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**[BIOL.4711] Applied and Environmental Microbiology**

**2023W**

**Professor: Dr. Noreen Yaqoob, PhD**

**Jan 9- Apr 26**

**Email: [nyaqoob@lakeheadu.ca](mailto:nyaqoob@lakeheadu.ca)**

**Lakehead University, 500 University Avenue. Orillia**

**Mode of Study: Lecture at campus**

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**Lecture Timings:** Tuesdays and Thursdays, 8:30 am- 10 am

**Lecture Room: OA 2015**      **Office hours: Tuesdays and Thursdays, 10 am- 12 am**

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**Course Outline:**

A fundamental knowledge of the role of micro-organisms in global nutrient cycles, interrelationships within and between microbial communities and environmental factors affecting microbial structure and function. Microbiological aspects of terrestrial and aquatic environments and selective topics on biotechnology will be discussed. Both traditional and molecular analysis for microbial communities will be introduced.

**Course Content:**

Evolution of biosphere, Physiological ecology and Microbial energetics and survival, Microbial diversity, Microorganisms in aquatic and terrestrial environments, Quantification of environmental microbes (numbers, biomass, activity), Molecular detection of microorganisms, Biogeochemical cycles, Water treatment and bioremediation

**Textbook:**

Environmental Microbiology: From genomes to biogeochemistry, 2<sup>nd</sup> Edition 2016 by Eugene L. Madsen. Blackwell Publishing. The textbook is available for purchase. Please follow the link [https://bookstore.lakeheadu.ca/CourseSearch/?course\[0\]=ORIL%2CWINT23%2CBIOL%2CBIOL4711WA&](https://bookstore.lakeheadu.ca/CourseSearch/?course[0]=ORIL%2CWINT23%2CBIOL%2CBIOL4711WA&)

### Course Timelines:

Dates:	Topics	Textbook	Pages
Jan 10 – Jan 12	Evolution of Biosphere 1	Chapter 2	25-54
Jan 17 - Jan 19	Evolution of Biosphere 2	Chapter 2	25-54
Jan 24 – Jan 26	Physiological Ecology	Chapter 3	56-116
Jan 31 - Feb 2	Microbial Energetics and Survival	Chapter 3	56-116
Feb 7 – Feb 9	Microbial Diversity	Chapter 4 & 5	117-237
Feb 14 – Feb 16	Microbial Diversity	Chapter 4 & 5	117-237
<b>Feb 21 – Feb 23</b>	<b>Reading week</b>		
<b>Feb 28</b>	<b>Mid Term Exam</b>		
Mar 2	Generating and Interpreting Information in Environmental Microbiology: Methods	Chapter 6	238-355
Mar 7 – Mar 9	Generating and Interpreting Information in Environmental Microbiology: Methods	Chapter 6	238-355
Mar 14 – Mar 16	Microbial Biogeochemistry	Chapter 7	356-430
Mar 21 – Mar 23	Microbial Biogeochemistry	Chapter 7	356-430
Mar 28 – Mar 30	Applied Topics in Environmental Microbiology	Chapter 8	432-537
Apr 4 – Apr 6	Water treatment and Bioremediation	Chapter 8	432-537
Apr 11 – Apr 13	Future Frontiers in Applied and Environmental Microbiology	Chapter 9	538-555
<b>Apr 18 – Apr 20</b>	<b>Final Exam</b>		

### Exams

#### **Assessment method and Marks distribution:**

Students progress during the course will be assessed through Assignments, Mid term and Final Exam.

Marks distributions are shown in table below:

Assessment method	Percentage	Dates
<b>Assignment 1</b>	<b>5%</b>	To be submitted by due dates
<b>Assignment 2</b>	<b>5%</b>	
<b>Mid Term</b>	<b>40%</b>	Tuesday, Feb 28
<b>Assignment 3</b>	<b>5%</b>	To be submitted by due dates
<b>Assignment 4</b>	<b>5%</b>	
<b>Final Exam</b>	<b>40%</b>	*April 14 to April 24 likely on April 18 or April 20th
<b>Exam Total</b>	<b>100</b>	

*\*Final Exam dates to be announced*

## **Teaching Mode: Lecture**

Lecture's will be delivered in class at the campus and presented as PowerPoints Presentation (ppts).

The ppts will be posted on D2L.

Please use the course textbook as reference in addition to the ppts.

Other learning reference material such as research papers will be posted on D2L.

