

Functional Foods & Health

FS 510 (3 credit) Spring 2017 Syllabus

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Course description:

Functional foods provide health benefits beyond our basic nutrient requirements. These benefits improve the quality of life by promoting optimal health and reducing the risk of chronic diseases. This course will explore the components of functional foods and highlight key mechanisms that may counteract current health issues and diseases.

Learning outcomes:

Upon completion of this course, students will be able to critically

- describe the molecular pathways involved in the development of chronic diseases
- evaluate the health implications of current functional foods
- develop the concept for a functional food product

Textbooks:

There are no required textbooks for this course.

Recommended textbooks:

- Vaclavik V, Christian EW. 2014. Essentials of food science, 4 ed. New York Springer.
- Aluko RE. 2012. Functional foods and nutraceuticals. New York: Springer.
- McGuire M, Beerman K. 2011. Nutritional Sciences: from fundamentals to food, 2nd ed: Wadsworth Cengage Learning.

COURSEWORK:

Study questions (optional):

Study questions are posted on Blackboard for each lesson. These questions will help students focus on the key ideas covered in the lecture materials.

Assignments (120 points) and Term Project (30 points): To summarize and integrate the concepts covered in this course, students will create a novel functional food product that addresses a current health issue or disease. Students will discuss the scientific evidence to substantiate a minimum of **one** health claim regarding the proposed product.

The term project is broken into **six** individual assignments that are due at specific dates throughout the semester. This format will help give students enough time to complete the project components and also give the instructor the opportunity to provide feedback for improvement. By the end of the semester, students will edit their six assignments and compile them into one Term Project for the final submission. Please refer to the course schedule for due dates.

Course schedule:

| Dates | Topic | Assignments |
|--|--|--|
| Week 1 Jan 9-13 | Lesson 1: Introduction | Open the "Class Discussions" and post a brief introduction about yourself in the "Student introductions" forum. Introduction (5 pts, Due Jan 20) |
| Week 2 Jan 16-20 Week 3 Jan 23-27 | Lesson 2: Inflammation & Diseases | Select a health issue or disease that you are interested in designing a functional product to alleviate. Describe the mechanism(s) involved in your target health issue or disease. Assignment 1 (20 pts, Due Jan 27) |
| Week 4 Jan 30-Feb 3 Week 5 Feb 6-10 | Lesson 3: Bioactive Carbohydrates & Lipids | Describe the advantages and disadvantages of the current treatments for your health issue or disease. Assignment 2 (15 pts, Due Feb 10) |
| Week 6 Feb 13-17 Week 7 Feb 20-24 | Lesson 4: Bioactive Peptides, Polyphenols, & Carotenoids | Develop a functional product: Submit the name and a brief description of your product. The product may not be a single-ingredient supplement; for example, a calcium tablet is unacceptable. Assignment 3 (5 pts, Due Feb 24) |
| Available Feb 24 | Midterm (50 points) | DUE Mar 6 th |
| Week 8 Feb 27-Mar 3 Week 9 Mar 6-10 | Lesson 5: Coffee, Tea, Chocolate, Beer & Wine | Design a nutritional label and an ingredient list for your product. Next, describe the mechanism(s) involved in the functionality of your product. Assignment 4 (15 pts, Due Mar 10) |
| Week 10 Mar 13-17 | Spring Break | |
| Week 11 Mar 20-24 Week 12 Mar 27-31 | Lesson 6: Milk & Dairy Products | Design a PowerPoint to showcase your functional food product; be creative, you may include images. Assignment 5 (25 pts, Due Mar 31) |
| Week 13 Apr 3-7 Week 14 Apr 10-14 | Lesson 7: Soy products | Describe a hypothetical experiment to test the effectiveness of your functional product; please include hypotheses, control treatment(s), expected results, and conclusions. Assignment 6 (25 pts, Due Apr 14) |
| Week 15 Apr 17-21 Week 16 Apr 24-28 | Lesson 8: Cognitive & immune health | None |

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|----------------------|--|---|
| FINAL Project | | Please edit your 6 assignments and submit them as one final Project 30 points + 10 points for references, Due May 2 |
|----------------------|--|---|

References (10 points): Students are required to have in-text citations of a minimum of 10 peer-reviewed articles upon submitting their final Project. In addition, a "References" page is required and must be formatted according to the Journal of Food Science style guide:

Journal article:

Author(s). Year. Article title. Journal abbreviation Volume (Issue optional): inclusive pages.

Gazzaniga FS, Kasper DL. 2016. Veggies and Intact Grains a Day Keep the Pathogens Away. Cell 167(5):1161-2

Book chapter:

Author(s) of the chapter. Year. Title of the chapter. In: Name Editor(s). Title of the book. Edition or volume, if relevant. Place of publication: Publisher name. Inclusive pages of chapter.

Parham P. 2009. Innate Immunity. In: The Immune System, 3rd ed. New York: Garland Science. p 151-70.

