FOOD MICROBIOLOGY
Biology 4770

COURSE OUTLINE WINTER 2015

Instructor:
Dr. Heidi Schraft
Biology, CB4015
Phone: 343-8351
Email: heidi.schraft@lakeheadu.ca

Office hours: Wednesday, 9 – 10am, or email for an appointment

Laboratory Instructor:
Mike Moore
Biology, CB3011A
Phone: 343-8909
Email: mnmoore@lakeheadu.ca

Teaching Assistant
BalRam Adhikari
Email: badhikar@lakeheadu.ca

Lectures	Wednesday, Friday: 11:30am - 1:00pm ATAC 1010
Laboratory Sessions	Thursday: 8:30am - 11:30am, CB 3012

Prerequisites:
Biology 2711, or equivalent basic microbiology course, or permission of instructor

Course Goals: *What will you learn?*

After successful completion of this course you will...

- understand the effects and significance of the presence and/or growth of microorganisms in foods.
- comprehend conditions that control microorganisms in foods and be able to apply this understanding to food processing situations.
- master the methods commonly used to detect, enumerate and identify microorganisms associated with foods and to understand the theory behind these methods.
- have developed the skills necessary to critically assess and communicate microbiological data.
- have improved your problem solving skills.
- have gained experience in using various tools (both electronic and printed) to locate up-to-date information in Food Microbiology.

Course Structure: *How will you learn?*

- **Lectures:** Readings from the textbook will be assigned for most lectures. During classes the information from the book will be complemented with additional background, problem solving exercises and discussions. You are expected to prepare for each lecture by reading the assigned text and to participate in class discussions.
- **Laboratories:** A problem based approach is taken for the labs. A short case study is presented at the beginning of each laboratory exercise. Methods and procedures necessary to solve the problem are compiled in a separate section of the lab manual. To prepare for each lab you will have to outline the experiments needed to arrive at a solution. You are also expected to keep an up-to-date lab-book. Laboratory exercises will be performed in groups. Laboratory participation and submissions of laboratory questions will be graded.
- **Assignments:** Two assignments will be given: You will be required to submit a comprehensive report for one of the laboratory case studies. Second, you will be given a set of questions to be answered in short essay format.
- **Tests:** Testing includes three announced in-class tests and a final three-hour examination. They consist mostly of short-answer questions.

Performance Evaluation:

Activity	**Weight**
Laboratories	15%
Class Participation (i>Clicker)	5%
Assignments Full Lab Report: 15% Assignment: 5%	20%
In-class quizzes *Best two of the three count*	20%
Final exam	40%

D2L:

You will have access to a course homepage through D2L where you'll find slides used in lectures, course updates, and links to selected web-sites.

Texts:

Mandatory:

- Montville, T.J. and K.R. Matthews. 2012. Food Microbiology: An Introduction. 3rd edition. ASM Press, Washington, DC. Available at the bookstore. (The 2nd edition of this book is fine to use as well.)
- Laboratory Manual, compiled by H. Schraft, Available at the bookstore.

Highly recommended:

A good basic microbiology textbook may also be useful (many are available in the library):

- Nester et al. Microbiology: A Human Perspective. McGraw-Hill, Boston.
- Black, J. Microbiology: Principles and Explorations. John Wiley & Sons, New York, NY.
- Madigan, M.T., Martinko, J.P. and Parker J. Brock - Biology of Microorganisms, Prentice Hall, Upper Saddle River, NJ

- Additional textbooks and reference materials will be placed in the library on reserve.

Required i>clicker2

In addition to the text-book, you will need an i>clicker2

- i>clicker2 is available at the bookstore. You may be able to buy a used i>clicker from another student.
- to have your i>clicker performance counted towards the course grade, you will need to register it in class.

NOTE: Starting Fall 2013, only i>clicker will be used in Biology courses.

Academic Dishonesty and Plagiarism

This course will have a zero-tolerance for academic dishonesty and plagiarism. For further information, please refer to the Code of Student Conduct and the Lakehead University Calendar (Section IX).

What is Plagiarism?

Plagiarism is taking the ideas or words of others and passing them off as your own. Plagiarism is a type of intellectual theft.

Plagiarism can take many forms, from deliberate cheating to accidentally copying from a source without acknowledgement. Plagiarism can have serious consequences, so it is important that students be aware of what it is, and how to avoid it.

It is also plagiarism, to submit an assessment item that has already been submitted for academic credit elsewhere, or to knowingly permit your work to be copied by another student.

There are very serious penalties for plagiarism, ranging from re-submission, reduction of marks (including to zero), failure of the course, and exclusion from the university.

Schedule for Lectures:

Date	Topic of Lecture	Quizzes and Materials due
Jan. 7	Historical perspective and scope of Food Microbiology Types and sources of microorganisms in foods	
Jan. 9		
Jan. 14	Isolation and enumeration of microorganisms in foods Criteria for microbiological quality of foods Sampling plans	
Jan. 16		
Jan. 21	Flora of different food commodities	From this day on, iClicker will count for class participation mark
Jan. 23		
Jan. 28	Factors affecting growth and survival of microorganisms in foods: intrinsic factors, extrinsic factors, interaction of factors, hurdle concept	Jan. 28: Test #1
Jan. 30		
Feb. 4		
Feb. 6	Control of microorganisms in foods: - High temperature processing - Low temperature preservation - Fermentation - Preservation with chemicals, Irradiation	
Feb. 11		
Feb. 13		
Feb. 18 – 20	STUDY WEEK	
Feb. 25	Introduction to HACCP, Overview foodborne pathogens	Assignment 1 - Lab Report due
Feb 27	Foodborne Intoxications and Toxico-Infections: *S. aureus* and *B. cereus*	Feb 27: Test #2
Mar. 4		
Mar. 6	Foodborne Intoxications and Toxico-Infections - *C. botulinum* - *C. perfringens*	**Mar. 6:** Last day to withdraw without academic penalty
Mar.11		
Mar. 13	Foodborne infections - *Salmonella* - *Listeria* - *Campylobacter* - *E. coli*	Assignment 2 due
Mar. 18		
Mar. 20		
Mar. 25		
Mar. 27	Parasites and Viruses	Mar. 27: Test #3
Apr. 1	Regulations and Rapid Methods in Food Microbiology	

Schedule for Laboratory Sessions:

Date	Topic	Lab Questions Due
Jan. 8	No Lab	
Jan 15	No Lab	
Jan. 22	Safety Laboratory 1: Review Techniques	
Jan. 29	Laboratory 1: Review Techniques Preparation for Laboratory 2	Lab-Questions 1
Feb. 5	Laboratory 2: Quality Control	Lab-Questions 2
Feb. 12	Laboratory 2: Quality Control Preparation for Laboratory 3	
Feb. 18-22	STUDY WEEK	
Feb. 26	Laboratory 3: Spores and Sporeformers Preparation for Laboratory 4	Lab-Questions 3
Mar. 5	Laboratory 4: Intoxications	
Mar. 12	Laboratory 4: Intoxications Preparation for Laboratory 5	Lab-Questions 4
Mar. 29	Laboratory 5: Infections	Lab-Questions 5
Mar. 26		
Apr. 2		