FDSC4090/FDSC5090 Food Microbiology
2014 Spring Semester
Department of Animal Science
University of Wyoming

COURSE DECRIPTION

Cr. 3 (3-0). Discusses microorganisms and theory of their growth and survival in relation to spoilage and preservation of foods and health hazards in foods. Dual listed with FDSC 5090; cross listed with MICR 4090. Prerequisite: MOLB 2210/MICR221.

CLASS MEETING TIMES

11:00 – 11:50 AM, MWF; AB Room 106.

INSTRUCTOR

Dr. Bledar Bisha, Rm.115, Animal Science/Molecular Biology Building; Phone: 307-766-3140 (office); E-mail: bbisha@uwyo.edu. Office hours: Monday 1:00PM-3:00PM.

TEXTBOOK (RECOMMENDED)

Fundamental Food Microbiology (5th Ed.), Ray Bibek and Arun Bhunia, CRC Press Taylor & Francis Group, 2014.

ALTERNATIVE TEXTBOOKS

Modern Food Microbiology (7th Ed.), James M. Jay, Springer Science + Business Media, Inc., 2005.
Food Microbiology: Fundamentals and Frontiers (3d Ed.), Larry R. Beuchat, ASM Press, 2007.

COURSE EXPECTATIONS AND OUTCOMES

Course attendance and participation is expected. It is also assumed that the students have read the assigned chapters from the textbook as well as other assigned materials prior to attending the lectures. Timely completion and submission of all assignments is required in order to award credit for those assignments. Successful completion of this course will provide students with a good understanding of the following:

- History, developments, and future directions and challenges in the field of food microbiology
- Current issues in microbial food safety
- Important foodborne pathogenic bacteria, viruses, molds, toxins, prions, protozoa and multicellular parasites and their characteristics
- Ecology and epidemiology of foodborne pathogens
- Biofilm formation and attachment by foodborne pathogens
- Cultural, immunological, molecular methods for detection of foodborne pathogens
- Rapid methods and typing methods for foodborne pathogens
- Beneficial microorganisms of importance to food microbiology and their characteristics
- Microorganisms of importance to spoilage of foods and their characteristics
- Control of spoilage and pathogenic microorganisms in food via modulation of intrinsic parameters of food, temperature, packaging, physical, biological treatments, etc
- Principles of cleaning and sanitation in food processing
- Hazard Analysis Critical Control Points (HACCP)

FDSC 4090 - SPRING 2014 (POINTS ALLOTTED)

3 written examinations: (100 pts each)	300
1 written final examination	150
3 case studies on food-borne diseases outbreaks (20 pts each)	60
1 presentation on a chosen food microbiology topic	40
Total	**550 points**

FDSC 5090 - SPRING 2014 (POINTS ALLOTTED)

3 written examinations: (100 pts each)	300
1 written final examination	150
1 take-home assignment	50
3 case studies on food-borne diseases outbreaks (20 pts each)	60
1 presentation on a chosen food microbiology topic	40
1 critical review of a published scientific manuscript	50
Total	**650 points**

GRADE ASSIGNMENT BASED ON THE POINTS ALLOTTED

90% + A
80% + B
70% + C
60%+ D
<60% F

WRITTEN EXAMINATIONS
Three written examinations will take place during the semester (100 points each) based on material covered in the course up to that point as specified by the schedule. The final examination (150 points) will be comprehensive. Short answers, yes and no questions, or short assays requiring critical thinking may be used in the examinations.

CASE STUDIES
Three case studies on foodborne outbreaks will be assigned during the semester to each student. A one page critical overview of the outbreak as well as a discussion sources, methods and outcomes of the outbreak will be due one week following the assignment (12 pt font, single space).

PRESENTATIONS
Presentations will take place at the end of the semester before the final exam. The students should pick a topic such as a foodborne microorganism, a control method, a detection method or any topic of relevance to food microbiology. The presentations will be 15 minutes long with 5 minutes for questions. The students should consult me before they choose the topic to allow for a diversity of topics covered in the course.

TAKE-HOME ASSIGNMENT (FDSC 5900)
The take home assignment will involve the critique of an important topic in food microbiology. The due

date will be specified when the assignment is designated.

REVIEW OF A SCIENTIFIC MANUSCRIPT (FDSC 5900)
Students will choose a peer-reviewed research scientific manuscript and prepare a written review covering the importance of the research, the merits of work, appropriateness of methods, results and discussions, strengths and weaknesses. The review can be submitted any time prior to the in class-presentations.

