

Washington State University – Health Sciences Spokane
Department of Nutrition and Exercise Physiology
Fall 2021 Course Syllabus

Instructor of Record

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Course Logistics

Course Title Host-Associated Microbiome in Health and Nutrition
 Course Number **NEP 430/530**
 Catalog Description Current knowledge, methodology and application of gut microbiome analyses in the context of animal and human health and nutrition
 Academic Hours 3-0-3 (lecture-lab-total)
 Meeting Time TuTh 9:10AM - 10:25AM
 Pre-requisites Junior/Senior standing and instructor consent (430) Graduate standing (530)

Course Communication

WSU Spokane and Pullman use the Canvas Learning Management System. If you have not used Canvas before, please take a few minutes to become familiar with the system:

<https://wsu.instructure.com/>

How do I access Canvas?

1. Go to learn.wsu.edu
2. Log in with your WSU Network ID and Password

Course Format, Objectives, and Student Learning Outcomes

This course will largely be on a flipped classroom model, with reading materials provided one week before each class. Each class will cover a relatively wide theme with three 45 minutes sessions consisting of in-depth discussion, exercises and other activities on selected topics. Areas of emphasis include human microbiome and health, the impact of nutrition on the gut microbiome and other associated areas of human (and to a lesser extent animal) microbiome research.

At the end of the course, students will be able to define and describe the different concepts covered in nutrition and gut microbiome research. Students will also gain an understanding of the analytical and bioinformatic methodologies necessary for microbiome research; as well as the challenges in experimental design and data analysis. Students will be exposed to the current knowledge of the influence of the microbiome on health and its role in nutrition. Students will be able to understand, assess and critique relevant journal articles and to provide concise interpretation and discussion of associated datasets. Students will be able to design appropriate microbiome studies to complement distinct research projects. All learning objectives will be assessed through papers, presentations, and exams

As part of this course students will...	Week	Evaluation of outcome
Gain knowledge of current nutrition and gut microbiome research concepts	3-13 and 15	Exams 1, 2 and 3 White/Term paper
Learn about analytical tools used for microbiome research	2-4	Exam 1
Critically assess data and figures from scientific articles and other resources	3-13 and 15	Exams 1, 2 and 3 White/Term paper
Learn strategies for scientific writing, reading and communication	1-3 and 16	In class discussion Presentations

Course Expectations & Requirements

In order to achieve course objectives, each student will be *expected* to participate in class discussions and will be *required* to complete and turn-in written assignments on-time.

- Class participation – through class discussions and presentations.
- Groups (Spokane and other campuses students, distributed randomly in each group) will be assigned to read specific articles in more details and to lead the discussion of said articles. The two groups will be in charge of designing a rotating leader to introduce the articles.
- Written assignments – A short written assignments is due during the semester and a longer, final written piece is due at the end of the semester (see below).

Graduate students: For each hour of lecture equivalent, students should expect to have a minimum of two hours of work outside class. Graduate students will have more short essay questions to answer as part of the mid-term and final exams. The short written assignment will be a one-page description of the white paper planned by the student. The white paper (5-8 pages; 1.5 line spacing minimum) intends to be a “pared-down” version of a research project proposal with emphasis on background information on the topic and description of the experimental design, proposed methods (than should be gleaned from relevant articles) and expected outcomes. The white paper will serve as the basis for the final presentation (15-20 minutes). Grading will be based on: 1.) Adequacy of content in each of the paper’s section, 2.) Flow and logical connectors along the paper, 3.) Sufficient use of relevant and carefully selected references, and 4.) General writing quality.

. Late assignment submission will result in a 20% down grade for the assignment.

Undergraduate students: For each hour of lecture equivalent, students should expect to have a minimum of two hours of work outside class. Exams will emphasize on multiple answers and similar questions, with only a few short essay questions. The short written assignment will be a one-paragraph summary of the term paper planned by the student. The term paper (3-5 pages; 1.5 line spacing minimum) should be a succinct review of the literature on a specific subject related to the class topics. The term paper will serve as the basis for the final presentation (approx. 10 minutes).). Grading will be based on: 1.) Adequacy of content in each of the paper’s section, 2.) Flow and logical connectors along the paper, and 3.) General writing quality.

Late assignment submission will result in a 20% down grade for the assignment.

