25 pages. Use APA format for in-text citations and the reference list. A minimum of 10 primary peer-reviewed journal articles and one review article must be cited within your paper and referenced in your reference list. (Additional citations are encouraged.), with 2 figures + 2 peer-reviews papers per subtopic. A penalty of 25 points per page will be deducted for each page above or below the page requirement, and for each missing PPR or review article.

Figures and/or tables from primary sources must be included in a "Figures and Tables" section that will follow your Conclusion. All figures or tables must:

- be numbered chronologically in the order they appear in your paper and be indicated in bold in the narrative.
- include a legend (a brief description of what the data shows, being sure to identify such features as axes, units of measure, order of samples in lanes, controls, different symbols, etc.)
- have an in-text APA-format citation, placed at the end of the legend in parentheses, that references the source of your data.

Your Senior Seminar classmates are the target audience for your thesis. This means that the author can assume that the target audience is familiar with material that is covered in the required courses of the major but might not necessarily be familiar with courses taught as electives. For example, you do not need to explain what an ion or a gene is, but you may have to explain more specialized concepts, including those only taught in upper-level elective courses.

The five main sections of the overall thesis will be graded based on the rubrics below. A paper that is missing an appropriate Abstract will lose up to 50 points, and if you fall short of the minimum number of cited papers (10 PPRs and one review), you will lose 50 points for each missing paper.

### Structural and abstract components (40 points)

	5 points	4 points	3 points	2 points
APA format title page and page components	Student has all APA-style title page components, page numbers, running header, and appropriate spacing throughout	Student is missing one component	Student is missing two components	Student is missing more than two components
Appropriate title	Title is creative, descriptive, and clear	Title is descriptive <u>and</u> clear	Title is either descriptive <u>or</u> clear	Title is neither descriptive nor clear
Abstract - significance	The significance of the topic is clearly and insightfully described	The significance of the topic is clearly described	The significance of the topic is mentioned	The significance of the topic is not mentioned
Abstract – subtopic 1	Subtopic 1 is clearly and concisely introduced	Subtopic 1 is clearly introduced	Subtopic 1 is mentioned	Subtopic 1 is not mentioned
Abstract – subtopic 2	Subtopic2 is clearly and concisely introduced	Subtopic 2 is clearly introduced	Subtopic 2 is mentioned	Subtopic 2 is not mentioned
Abstract – subtopic 3	Subtopic 3 is clearly and concisely introduced	Subtopic 3 is clearly introduced	Subtopic 3 is mentioned	Subtopic 3 is not mentioned
Abstract – conclusion	The main conclusions of the thesis are clearly and concisely summarized	The main conclusions of the thesis are clearly summarized	The main conclusions of the thesis are mentioned	The main conclusions of the thesis are not mentioned
Acknowledgements	Student includes acknowledgements section	N/A	N/A	N/A

### **Thesis Paper Component: Introduction Section**

The Introduction section of the thesis has two primary purposes:

- It should provide sufficient background information for the reader (for example, another Senior Seminar student) to understand the overall topic and the specific studies to be presented later in the paper.
- It should convince the reader of the importance of the topic, and of the studies currently being performed on this topic.

Information presented in the Introduction can be drawn from PPRs, review papers, or other acceptable scholarly sources. A minimum of one figure is required for the Introduction; this figure can be derived from either a PPR or a review article. There is not a specific page requirement, but since your five-section thesis eventually needs to be 20-25 pages, the sections should average 4-5 pages each, so if your Introduction is less than 3 pages, you should probably re-consider whether you've included extensive enough background information to effectively frame your topic.

### Introduction Section Grading Rubric (200 points)

	<b>20 points</b>	<b>16 points</b>	<b>12 points</b>	<b>8 points</b>
Utilizes valid sources of information	Student presents information from many high-quality scholarly sources, including multiple PPRs.	Student presents information from multiple scholarly sources, <u>and</u> avoids all inappropriate non-scholarly sources.	Student presents information from multiple scholarly sources, <u>or</u> avoids all inappropriate non-scholarly sources.	Student fails to present information from multiple scholarly sources, <u>and</u> uses all inappropriate non-scholarly sources.
Provides a broad overview of the topic	Section includes information on all the relevant areas of inquiry necessary to understand the context of the thesis topic.	Section includes information on nearly all the relevant areas of inquiry necessary to understand the context of the thesis topic.	Section includes information on most of the relevant areas of inquiry necessary to understand the context of the thesis topic.	Section fails to include information on multiple relevant areas of inquiry necessary to understand the context of the thesis topic.
Extensive information about the topic	Clearly and concisely presents enough depth on each of the relevant areas of inquiry to give the reader a solid understanding.	Presents enough depth on each of the relevant areas of inquiry to give the reader a solid understanding.	Presents enough depth on most of the relevant areas of inquiry to give the reader a solid understanding.	Fails to present enough depth on multiple relevant areas of inquiry to give the reader a solid understanding.
Explanations at the appropriate level	Clearly and concisely explains advanced concepts in a style appropriate to the audience, while avoiding unnecessary explanations.	Explains advanced concepts in a style appropriate to the audience, while avoiding unnecessary explanations.	Generally explains advanced concepts in a style appropriate to the audience, while mostly avoiding unnecessary explanations.	Fails to explain advanced concepts in a style appropriate to the audience, and/or includes multiple unnecessary explanations.
Scientifically accurate information	All information presented is clear and accurate.	Nearly all information presented is clear and accurate.	Most information presented is clear and accurate.	Much information presented is unclear and/or inaccurate.
Figures/ tables are presented clearly	Each figure and table is referenced in the text of the paper, easily legible, and is accompanied by a clear and accurate explanatory legend.	Nearly all figures and tables are referenced in the text of the paper, easily legible, and are accompanied by a clear and accurate explanatory legend.	Most figures and tables are referenced in the text of the paper, easily legible, and are accompanied by a clear and accurate explanatory legend.	Many figures and tables are not referenced in the text of the paper , or not accompanied by a clear and accurate explanatory legend.