Midterm (50 points):

There will be one open-book midterm exam that covers lessons 1-4. Students will have one week to complete and submit the exam.

NOTE: ALL assignments submitted to Blackboard must be typed in Times New Roman font, single-spaced, and saved under a filename that contains your last name and assignment (example: "Nguyen Assignment 1", "Nguyen Midterm").

Chat sessions (optional): While email is the preferred form of communication and students are encouraged to contact Dr. Nguyen at any time, there will be 1-hr chat sessions held throughout the semester to review lecture materials and to answer any questions. Specific dates and time will be determined after the first week of class.

Grades:

| Coursework | Points | Percent of Final Grade |
|-------------------|---------------|-------------------------------|
| Assignments | 120 | 60 |
| Term Project | 30 | 15 |
| Midterm | 50 | 25 |
| Total | 200 | 100 |

| <u>Grade</u> | <u>% of Total Points</u> |
|--------------|--------------------------|
| A | >93.0 |
| A- | 90.0 - 92.9 |
| B+ | 87.0 - 89.9 |
| B | 83.0 - 86.9 |
| B- | 80.0 - 82.9 |
| C+ | 77.0 - 79.9 |
| C | 73.0 - 76.9 |
| C- | 70.0 - 72.9 |
| D+ | 67.0 - 69.9 |
| D | 60.0 - 66.9 |
| F | <59.9 |

Student Policies:

Students are encouraged to consult the WSU Student Handbook for information related to student policies and procedures (<http://handbook.wsu.edu/what-is-the-student-handbook/>)

Late Work Policy:

All due dates for course work are outlined in the course schedule. Please promptly submit assignments by these dates; midterm and final projects must be submitted on-time in order to meet the WSU deadlines. If you need additional accommodations, please notify the instructor in advance.

Unexcused late work will receive a 30% grade deduction.

Students with Disabilities

(WSU online) Reasonable accommodations are available in online classes for students with a documented disability. All accommodations must be approved through your WSU Disability Services office. If you have a disability and need accommodations, we recommend you begin the process as soon as possible. For more information, contact a Disability Specialist on your home campus:

- Pullman or WSU Online: 509-335-3417, <http://accesscenter.wsu.edu>, access.center@wsu.edu
- Spokane: 509-358-7534, <https://spokane.wsu.edu/studentaffairs/disability-resources>
- Tri-Cities: 509-358-7534, <http://www.tricity.wsu.edu/disability/>
- Vancouver: 360-546-9138, <http://studentaffairs.vancouver.wsu.edu/studentresource-center/disability-services>

Academic Dishonesty/Plagiarism Policy:

WSU's Academic Integrity Statement* "As an institution of higher education, Washington State University is committed to principles of truth and academic honesty. All members of

the University community share the responsibility for maintaining and supporting these principles. When a student enrolls in Washington State University, the student assumes an obligation to pursue academic endeavors in a manner consistent with the standards of academic integrity adopted by the University. To maintain the academic integrity of the community, the University cannot tolerate acts of academic dishonesty including any forms of cheating, plagiarism, or fabrication. Washington State University reserves the right and the power to discipline or to exclude students who engage in academic dishonesty." *

Academic Integrity Statement and link to WSU's policy:

www.conduct.wsu.edu/default.asp?PageID=343

www.wsulibs.wsu.edu/plagiarism/main.html

Plagiarism is defined by Webster's Dictionary as, "to steal and pass off the ideas or words of another as one's own." There are two general forms of plagiarism:

(a) Unintentional: the use of other writers' words, phrases, sentences, paragraphs as though they were your own without understanding the need to cite the original source. Unintentional plagiarism normally occurs when the individual does not understand the conventions of scientific writing and the need to cite sources of information.

(b) Intentional: the use of another writers' work and claiming it as your own. Intentional plagiarism includes knowingly copying or incorporating sections of books, articles, or other sources into your work without citation.

To evade plagiarism, you must acknowledge the source of information. In scientific writing, this can be performed in the text of your work through the use of surnames of authors and the year of publication (e.g., Edwards et al., 2003) or by using numbers enclosed by parentheses which correspond to specific citations in the reference section. In addition to employing citations in the text, plagiarism can be avoided by applying special techniques when writing about information obtained from a source:

(a) Paraphrase: rewording information in which you accurately present the main ideas from the source but do so using your own organization, words, and sentence structures.

(b) Summary: a concise statement of the main idea from a section within a source.

(c) Direct quotation: use of quotes surrounding the passage written by another author.

In general, paraphrasing (a) and the use of summary statements (b) are very common techniques used in scientific writing. Use of quotations (c) in scientific writing is rare and should be avoided. Plagiarism is dishonest and is not tolerated. If caught using all or portions of a current or former classmate's writing or other sources of information (e.g., purchase a paper), a grade of "zero" will be given for the exercise. Additional penalties for plagiarism are possible as outlined in the Washington State University Student Handbook.