

**Food Microbiology II-NFSC 278**  
**Course Outline**

Department of Nutrition and Food Science  
Spring 2012

**Course Instructor:**    **Dr. Zeina Kassaify**

**Office:** 317

**Email:** zk18@aub.edu.lb

**Office Hours:** Tuesday & Thursday 11:00 am-12:00 pm OR by appointment

**Credits:**        3 cr. (2 cr. lectures and 1 cr. Lab)

**Class hours:** Monday & Wednesday: 12:00 a.m.-12:50 a.m.

**Classroom:** Agr Wing A Room: 205

**Course Overview:**

The course will present microbiological and technological principles of the application of microorganisms in industry, agriculture and the environment followed by specific examples. Various industrial fermentations and fermentation systems will be studied these will include different aerobic and anaerobic fermentations. A special focus will also be given to winemaking, brewing and antibiotic production.

**Course Objectives:**

By the end of the course students should be able to:

- 1- Understand the relationship of microorganisms to food manufacture and preservation
- 2- Understand the relationship of microorganisms to industrial fermentation and processing
- 3- Build basic knowledge that can be used as foundation in post-graduate studies or within industrial positions
- 4- Critically review scientific literature

**Learning Outcomes:**

On successful completion, students should be able to:

<b>Outcomes</b>	<b>Teaching Strategy</b>	<b>Assessment Method &amp; Criteria for Evaluation</b>
1- Identify the roles of microorganisms in food manufacture, preservation, industrial fermentation and processing	Class Lecture	Midterm (Multiple choice and Short answer questions)
2- Illustrate the processes and techniques of industrial food fermentations	Class Lecture and field trips (Winery, brewery and Bakery)	Midterm (Multiple choice) and field demonstrations
3- Discuss and explain the principles of biotechnology, food microbiology, and industrial microbiology in the production of useful products	Class Lecture	Midterm (Multiple choice questions)
4- Apply their knowledge on the main microbial groups responsible for fermentative processes in food industry	Class Lecture & Class Discussions	Midterm/Final Exam (Short answers and multiple choice questions)
5- Provide specific information on the technological operations and problems that occur in the food fermentation industry	Class Lecture Explanation & discussion	Final Exam (short answers and multiple choice) and Assignment
6 Identify the commercial standards and health aspects of fermented foods	Class Lecture	Final Exam (short answers and multiple choice)

**Prerequisites:** NFSC 277

**Grades:** Midterm exam: 35%  
Laboratory reports and performance: 30%  
Final Exam: 35%

### **Attendance**

Attendance is a must based on AUB rules. Missing one third of the class during the semester and without valid reasons would result in course withdrawal.

### **Course Instructional styles:**

#### **Lectures**

Reading from the recommended textbooks and references and course notes that will be supplemented with information in class

#### **Laboratory Reports (refer to the laboratory syllabus)**

#### **Examination**

Midterm and a Final exam will be set based on multiple choice and short answer questions

#### **Course Outline:**

<b>Week</b>	<b>Date</b>	<b>Topic</b>
<b>1</b>	<b>Feb 13</b>	<b>Course Overview</b>
	<b>Feb 15</b>	<b>Review of CFU calculations</b>
<b>2</b>	<b>Feb 20</b>	<b>Introduction to Industrial Microbiology</b>
	<b>Feb 22</b>	<b>NO CLASS</b>
<b>3</b>	<b>Feb 27</b>	<b>Introduction to Industrial Microbiology</b>

	<b>Feb 29</b>	<b>Principles of Food and Industrial Fermentations</b>
<b>4</b>	<b>March 5</b>	<b>Lactic Acid Bacteria and starter cultures (Taxonomy, ecology, physiology, genetics and biotechnology, phage control)</b>
	<b>March 7</b>	<b>Dairy Fermentations (Cheeses)</b>
<b>5</b>	<b>March 12</b>	<b>Dairy Fermentations (Cheeses)</b>
	<b>March 14</b>	<b>Dairy fermentations (Milks)</b>
<b>6</b>	<b>March 19</b>	<b>Microbiology of Alcoholic Beverages</b>
	<b>March 21</b>	<b>Microbiology of Alcoholic Beverages</b>
<b>7</b>	<b>March 26</b>	<b>Microbiology of Alcoholic Beverages</b>
	<b>March 28</b>	<b>Microbiology of Alcoholic Beverages</b>
<b>8</b>	<b>April 2</b>	<b>Vinegar</b>
	<b>April 4</b>	<b>Microbiology of Vegetable Fermentations</b>
<b>9</b>	<b>April 11</b>	<b>Bread and Baker's yeast</b>
<b>10</b>	<b>April 18</b>	<b>Bread and Baker's yeast</b>
<b>11</b>	<b>April 23</b>	<b>Fermented Meats and Sausages</b>
	<b>April 25</b>	<b>Fermented Meats and Sausages</b>
<b>12</b>	<b>April 30</b>	<b>Midterm</b>
	<b>May 2</b>	<b>Oriental and Indigenous Fermented Foods</b>
<b>13</b>	<b>May 7</b>	<b>Industrial fermentations/production of industrial enzymes (including Rennet Technology) and application in some fermented foods</b>
	<b>May 9</b>	<b>Industrial fermentations/production of industrial enzymes (including Rennet Technology) and application in some</b>

<b>fermented foods</b>		
<b>14</b>	<b>May 14</b>	<b>Bio-enrichment; production of vitamins in fermented foods</b>
	<b>May 16</b>	<b>Potential infective and toxic microbiological hazards associated with fermented foods</b>
<b>15</b>	<b>May 21</b>	<b>Microbiology of Food Groups</b>
	<b>May 23</b>	<b>Microbiology of Food Groups Rapid Detection Techniques</b>

**Due Dates:**

Laboratory reports	(refer to laboratory syllabus)
Midterm test	April 23
Final test	TBA

**Recommended Texts (available at Science Library Reserve):**

“Encyclopedia of Food Microbiology (Academic Press)”.

Waites M. J. et al . (2001) Industrial Microbiology; An Introduction

**Policies:**

- Make up exams: Only students with valid documented excuses (see University’s policy) will be allowed to take a make-up midterm or final, no more than three working days after the exam.
- **Reports submitted late will be penalized as follows: 10% of the maximum points will be deducted for each day after the due date.**
- Cheating on assignments or examinations; plagiarizing, which means misrepresenting as your own work any part of work done by another; submitting the same paper, or substantially similar papers, to meet the requirements of more than one course without the approval and consent of all instructors concerned; will not be tolerated and students will be penalized