Presents importance of topic to scientists	Student clearly and compellingly describes the importance of the thesis topic within the context of our overall scientific understanding.	Student clearly describes the importance of the thesis topic within the context of our overall scientific understanding.	Student mentions the importance of the thesis topic within the context of our overall scientific understanding.	Student fails to mention the importance of the thesis topic within the context of our overall scientific understanding.
Presents importance of topic to the general public	Student clearly and compellingly describes the importance of the thesis topic to ordinary people.	Student clearly describes the importance of the thesis topic to ordinary people.	Student mentions the importance of the thesis topic to ordinary people.	Student fails to mention the importance of the thesis topic to ordinary people.
Follows conventions of scientific writing	Section is written in a clear and engaging style, and follows conventions of good scientific writing and meets the format guidelines listed above.	Section is clear and has only a few errors of scientific writing convention and meets the format guidelines listed above in nearly all instances.	Section is mostly clear and follows scientific writing conventions more often than not and meets the format guidelines listed above in most instances.	Section is unclear and/or fails to follow conventions of scientific writing and/or does not meet the format guidelines listed above.
Appropriate citations	All resources are cited correctly in narrative and in the reference list.	Nearly all resources are cited correctly in narrative and in the reference list.	Most resources are cited correctly in narrative and in the reference list.	Many resources are not cited correctly in narrative and/or in the reference list.

## Thesis Paper Component: Subtopic Sections

Each Subtopic section of your thesis presents information on one specific area that is part of your overall topic. Your goal is to present studies that have been done recently (within the past 5 years, and especially within the past 2 years if possible) that have advanced scientific knowledge of this particular subtopic. Each Subtopic section must present a minimum of two PPRs, and since the final thesis must present a minimum of 10 PPRs (across three Subtopic sections), most will present more than two.

For each paper, you should describe its purpose, methodology, principle findings, and conclusions. You should highlight important strengths and drawbacks of the study, and open questions that still remain to be answered. In addition, you should explain the connections among the different studies you present, and how they relate to each other. You can then synthesize the information that is currently known about this subtopic, and present overall conclusions and future research directions based on that synthesis.

Subtopic Section 1 Grading Rubric (200 points)

	<b>20 points</b>	<b>16 points</b>	<b>12 points</b>	<b>8 points</b>
Utilizes sufficient, valid sources of information	Section cites at least two recent, highly relevant PPRs.	One PPR is not recent or not centrally relevant to the subtopic.	Two errors in choosing recent, centrally relevant papers.	More than two errors in choosing recent, centrally relevant papers.
Explains the purpose of studies	For every PPR discussed, student clearly and concisely explains the purpose of the study.	For nearly every PPR discussed, student clearly explains the purpose of the study.	For most of the PPRs discussed, student clearly explains the purpose of the study.	In many cases, student fails to clearly explain the purpose of the study.
Explains the methodology of studies	For every PPR discussed, student clearly and concisely explains the methods used in the study.	For nearly every PPR discussed, student clearly explains the methods used in the study.	For most of the PPRs discussed, student clearly explains the methods used in the study.	In many cases, student fails to clearly explain the methods used in the study.
Explains the results of studies	For every PPR discussed, student clearly and concisely explains the principle results of the study, and presents relevant data.	For nearly every PPR discussed, student clearly explains the principle results of the study, and presents relevant data.	For multiple PPRs, student fails to clearly explain the principle results of the study, <u>or</u> fails to present relevant data.	For multiple PPRs, student fails to clearly explain the principle results of the study, <u>and</u> fails to present relevant data.
Figures/ tables are presented clearly	Each figure and table is referenced in the text of the paper, easily legible, and is accompanied by a clear and accurate explanatory legend.	Nearly all figures and tables are referenced in the text of the paper, easily legible, and are accompanied by a clear and accurate explanatory legend.	Most figures and tables are referenced in the text of the paper, easily legible, and are accompanied by a clear and accurate explanatory legend.	Many figures and tables are not referenced in the text of the paper , or not accompanied by a clear and accurate explanatory legend.
Explains the conclusions of studies	For every PPR discussed, student clearly and concisely explains the principle conclusions of the study.	For nearly every PPR discussed, student clearly explains the principle conclusions of the study.	For most of the PPRs discussed, student clearly explains the principle conclusions of the study.	In many cases, student fails to clearly explain the principle conclusions of the study.
Critique of studies	For every PPR discussed, student clearly highlights multiple valid, thoughtful strengths and/or drawbacks of the study.	For nearly every PPR discussed, student presents multiple valid, thoughtful strengths and/or drawbacks of the study.	For most of the PPRs discussed, student presents at least one valid, thoughtful strength and/or drawback of the study.	In many cases, student fails to present valid, thoughtful strengths and/or drawbacks of the study.



