

**Biology of Microorganisms 2016F (Biology 2711)**

**Lecture:** Monday & Wednesday 1:00 pm – 2:30 am (Room RB2047)  
**Course instructor:** Kam Tin Leung, CB4024 (Office hour – Monday 2:30 - 3:30 pm)  
**Phone:** 343-8265  
**E-mail:** [ktleung@lakeheadu.ca](mailto:ktleung@lakeheadu.ca)  
**Lab:** Room CB 3012 (Starts in the 2<sup>nd</sup> week of the term)  
**Lab instructor:** Michael Moore, CB3011  
**Phone:** 343-8909  
**E-mail:** [mnmoore@lakeheadu.ca](mailto:mnmoore@lakeheadu.ca)

This course gives an overview of the biology of microorganisms. Two major areas will be covered in this course. Theme 1 includes some history and general aspects of microbiology, bacterial cell structure, metabolism and taxonomy. Theme 2 includes general bacterial and viral genetics. Specific disciplines of microbiology will be offered in the 3<sup>rd</sup> and the 4<sup>th</sup> years (e.g. Pathogenic Bacteriology, Applied and Environmental Microbiology, Food Microbiology, Biology of Food Safety, Molecular Genetics, Biology of Fungi, Parasitology, Research Internship and Honours Thesis).

Michael Moore is the lab instructor of the Biology of Microorganisms course. The lab is a mandatory part of this course. Students will learn basic skills in handling bacteria, proper use of microscope, staining and aseptic techniques, characterize and identify microorganisms.

Textbook	Microbiology by Foster et al.
Class notes	D2L
Lab book	D2L
Lecture	Mon & Wed 1:00 – 2:30 am (Room RB2047).
Lab	CB 3012
Final date to register	Sept. 19 (Monday)
Final date to withdraw	Nov. 7 (Monday)
1st midterm exam (20%)	Sept. 28 (Wednesday)
2 <sup>nd</sup> midterm exam (20%)	Oct. 31 (Monday)
Final exam (30%)	To be arranged
Laboratory (30%)	
Total = 100%	

**Lecture schedule for Biology of Microorganisms (Biol. 2711)**

- May change depending on the progress of the course.

Date	Topic
Sept. 7 (Wed)	Introduction and general microbiology
Sept. 12 (Mon) Sept. 14 (Wed)	Introduction and general microbiology Introduction and general microbiology
Sept. 19 (Mon) Sept. 21 (Wed)	Cell structure and function Cell structure and function
Sept. 26 (Mon) Sept. 28 (Wed)	Cell structure and function <b>1<sup>st</sup> Mid-term exam</b>
Oct. 3 (Mon) Oct. 5 (Wed)	Microbial metabolism Microbial metabolism
Oct. 17 (Mon) Oct. 19 (Wed)	Microbial metabolism Microbial growth
Oct. 24 (Mon) Oct. 26 (Wed)	Sterilization, disinfection and antimicrobial agents Antibiotics
Oct. 31 (Mon) Nov. 2 (Wed)	<b>2<sup>nd</sup> Mid-term exam</b> Molecular genetics: DNA replication
Nov. 7 (Mon) Nov. 9 (Wed)	Molecular genetics: DNA replication Gene expression and regulations
Nov. 14 (Mon) Nov. 16 (Wed)	Bacterial genetics Bacterial genetics
Nov. 21 (Mon) Nov. 23 (Wed)	Bacterial taxonomy and diversity Bacterial taxonomy and diversity
Nov. 28 (Mon) Nov. 30 (Wed)	Viruses Viruses
Dec. 5 (Mon)	Viruses

### Biology 2711 Lab outline

Lab	Content
Lab 1	Introduction 1. Lab Organization / Safety/ Orientation 2. Media Preparation
Lab 2	Microscopy 1. Assignment of Unknown Cultures 2. Use and care of the Microscope
Lab 3	Staining Methods 1. Preparation of Smears and Simple Staining 2. Differential Stains - The Gram Stain and Acid-Fast Stain 3. Structural Stains - Endospores, capsules, and Flagella
Lab 4	Techniques for Cultivation of Bacteria 1. Transfer of Bacteria: Aseptic Technique 2. Isolation of Bacteria by Dilution techniques 3. Special Media for Isolating Bacteria
Lab 5	Microbial Metabolism 1. Exoenzymes 2. Carbohydrate Catabolism I - Endoenzymes - Respiration, Fermentation 3. Carbohydrate Catabolism II – Fermentation 4. Protein Catabolism
Lab 6	Systematic Identification of Bacteria 1. Assignment of Bacterial Unknowns, Primary Characteristics 2. Biochemical Tests - Secondary Characteristics 3. Identification of Your Unknown Organism
Lab 7	Microbial Growth 1. Oxygen, Organisms with Special Atmospheric Requirements 2. Temperature 3. pH 4. Osmotic Pressure
Lab 8	Control of Microbial Growth 1. Physical Control - Heat 2. Physical Control - Ultra-Violet Radiation 3. Chemical Control - Non-Microbial Agents 4. Chemical Control - Antimicrobial Agents - Disc Diffusion
Lab 9	Lab 8 Results/Lab 6 Assignment Due/Review
Lab 10	Lab exam