

Assignment Guidelines

Please write a **15 to 20-page** literature review (**single-spaced; ~50 references**), including figures if appropriate, about a microbiology-related topic that interests you. Additional pages can be used for references. Note: figures are encouraged but there need to be 15 pages of text. In other words, don't fill the paper with images.

Due Date: (typically deadline is one month before end of the semester and is set by the graduate school)

Submit: Use Canvas to submit as **Word** document through the course MCB 7922 – Final Literature Review

Contact: Jamie Foster jfoster@ufl.edu if there are questions about this final assessment.

What is a literature review?

A literature review may be published as an independent report or as part of a larger report. The purpose of both is to provide information on current publications about a particular topic. Literature reviews are highly condensed and heavily documented. *This literature review will serve as your final assessment for the online Master of Science degree program in Microbiology and Cell Science.*

A literature review is a report that describes the “literature” (i.e., the important source material) on a particular topic. A literature review also helps you synthesize the literature on your topic because, in the process of writing a literature review, the writer learns to (1) identify various important issues/questions raised in the literature, and (2) sort and categorize experts’ views according to the issues/questions identified in the literature.

The primary **purpose** of the report is to provide your target audience with an overview of what the experts are saying about the problem under investigation. Your report will update your target audience on recent research in the field.

Completion of this assignment will build your skills in the following areas: critical reading, evaluation, analysis, synthesis, report organization, use and integration of sources, and reference documentation. Developing these skills will demonstrate great progress toward achieving our programmatic goals.

Who is the intended audience?

A literature review is often written for another researcher who is interested in gaining a general understanding of the important literature on a particular topic. Therefore, the review should go into depth regarding the topic of interest.

Tips on synthesize multiple sources

Literature reviews synthesize large amounts of information and present it in a coherent, organized fashion. Synthesis comes from the Greek word *suntithenai* -- to put together, and occurs when two or more things are combined to create something new -- whether it is a new idea, a new

fabric, a new sound, or a new piece of writing. Therefore, for this assessment, you will be combining material from several texts to create a new text – your literature review.

One tip to help organize your multiple sources is to generate a spreadsheet or outline of common points among the articles is critical to helping you synthesize the material. This tool will ensure that your review is organized by subtopic, not by source. Therefore, each paragraph of the literature review will mention several different authors. In drafting the review of the literature, some students make the mistake of structuring it like an annotated bibliography without the citations. They list the sources one after another but don't make connections between them or show how the authors' views compare or contrast. Those connections should weave the elements of the lit review together, but the connections can't be made if the sources are simply listed. *Creating and using a spreadsheet or outline will almost guarantee that you won't make this mistake!*

How do you gather information?

Using the UF library resources as well as various online search engines (e.g. Google Scholar, Pubmed) include only authoritative, reliable, recently published articles from credible journals, which address your topic of interest.

You have to decide what pieces of information from which articles to include in your literature review. To fulfill the purpose of the assignment, you will probably be most interested in the causes and effects of a particular problem or environment and the strategies the authors suggest, or which other organizations have used, to address the issue. Evaluate the articles and narrow the collection to the best articles. It is expected that you will have read these top articles that are referenced in your literature review.

How do you decide which articles to use?

Carefully evaluate the information presented in each of your articles by asking the same questions that a skeptical reader would ask:

- Is it accurate?
- Is it complete?
- Is it up-to-date?
- Is it unbiased?
- Is it supported by evidence my readers will find compelling?
- Does it conflict with other evidence?
- Is it clearly relevant to my readers' situation?

As I write, how do I maintain the focus on the literature?

You must remain objective and unbiased as you review the literature. Remember, your purpose is only to report on what has been written recently about your topic. *You should not discuss the issues involved or take a position.* The readers of the literature review do not wish to learn what *you* think; they want to learn what the *authors* think. Therefore, you must be careful not to go beyond describing the authors' views. Don't say which views are "right" or "better"; instead, show how they are related.