Connections between studies	Student presents clear, insightful connections between the different papers, and structures the section to highlight these connections.	Student presents clear connections between most of the different papers, and structures the section to highlight these connections.	Student presents some connections among papers, but structure does not highlight these connections.	Student fails to make connections between most of the papers.
Follows conventions of scientific writing	Section is written in a clear and engaging style, and follows conventions of good scientific writing and meets the format guidelines listed above.	Section is clear and has only a few errors of scientific writing convention and meets the format guidelines listed above in nearly all instances.	Section is mostly clear and follows scientific writing conventions more often than not and meets the format guidelines listed above in most instances.	Section is unclear and/or fails to follow conventions of scientific writing and/or does not meet the format guidelines listed above.
Appropriate citations	All resources are cited correctly in narrative and in the reference list.	Nearly all resources are cited correctly in narrative and in the reference list.	Most resources are cited correctly in narrative and in the reference list.	Many resources are not cited correctly in narrative and/or in the reference list.

#### Subtopic Section 2 Grading Rubric (200 points)

	<b>20 points</b>	<b>16 points</b>	<b>12 points</b>	<b>8 points</b>
Utilizes sufficient, valid sources of information	Section cites at least two recent, highly relevant PPRs.	One PPR is not recent or not centrally relevant to the subtopic.	Two errors in choosing recent, centrally relevant papers.	More than two errors in choosing recent, centrally relevant papers.
Explains the purpose of studies	For every PPR discussed, student clearly and concisely explains the purpose of the study.	For nearly every PPR discussed, student clearly explains the purpose of the study.	For most of the PPRs discussed, student clearly explains the purpose of the study.	In many cases, student fails to clearly explain the purpose of the study.
Explains the methodology of studies	For every PPR discussed, student clearly and concisely explains the methods used in the study.	For nearly every PPR discussed, student clearly explains the methods used in the study.	For most of the PPRs discussed, student clearly explains the methods used in the study.	In many cases, student fails to clearly explain the methods used in the study.
Explains the results of studies	For every PPR discussed, student clearly and concisely explains the principle results of the study, and presents relevant data.	For nearly every PPR discussed, student clearly explains the principle results of the study, and presents relevant data.	For multiple PPRs, student fails to clearly explain the principle results of the study, <u>or</u> fails to present relevant data.	For multiple PPRs, student fails to clearly explain the principle results of the study, <u>and</u> fails to present relevant data.

Figures/ tables are presented clearly	Each figure and table is referenced in the text of the paper, easily legible, and is accompanied by a clear and accurate explanatory legend.	Nearly all figures and tables are referenced in the text of the paper, easily legible, and are accompanied by a clear and accurate explanatory legend.	Most figures and tables are referenced in the text of the paper, easily legible, and are accompanied by a clear and accurate explanatory legend.	Many figures and tables are not referenced in the text of the paper , or not accompanied by a clear and accurate explanatory legend.
Explains the conclusions of studies	For every PPR discussed, student clearly and concisely explains the principle conclusions of the study.	For nearly every PPR discussed, student clearly explains the principle conclusions of the study.	For most of the PPRs discussed, student clearly explains the principle conclusions of the study.	In many cases, student fails to clearly explain the principle conclusions of the study.
Critique of studies	For every PPR discussed, student clearly highlights multiple valid, thoughtful strengths and/or drawbacks of the study.	For nearly every PPR discussed, student presents multiple valid, thoughtful strengths and/or drawbacks of the study.	For most of the PPRs discussed, student presents at least one valid, thoughtful strength and/or drawback of the study.	In many cases, student fails to present valid, thoughtful strengths and/or drawbacks of the study.
Connections between studies	Student presents clear, insightful connections between the different papers, and structures the section to highlight these connections.	Student presents clear connections between most of the different papers, and structures the section to highlight these connections.	Student presents some connections among papers, but structure does not highlight these connections.	Student fails to make connections between most of the papers.
Follows conventions of scientific writing	Section is written in a clear and engaging style, and follows conventions of good scientific writing and meets the format guidelines listed above.	Section is clear and has only a few errors of scientific writing convention and meets the format guidelines listed above in nearly all instances.	Section is mostly clear and follows scientific writing conventions more often than not and meets the format guidelines listed above in most instances.	Section is unclear and/or fails to follow conventions of scientific writing and/or does not meet the format guidelines listed above.
Appropriate citations	All resources are cited correctly in narrative and in the reference list.	Nearly all resources are cited correctly in narrative and in the reference list.	Most resources are cited correctly in narrative and in the reference list.	Many resources are not cited correctly in narrative and/or in the reference list.