Additional learning materials used in the class may not be possible to post online such as minerals, rocks, fossils or other such learning material pertaining to specific part of a class activity. *This may be subject to change, if time permits.*

## **Announcements:**

All Announcements will be posted on D2L

## **Email Correspondence:**

Please reach out to me for any questions, thoughts or comments you may have. I am here to help you succeed!

\*\*\*\*\*All the Best Wishes to a Happy & Successful Semester 😊\*\*\*\*\*

**The Lakehead University Program Policies are posted for your guidance.**

### **Program Policies**

The following policies have been adopted by the School of Kinesiology and apply to all programs offered by the School. Students are expected to be familiar with these policies and abide by them.

### **Student Code of Conduct**

Lakehead University is committed to the highest standards of academic integrity and honesty. Lakehead University has very strict policies regarding academic dishonesty, such as plagiarism and cheating. Students are expected to be familiar with these standards and to uphold the policies of the University in this respect. [Please refer to the Student Code of Conduct pages.](#)

### **Program Specific Regulations**

It is the responsibility of each student registering at Lakehead University to be familiar with the specific requirements of the degree, diploma, or certificate which he/she seeks.

Each student is responsible for ensuring that the courses selected at registration satisfy the program requirements of the degree sought. Academic advice and counselling for all who need assistance are freely available.

It is also understood that every student, by the act of registering, agrees to abide by all rules and regulations of the University.

Each student is expected to be familiar with the General Information outlined in the Academic Calendar as well as the information pertaining to the faculty or school in which he/she is enrolled. For further information [see this link](#).

### **Mutual Expectations**

In order to promote a collegial and stimulating learning environment, it is important that students and course instructors abide by a mutual code of courtesy and respect.

*Instructor's expectations of the students:*

- Students are asked to be respectful to the instructor, the TAs, and their fellow classmates during both class and laboratory sessions.
- Students must come prepared and on-time for lectures and laboratories (i.e., having completed required readings, wearing proper attire, etc.)
- Students must pay attention and are expected to be active participants in all lecture and laboratory sessions.
- Cell phones must be turned off and put away upon entering the classroom or laboratory (unless an arrangement has been made with the Instructor or TA ahead of time).
- Personal computer use is welcome during class time as long as it is related to the course. The volume must be muted.
- In the event that students must either arrive late or leave early, every effort should be made to minimize disruption when entering or leaving the classroom.
- Students are prohibited from making audio or video recordings of lectures or taking pictures of lecture material.

*Students' expectations of the Instructor:*

- Instructors will come prepared and on-time for lectures and laboratories.
- Questions, discussions, and constructive comments pertaining to class material will be encouraged and are always welcome.
- Instructors will be approachable. If a student is having problems with any aspect of the course, Instructors will be available during office hours or by appointment as indicated on the course outline.
- Instructors will respond to student emails in a timely manner.
- Instructors will return graded material or provide feedback in a timely manner.
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**APA Formatting**

The School of Kinesiology follows the guidelines of the American Psychological Association (more commonly known as APA) as the standard method of formatting for all submitted work, unless otherwise stated by an Instructor. Students should refer to the course material (course outline, assignment instructions, D2L, etc.) for specific instructions and guidance to ensure that documents are formatted properly.

## **Examinations**

All examinations must be written on the scheduled day and time as noted on the course outline or on the final exam schedule. Students who miss exams without a valid reason will receive a mark of “0” for that exam.

When a student knows in advance that he/she will miss an exam, or in the case of a missed exam due to unexpected reasons, the Instructor must be notified as soon as possible. Following a review of the circumstances, alternative arrangements may be considered by the Instructor if the reason is determined to be valid.

All electronic communication devices (e.g., laptop computers, cell phones, etc.) are strictly prohibited during examinations unless previously approved by the Instructor. Any student found using any type of electronic communication device during an exam will receive a mark of “0” on the exam.

## **Email Communication**

All email communication from the School of Kinesiology and from course Instructors will be sent to students’ email addresses provided by Lakehead University (i.e., your “[userid@lakeheadu.ca](mailto:user@lakeheadu.ca)” email address). Students are expected to check their email frequently to make sure that they stay up to date with course news, School information, and events. All School of Kinesiology Instructors and administrative personnel may be contacted by email at “[firstname.lastname@lakeheadu.ca](mailto:firstname.lastname@lakeheadu.ca).” Additional information on email communication may be provided by course Instructors.