

**FALL 2018**

**NFS 205 FUNCTIONAL FOODS: PRINCIPLES AND TECHNOLOGY**

**Course Description**

Functional Foods, sometimes referred to as nutraceuticals, are foods (or food ingredients) that deliver specific non-nutritive physiological benefits that may enhance health. The growing consumer interest in Functional Foods is transforming the food industry as we know it, and redefining the relationship between food, nutrition, and health. In Functional Foods: Principles and Technology, you will learn what constituents make a food product functional, and we will discuss the chemistry and physiological effects of functional foods.

**Syllabus**

Students will be presented with definitions and concepts pertaining to these categories of functional foods. They will learn the importance of chemical structures and properties as well as the non-nutritive functions of several different foods in these categories.

**1. Introduction**

The definition of Functional Foods will be outlined. Students will explore both the industry and the consumer roles involved in this growing field.

**2. Antioxidants**

Students will learn the chemical makeup, free radicals and biochemical functions of antioxidants. Foods explored in this unit will include cranberries, tomatoes, garlic, pomegranate and different iced teas.

**3. Dietary Fiber**

Students will learn about soluble and insoluble fiber, resistant starch, and how important these are to human health. The biochemical functions of dietary fiber will be explored, and oats and oats products will be the main example used in the classroom.

**4. Prebiotics and Probiotics**

Students will learn the definition of both pre-and probiotics, and their biological functions. How to develop prebiotics and probiotics. Pre- and probiotics will be used together as symbiotics.

**5. Mid – term Exam**

**6. Lipids and health**

Students will learn the structure and function of essential fatty acids. Chemistry and health benefits of W-3 fatty acids, phytosterols, and CLA will be discussed. Olive oil.

**7. Minerals and Vitamins**

The chemistry, functions and sources of vitamins and minerals will be

discussed, along with proposed functional claims.

### **8. Projects / Presentations**

Students are invited to develop a functional food product (or alter a favourite recipe to enhance functionality). Students may work in small groups or individually. Project presentations will consist of production of the foodstuff your group developed (with sufficient product to allow for tasting by the class) and a **brief** (5-6 minutes) powerpoint or similar presentation. These presentations will be arranged during the semester and can be arranged outside of class times due to time limitations if this can be agreed with the class. The other option is to write a thorough essay on a topic of your choice related to Functional Foods. This will be discussed at a later date and the class may choose one of the options to complete for the project.

### **9. Sports Drink**

In this unit students will learn functional qualities of sports drinks. Electrolytes and sugar level will be a large part of the discussion.

### **10. Infant Formula**

Students will learn the ingredients and formulation techniques of infant formula, and all aspects of the product that make it a functional food. Consumer trends surrounding infant formula will also be outlined.

### **11. Soy Products**

The history of soy products around the world will be described. As well as the health benefits that soy foods have contributed to the American diet, the chemistry, and biological functions of isoflavones will be discussed. Tofu, tempeh, soy milk, and other soy products will be discussed in this unit.

### **12. Final Exam**

This will be an open book / take home exam. Paper must be handed in on or before December 7<sup>th</sup> (Friday)

## Location

01:15 pm-02:30 pm Tuesdays/Thursdays  
Terrill 207  
Aug 28 - Dec 04, 2018

## Instructor

Mingruo Guo, PhD.  
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Office Hours: Thurs 2:30 – 3:30pm

## Teaching Assistant

Hao Shi  
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Office: 259 Marsh Life Science  
Office Hours: by appointment via e-mail.

## Course Materials

Suggested Text Book: Functional Foods – Principles and technology, Guo M. 2009, Woodhead Publishing Company, UK.

**Classroom Rules:** In order for everyone to stay fully engaged please do not use cell phones or participate in side conversations during class. Eating and drinking is allowed, however due to the course topic; Functional Foods, it would be appropriate to not eat unhealthy junk foods during class. Computers are allowed and asking questions is encouraged.

## Grading

|                         | Each | Total      |
|-------------------------|------|------------|
| Pop Quiz (4)            | 5 %  | 20 %       |
| Mid-term Exam           |      | 25 %       |
| Projects                |      | 10 %       |
| Attendance (5 random)   | 1 %  | 5 %        |
| Final Exam              |      | 40 %       |
| <i>Cumulative Grade</i> |      | <i>100</i> |

|                   | <b>Date</b>                |   |
|-------------------|----------------------------|---|
| Week 1            | Aug 28 & 30                | Introduction  |
| Week 2            | Sep 04 & 06                | Antioxidants and related foods                                    |
| Week 3            | Sep 11 & 13                | Antioxidants and related foods                                    |
| Week 4            | Sep 18 & 20                | Dietary fiber   |
| Week 5            | Sep 25 & 27                | Pre and probiotics  |
| Week 6            | Oct 02 & 04                | Pre and probiotics  |
| <b>Week 7</b>     | <b>Oct 9</b>               | <b>Mid Term Exam</b>  |
|                   | Oct 11 & 16                | Lipids and health   |
| Week 8            | Oct 18                     | Minerals and vitamins   |
| Week 9            | Oct 23 & 25                | Sports drinks   |
| <b>Week 10</b>    | <b>Oct 30 &amp; Nov.01</b> | <b>Projects</b>   |
| Week 11           | Nov 06 & 9                 | Infant formula  |
| Week 12           | Nov 13 & 15                | Soy foods   |
| Week 13           | Nov 20 & 22                | Thanksgiving  |
| Week 14           | Nov 27 & 29                | Soy Foods   |
| <b>Week 15</b>    | <b>Dec 04</b>              | <b>Review</b>   |
| <b>Week 15</b>    | <b>Dec 6 2018</b>          |   |
| <b>Final Exam</b> |                            | <b><i>NFS 205 Functional Foods: Principles and Technology</i></b> |