Subtopic Section 3 Grading Rubric (200 points)

	<b>20 points</b>	<b>16 points</b>	<b>12 points</b>	<b>8 points</b>
Utilizes sufficient, valid sources of information	Section cites at least two recent, highly relevant PPRs.	One PPR is not recent or not centrally relevant to the subtopic.	Two errors in choosing recent, centrally relevant papers.	More than two errors in choosing recent, centrally relevant papers.
Explains the purpose of studies	For every PPR discussed, student clearly and concisely explains the purpose of the study.	For nearly every PPR discussed, student clearly explains the purpose of the study.	For most of the PPRs discussed, student clearly explains the purpose of the study.	In many cases, student fails to clearly explain the purpose of the study.
Explains the methodology of studies	For every PPR discussed, student clearly and concisely explains the methods used in the study.	For nearly every PPR discussed, student clearly explains the methods used in the study.	For most of the PPRs discussed, student clearly explains the methods used in the study.	In many cases, student fails to clearly explain the methods used in the study.
Explains the results of studies	For every PPR discussed, student clearly and concisely explains the principle results of the study, and presents relevant data.	For nearly every PPR discussed, student clearly explains the principle results of the study, and presents relevant data.	For multiple PPRs, student fails to clearly explain the principle results of the study, <u>or</u> fails to present relevant data.	For multiple PPRs, student fails to clearly explain the principle results of the study, <u>and</u> fails to present relevant data.
Figures/ tables are presented clearly	Each figure and table is referenced in the text of the paper, easily legible, and is accompanied by a clear and accurate explanatory legend.	Nearly all figures and tables are referenced in the text of the paper, easily legible, and are accompanied by a clear and accurate explanatory legend.	Most figures and tables are referenced in the text of the paper, easily legible, and are accompanied by a clear and accurate explanatory legend.	Many figures and tables are not referenced in the text of the paper , or not accompanied by a clear and accurate explanatory legend.
Explains the conclusions of studies	For every PPR discussed, student clearly and concisely explains the principle conclusions of the study.	For nearly every PPR discussed, student clearly explains the principle conclusions of the study.	For most of the PPRs discussed, student clearly explains the principle conclusions of the study.	In many cases, student fails to clearly explain the principle conclusions of the study.
Critique of studies	For every PPR discussed, student clearly highlights multiple valid, thoughtful strengths and/or drawbacks of the study.	For nearly every PPR discussed, student presents multiple valid, thoughtful strengths and/or drawbacks of the study.	For most of the PPRs discussed, student presents at least one valid, thoughtful strength and/or drawback of the study.	In many cases, student fails to present valid, thoughtful strengths and/or drawbacks of the study.

Connections between studies	Student presents clear, insightful connections between the different papers, and structures the section to highlight these connections.	Student presents clear connections between most of the different papers, and structures the section to highlight these connections.	Student presents some connections among papers, but structure does not highlight these connections.	Student fails to make connections between most of the papers.
Follows conventions of scientific writing	Section is written in a clear and engaging style, and follows conventions of good scientific writing and meets the format guidelines listed above.	Section is clear and has only a few errors of scientific writing convention and meets the format guidelines listed above in nearly all instances.	Section is mostly clear and follows scientific writing conventions more often than not and meets the format guidelines listed above in most instances.	Section is unclear and/or fails to follow conventions of scientific writing and/or does not meet the format guidelines listed above.
Appropriate citations	All resources are cited correctly in narrative and in the reference list.	Nearly all resources are cited correctly in narrative and in the reference list.	Most resources are cited correctly in narrative and in the reference list.	Many resources are not cited correctly in narrative and/or in the reference list.

### Thesis Paper Component: Conclusions Section

The main goals of the Conclusions section are analysis, synthesis, and recommendation of future research directions. You should summarize the principle conclusions of each of your three Subtopic sections, and then highlight the connections among the three subtopics. Be sure to mention important strengths and drawbacks of the recent research within these subtopics, and the critical open questions that remain. You should then synthesize this information to draw overall conclusions about the state of knowledge regarding the overall topic of your thesis. Based on this synthesis, you should suggest creative and innovative new directions for specific future research projects and explain how this future research will address current unanswered questions and advance our scientific understanding of your overall thesis topic.

#### Conclusions Section Grading Rubric (160 points)

	<b>20 points</b>	<b>16 points</b>	<b>12 points</b>	<b>8 points</b>
Summarizes principle conclusions of each subtopic	Section clearly and concisely highlights the principle conclusions of all three subtopic sections.	Section describes the principle conclusions of all three subtopic sections.	Section describes the principle conclusions of at least two subtopic sections.	Section is missing the principle conclusions of at least two subtopic sections.
Makes connections among subtopics	Student draws clear and compelling connections between all three subtopics.	Student draws clear connections between all three subtopics.	Student draws some connections between all three subtopics.	Student fails to draw connections between all three subtopics.

