

## **BHS 323: Microbial Influences on Human Health**

3 credits

**Lectures:** Tuesday/Thursday, 10:00-11:20 am, Kidder Hall 280

**Instructor:** Shawn Massoni, Ph.D.

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Office hours: By appointment

**Prerequisites:** MB 302 or BI 314 or BB 450

**Introduction:** Infections by disease-causing microorganisms were once the most common cause of illness and death in human populations. Upon the advent of modern medicine, including antibiotics and vaccines, deaths due to infectious diseases caused by microorganisms have significantly decreased, particularly in developed countries. However, many of the current diseases that affect a large portion of the human population (heart disease, cancer, diabetes, etc.) are influenced by the interactions that humans have with microorganisms. Understanding these interactions is important in the context of disease mechanisms and epidemiology of human health.

The goal of this course is to learn the types of interactions microorganisms have with humans and the mechanisms by which they contribute to health and/or disease. We will focus primarily on microbial influences on cancer, gut diseases, chronic and autoimmune disorders, and the impact of the emergence of antibiotic resistance. We will use peer-reviewed research articles, clinical trials, case studies, review articles, and news articles to learn about these topics. Later in the course, you will independently research the contribution of (a) microorganism(s) to human health or a disease that fits your particular interests. This research will culminate in a peer-reviewed final essay portfolio. Through this course you will gain an appreciation for the variety of ways in which we interact with microorganisms and the mechanisms by which microorganisms can contribute to or protect against disease development.

Through this course you will gain experience in writing about medically related topics in different formats, and how to strategically write to a variety of audiences. We will have daily informal journaling to reflect on the content we've discussed in class that day. There will also be a variety of out-of-class writing assignments, which will include writing article summaries and essays. These will culminate in a large research review paper on a topic of your choice.

By the end of this course, you will become confident in interpreting and evaluating the main points of a scientific paper and successfully communicating these to your intended audience, as well as being able to read and write in the various formats that are common in biohealth-related professions.

## Course Learning Outcomes and Assessment

This class is designed to be part of the Writing Intensive Curriculum (WIC) and satisfies the requirement for a WIC course in the BioHealth Science (BHS) major. After completing this course, you will be able to:

### OSU WIC Learning Outcomes:

- Develop and articulate content knowledge and critical thinking in the discipline through frequent practice of informal and formal writing.
- Demonstrate knowledge/understanding of audience expectations, genres, and conventions appropriate to communicating in the discipline.
- Demonstrate the ability to compose a document of at least 2000 words through multiple aspects of writing, including brainstorming, drafting, using sources appropriately, and revising comprehensively after receiving feedback on a draft.

### Learning Outcomes:

- Explain how microorganisms contribute to human health in beneficial and detrimental ways, citing specific examples.
- Critically discuss and defend with evidence how humans can modify behaviors that can alter the interactions with microbes in a way that promotes individual and community wide health.
- Accurately, logically, and clearly communicate explanations and opinions on topics related to microbial influences on human health to a variety of audiences.
- Locate scientific information, and evaluate the reliability of sources.
- Differentiate between types of scientific information (e.g. primary research articles, clinical trials, case studies, review articles, news articles, press releases).
- Critically think about and interpret key findings from different scientific articles.
- Use writing to aid in your acquisition and retention of knowledge.

**Assessment of Learning Outcomes:** Learning outcomes will be assessed via the following in and out of class activities:

#### In class activities:

1. Pre and post-course writing survey (informal)	5
2. Written responses to prompts (informal)	15
3. Participation	10
4. Peer review of final essays	10

#### Out of class activities:

5. Note taking for pre-class readings (informal)	5
6. Summary review articles (formal)	15
7. Mid-term audience essays (formal)	15
8. Final opinion review essay/portfolio (formal)	25

#### **Total**

**100**

Assignment of final grades based on point total in the course:

A	94.0 or above
A-	90.0-93.9
B+	87.0-89.9
B	84.0-86.9
B-	80.0-83.9
C+	77.0-79.9
C	74.0-76.9
C-	70.0-73.9
D+	67.0-69.9
D	64.0-66.9
D-	60.0-63.9

59.9 or less will result in a failing grade for this course

### Learning resources:

- Canvas
- The Library, <http://guides.library.oregonstate.edu/BHS323>
  - Hannah Rempel, [Hannah.Rempel@oregonstate.edu](mailto:Hannah.Rempel@oregonstate.edu)
- The Writing Center, Waldo 123, <http://writingcenter.oregonstate.edu>
- PubMed, Google Scholar (for finding/accessing scientific articles)
- How to cite articles: (ASM style) [www.citethisforme.com/guides/american-society-for-microbiology/how-to-cite-a-journal](http://www.citethisforme.com/guides/american-society-for-microbiology/how-to-cite-a-journal)
- Your instructor: brainstorming, interpreting papers, written feedback, etc.
- Your peers

**Required course materials:** You will need a bound journal (no loose-leaf pages) for in class writing assignments and prompts. There is no textbook for this class; rather, all required readings will be posted online through Canvas (under the “Course Readings” module) or provided as hard copies in class by the instructor. You are expected to come to class prepared with your journals and writing implements, and having read the material prior to class.