A good literature review sticks to its purpose by “addressing the literature.” Addressing the literature means that as you write you make it clear that the subject of the paper is the **literature**. You should identify the topic of each section or paragraph with **topic statements** like *Although the literature suggests that elucidating microbiome interactions are not easily solved, several strategies are mentioned which* Since the literature itself is the subject of your paper, you must be careful to introduce and identify sources consistently.

Establish your focus on the literature, beginning with the introduction, and maintain it through to the conclusion. Use transitional words and phrases, which show the connection between the sources. Using effective transitions will help you sustain the focus on the literature. End each section with a **closing sentence** that wraps up the section and/or serves as a transition to the next section: what can be concluded about the literature on that specific subtopic?

Overview of Compiled Literature Review Format – 15 – 20 pages total (single-spaced, single column). Figures are encouraged but the paper has to be 15 pages text minimum (in other words don't fill the literature review with images)

Introduction: First, you will add a brief introduction to the literature review: simply introduce the **purpose and scope** of the literature review, including the **key issues** the review will address.

Body: Using relevant **headings**, the body should be composed of sections. If these sections were done effectively by individual team members, they take up each issue one at a time and discuss how the authors of the articles respond to that issue.

Don't forget to introduce and close each section with a sentence **focused on the literature** (topic sentence and a concluding sentence.)

Length of body: 15-20 pages or more, single-spaced, single column. (Length of each section will vary, but each typically contains several paragraphs. Estimate about 50 citations to thoroughly cover the subject matter)

Conclusion: Summarize what the literature says about your topic. Approximate length 1 page

Additional Formatting Guidelines

The document needs to be single-spaced (no spaces between paragraphs except headers, indent paragraphs) use Times New Roman font of 12 pt and margins of 1". It is acceptable to include figures as long as they are properly cited in the text and references. The length of the manuscript should be no less than 15 pages and no more than 20 pages excluding references. **The formatting of the citations (e.g. Foster et al., 2019) and references (estimated n = 50) can following any mainstream science peer-review journal formats** (e.g. Environmental Microbiology, PLOS One, Frontiers in Microbiology ect...).

The page limit is firm. We will check for compliance. If the document is less than 15 single-spaced text pages your paper will be deemed non-compliant and returned without review.

Also, I will be running the essay through Turn-it-In to look for any evidence of plagiarism and patch writing. For example, it is important to put things in your own words and **not directly quote from sources** in literature reviews, as this is a test of your ability to synthesize the

material. I also recommend running the review through the free Grammarly program (<https://www.grammarly.com>) to screen for punctuation and grammar.

More tips are available here: [Ways to improve your scientific writing skills Edlmann Maupin-Furlow document.docx](#)

If you have questions you can contact your faculty mentor, which will be assigned at the beginning of the semester you intend to graduate.

Evaluation Rubric

The Rubric used by the faculty to evaluate your literature review is listed below. You will receive a copy of the rubric in your final semester of the program.

Online MS Program Writing Evaluation Rubric														
		Exemplary		Accomplished		Acceptable		Minimally Acceptable		Emerging		Unacceptable		Score
Item 1. Is the writing appropriate for the target audience? Students should limit their jargon, and should explain or define all key terms and concepts associated with the subject matter.		10	9	8	7	6	5	4	3	2	1			
Item 2. Is there a compelling argument or articulation of the significance of the work? Students should contain an overview of the research within its appropriate scientific context. It should also identify gaps-in-knowledge that the student intends to address (if appropriate for the assignment). The student should also include an explanation of the broader significance of the research.		10	9	8	7	6	5	4	3	2	1			
Item 3. Interpretation of the results	Introduction to the topic and balanced view point: Objective, goals of the work are presented. A balanced view from various perspectives are included and the student presents study relates to the topic and to other studies	10	9	8	7	6	5	4	3	2	1			
	Depth and breadth of research: Variety of studies and attention to detail about the topic presented. Students should not overlook that science data has complexities that defy a simple interpretation, therefore, it may be necessary to discuss plausible inconsistencies, uncertainties and alternative explanations and potential limitations of the results.	10	9	8	7	6	5	4	3	2	1			
Item 4. Conclusion and Synthesis: Information is synthesized and brought to a logical conclusion. Students should make connections between the results and other published studies. Also, students should address how this work could lead to future research within the targeted field of inquiry. Potentially a suggestion of additional experiments or alternative approaches.		10	9	8	7	6	5	4	3	2	1			
Item 5. Organization, Mechanics and Alignment: Information logically organized with good flow. Issues threaded throughout the review. Correct spelling, punctuation, sentence structure, scientific names in italics, word usage		10	9	8	7	6	5	4	3	2	1			
Item 6. References and Citations: References presented consistently and professional throughout the text.		10	9	8	7	6	5	4	3	2	1			
Total Score													0	