Highlights strengths and drawbacks of specific types of relevant research	Student clearly describes the strengths and/or weaknesses of each of the general types of studies presented, highlighting the impact of this critique on the ability to draw overall conclusions about the topic.	Student clearly describes the strengths and/or weaknesses of each of the general types of studies presented.	Student mentions at least one strength or weakness of each of the general types of studies presented.	Student fails to mention at least one strength or weakness of each of the general types of studies presented.
Synthesizes various studies to present current state of knowledge about overall topic	Student presents a clear and insightful picture of the current state of knowledge about the thesis topic, explicitly drawing upon multiple studies.	Student presents a clear picture of the current state of knowledge about the thesis topic, explicitly drawing upon multiple studies.	Student describes the current state of knowledge about the thesis topic, mentioning some studies.	Student fails to describe the current state of knowledge about the thesis topic, and/or fails to mention any studies.
Conclusions are scientifically valid and insightful	Student's conclusions regarding the current state of knowledge about the thesis topic are clear, accurate, and provide original insights based on their understanding of the studies presented.	Student's conclusions regarding the current state of knowledge about the thesis topic are accurate and provide at least one original insight based on their understanding of the studies presented.	Student's conclusions regarding the current state of knowledge about the thesis topic are mostly accurate, providing thoughtful, if not original, insights.	Student's conclusions regarding the current state of knowledge about the thesis topic are not accurate, and student has failed to provide thoughtful conclusions.
Specific and insightful future directions	Student presents multiple creative and original recommendations for future research, clearly specifying how that research should be conducted and why.	Student presents multiple thoughtful recommendations for future research, specifying how that research should be conducted and why. Some should demonstrate originality	Student presents multiple recommendations for future research, in some cases specifying how and/or why that research should be conducted.	Student fails to present multiple recommendations for future research, or recommendations fail to demonstrate understanding of research presented.
Follows conventions of scientific writing	Section is written in a clear and engaging style and follows conventions of good scientific writing and meets the format guidelines listed above.	Section is clear and has only a few errors of scientific writing convention and meets the format guidelines listed above in nearly all instances.	Section is mostly clear and follows scientific writing conventions more often than not and meets the format guidelines listed above in most instances.	Section is unclear and/or fails to follow conventions of scientific writing and/or does not meet the format guidelines listed above.

Appropriate citations	All resources are cited correctly in narrative and in the reference list.	Nearly all resources are cited correctly in narrative and in the reference list.	Most resources are cited correctly in narrative and in the reference list.	Many resources are not cited correctly in narrative and/or in the reference list.
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## Lightning Talk

A “lightning talk” is a very brief talk that introduces the audience to key information about a topic in an engaging, high-energy way. This style of talk is becoming more common in graduate programs and research conferences. For your lightning talk, you will present the basics of your Introduction (making sure to focus on the importance of your topic) and a couple of highlights from your First Subtopic. The talk has a strict 5-minute time limit, so make sure to plan accordingly. Keep your slides simple and avoid extraneous information. You will definitely want to practice your talk a number of times to get the timing right.

### Lightning Talk Grading Rubric

	<b>20 points</b>	<b>16 points</b>	<b>12 points</b>	<b>8 points</b>
Visual Appeal	Slides are well-organized, easy to read, attractive, and creative	Missing one of the following: well-organized, easy to read, attractive, and creative	Missing two or three of the following: well-organized, easy to read, attractive, and creative	Missing all of the following: well-organized, easy to read, attractive, and creative
Clarity	Student presents information in a way that is clear, concise, and easy to follow.	Talk is missing one of the following: clear, concise, and easy to follow.	Talk is missing two of the following: clear, concise, and easy to follow.	Talk is missing all three of the following: clear, concise, and easy to follow.
Engaging	Student uses consistent eye contact, expressive speech, and engaging language	Talk is missing one of the following: consistent eye contact, expressive speech, and engaging language	Talk is missing two of the following: consistent eye contact, expressive speech, and engaging language	Talk is missing all three of the following: consistent eye contact, expressive speech, and engaging language
Sufficient background information	Talk provides all the necessary background information to understand the topic	Talk provides most of the necessary background information to understand the topic	Talk provides some of the necessary background information to understand the topic	Talk provides none of the necessary background information to understand the topic
Importance/Relevance	Provides a clear and compelling argument that listeners should care about the topic	Provides a clear argument that listeners should care about the topic	Provides some evidence that listeners should care about the topic, but the argument lacks clarity	Fails to provides any evidence that listeners should care about the topic

## Progress Report

Your Progress Report is a 15-minute oral presentation with 5 minutes for questions. Dates and times for progress report presentations cannot be changed without the instructor's permission. You should prepare PowerPoint slides to hand in in advance of your presentation. In this presentation, you should present enough background information for your classmates to understand the topic you're studying and describe the importance of the topic. You should then present 2-3 PPRs, going over the purpose, methods, results, and conclusions of each one. Make sure to highlight any important strengths and/or weaknesses of each study. Next, you should synthesize the findings of these studies, showing connections between them and drawing overall conclusions, including potential future research directions. Finally, be prepared to answer your classmates' and instructors' questions about your topic.

