



<p><b>BIO 241</b></p> <p><b>Introductory Microbiology</b></p>	<p><b>Semester:</b> Fall, 2014</p> <p><b>Days:</b> Mon and Wed, 1 – 2:15 pm</p> <p><b>Room:</b> A2082</p> <p><b>Lab – day:</b> Mon, 4 – 6:30 pm</p> <p><b>Lab–Room:</b> A2145</p>
	<p><b>Number of credits:</b> 3</p>
<p><b>Prerequisite:</b> Bio 131, Bio 133</p>	<p><b>Instructor:</b> Jessmi Ling</p> <p><b>Email:</b> jling@ambrose.edu</p> <p><b>Phone:</b> 403-410-2000 (2919)</p> <p><b>Office:</b> A2158</p> <p><b>Office hours:</b> By appointment</p>

**Course Description:**

Microbiology explores the biology of microorganisms, namely viruses, bacteria, unicellular and microscopic multicellular eukaryotes. The course will review fundamental information about the biology of these organisms and will expand this knowledge base with microbial genetics, diversity and ecology. The field of applied microbiology will also be explored in topics regarding health, industry and the environment. The accompanying laboratory component will introduce a variety of laboratory techniques to identify microorganisms.

**Further Course Information:**

**Expected Learning Outcomes:**

It is the aim of the course that students acquire the following skills:

1. Understand the basic features of microbes.
2. Understand and appreciate the diversity of microbes.
3. Comprehend the intimate interaction between humans and microbes in health, industry and the environment.
4. Competently handle and experiment on bacteria.

**Important Dates:**

First day of classes: September 3, 2014

Registration revision period: September 14, 2014

Last day to request revised examination: October 27, 2014

Last day to withdraw from course: November 12, 2014

Last day to apply for time extension for coursework: November 24, 2014

Last day of classes: December 9, 2014

<p><b>Final Exam: December 13, 2014</b></p> <p><b>Time: 1:00 PM – 4:00 PM</b></p> <p><b>Room: A2145</b></p>
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**Outline:**

Date	Topic	Chapter
Wed. Sept 3	Introduction to the course.	
<b>A. Microbial cell structure, function and genetics</b>		
Wed. Sept 3	Overview of general microbiology	1 and 2
Mon. Sept 8 Lab	Cell structure and function in <i>Bacteria</i> and <i>Archaea</i> . Lab 1: Introduction and analyses of microbial communities. Assignment due – Sept 15 Sample collection.	3 22
Wed. Sept 10	Molecular biology of <i>Bacteria</i> , <i>Archaea</i> and Eukaryotes.	6 and 7
Mon. Sept 15 Lab	Regulation of gene expression. Microbial growth and factors influencing it. Lab 2: Morphology of colonies on plates. Isolate selection or assignment of student per unknown isolate followed by subculture of isolate on LB and TSA as the master plate. Assignment due – Sept 22 Term paper 1 instructions.	8 4(I), 5
Wed. Sept 17	Genetics of <i>Bacteria</i> and <i>Archaea</i>	10
Mon. Sept 22 Lab	Viruses and Virology. Lab 3: Colony count assignment. Serial dilution and enumeration of bacterial colonies and viral plaques. Morphology of selected unknown isolate on LB agar and TSA.	9

	Assignment due – Oct 6	
Wed. Sept 24	Spiritual Emphasis Day (no class)	
Mon. Sept 29 Lab	<b>Test 1 (Chapters 3, 6, 7, 8, 9 and 10)</b> Term paper 2 instructions. Lab 4: Bacterial stain. Gram, negative, capsule and endospore staining techniques, followed by microscopy. Assignment for Lab 4 due – Oct 8	
<b>B. Microbial metabolism</b>		
Wed. Oct 1	Metabolism of microorganisms	4(II-V)
Mon. Oct 6 Lab	Phototrophy, chemolithotrophy and major biosyntheses Lab 5: Bacterial biochemical properties. Inoculation of unknown isolate and controls in various tests. Data collection (bring your camera) in A2145: Tues, Oct 7 anytime between 9:30 am – 2:30 pm. Thurs, Oct 9 anytime between 9:30 am – 2:30 pm. Assignment for Lab 5 due – Oct 20 Microscopy of Lab 4 slides.	13
Wed. Oct 8	Catabolism of organic compounds	14
Mon. Oct 13	Thanksgiving (no classes)	
Wed. Oct 15	Industrial microbiology	15
Mon. Oct 20 Lab	<b>Test 2 (Chapters 4, 5, 13, 14 and 15)</b> Microbial evolution and systematics Lab 6: Ribosomal Database Project. Analysis of 16S rRNA gene and identification of unknown isolate. Assignment for Lab 6 due – Oct 27	16
<b>C. Microbial evolution, diversity and ecology</b>		

