MCB101 Introductory Microbiology Lab
Syllabus, Course Policies and Schedule
Spring 2014

Course Instructor and Laboratory Coordinator:
Dr. Kenneth Chapman
Office: 241 Burrill Hall
Hours: M 3:15 – 3:45 PM, TW 3:15 – 5 PM, Thurs. 3 – 4 PM
Phone: 217-244-4941 (4-4941)
e-mail: kenchap@life.uiuc.edu

Teaching Assistants
Section A Monday and Wednesday 3 – 4:50 PM
TA: Weiho Ge
e-mail: wge2@illinois.edu
Section B Monday and Wednesday 5 PM – 6:50 PM
TA: Joseph Brodsky
e-mail: jbrodsk2@illinois.edu
Section C Tuesday and Thursday 8 – 9:50 AM
TA: Daryl Meling
e-mail: dmeling@illinois.edu
Section D Tuesday and Thursday 10 – 11:50 AM
TA: Daryl Meling
e-mail: dmeling@illinois.edu
Section E Tuesday and Thursday 1 – 2:50 PM
TA: Hanna Erickson
e-mail: herick3@illinois.edu
Section F Tuesday and Thursday 3 – 4:50 PM
TA: Joseph Brodsky
e-mail: jbrodsk2@illinois.edu
Section G Tuesday and Thursday 5 – 6:50 PM
TA: Gus Lawrence
e-mail: glawre2@illinois.edu
Section H Tuesday and Thursday 7 – 8:50 PM
TA: Gus Lawrence
e-mail: glawre2@illinois.edu

Course Description:
Laboratory introduction to the techniques employed in the investigation of microbial activities and properties; experiments designed to familiarize the student with the handling, identification, and characterization of microorganisms and their activities.
Credit:
2 credit hours. Students must register for one lab-discussion and one lecture section. Credit is not given for both MCB 101 and MCB 301.

Prerequisite:
Credit or concurrent registration in MCB 100.

Required Course Materials:
1. The Lab Manual
   Introductory Experimental Microbiology: Laboratory Exercises for MCB 101, Spring 2014
   by: Kenneth A. Chapman and Tina M. Knox.
2. Spiral notebook
3. Ruler
4. Calculator (with logarithmic and exponent functions)

Note: A ruler and calculator should be brought to EVERY exam and lab period.

Recommended Materials:
Microbiology, With Diseases by Taxonomy
(4th Custom Edition for the University of Illinois) by: Robert W. Bauman
Copies of this text will be on reserve in the Undergraduate Library.

Course Policies
All students are assumed to have read and understood the “Code of Policies and Regulations Applying to All Students,” University of Illinois, and will be expected to act accordingly. The Code is available online at: http://www.admin.uiuc.edu/policy/code/index.html

Attendance Policies:
If you have any valid schedule conflicts or must be absent due to illness, contact Dr. Chapman. All students should read and understand attendance policies that are printed in the lab manual.

Academic Integrity:
All students are expected to have read the statement on academic integrity in the course lab manual and will be expected to act accordingly. Cheating or plagiarism of any kind will not be tolerated. All parties involved will be punished in accordance with class policies.

Disabilities and Religious Observances:
Please contact Ken Chapman during the first week of classes to make requests for disability accommodations or observation of religious holidays.
Basis of Course Grade:
Student grades in MCB 101 will be based on total of 1000 points. While the instructor reserves
the right to make minor changes or corrections, the distribution of points will closely resemble
the following:

- Lecture assignments (5 pts. each) 50 points nominal
- LON-CAPA homework assignments 220 points nominal
- LON-CAPA based labs 40 points possible
- Lab worksheets 290 points nominal
- 2 hourly exams (100 pts. Each) 200 points possible
- 1 final exam (100 pts.) 100 points possible
- Lab practical exam (4 parts) 100 points possible

The Grading Scale
A+ > 966 points
A 966 – 933 points
A- 932 – 900 points
B+ 899 – 867 points
B 866 – 833 points
B- 832 – 800 points
C+ 799 – 767 points
C 766 – 733 points
C- 732 – 700 points
D+ 699 – 667 points
D 666 – 633 points
D- 632 – 600 points
F < 599 points

Note: It is theoretically possible for a student to get more than 1000 points but the 1000 point
scale given above will be used to determine final grades.