### Progress Report Grading Rubric

	<b>20 points</b>	<b>16 points</b>	<b>12 points</b>	<b>8 points</b>
Oral communication skills (including clarity and professionalism)	Student demonstrates exemplary command of subject matter, engages audience, and narrative provides a seamless flow of information.	Student demonstrates familiarity with subject matter, engages audience, and provides logical narrative structure.	Student is lacking in either familiarity with subject matter, ability to engage audience, <b>or</b> logical narrative structure.	Student is lacking in two or more of the following: familiarity with subject matter, ability to engage audience, or logical narrative structure.
Appropriate visual aids (including organization and neatness)	Slides (or poster) have excellent visual appeal, highlight critical information, and provide strong support for the oral presentation.	Slides (or poster) are neat and attractive, well organized, and highlight critical information.	Slides (or poster) are lacking either visual appeal <b>or</b> clear information.	Slides (or poster) are lacking both visual appeal <b>and</b> clear information.
Presentation of relevant background information for each current investigation paper (and methods, as appropriate)	Student provides ample relevant and engaging foundational concepts to frame main topic and summarizes this information clearly and concisely.	Student provides sufficient relevant foundational concepts to frame current studies and summarizes this information clearly and concisely.	Student either fails to provide sufficient relevant foundational information or fails to summarize clearly and concisely.	Student both fails to provide sufficient relevant foundational information and fails to summarize clearly and concisely.
Presentation of main topic: information/ data	Student comprehensively articulates the central ideas of the topic, with clear and compelling presentation of data.	Student accurately explains the central ideas of the topic, and clearly presents relevant data.	Student either fails to accurately explain the central ideas of the topic or fails to clearly present relevant data.	Student both fails to accurately explain the central ideas of the topic and fails to clearly present relevant data.



Ability to synthesize information and draw conclusions (with future directions, as appropriate)	Student demonstrates excellent critical and analytical skills in synthesizing a variety of information and highlighting its significance.	Student draws connections between separate pieces of information and highlights its significance.	Student either fails to draw connections between separate pieces of information or fails to highlight its significance.	Student both fails to draw connections between separate pieces of information and fails to highlight its significance.
Ability to answer questions clearly and accurately	Student demonstrates exemplary content knowledge, applies this information accurately and creatively, with poise and clarity.	Student demonstrates adequate content knowledge, applies this information accurately, and speaks clearly.	Student either fails to accurately apply content knowledge or fails to answer questions clearly and directly.	Student both fails to accurately apply content knowledge and fails to answer questions clearly and directly.
Participation	Asks numerous questions of classmates that demonstrate understanding of their presentations and creative thinking. (30 points)	Asks numerous questions of classmates that demonstrate understanding of their presentations. (24 points)	Asks some questions of classmates that demonstrate understanding of their presentations. (18 points)	Fails to ask multiple, relevant questions. (0 points)

## Poster

Your poster should be 32 inches wide and 48 inches tall (see the PowerPoint science poster template on the Cabrini Symposium website). All of the text (except for the references) should be clearly readable from five feet away. Except for the Abstract, you should use bullet lists, rather than paragraph form, to present information. Look around at the posters from previous years that are on display in the second and third floor hallways of Iadarola for examples of what works well in terms of visual presentation.

Your poster should contain the following elements:

- A Banner Heading giving an appropriate title of the poster that adequately captures the nature of your research Under the title, in smaller letters should be (from left to right): Your Name, Cabrini University – Science Department, Faculty Mentor: Mentor's Name (do not use academic titles, i.e., do not use Dr. or Professor).
- An Abstract, which should be one paragraph in length and should summarize what the poster (not your thesis) will discuss.
- Background about the topic, with text and some information in graphic form: pictures, diagrams, graphs, bar diagrams, tables, and figures. All graphic materials must be labeled clearly so that the viewer understands what is being presented.
- Two PPR's, including:
  - Methods: Very briefly describe the main methodology used in each study. Do not include specific details, just enough about the methods for the reader to interpret the results.
  - Results: Include bullet points listing the principle results of the study, along with at least two figures/tables per PPR that describe the experiments carried out to investigate your topic. Be sure to include a figure legend underneath each one and an appropriate reference at the end of each figure legend.
- Conclusion: In bulleted format, list the major conclusion(s) of your study or research. This section should be concise and emphasize what you wish your readers to "take home" as the message of your work.
- Future Directions: A few sentences about what more could be learned and how this research might be carried out; what is still not known or understood.
- References: List complete bibliographical references in alphabetical order for all your source materials. Only list the references associated with the poster information, not the full bibliography of your senior thesis.
- Acknowledgments: Acknowledge the assistance of others in completing your project.

You will present your poster at the Cabrini University Annual Undergraduate Arts, Research and Scholarship Symposium during the Spring semester. You are responsible for submitting an appropriate poster abstract to your mentor in advance of the Symposium. Failure to write a suitable poster abstract, or failure to submit it on time, will result in a penalty of 25 points.

This poster will also be used as your visual aid for your final oral defense at the end of the Spring semester.