**In-class Expectations:** Students are expected to attend class prepared and participate in discussions, assignments, and activities. During class, students may not use cell phones. Laptops or tablets may be used for note taking or reviewing papers, but cannot be used for any other purposes (social media, email, etc.). If electronics are used for other purposes, the instructor has the right to ban the student from bringing laptops and other electronics to class.

**Academic Integrity:** The following is a condensed version of the Student Conduct Code on Academic Dishonesty. Academic or Scholarly Dishonesty is defined as an act of deception in which a Student seeks to claim credit for the work or effort of another

person, or uses unauthorized materials or fabricated information in any academic work or research, either through the Student's own efforts or the efforts of another. It includes:

(A) CHEATING - use or attempted use of unauthorized materials, information or study aids, or an act of deceit by which a Student attempts to misrepresent mastery of academic effort or information.

(B) FABRICATION - falsification or invention of any information including but not limited to falsifying research, inventing or exaggerating data, or listing incorrect or fictitious references.

(C) ASSISTING - helping another commit an act of academic dishonesty.

(D) TAMPERING - altering or interfering with evaluation instruments or documents.

(E) PLAGIARISM - representing the words or ideas of another person or presenting someone else's words, ideas, artistry or data as one's own, or using one's own previously submitted work. Plagiarism includes but is not limited to copying another person's work (including unpublished material) without appropriate referencing, presenting someone else's opinions and theories as one's own, or working jointly on a project and then submitting it as one's own.

**Expectations for Student Conduct:** <http://oregonstate.edu/studentconduct/offenses-0>

**IF YOU HAVE A QUESTION ABOUT USE OF SOURCES, HOW TO CITE, OR ANYTHING ELSE, CONSULT THE INSTRUCTOR.** The instructor will check written assignments for plagiarism from the Web.

**Students with Disabilities:**

Accommodations are collaborative efforts between students, faculty and Disability Access Services (DAS). Students with accommodations approved through DAS are responsible for contacting the faculty member in charge of the course prior to or during the first week of the term to discuss accommodations. Students who believe they are eligible for accommodations but who have not yet obtained approval through DAS should contact DAS immediately at (541) 737-4098.

**Diversity Statement:** The College of Science strives to create an affirming climate for all students including underrepresented and marginalized individuals and groups. Diversity encompasses differences in age, color, ethnicity, national origin, gender, physical or mental ability, religion, socioeconomic background, veteran status, sexual orientation, and marginalized groups. We believe diversity is the synergy, connection, acceptance, and mutual learning fostered by the interaction of different human characteristics.

**Religious Holiday Statement:** Oregon State University strives to respect all religious practices. If you have religious holidays that are in conflict with any of the requirements of this class, please see me immediately so that we can make alternative arrangements.

## **Description of assignments and activities:**

In general, informal writing assignments will be evaluated on a completion and effort basis. Formal writing assignments will be graded on content, with grading rubrics provided by the instructor. Formal writing assignments will be returned with instructor feedback in a timely manner with comments and suggestions for future improvement.

For assignments to be turned in on Canvas, you will submit them under the appropriate section in the “Assignments” module by 11:59pm on the due date. Assignments submitted 24 hours past the due date will receive a 20% point penalty. Assignments submitted between 24 and 48 hours past the due date will receive a 50% point penalty. Assignments will not be accepted after 48 hours past the due date, and there will be no opportunity to make up lost points.

### *1. Pre and post-course writing survey (informal)*

The purpose of this assignment is to allow you to assess and reflect on your writing abilities and knowledge of the content covered in this course as it relates to human health. You will be prompted to answer short questions, as well as quantify your experience and confidence in aspects relating to this course. The data obtained from these surveys will serve to demonstrate your perceived and actual growth through taking this course, as well as provide insight for the instructor for ways to improve this course in the future. As this is in an informal assignment, you will not be graded on correctness of content but by participation and completion of this assignment.

