FOOD MICROBIOLOGY
Biology 4770

COURSE OUTLINE WINTER 2019

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

Office hours: Tuesday, Wednesday, Friday: 1 – 2 pm
You can also email for an appointment.

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

Teaching Assistant:
Martina Agostino
Email: magosti1@lakeheadu.ca

Lectures	Monday, Wednesday: 10:00am - 11:30am ATAC 1010
Laboratory Sessions	Thursday: 8:30am - 11:30am, CB 3012

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

Learning Objectives: *What will you learn?*
After successful completion of this course you will be able to...

- describe and assess the effects and significance of the presence and/or growth of spoilage and pathogenic microorganisms in foods.
- describe conditions that control microorganisms in foods and use this understanding to solve problems in food processing situations.
- master the methods commonly used to detect, enumerate and identify microorganisms associated with foods and explain the theory behind these methods.
- critically assess and communicate microbiological data.
- explain why microbiological quality control programs are necessary in food production.

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 types of assignments will be given:
    - You will be required to submit a comprehensive report for one of the laboratory case studies.
    - Second, there will be brief assignments on D2L throughout the semester.
- **Tests:** Testing includes three announced in-class tests and a final three-hour examination. They consist mostly of long-answer questions.

Performance Evaluation:

Activity	**Weight**
Laboratories	15%
Class Participation (i>Clicker)	5%
D2L Assignments	5%
Lab Report – Quality Control	15%
In-class quizzes *Best two of the three count*	25%
Final exam	35%

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

Texts:
Mandatory:
- Montville, T.J. and K.R. Matthews. 2014. Food Microbiology: An Introduction. 4th edition. ASM Press, Washington, DC. Available in the bookstore. (The 3rd 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):
- Foster et al., Microbiology: The Human Experience. Norton.
- 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. **There is no need to register on-line, in-class registration will save you the on-line fee!**

Accommodation for Disabilities

Lakehead University is committed to achieving full accessibility for persons with disabilities. Disabilities include physical disability, learning disability, mental disorder etc.

Part of this commitment includes arranging academic accommodations for students with disabilities to ensure they have an equitable opportunity to participate in all of their academic activities. If you think you may need accommodations, you are strongly encouraged to contact Student Accessibility Services (SAS) and register as early as possible. For more information, please visit: http://studentaccessibility.lakeheadu.ca

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
Mon	Jan. 7	Overview and history of food microbiology	
Wed	Jan. 9	Growth, survival and death of bacteria in foods	
Mon	Jan. 14	Detection and enumeration of bacteria in foods	
Wed	Jan. 16	Detection and enumeration of bacteria in foods	Jan. 18: Last day to add
Mon	Jan. 21	Indicator organisms and microbiological criteria	From this day on, i>Clicker will count
Wed	Jan. 23	Indicator organisms and microbiological criteria	
Mon	Jan. 28	**Test #1**	Jan. 28: Test #1
Wed	Jan. 30	Lactic acid bacteria and fermentation	
Mon	Feb. 4	Red meat, poultry, seafood and meat products	
Wed	Feb. 6	Milk and dairy products	
Mon	Feb. 11	Produce	
Wed	Feb. 13	**Test #2**	Feb. 13: Test #2
	Feb. 18 – 22	February Break	
Mon	Feb. 25	Chemical antimicrobials	
Wed	Feb. 27	Biologically based preservation and probiotic bacteria	
Mon	Mar. 4	Physical methods of food preservation and nonthermal processing	March 4: Lab Report due
Wed	Mar. 6	HACCP, food safety objectives and sanitation	**March 8:** Last day to withdraw
Mon	Mar. 11	*Staphylococcus aureus*, *Bacillus cereus*	
Wed	Mar. 13	*Clostridium botulinum*, *Clostridium perfringens*	
Mon	Mar. 18	**Test #3**	March 18: Test #3
Wed	Mar. 20	*Salmonella enterica*	
Mon	Mar. 25	*Salmonella enterica*	
Wed	Mar. 27	Selected foodborne infections	
Mon	Apr 1	Selected foodborne infections	
Wed	Apr. 3	Selected foodborne infections	

Schedule for Laboratory Sessions:

Date	Topic	Lab Questions Due
Jan. 10	No Lab	
Jan 17	Safety Laboratory 1: Review Techniques	
Jan. 24	Laboratory 1: Review Techniques Preparation for Laboratory 2	Lab-Questions 1
Jan. 31	Laboratory 2: Quality Control	Lab-Questions 2
Feb. 7	Laboratory 2: Quality Control Preparation for Laboratory 3	
Feb. 14	Laboratory 3: Spores and Sporeformers Preparation for Laboratory 4	Lab-Questions 3
Feb. 18 - 22	Study Week	
Feb. 28	Laboratory 4: Intoxications	
Mar. 7	Laboratory 4: Intoxications Preparation for Laboratory 5	Lab-Questions 4
Mar. 14	Laboratory 5: Infections	Lab-Questions 5
Mar. 21		
Mar. 28		
Apr. 4		