Wed. Oct 22	Major microbial habitats and diversity	23
Mon. Oct 27 Lab	Nutrient cycles, biodegradation and bioremediation Lab 7: Case Study: Microbial oil degradation. Assignment for Lab 6 is due – Nov 10	24
Wed. Oct 29	Microbial symbioses	25
Mon. Nov 3 Lab	Microbial growth control Microbial interactions with humans	26 27
Wed. Nov 5	<b>Test 3 (Chapters 16, 23, 24, 25 and 26)</b>	
<b>D. Microbe-Human interactions</b>		
Mon. Nov 10 Lab	Immunity and host defense Diagnostic immunology. Lab 8 Immunology tutorial. Assignment due – Nov 19 <a href="http://www.docvid.com/immunesystem.php#0_2">http://www.docvid.com/immunesystem.php#0_2</a>	28 31
Wed. Nov 12	Immune response in a nutshell	29, 30
Mon. Nov 17 Lab	<b>Test 4 (Chapters 27, 28, 29, 30 and 31)</b> Lab 9: Microscopy of selected pathogens. Assignment due – Nov 24	
Wed. Nov 19	Epidemiology	32
Mon. Nov 24 Lab	Person-to-person microbial diseases Lab 10: Typhoid Mary. Assignment due – Dec 1	33
Wed. Nov 26	Vectorborne and soilborne microbial pathogens	34
Mon. Dec 1 Lab	Wastewater treatment, water purification and waterborne microbial diseases Questions and answers session on Term Papers 1 and 2, as	35

	well as Term Paper 1 presentation.	
Wed. Dec 3	Food preservation and foodborne microbial diseases Term paper 2 due by email.	36
Mon. Dec 8 No Lab	<b>Test 5 (Chapters 32 – 36)</b>	
Sat. Dec 13 A2145 1 – 4 PM	Term paper 1 presentations. Term paper 1 deadline at midnight by electronic submission to <a href="mailto:jling@ambrose.edu">jling@ambrose.edu</a>	

### Requirements:

Tests will consist of short answer questions based on topics covered during lectures. The tests are not cumulative. Each test carries 12% of the total course marks. The final exam for this course is replaced by Term paper 1 with presentations held on the allotted final exam time and venue. Please refer to Term paper 1 outline for further instructions.

Students must score a minimum of 60% for the Bio 241L in order to have it included in the final marks used to determine their grades. Assignments for the Bio 241L are due at various dates – please note deadlines in Moodle and in the assignment sheets.

### Submission of Assignments:

Due dates for assignments are provided in the lecture and laboratory schedule. Format for each assignment are specified in the assignment sheets. Late submissions are not accepted unless sufficient reason is provided as a written request for extension to the instructor prior to the due date. Note that any request for extension is not automatically granted. Each request is assessed individually and the length of extension, if any, will vary. The instructor's decision on the extension is final.

### Attendance:

There are no penalties for non-attendance for any lectures. However, attendance is compulsory for all laboratory exercises, presentations, tests and exams. Allocated marks will not be awarded if student is absent from any laboratory, presentation, test or exam without notice and sufficient reason.

### Evaluation:

#### Mark distribution:

Term paper 1 and presentation	12%
Term paper 2	8%
Tests (5 × 12%)	60%
Lab component	20%

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The sum of all laboratory assignment marks is 1500, from where 20% of the laboratory component marks will be calculated.

Laboratory assignment marks distribution:

Lab 1	100
Lab 2	100
Lab 3	100
Lab 4	200
Lab 5	300
Lab 6	200
Lab 7	200
Lab 8	100
Lab 9	100
Lab 10	100

Because of the nature of the Alpha 4.00 system, there can be no uniform College-wide conversion scale. The relationship between raw scores (e.g. percentages) and the resultant letter grade will depend on the nature of the course and the instructor's assessment of the level of each class, compared to similar classes taught previously.

Please note that final grades will be available on student registration system. Printed grade sheets are no longer mailed out.

## Grade Summary:

The scale which indicates how percentages will be translated to letter grades is as follows:

A+	90.0 – 100%	C+	67.0 – 69.9%
A	85.0 – 89.9%	C	63.0 – 66.9%
A-	80.0 – 84.9%	C-	60.0 – 62.9%
B+	77.0 – 79.9%	D+	55.0 – 59.9%
B	73.0 – 76.9%	D	50.0 – 54.9%
B-	70.0 – 72.9%	F	Below 49.9%

The available letters for course grades are as follows:

<u>Letter Grade</u>	<u>Description</u>
A+	
A	Excellent
A-	
B+	
B	Good
B-	
C+	
C	Satisfactory
C-	
D+	
D	Minimal Pass
F	Failure

## Textbooks:

### Required textbook:

Brock Biology of Microorganisms. Madigan MT, Martinko JM, Stahl DA and Clark DP. 2012. 13<sup>th</sup> edition. Benjamin Cummings. (ISBN-13: 978-0321649638).

Note: 14<sup>th</sup> edition (2014) is available. If you choose to purchase this edition, please take note of changes in page or figure numbers referenced in lectures. Lectures and assignments are based off the 13<sup>th</sup> edition.