Online MS Program Writing Evaluation Rubric						
	Exemplary	Accomplished	Acceptable	Minimally Acceptable	Emerging	Unacceptable
Item 1. Is the writing appropriate for the target audience? Students should limit their jargon, and should explain or define all key terms and concepts associated with the subject matter.	The writing is fully accessible to the target audience. No jargon is used and terms are clearly defined.	The writing is somewhat accessible to the target audience. There are some terms or jargon that is not clearly defined. Non-specialist readers are able to follow the main themes, but the writer has not made the task easy.	The writing includes some useful definitions or explanations but some key terms or concepts are very challenging for the non-specialist reader.	The writing includes few useful definitions or explanations and most concepts are still challenging for the non-specialist reader.	The writing is not easily accessible to a non-specialist and contains extensive jargon but makes an attempt at defining concepts.	The writing is written with excessive jargon, lacks definitions and is inaccessible to a non-specialist reader.
Item 2. Is there a compelling argument or articulation of the significance of the work? Students should contain an overview of the research within its appropriate scientific context. It should also identify gaps-in-knowledge that the student intends to address (if appropriate for the assignment). The student should also include an explanation of the broader significance of the research.	The writing reviews the literature and demonstrates how the student has addressed the knowledge gaps. The student clearly articulates the larger implications and broader significance of the work and the scientific value of the targeted research area.	The writing reviews the literature and addresses the knowledge gaps but does not fully articulate the significance of the work in the text.	The writing reviews the literature and addresses the knowledge gaps but does not explicitly present a compelling argument of significance of the work in the text.	The writing reviews the literature but does not fully address gaps in knowledge that the scientific study address nor is the significance of the work discussed.	The writing does not provide an adequate view of the science literature but does have some discussion of knowledge gaps and scientific significance.	The writing does not provide an adequate view of the scientific literature and does not make sufficient connections between the literature and larger significance of the work.
Item 3. Interpretation of the results	Introduction to the topic and balanced view point: Objective, goals of the work are presented. A balanced view from various perspectives are included and the student presents study relates to the topic and to other studies. Depth and breadth of research: Variety of studies and attention to detail about the topic presented. Students should not overlook that science data has complexities that defy a simple interpretation, therefore, it may be necessary to discuss plausible inconsistencies, uncertainties and alternative explanations and potential limitations of the results.	The writing clearly and explicitly articulates a research question or the goals of the study. However, a balanced perspective is not provided and students do not fully support their introductory materials with appropriate arguments or scientific literature. The interpretation of the results is insightful and the writing explains the implications of plausible inconsistencies, uncertainties, alternative explanations, counterintuitive evidence and limitations of the results.	The writing clearly and explicitly articulates a research question or the goals of the study. However, a balanced perspective is not provided and students do not fully support their introductory materials with appropriate arguments or scientific literature. The interpretation of the results is insightful and the writing explains some aspects of the implications, plausible inconsistencies, uncertainties, alternative explanations, counterintuitive evidence and limitations of the results.	The writing articulates the research question or goals and provides key introductory material but at times the writing is unclear, inconsistent or in a disorganized manner. The writing presents a reasonable interpretation of the results and mentions inconsistencies, uncertainties and alternative explanations and or limitations of the work, but does not explain the implications of these potential problems.	The goals and objectives are explicitly stated but some key introductory materials to understand or support the research goals or objectives are lacking. The writing is unclear, inconsistent or presented in a disorganized manner. The writing presents a reasonable interpretation of the results but rarely mentions inconsistencies, uncertainties and alternative explanations and or limitations of the work, and does not explain the implications of these potential problems.	The goals and objectives are not explicitly stated and introductory materials to understand or support the research goals or objectives are lacking. The writing is unclear, inconsistent or presented in a disorganized manner. The writing does not present a reasonable interpretation of the results or presents only a partial interpretation and rarely mentions inconsistencies, uncertainties and alternative explanations and or limitations of the work. The writing does not explain the implications of these potential problems.