### *2. Written responses to prompts (informal)*

We will think critically about the content in this course through the frequent use of writing. Each class we will have dedicated time to write on the topic of lecture, which will allow you to digest and reflect on the material we discussed that day. You will hand in your journals **Thursday, November 29 (week 10)** to receive points towards this portion of your grade. You have the option to submit your journal to the instructor on **Thursday, October 25** for preliminary feedback and suggestions for improvement.

The types of writing assignments will vary on the topic discussed, but may include prompts such as:

- What are some of the pros and cons of probiotics?
- What was the most surprising thing you learned today?
- Which source did you find most helpful in understanding the material today, and why?
- Are you convinced with the main finding from this paper? Why or why not?
- How would you define a “pathogen”?

### *3. Participation*

Active participation in this class is fundamental in the overall success of this course. Your participation grade will be assessed by attendance, preparedness for class, and

contributions to discussion. **Each class is worth 0.5 pts for attendance**, totaling 10 points for the entire term.

#### 4. *Peer review of final opinion review essays*

The purpose of peer review is two-fold: 1) you will get constructive feedback on your essays prior to the final draft, and 2) you will get experience critiquing others' work, which will help you identify places to improve in your own writing. We will have one in-class peer review session in which you will read, critique, and discuss with a partner each other's drafts of the final opinion review essay through the use of provided rubrics. This is an informal assignment that will be based on participation and effort.

#### 5. *Note taking for pre-class readings*

The purpose of this assignment is to guide you through critically thinking about the readings prior to coming to class. You will be asked to journal notes and your thoughts as you make your way through the readings. You are encouraged to write questions related to content that can foster in-class discussions. You will hand in your journals **Thursday, November 29 (week 10)** to receive points towards this portion of your grade. You have the option to submit your journal to the instructor on **Thursday, October 25** for preliminary feedback and suggestions for improvement.

#### 6. *Summary review articles*

You will be assigned a primary research article or clinical trial article to read, interpret, and identify the important findings. In response, you will write a 250-word summary article (no fewer than 250 words, not to exceed 275) that summarizes the key findings in the research article to an audience specified by the instructor. You will be assigned three summary articles throughout the course, each worth 5 points. The total points for this assignment are 15.

*Optional:* You have the option of writing a 4<sup>th</sup> summary review article (due week 8) on a primary research paper of your choosing. The points you receive (up to 5) on this summary article can be used to replace a score received on any of the prior 3 summary articles. You must include a copy of the article with your summary article. Be sure to check with the instructor if you are unsure about the type of article you choose for this assignment. Completing the fourth review cannot lower your overall grade.

#### 7. *Midterm audience essay*

The purpose of this assignment is to give you an opportunity to explore the language and content needed to explain scientific concepts to different audiences. You will be given the option of picking one of three writing prompts, which will have you write two-500-word essays to two different audiences (as explained within the prompt). On **Thursday, October 11**, you will hand in one draft of one essay with a reference list to the instructor for feedback and revisions before **submitting both essays Thursday, October 25**. Please refer to the assignment instructions on Canvas for grading rubric and more specific information pertaining to this assignment.

### 8. *Final opinion review essay/portfolio*

The final paper in this course will have you demonstrate your ability to find, read, critically interpret, evaluate, and communicate findings from scientific primary research articles and case studies on a controversial topic (of your choosing) that relates to microbial contributions to human health. This review essay must be a minimum of 2000 words, not to exceed 2200, and you will explain your topic of choice, what the controversy is, and what your stance is on the topic based on your interpretation of the current state of knowledge of that field from multiple references. This essay will be peer-reviewed and you will make significant revisions between first and final drafts.

As part of your grade for this essay, you will need to provide a reference list that has a minimum of 10 references with 3 different types (one of which needs to be a primary research article, and you must have at least half of your references be peer-reviewed primary research/clinical trial articles). This reference list will be due at the same time as the first draft (**Thursday, November 8**) and be worth 2.5 points out of the total 20 points possible for this assignment.

You also will be asked to write a 1-2 page “Response to Reviewer Comments” paper based on the comments you received from your peer review, which will be worth 2.5 points out of the total 20 points possible. This assignment is due **Tuesday, November 27**. You are expected to make substantial revisions to your draft based on the peer-review comments you received. Please refer to the assignment instructions on Canvas for grading rubric and more specific information pertaining to this assignment.

The final essay is due by 11:50 pm on Canvas on the day of our scheduled final exam, Monday, December 3. We will not meet during our scheduled final exam time.