### Recommended textbook for Bio 241L:

Techniques in Microbiology. A Student Handbook. Lammert JM. 2007. Pearson Education, Inc. (ISBN-13: 978-0132240116).

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## Policies:

All students have received an Ambrose e-mail account upon registration. It is the student's responsibility to check this account regularly as the Ambrose email system will be the professor's instrument for notifying students of important matters (Cancelled class sessions, extensions, requested appointments, etc.) between class sessions. If students do not wish to use their Ambrose accounts, it is highly recommended that they forward all messages from the Ambrose account to the other account.

During the **Registration Revision Period** students may to enter a course without permission, change the designation of any class from credit to audit and /or voluntary withdraw from a course without financial or academic penalty. These courses will not appear on the student's transcript. Courses should be added or dropped on the student portal by the deadline date, please consult the List of Important Dates. After that date, the original status remains and the student is responsible for related fees.

Students intending to withdraw from a course after the Registration Revision Period must apply to the Office of the Registrar by submitting a Request to Withdraw from a Course by the **Withdrawal Deadline**, please consult the List of Important Dates. Withdrawal from courses after the Registration Revision period will not be eligible for tuition refund. A grade of "W" will appear on the student's transcript.

Students wishing to withdraw from a course, but who fail to do so by the applicable date, will receive the grade earned in accordance with the course syllabus. A student obliged to withdraw from a course after the Withdrawal Deadline because of health or other reasons may apply to the Registrar for special consideration.

Students, who find a conflict in their exam schedule must submit a **Revised Examination** Request form to the Registrar's Office by the deadline date, please consult the List of Important Dates. Requests will be considered for the following reasons only: 1) the scheduled final examination slot conflicts with another exam; 2) three final exams within three consecutive exam time blocks; 3) the scheduled final exam slot conflicts with an exam at another institution; 4) extenuating circumstances. Travel is not considered a valid excuse for re-scheduling or missing a final exam.

### Electronic Etiquette

Students are expected to treat their instructor, guest speakers, and fellow students with respect. It is disruptive to the learning goals of a course or seminar and disrespectful to fellow students and the instructor to engage in electronically-enabled activities unrelated to the class during a class session. Please turn off all cell phones and other electronic devices during class. Laptops should be used for class-related purposes only. Please do not use iPods, MP3 players, or headphones. Do not text, read, or send personal emails, go on Facebook or other social networks, search the internet, or play computer games during class. The professor has the right to disallow the student to use a laptop in future lectures and/or to ask a student to withdraw from the session if s/he does not comply with this policy. Repeat offenders will be directed to the Dean. If you are expecting communication due to an emergency, please speak with the professor before the class begins.

### Academic Policies

It is the responsibility of all students to become familiar with and adhere to academic policies as stated in the Academic Calendar. Personal information, that is information about an individual that may be used to identify that individual, may be collected as a requirement as part of taking this class. Any information collected will only be used and disclosed for the purpose for which the collection was intended. For further information contact the Privacy Compliance Officer at [privacy@ambrose.edu](mailto:privacy@ambrose.edu).

### Extensions

Although extensions to coursework in the semester are at the discretion of the instructor, students may not turn in coursework for evaluation after the last day of the scheduled final examination period unless they have received permission for a "**Course Extension**" from the Registrar's Office. Requests for course extensions or alternative examination time must be submitted to the Registrar's Office by the deadline date, please consult the List of Important Dates. Course extensions are only granted for serious issues that arise "due to circumstances beyond the student's control".

### Appeal of Grade

An appeal for change of grade on any course work must be made to the course instructor within one week of receiving notification of the grade. An appeal for change of final grade must be submitted to the Office of the Registrar in writing within 30 days of

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receiving notification of the final grade, providing the basis for appeal. A review fee of \$50.00 must accompany the appeal to review final grades. If the appeal is sustained, the fee will be refunded.

### **Academic Integrity**

We are committed to fostering personal integrity and will not overlook breaches of integrity such as plagiarism and cheating. Academic dishonesty is taken seriously at Ambrose University College as it undermines our academic standards and affects the integrity of each member of our learning community. Any attempt to obtain credit for academic work through fraudulent, deceptive, or dishonest means is academic dishonesty. Plagiarism involves presenting someone else's ideas, words, or work as one's own. Plagiarism is fraud and theft, but plagiarism can also occur by accident when a student fails or forgets to give credit to another person's ideas or words. Plagiarism and cheating can result in a failing grade for an assignment, for the course, or immediate dismissal from the university college. Students are expected to be familiar with the policies in the current Academic Calendar that deal with plagiarism, cheating, and the penalties and procedures for dealing with these matters. All cases of academic dishonesty are reported to the Academic Dean and become part of the student's permanent record.

Students are strongly advised to retain this syllabus for their records.

### **Other**

*Any added features in the syllabus are optional. You may or may not wish to include elements such as a bibliography, reading list, schedule of lectures/topics, or reporting form.*