Reading List & Learning Materials

- The course Canvas page contains important information about this course including the syllabus, links to the lecture slides, and readings.
- Readings for this class come from selected articles. The articles will be provided each week.
- If needed, students can request to check out laptops form the WSU Spokane Library (and an equivalent mechanism for other campuses)

Methods of Assessment & Grading Scale

Course assessment will be based on the following graded components, which differ slightly depending on the graduate program:

		Undergraduate students	MS-thesis and PhD students
Written	25%	Term paper	White paper of microbiome research project relevant to your own project/interests
Oral	15%	Oral Presentation on your review or white paper	
Exams	20% each	Mid-terms 1, 2 and final cumulative exam	

Grading Scale – Based on % of Total Points Achieved (Grades will be rounded to one decimal place using standard rounding procedures)	
A = 93-100%	C = 73-76.9%
A- = 90-92.9%	C- = 70-72.9%
B+ = 87-89.9%	D+ = 67-70%
B = 83-86.9%	D = 60-66.9%
D = 60-66.9%	F = <59.9%
F = <59.9%	

Course Schedule *The outline below is a guideline. Consult Blackboard regularly for weekly topics, reading assignments, and any changes to content. Examples of relevant articles for selected sessions can be found in Footnotes*

Week	Date	Session#/Topics	Readings/What's Due
1	08/24	1. Introduction and overview	
	08/26	2. Biology/microbiology refresher	
2	08/31	3.a) Moving definitions of the microbiome(s)	Articles in Folder[1]
	09/02	3.b) Articles discussion	
3	09/07	4.a) Host microbiome interactions	Articles in Folder[2]
	09/09	4.b) Articles discussion	
4	09/14	5.a) Gut microbiome and health	Articles in Folder[3, 4]
	09/16	5.b) Articles discussion	
5	09/21	6.a) Gut microbiome and animal nutrition	Articles in Folder[5]
	09/23	6.b) Articles discussion	Written assignment proposal
6	09/28	7.a) Gut microbiome and human nutrition	Articles in Folder[6]
	09/30	7.b) Articles discussion	
7	10/05	Mid-term exam 1	
	10/07	7.Omics in nutrition and gut microbiome research	
8	10/12	8.a) Metabolomics and gut microbiome	Articles in Folder[7]
	10/14	8.b) Articles discussion	
9	10/19	9.a) Food science and gut microbiome	Articles in Folder[8]
	10/21	9.b) Articles discussion	
10	10/26	10.a) Probiotics and prebiotics	Articles in Folder[9, 10]
	10/28	10.b) Articles discussion	
11	11/02	11.a) Dietary patterns and gut microbiome	Articles in Folder[11]
	11/04	11.b) Articles discussion	
12	11/09	12.a) Geography, ethnicity and gut microbiome	Articles in Folder[12]
	11/11	Veterans' Day-No class	
13	11/16	12.b) Articles discussion	
	11/18	Mid-term exam 2	
14	11/23	Thanksgiving break-No class	
	11/25	Thanksgiving break-No class	
15	11/30	13.a) Hot topics in nutrition and gut microbiome	Articles in Folder[13]
	12/02	13.b) Hot topics in nutrition and gut microbiome	Written assignment
16	12/07	14.a) Student presentations	
	12/09	14.b) Student presentations	
	12/??	Final Exam (cumulative)	

1. Allaband C, McDonald D, Vázquez-Baeza Y, et al (2019) Microbiome 101: Studying, Analyzing, and Interpreting Gut Microbiome Data for Clinicians. *Clin Gastroenterol Hepatol* 17:218–230. <https://doi.org/10.1016/j.cgh.2018.09.017>
2. Rawls JF, Mahowald MA, Ley RE, Gordon JI (2006) Reciprocal gut microbiota transplants from zebrafish and mice to germ-free recipients reveal host habitat selection. *Cell* 127:423–433. <https://doi.org/10.1016/j.cell.2006.08.043>
3. Kim S, Kim H, Yim YS, et al (2017) Maternal gut bacteria promote neurodevelopmental abnormalities in mouse offspring. *Nature* 549:528–532. <https://doi.org/10.1038/nature23910>
4. Sokol H, Pigneur B, Watterlot L, et al (2008) Faecalibacterium prausnitzii is an anti-inflammatory commensal bacterium identified by gut microbiota analysis of Crohn disease patients. *Proc Natl Acad Sci U S A* 105:16731–16736. <https://doi.org/10.1073/pnas.0804812105>
5. Just S, Mondot S, Ecker J, et al (2018) The gut microbiota drives the impact of bile acids and fat source in diet on mouse metabolism. *Microbiome* 6:134. <https://doi.org/10.1186/s40168-018-0510-8>
6. De Angelis M, Ferrocino I, Calabrese FM, et al (2020) Diet influences the functions of the human intestinal microbiome. *Sci Rep* 10:4247. <https://doi.org/10.1038/s41598-020-61192-y>
7. Noronha A, Modamio J, Jarosz Y, et al (2019) The Virtual Metabolic Human database: integrating human and gut microbiome metabolism with nutrition and disease. *Nucleic Acids Res* 47:D614–D624. <https://doi.org/10.1093/nar/gky992>
8. Aljadhali N, Gadonna-Widehem P, Anton PM, Carbonero F (2020) Gut Microbiota Modulation by Dietary Barley Malt Melanoidins. *Nutrients* 12:. <https://doi.org/10.3390/nu12010241>
9. Spinler JK, Sontakke A, Hollister EB, et al (2014) From Prediction to Function Using Evolutionary Genomics: Human-Specific Ecotypes of *Lactobacillus reuteri* Have Diverse Probiotic Functions. *Genome Biology and Evolution* 6:1772–1789. <https://doi.org/10.1093/gbe/evu137>
10. Thompson RS, Vargas F, Dorrestein PC, et al (2020) Dietary prebiotics alter novel microbial dependent fecal metabolites that improve sleep. *Sci Rep* 10:3848. <https://doi.org/10.1038/s41598-020-60679-y>
11. Sheflin AM, Melby CL, Carbonero F, Weir TL (2017) Linking dietary patterns with gut microbial composition and function. *Gut Microbes* 8:113–129. <https://doi.org/10.1080/19490976.2016.1270809>
12. Martínez I, Stegen JC, Maldonado-Gómez MX, et al (2015) The gut microbiota of rural papua new guineans: composition, diversity patterns, and ecological processes. *Cell Rep* 11:527–538. <https://doi.org/10.1016/j.celrep.2015.03.049>
13. Tiffany CR, Bäumlér AJ (2019) Dysbiosis: from fiction to function. *Am J Physiol Gastrointest Liver Physiol* 317:G602–G608. <https://doi.org/10.1152/ajpgi.00230.2019>