GENERAL INFORMATION
All members of the University community are responsible for upholding the values of academic integrity. The faculty considers academic integrity a matter of common concern, not merely a private issue between instructor and student. Honesty in all academic endeavors is a component of academic integrity that is vital to the educational functions of the University. Whatever form academic dishonesty may take, the faculty considers it as establishing a student's failure to demonstrate the acquisition of knowledge and the failure to apply it to an academic endeavor. It is a student's responsibility to learn the standards of conduct for the performance of academic endeavors; it is an instructor or faculty member's responsibility to make reasonable effort to make known the standards of conduct for the performance of academic endeavors. Through an atmosphere of mutual respect we enhance the value of education and maintain high standards of academic excellence. Failure on the part of the student to observe and maintain standards of academic honesty, as hereafter defined or made known by an instructor responsible for a course or other academic endeavor, requires corrective action as hereafter authorized

ACADEMIC DISHONESTY is defined by the UW Faculty as: **An action attempted or performed that misrepresents one's involvement in an academic endeavor in any way, or assists another student in misrepresenting his or her involvement in an academic endeavor.** Examples of academic dishonesty include, but are not limited to: Plagiarism, Cheating, Fraud, Violation of Standards, Multiple Submissions, Interference or Obstruction, Complicity.

See University Regulation 6-802 for details. http://www.uwyo.edu/intstudy/courses/academic-dishonesty.pdf

Also see the file on Academic Honesty at the UW A-Z Directory.
http://www.uwyo.edu/UW/WebDirectory/

FDSC 490 Food Microbiology Lecture Schedule (Spring Semester 2014)

Date	Day	Topic	Text Chapter
Jan 13	M	Course Overview, Food Microbiology and its History	1
Jan 15	W	Microbes in Food: Morphology and Taxonomy	2
Jan 17	F	Microbial Sources and Growth Characteristics	3, 5
Jan 20	M	Martin Luther King/Wyoming Equality Day	Break
Jan 22	W	Factors Influencing Microbial Growth	6
Jan 24	F	Microbial Metabolism, Attachment and Biofilm Formation	7, 8
Jan 27	M	Microbial Sporulation, Stress, and Injury	9, 10
Jan 29	W	Characteristics of Beneficial Microorganisms	11, 12, 13
Jan 31	F	Microbiology of Fermented Foods, Starter Cultures and Bacteriophages	14, 15
Feb 3	M	Microbiology of Fermented Foods, Starter Cultures and Bacteriophages	14, 15
Feb 5	W	Biopreservation of Food, Intestinal Bacteria, and Probiotics	16, 17
Feb 7	F	**Examination I**	
Feb 10	M	Food Spoilage Caused by Microorganisms and their Products	19, 22
Feb 12	W	Spoilage by Food Commodity	20, 21
Feb 14	F	Spoilage by Food Commodity (cont'd)	20, 21
Feb 17	M	Foodborne Disease: Overview:	24
Feb 19	W	Foodborne Disease: Infections	26
Feb 21	F	Foodborne Disease: Infections (cont'd)	26
Feb 24	M	Foodborne Disease: Infections (cont'd)	26
Feb 26	W	Foodborne Disease: Infections (cont'd)	26
Feb 28	F	Foodborne Disease: Intoxications and Toxico-infections	25, 27
Mar 3	M	Foodborne Disease: Intoxications and Toxico-infections (cont'd)	25, 27
Mar 5	W	Foodborne Disease: Intoxications and Toxico-infections (cont'd)	25, 27
Mar 7	F	Foodborne Disease: Viral, Parasitic	28
Mar 10	M	Foodborne Disease: Mycotoxins, Molds, Fish and Shellfish-associated Toxins	28
Mar 12	W	Foodborne Disease: Prions and Emerging Pathogens	28, 29
Mar 14	F	**Examination II**	
Mar 17	M	Spring Break	
Mar 19	W	Spring Break	
Mar 21	F	Spring Break	
Mar 24	M	Indicators of Pathogenic and Spoilage Microorganisms	23, 30
Mar 26	W	Detection of Microorganisms from Foods: Culture Methods	42
Mar 28	F	Detection of Microorganisms from Foods: Immunological Methods	42
Mar 31	M	Detection of Microorganisms from Foods: Molecular Methods	42
Apr 2	W	Control of Microorganisms in Food: Cleaning, Sanitation, Physical Removal	31, 32
Apr 4	F	Control of Microorganisms in Food: Thermal, Low Temperature	33, 34
Apr 14	M	Control of Microorganisms in Food: A_w, pH, Modified Atmosphere	35, 36, 37
Apr 16	W	**Examination III**	
Apr 18	F	**Break – Easter**	
Apr 21	M	Control of Microorganisms in Food: Natural and Food-grade Antimicrobials, Bacteriophages	38
Apr 23	W	Control of Microorganisms in Food: Irradiation, New Processing Technologies and the Hurdle Concept	39, 40, 41
Apr 25	F	Hazard Analysis and Critical Control Points: HACCP	Appendix C

Apr 28	M	**Student Presentations**
Apr 30	W	**Student Presentations**
May 2	F	**Summary and Discussion**
May 5-9	M-F	**Final Exam According to the University of Wyoming Schedule**