Item 4. Conclusion and Synthesis: Information is synthesized and brought to a logical conclusion. Students should make connections between the results and other published studies. Also, students should address how this work could lead to future research within the targeted field of inquiry. Potentially a suggestion of additional experiments or alternative approaches.	The writing effectively synthesizes the presented results and informations. There are clear connections between these results and other published studies. There is a clear effort to connect this research to the targeted field or inquiry. Additional experiments or potential future directions are discussed.	The writing effectively synthesizes the presented results and informations. There is an attempt to make connections between these results and other published studies. There is some effort to connect this research to the targeted field or inquiry but it is not well articulated. Additional experiments or potential future directions are discussed.	The writing effectively synthesizes the presented results and informations. There are connections between these results and other published studies. There is no clear effort to connect this research to the targeted field or inquiry. Additional experiments or potential future directions are discussed.	The writing attempts to synthesize the results and form conclusions but these efforts are disorganized and unclear. There is little or no mention of future directions or potential follow up research or alternative approaches.	The writing does fully synthesize the results and does not present a clear conclusion. There is, however, some mention of future directions or potential follow-up research or alternative approaches.	The writing makes no effort to synthesize the results into a coherent conclusion. There is little or no mention of future directions or potential follow-up research or alternative approaches.
Item 5. Organization, Mechanics and Alignment: Information logically organized with good flow. Issues threaded throughout the review. Correct spelling, punctuation, sentence structure, scientific names in italics, word usage	The writing organization is easy to follow in almost all cases. Topic sentences are clearly articulated and transitions between paragraphs are logical. There are virtually no obvious scientific writing, grammatical and punctuation errors.	The writing organization is easy to follow in almost all cases. Topic sentences are not always used and transitions between paragraphs and concepts are not always clear. There are virtually no obvious scientific writing, grammatical and punctuation errors.	The writing organization is usually easy to follow but there are some problems between transitions of paragraphs. There are some scientific writing, grammatical and punctuation errors.	The writing organization is usually easy to follow but transitions between paragraphs and concepts are not always logical. There are many scientific writing, grammatical and punctuation errors.	The writing organization is usually easy to follow but transitions between paragraphs and concepts are not logical. There are excessive scientific writing, grammatical and punctuation errors.	The writing within paragraphs is difficult to follow, no topic sentences are used. Transitions between paragraphs and concepts are not logical. Scientific writing conventions are not followed. There are excessive grammatical and punctuation errors.
Item 6. References and Citations: References presented consistently and professionally throughout the text.	The writing uses consistent and appropriate citation formats and presents the list of works in a professional manner.	score not used for this item	The writing uses consistent and appropriate citation format, or presents the list of works in a professional manner, although there may be some minor inconsistencies or errors.	score not used for this item	The writing uses inconsistent citation format, however, all citations are included.	The writing uses inconsistent citation format, is missing citations or presents the list of works cited in an unprofessional manner.