Academic Honesty, Conduct, and Behavior

Academic integrity is the cornerstone of higher education. As such, all members of the university community share responsibility for maintaining and promoting the principles of integrity in all activities, including academic integrity and honest scholarship. Academic integrity will be strongly enforced in this course. Students who violate WSU's Academic Integrity Policy (identified in Washington Administrative Code (WAC) 504-26-010(3) and -404) will receive a failed grade for the specific assignment (and fail the

course in case of repeated violation) , will not have the option to withdraw from the course pending an appeal, and will be reported to the Office of Student Conduct.

Cheating includes, but is not limited to, plagiarism and unauthorized collaboration as defined in the Standards of Conduct for Students, WAC 504-26-010(3). You need to read and understand all of [the definitions of cheating](#). If you have any questions about what is and is not allowed in this course, you should ask course instructors before proceeding.

If you wish to appeal a faculty member's decision relating to academic integrity, please use the form available at communitystandards.wsu.edu. Make sure you submit your appeal within 21 calendar days of the faculty member's decision.

The Department of Nutrition and Exercise Physiology (NEP) expands upon the University's statement of academic integrity. When a student enrolls in WSU, the student assumes an obligation to pursue academic endeavors in a manner consistent with the standards of academic integrity adopted by the University *and* the Department of NEP. The Department of NEP recognizes the importance of and encourages collaborative work, specifically in cases in which collaborative work is the chosen form of didactic instruction, including group projects and presentations. Thus, you may collaborate with classmates on specific assignments as stipulated in the course syllabus and with the instructor's explicit permission. **However, the guiding principle of academic integrity in the Department of NEP shall be that all of your submitted work, such as assignments, examinations, reports, presentations, and projects, whether completed on your own or in collaboration with classmates where specifically deemed appropriate, must properly cite any and all outside sources used to complete such work. These sources must be cited in the standard format identified by the instructor for this course (e.g., AMA style). Assignments submitted electronically are subject to review by electronic plagiarism detection programs (e.g., SafeAssign). Illustrative, but not exhaustive, examples of outside sources used to complete assignments include: peer reviewed journal articles, non-peer reviewed review papers or commissioned articles, white papers, newspaper or magazine articles, and social media and blog posts.**

Students are reminded that they must adhere to the policies agreed to in writing when entering the Department of NEP. These are detailed in the BS NEP and MS CPD NEP Student Handbooks under Code of Professionalism. Departures from this code may have serious consequences for academic standing in the class and/or continued enrollment in the program.

For additional information on academic integrity and plagiarism, the Department of NEP recommends that students read and review the following sources of information:

<https://academicintegrity.wsu.edu/resources-for-students/> and <https://libraries.wsu.edu/library-instruction/plagiarism>

Course Evaluations

Student evaluations of courses/course materials and faculty teaching effectiveness are a valuable and important component of the department's commitment to providing quality learning experiences and contributing to our efforts to assure that students achieve the objectives of our degree programs. Thus, all evaluations are given serious consideration as part of the annual faculty evaluation process and are read by the Department Chair and faculty instructor of record. Because the most effective way to impact positive changes is through constructive comments, we encourage you to provide feedback as you would wish to receive it. This will allow the faculty member to focus on improvements or affirm students' perspective on effective elements of the course.