Poster Grading Rubric

	<b>12.5 points</b>	<b>10 points</b>	<b>7.5 points</b>	<b>5 points</b>
Neatness & visual appeal	Every part of the poster is neat and visually appealing.	A couple components are untidy (such as poorly aligned margins) or lack visual appeal.	Several components are untidy (such as poorly aligned margins) or lack visual appeal.	Many components are untidy (such as poorly aligned margins) or lack visual appeal.
Logical flow between sections	The layout of the poster clearly directs the viewer through the sections in a logical fashion.	The layout of the poster generally directs the viewer through the sections in a logical fashion.	The layout of the poster mostly directs the viewer through the sections in a logical fashion.	The layout of the poster fails to direct the viewer through the sections in a logical fashion.
Visibility at five feet	All of the font (except the references) and the main components of the figures are clearly readable from five feet away.	Nearly all of the font (except the references) and the main components of the figures are clearly readable from five feet away.	Most of the font (except the references) and the main components of the figures are clearly readable from five feet away.	A substantial portion of the font and/or figures are not readable from five feet away.
Well-chosen figures	All figures are compelling, comprehensible, and highlight the main findings of the PPRs.	The figures are comprehensible, and highlight the main findings of the PPRs.	Figures are difficult for the viewer to understand, <u>or</u> fail to highlight the main findings of the PPRs.	Figures are difficult for the viewer to understand, <u>And</u> fail to highlight the main findings of the PPRs.
Concise yet comprehensive figure legends	Figure legends are brief, yet clearly explain the contents of all figures.	Figure legends clearly explain the contents of all figures.	Figure legends explain the contents of most figures.	Figure legends fail to explain the contents of most figures.
Major points denoted by bullet points	Every section (except the abstract) contains information clearly presented in a bullet-point list.	Every section (except the abstract) contains information presented in a bullet-point list.	Most sections (except the abstract) contains information presented in a bullet-point list.	Several sections contain information in paragraph form.
APA format in-text citations	All facts are followed by correctly-formatted APA-style in-text citations.	Most facts are followed by correctly-formatted APA-style in-text citations.	Several in-text citations are missing or incorrectly formatted.	Most in-text citations are missing or incorrectly formatted.
APA format bibliography	All references are correctly listed in APA style in the References section.	One or two errors in the APA style citations in the References section.	Several errors in the APA style citations in the References section.	Most references are missing or incorrectly formatted in the References section.

## Peer Editing

Your peer editing assignment consists of two components. First, you will hand in a completed, well-written thesis to your peer editor. This should not be a rough draft – it should already have undergone substantial editing and proofreading before you hand it in. Then, you will provide high-quality feedback as the peer editor for your partner’s paper. For each section of the final thesis rubric, you will award a score and provide comments about what the writer did well, and/or what the writer could improve on. In addition, you should include comments directly on the paper itself, using the Track Changes function in Word. Note that it is not your primary objective to point out specific spelling, punctuation, and grammar mistakes – focus on the big picture, not the details.

### Peer Editing Grading Rubric

	<b>20 points</b>	<b>16 points</b>	<b>12 points</b>	<b>8 points</b>
Completeness of paper handed in	Paper contains all components of final thesis, and meets all formatting requirements.	Paper contains all components of final thesis.	Paper is missing one component of final thesis.	Paper is missing two or more components of final thesis.
Quality of paper handed in	Paper shows evidence of being carefully written and extensively proofread throughout.	Paper shows evidence of being carefully written throughout.	Most of the paper shows evidence of being carefully written.	Paper contains numerous errors that would have been caught by careful proofreading.
Scoring of peer-edited paper	All scores are reasonable for the work being edited.	Nearly all scores are reasonable for the work being edited.	Most scores are reasonable for the work being edited.	Many scores are not reasonable for the work being edited.
Rubric comments on peer-edited paper	Every line of the rubric contains valid comments about what the writer did well and/or what the writer could do better.	Nearly every line of the rubric contains valid comments about what the writer did well and/or what the writer could do better.	Most lines of the rubric contain valid comments about what the writer did well and/or what the writer could do better.	Most lines are missing valid comments.
Track Changes comments on peer-edited paper	Nearly every page has a valid comment or comments for the writer.	Most pages have a valid comment or comments for the writer.	Many pages have a valid comment or comments for the writer.	Few pages have a valid comment or comments for the writer.

## Oral Defense

The oral defense will be in the format of a poster session. You will stand by your poster for one hour, broken into three 20-minute sessions. During each of these 20-minute sessions, a faculty member will come to your poster. You should plan to present the main ideas of your poster in no more than 10 minutes. Briefly discuss the relevant background information, highlighting the importance of your topic. Concisely walk the listener through the main methods, results, and conclusions of each PPR, and then discuss how the papers relate to each other. Describe your overall conclusions and proposed future research directions.

Please leave the remaining 10 minutes for questions. Questions asked during your Oral Defense may cover how experiments were done, interpretation of the data, why you chose your topic, what next, etc. You will also be asked about fundamental scientific knowledge (learned in your required courses for your major) relating to your topic.

### Oral Defense Grading Rubric

	20 points	16 points	12 points	8 points
Oral communication – student concisely summarizes information	All relevant information is summarized concisely and clearly.	Nearly all relevant information is summarized concisely and clearly.	Most relevant information is summarized concisely and clearly.	Much information is not concise or not clear.
Oral communication – student engages audience	Student uses expressive speech, body language, and eye contact to effectively engage the audience throughout the talk.	Student uses expressive speech, body language, and eye contact to effectively engage the audience for most of the talk.	Student uses expressive speech, body language, <u>or</u> eye contact to engage the audience during the talk.	Student fails to use expressive speech, body language, or eye contact to engage the audience during much of the talk.
Oral communication – student demonstrates command of subject matter	Presentation clearly demonstrates that the student understands all of the information being presented.	Presentation demonstrates that the student understands nearly all of the information being presented.	Presentation demonstrates that the student understands much of the information being presented.	Presentation fails to demonstrate that the student understands the information being presented.
Oral communication – Narrative flows logically	Student moves through the sections of the talk in a logical order, with smooth and clear transitions between sections.	Student moves through the sections of the talk in a logical order.	Student mostly moves through the sections of the talk in a logical order,	Student fails to move through the sections of the talk in a logical order,
Background information – Student establishes information relevant to studies presented	Student provides clear, compelling background necessary for the audience to understand the topic and its importance.	Student provides clear background necessary for the audience to understand the topic and its importance.	Student provides sufficient background necessary for the audience to understand the topic.	Student fails to provide sufficient background necessary for the audience to understand the topic.