Spring Semester 2014
MLK Day – No Class Monday & Tuesday, January 20 & 21
MCB101 Lab Instruction Begins Wednesday, January 22
Spring Vacation Begins Saturday, March 22
Instruction Resumes Monday, March 31
Instruction Ends Wednesday, May 7
Reading Day Thursday, May 8
Final Examinations Begin Friday, May 9
End Friday, May 16
Commencement Saturday, May 17
MCB101 Introductory Microbiology Lab
Course Schedule Spring 2014

January 22/23 Lab Day 1
Lab Safety, Required Materials, Policies, Drawers and Using LON-CAPA  read pages: i – xvi
LON-CAPA Prelab – 1 Microscopy  opens at 8 AM,  due 1:00 PM on Wednesday, January 29

January 24 Lecture 1 Microscopy and Stains
LON-CAPA Quiz -1 opens at 10 AM
covers: Lab Safety, Course Policies and Microscopes  pages i – xvi and 1 - 10
Due: 8:30 AM  Friday, January, 31  (Note: there is a time limit on quizzes.)
LON-CAPA: Prelab – 2 More Microscopy  opens at 10 AM,  due at 1:00 PM on Wed,  Feb. 5

January 27/28 Lab Day 2
Experiment 1 Basic Techniques in Microscopy  pages 1 - 9

January 29/30 Lab Day 3
LON-CAPA: Prelab – 1 Microscopy  due at 1:00 PM on Wednesday, January 29
Experiment 2 Microscopy: Preparing Smears and the Simple Stain  pages 10 – 15

January 31 Lecture 2 Microscopy and Stains  (continued)
LON-CAPA Quiz -1 Due at  8:30 AM
LON-CAPA Quiz -2 Opens at  10:00 AM
covers: Microscopy, Simple and Differential Stains  pages 1 - 24
Due: 8:30 AM  Friday, February 7

February 3/4 Lab Day 4
Experiment 3 The Gram Stain  pages 16 – 18

February 5/6 Lab Day 5
LON-CAPA: Prelab – 2 More Microscopy  due at 1:00 PM on Wed,  Feb. 5
Experiment 4 Microscopy: Bacterial Endospores, Capsules and Flagella pages 19 -24

February 7 Lecture 3 Aseptic technique, Pure Culture, Media, The Streak Plate
LON-CAPA Quiz -2 Due at  8:30 AM
LON-CAPA Quiz -3 Opens at  10:00 AM
covers: Aseptic Technique, Pure Culture, Media, Streak Plate  pages 25 - 44
Due: 8:30 AM  Friday, February 14

February 10/11 Lab Day 6
LON-CAPA: Prelab – 3 Aseptic Technique, Pure Culture, Media, The Streak Plate
  due at 1:00 PM on Monday,  February 10
Experiment 5 Aseptic Technique  pages 25 – 34  introduction and set up
February 12/13  Lab Day 7
Experiment 5  Aseptic Technique  pages 25 – 34  results
Experiment 6  Growth Media and Streak Plates  pages 35 – 44  introduction and set up

February 14  Lecture 4  *Bacterial Nutrition, Enzymes and Adaptations*
LON-CAPA Quiz -3  Due at  8:30 AM
LON-CAPA Quiz -4  Opens at  10:00 AM
covers: Bacterial Nutrition, Enzymes and Adaptations  pages 35 - 67
Due:  8:30 AM  Friday, February 21

February 17/18  Lab Day 8
LON-CAPA: Prelab – 4  *Bacterial Nutrition, Enzymes and Adaptations*
due at 1:00 PM on Monday, February 17
Experiment 6  Growth Media and Streak Plates  pages 35 – 44  results
Experiment 7  Bacterial Nutritional Requirements  pages 45 - 57  introduction and set up

February 19/20  Lab Day 9
Experiment 7  Bacterial Nutritional Requirements  pages 45 - 57  results
Experiment 8  Enzymes and Adaptations  pages 58 – 67  introduction and set up

February 21  Lecture 5  *Enzymes and Biochemical Tests for Bacterial Identification*
LON-CAPA Quiz -4  Due at  8:30 AM
No quiz opens today.  Review for Exam – 1 this week.

February 24/25  Lab Day 10
LON-CAPA: Prelab – 5  *Biochemical Tests for Bacterial ID*  due by 1:00 PM, Monday 2/24/14
Experiment 8  Enzymes and Adaptations  pages 58 – 67  results
Experiment 9  Biochemical Tests for Bacterial ID  pages 68 – 86  introduction and set up

February 26/27  Lab Day 11
Experiment 9  Biochemical Tests for Bacterial ID  pages 68 – 86  results

February 28  EXAM – 1  *Covers Experiments 1 – 8*
LON-CAPA Quiz # 5  opens  Biochemical Tests for Bacterial ID  pages 68 – 86
Due Friday,  March 7 at 8:30 AM

March 3/4  Lab Day 12
LON-CAPA: Prelab - 6  *Bacterial ID, Enterobacteriaeae*  due by 1:00 PM, Mon. 3/3/14
Experiment 10  Bacterial ID  pages 87 – 99  day 1, streak plate
Introduction to dilutions/pipettors  handout -  *Practice Using Micropipettors*
Experiment 11  Identification of Bacteria in the family Enterobacteriaeae  pages 100-105
(Virtual lab on LON-CAPA, opens: March 3,  due: March 13.)

