FOOD MICROBIOLOGY LECTURE
The Ohio State University

(Food Science & Technology 5536/ Microbiology 5536)
Autumn Semester, 2017

https://carmen.osu.edu

INSTRUCTOR

Ahmed E. Yousef, Professor
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Department of Microbiology
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TIME and LOCATION

Monday, Wednesday & Friday: 11:30-12:25
Hamilton Hall, Room 0107

OFFICE HOUR

E-mail to schedule a meeting with the instructor.

COURSE OBJECTIVES

Students completing this course should:

- Understand the **causes** of food spoilage and predict the **microorganisms** that can spoil a given food, when prepared, processed and stored under given conditions.
- Understand the **causes** of foodborne microbial diseases and predict the **pathogens** that can grow in a given food, when prepared, processed and stored under given conditions.
- Be able to predict the necessary **measures to control** the spoilage and pathogenic microorganisms in food.
- Understand the role of **beneficial microorganisms** in food processing, preservation and safety, and the possible health benefits resulting from the consumption of these microorganisms.

READINGS

Handouts

- **Provided for each lecture (Download from Carmen & print before lecture)**
- **Serve only as lecture outlines**
- **Do not contain enough information to prepare the students for quizzes or exams.**

Therefore, students are advised to

- **Take detailed notes during the lecture**
- **Read assigned review articles or research papers (uploaded to Carmen)**
- **Read chapters, assigned occasionally, from the books on reserve.**

The following are recommended (but not required) books:

- Ray, B., and A. Bhunia. 2014. Fundamental food microbiology, 5th Ed. CRC Press, Boca Ratan, FL.
- Jay, J. M., M. J. Loessner, and D. A. Golden. 2005. Modern food microbiology, 7th ed. Springer, New York, NY.
- Montville, T.J., K.R. Mathews, and K. Kniel. 2012. Food microbiology, an introduction, 3rd Ed. ASM Press, Washington, DC.

EXAMINATIONS and GRADING CRITERIA

- Three examinations will be given in this course; two midterms and a final.
- The final only is comprehensive: The final represents 35% of total grade, with 20% from the third part of the course and 15% from the first and second parts.
- Seven (7) quizzes will be given, and the highest 6 scores only will be considered.
- The distribution of the points in this course will be as follows:

First Mid-Term	25%
Second Mid-Term	25%
Quizzes (the best 6 of 7)	12%
Random attendance check/participation	3%
Final	35%
Total	100

Bonus points: Additional points (up to 3) are available to students who volunteer to present, in front of the class, a hot topic in food microbiology. ***Eligible students are those with better than average grade by mid-quarter.*** *The chosen topic should complement, but not overlap with course material. Five minutes will be set-aside for such a presentation. For those who choose to present, their* ***topics should be selected and finalized with the instructor before the second mid-term examination****. The instructor reserves the right to accept or reject any topic for such class presentations.*

Final Grade

Grade will be based on the relative performance of individual students within the class. A grading curve will be constructed with a (B-) median. The instructor reserves the right to skew grades below or above the grade median for exceptional or less than exceptional classes. The approximate cutoffs for the grading curve are as follows:

Grade	Percentile	Explanation (of percentile ranking)
A	75 to 100	After grades are ranked, students in the top 25% of the ranking get A (regardless their actual score)
B	35 to < 75	
C	10 to < 35	
D	5 to < 10	
E	< 5	Lowest scoring students (the bottom 5% of ranked grades) get E, regardless their actual score

Make-up Exams

There is NO make-up for mid-terms or final exam, except when a student is under **extraordinary circumstances**. The instructor reserves the right to determine what constitutes an extraordinary circumstance. Well-documented justification will be needed for any potential make-up exam. **There will be no make-up exams for the quizzes, regardless the circumstances.**

ACADEMIC MISCONDUCT

Academic misconduct will not be tolerated. Academic misconduct will be dealt with as defined in the Code of Student Conduct: {http://studentaffairs.osu.edu/resource_csc.asp}. If questions arise, please refer to the web sites just listed or ask the instructor. Any suspected violation of the Code of Student Conduct will be forwarded to the Committee on Academic Misconduct.

DISABILITY SERVICES

Any student who may need an accommodation because of a disability should contact the instructor privately to discuss specific needs. The Office for Disability Services assists faculty in verifying the need for accommodations and developing accommodation strategies. Students with disabilities are encouraged to contact the Office for Disability Services.

Tentative Schedule			
Week	Date	Topic	
1		**Introduction**	
	8/23		What is *Food Microbiology*?
	8/25		Microbiology basics (review)
2	8/28		Food microbiology basics (review)
		Food Microbiota	
	8/30		Gram-positive bacteria
	9/1		Gram-negatives
3			
	9/4		**Labor Day (no classes)**
	9/6		Spore-forming bacteria
	9/8		Foodborne fungi
4			
	9/11		Characteristics of food microbiota
	9/13		Food characteristics important to microbiota
	9/15		Meat microbiota
5			
	9/18		Poultry microbiota
	9/20		Dairy microbiota
	9/22		**Exam (First Midterm)**
6			
	9/25		Fresh produce microbiota
	9/27		Seafood microbiota
	9/29		Review: Food microbiota section
7		**Foodborne pathogens**	
	10/2	Gram-positives pathogens	*Staphylococcus aureus*
	10/4		*Listeria monocytogenes*
	10/6		*Clostridium botulinum*
8			
	10/9		*Clostridium perfringens* and *Bacillus cereus*
	10/11		Other Gram-positive pathogens
	10/13		**Autumn Break (no classes)**
9			
	10/16	Gram-negative pathogens	*Salmonella*
	10/18		Pathogenic *Escherichia coli*
	10/20		Other pathogenic *Enterobacteriaceae*
10			
	10/23	Miscellaneous pathogens	Pathogenic fungi
	10/25		Foodborne parasites
	10/27		Foodborne viruses
11			
	10/30		**Exam (Second Midterm)**
		Control of microorganisms during food production and processing	
	11/1		Thermal inactivation
	11/3		Thermal inactivation (Cont.)
12			

	11/6		Thermal inactivation (Cont.)
	11/8		Gamma radiation
	11/10		**Veteran's Day (no classes)**
13			
	11/13		Antimicrobial preservatives
	11/15		Antimicrobial preservatives (Cont.)
	11/17		Cleaning and sanitization
14			
	11/20		Emerging technologies
	11/22		**No Classes (Thanksgiving)**
	11/24		**No Classes (Columbus Day)**
15			
	11/27		Biopreservation and probiotics
	11/29		Foodborne disease outbreaks: Case studies
	12/1		Hazard analysis and critical control point (HACCP)
16			
	12/4		Miscellaneous topics
	12/6		Review
	12/8		**No Classes**
Final Exam	**Thurs. 12/14**	**Time: 10:00-11:45** **Location: Same lecture room**	