Students with Disabilities Statement

Reasonable accommodations are available for students with documented disabilities or chronic medical or psychological conditions. If you have such a condition and need accommodations to fully participate in this class, please visit your campus' Access Center/Services website to follow published procedures to request accommodations. Students may also contact their campus offices to schedule an appointment with a Disability Specialist. All disability related accommodations are to be approved through the Access Center/Services on your campus. It is a university expectation that students connect with instructors (via email, Zoom, or in person) to discuss logistics within two weeks after they have officially requested their accommodations.

For more information, contact a Disability Specialist on your home campus:

Pullman, WSU Global Campus, Everett, Bremerton, and Puyallup: 509-335-3417 Access Center (<https://www.accesscenter.wsu.edu>) or email at access.center@wsu.edu

Spokane: 509-358-7816 Access Services (<https://spokane.wsu.edu/studentaffairs/access-resources/>) or email j.schneider@wsu.edu

Tri-Cities: Access Services (<http://www.tricity.wsu.edu/disability/>) or email g.hormel@wsu.edu

Vancouver: 360-546-9238 Access Center (<https://studentaffairs.vancouver.wsu.edu/student-wellness-center/access-center>) or email van.access.center@wsu.edu

Non-Discrimination Statement

Extension programs and policies are consistent with federal and state laws and regulations on nondiscrimination regarding race, sex, religion, age, color, creed, national or ethnic origin; physical, mental or sensory disability; marital status, sexual orientation, or status as a Vietnam era or disabled veteran. Evidence of noncompliance may be reported through your local Extension office.

Religious and Extended Absence Accommodations

Students requesting reasonable accommodations for religious observations should complete the request form in the student handbook. (<https://medicine.wsu.edu/md-program/studentaffairs/student-handbook/request-for-reasonable-accommodations-for-religious-observances/>) Students exploring an

extended personal leave for opportunities such as research or parental/family leave should contact the Office of Admissions, Student Affairs, and Inclusion to begin the conversation of what approved absences and or other leave of absence options may be available. Collaboration with the Access Services Office may be needed for absences where reasonable accommodations apply.

Attendance and Make-Up Statement

Students are responsible for ensuring that they attend all class meetings and complete all in-class and out-of-class work as assigned by the instructor. Students are also responsible for communicating with the instructor should they need to be absent.

The instructor is responsible for determining the attendance policy and for making decisions regarding the policy, including the consequence of missed classes, within guidelines established by the academic unit. The instructor is responsible for communicating the policy to the students in the course syllabus. Administrative Drops for Non-Attendance: Students who have not attended class meetings (including lectures, laboratories, and other meetings) during the first week of the semester or according to a prorated schedule for shorter sessions may be dropped from the course by the department. Students enrolled in online classes may be dropped if they have not logged into the class during the first week. Students should not assume that they have been dropped without checking their class schedules.

Students should make all reasonable efforts to attend all class meetings. However, in the event a student is unable to attend a class, it is the responsibility of the student to inform the instructor as soon as possible, explain the reason for the absence (and provide documentation, if appropriate), and make up class work missed within a reasonable amount of time, if allowed. Missing class meetings may result in reducing the overall grade in the class.

The primary approach for making up for missed class will be by the student's ability to access the Zoom recording available through Canvas. Students will be provided directions to access these recordings.

Campus Safety

Classroom and campus safety are of paramount importance at Washington State University and are the shared responsibility of the entire campus population. WSU urges students to follow the "Alert, Assess, Act," protocol for all types of emergencies and the "[Run, Hide, Fight](#)" response for an active shooter incident. Remain ALERT (through direct observation or emergency notification), ASSESS your specific situation, and ACT in the most appropriate way to assure your own safety (and the safety of others if you are able).

There is an all-campus safety alert system designed to alert all employees and students should there be closure because of weather or a safety concern. You may sign up to receive Campus Alerts by following instructions here: <http://spokane.wsu.edu/alert/> and learn more about the Campus Safety Plan here: <https://spokane.wsu.edu/campus-security/campus-safety-plan/>

Finally, all faculty, staff, and students should go to the my.wsu portal at <https://login.wsu.edu/> and register their emergency contact information for the Crisis Communication System (CCS). Enter your network ID and password and you will be taken to the my.wsu portal page. Look for the "Emergency Notification" box on the left side of the page and click on "Review or Update Your Emergency Contact" hyperlink to be taken to the registration page where you can enter your cell, landline, and email contact details as well as arrange for emergency text messages to be sent to your phone.

COVID-19 Policy

Students are expected to abide by all current COVID-19 related university policies and public health directives, which could include wearing a cloth face covering, physically distancing, self-attestations, and sanitizing common use spaces. All current COVID-19 related university policies and public health directives are located at <https://wsu.edu/covid-19/>. Students who do not comply with these directives may be required to leave the classroom; in egregious or repetitive cases, students may be referred to the Center for Community Standards for university disciplinary action.