Methodology – student concisely explains methods used in data figures	Student clearly and concisely explains the methods used for all of the results to be presented.	Student clearly explains the methods used for nearly all of the results to be presented.	Student clearly explains the methods used for most of the results to be presented.	Student fails to clearly explain the methods used for many of the results to be presented.
Results – student concisely expresses main findings from each data figure	Student clearly and concisely explains the principle results presented in every figure.	Student clearly explains the principle results presented in nearly every figure.	Student clearly explains the principle results presented in most figures.	Student fails to clearly explain the principle results presented in many figures.
Conclusions – student concisely summarizes the main conclusion of each study	Student clearly and concisely explains the major conclusions of each study presented.	Student explains the major conclusions of each study presented.	Student explains the major conclusions of at least one study presented.	Student fails to explain the major conclusions of at least one study presented.
Analysis – student describes strengths and weaknesses of each data figure/study	Student clearly describes insightful examples of strengths and/or drawbacks of each study.	Student clearly describes some examples of strengths and/or drawbacks of each study.	Student describes examples of strengths and/or drawbacks of each study.	Student fails to describe examples of strengths and/or drawbacks of each study.
Synthesis – student highlights the connection between chosen studies	Student clearly describes multiple important connections between the studies presented.	Student clearly describes at least one important connection between the studies presented.	Student describes at least one connection between the studies presented.	Student fails to describe any connections between the studies presented.
Synthesis – student concisely explains his/her overall conclusion	Student clearly and concisely explains well-reasoned overall conclusions, based on the information presented.	Student clearly explains overall conclusions, based on the information presented.	Student explains some overall conclusions, based on the information presented.	Student fails to explain any overall conclusions, based on the information presented.
Synthesis – student describes future directions	Student clearly and concisely lays out insightful suggestions for specific future research based on the studies presented.	Student clearly lays out some suggestions for specific future research based on the studies presented.	Student lays out some suggestions for future research based on the studies presented.	Student fails to describe valid suggestions for future research based on the studies presented.

Q & A – student demonstrates command of subject matter	In answering questions, the student demonstrates exemplary understanding of the subjects raised by the work presented.	In answering questions, the student nearly always demonstrates understanding of the subjects raised by the work presented.	In answering questions, the student mostly demonstrates understanding of the subjects raised by the work presented.	In answering questions, the student fails to demonstrate understanding of the subjects raised by the work presented.
Q & A – student applies knowledge gained in their time at Cabrini toward thoughtfully and creatively answering questions	The student is consistently able to thoughtfully and creatively draw upon the knowledge expected of graduating science majors to work out answers to questions.	The student is sometimes able to thoughtfully and creatively draw upon the knowledge expected of graduating science majors to work out answers to questions.	The student is sometimes able to draw upon the knowledge expected of graduating science majors to work out answers to questions.	The student fails to draw upon the knowledge expected of graduating science majors to work out answers to questions.
Q & A – student demonstrates problem-solving skills	When presented with a challenging question, the student consistently shows creativity and persistence in working out potential answers.	When presented with a challenging question, the student sometimes shows creativity and persistence in working out potential answers.	When presented with a challenging question, the student sometimes shows persistence in working out potential answers.	When presented with a challenging question, the student fails to show persistence in working out potential answers.

## Summary of Course Evaluation

### Fall Semester

<u>Assignment</u>	<u>Points</u>
Article Comprehension Questions	50
Concept Map	50
Revised Concept Map	50
Annotated Bibliographies (6)	150
Outline	100
Progress Checkpoints	100
Lightning Talk	100
Introduction Section & First Subtopic	400
<b>Total</b>	<b>1,000</b>

### Spring Semester

<u>Assignment</u>	<u>Points</u>
Annotated Bibliographies (4)	100
Progress Checkpoint	50
Revised Outline	100
Progress Report (oral presentation)	150
Peer Editing	100
Poster	100
Laboratory Skill Practicum <u>or</u> Social Justice Essay Assignment	100
Final Thesis	1,000
Oral Defense	300
<b>Total</b>	<b>2,000</b>

### Overall Grading

<u>Percentage (%)</u>	<u>Total Points</u>	<u>Letter Grade</u>
93–100	2790-3000	A
90–92	2700-2789	A–
87–89	2610-2699	B+
83–86	2490-2609	B
80–82	2400-2489	B–
77–79	2310-2399	C+
73–76	2190-2309	C
70–72	2100-2189	C–
67–69	2010-2099	D+
60–66	1800-2009	D
Less than 60	≤1799	F





This senior seminar manual was written in the summer of 2020 by Dr. Carrie Nielsen, with sections taken from an earlier manual written by Dr. Sheryl Fuller-Espie, and with input from Dr. Joe Smith, Dr. Anna Blice-Baum, and Dr. Vinayak Mathur. All contents are subject to modification by the current year's Senior Seminar instructors. Any questions or suggestions can be directed to Dr. Nielsen at [cbn24@cabrini.edu](mailto:cbn24@cabrini.edu).