March 5/6  Lab Day 13
Experiment 10  Bacterial ID  pages 87 – 99  day 2, Gram Stains
March 7  Lecture 6  Bacterial Identification, Dilution Calculations, Viable Plate Count
LON-CAPA Quiz -5  Due at  8:30 AM
LON-CAPA Quiz -6  Opens at  10:00 AM
covers:  Dilutions, Viable Plate Count, Enterobacteriaceae  pages 100 - 113
Due:  8:30 AM  Friday,  March 14

March 10/11  Lab Day 14
LON-CAPA: Prelab-7  Dilutions, Plate Count, Enterobacteriaceae  due: 1 PM, Mon. 3/10/14
Experiment 10  Bacterial ID  pages 87 – 99  results
Experiment 12  Viable Plate Count  pages 106 - 113  introduction and set up

March 12/13  Lab Day 15
LAB PRACTICAL EXAM  Parts A & B  Gram Stain, Streak Plate
Experiment 12  Viable Plate Count  pages 106 - 113  results
Experiment 11  Identification of Bacteria in the family Enterobacteriaceae  pages 100-105
  (Virtual lab on LON-CAPA, due March 13 at 11 PM)

March 14  Lecture 7  Bacterial Recombination
LON-CAPA Quiz -6  Due at  8:30 AM
LON-CAPA Quiz -7  Opens at  10:00 AM
covers:  Bacterial Recombination  pages 114 - 120
Due:  8:30 AM  Friday,  March 21

March 17/18  Lab Day 16
LON-CAPA: Prelab – 8  Bacterial Recombination  due by 1:00 PM, Mon. 3/17/14
Experiment 13  Bacterial Conjugation  pages 114 - 120  introduction and set up

March 19/20  Lab Day 17
Experiment 13  Bacterial Conjugation  pages 114 – 120  day 2, dilutions and selective plates

March 21  Lecture 8  Bacterial Growth
LON-CAPA Quiz -7  Due at  8:30 AM
LON-CAPA Quiz -8  Opens at  10:00 AM
covers:  Bacterial Growth  pages 121 - 132
Due:  8:30 AM  Friday,  April 4

Spring Break  March 22 - 30

March 31/April 1  Lab Day 18
LON-CAPA: Prelab – 9  Bacterial Growth due at 1 PM Mon. March 31
Experiment 13  Bacterial Conjugation  Final Results, calculate transformation efficiency
Experiment 14  Bacterial Growth  - Exercise on LON-CAPA, Opens Today  see pages 121 - 132

April 2/3  Lab Day 19
Experiment 14  Bacterial Growth  - An Exercise on LON-CAPA  pages 121 - 132
Experiment 14 is on LON-CAPA.  The Lab is closed today.
Work on the growth curve exercise on LON-CAPA for Experiment 14.
April 4  Lecture 9  Control of Bacterial Growth
LON-CAPA Quiz -8  Due at 8:30 AM

April 7/8  Lab Day 20
LON-CAPA: Prelab – 10 Control of Bacterial Growth – Antibiotics  due: 1:00 PM, Mon. 4/7/14

April 9/10  Lab Day 21
Experiment 15  Antibiotics and Disinfectants  pages 133 - 145
Introduction and Set Up - parts A, B & C

April 11  EXAM – 2  Covers Experiments 9 – 14
LON-CAPA Quiz -9  Opens at 10:00 AM
covers: Antibiotics, Disinfectants and Preservatives  pages 133 - 152
Due: 8:30 AM  Friday, April 18

April 14/15  Lab Day 22
LON-CAPA: Prelab – 11 Antibiotics, Disinfectants, Preservatives
Experiment 15  Antibiotics and Disinfectants  results - parts A, B & C

April 16/17  Lab Day 23
Experiment 16  Food Preservatives, Mold Inhibition  pages 146 - 152
Introduction and Set Up

April 18  Lecture 10 Pasteurization of Milk, Enrichment Cultures
LON-CAPA Quiz -9  Due at 8:30 AM
LON-CAPA Quiz -10  Opens at 10:00 AM
covers: Pasteurization and Controlling Bacterial Contamination of Milk  pages 153 - 161
Due: 8:30 AM  Friday, April 25

April 21/22  Lab Day 24
LON-CAPA: Prelab – 12 Pasteurization - due at 1:00 PM Monday, 4/21/14
Experiment 17  Control of Bacteria Using Heat – Pasteurization of Milk  pages 153 - 161
Introduction and Set Up
Experiment 18A  Background - pages 162 – 166, 18A Day 1 Procedure - page 167

April 23/24  Lab Day 25
Experiment 16  Food Preservatives, Mold Inhibition  results
Experiment 17  Control of Bacteria in Milk – Pasteurization  results
Experiment 18A day 2  page 167

April 25  Lecture 11 Lactic Acid Fermentation, The Nitrogen Cycle
LON-CAPA Quiz -10 Pasteurization  Due at 8:30 AM
LON-CAPA Quiz -11 Enrichments, The Nitrogen Cycle  Opens at 10:00 AM
covers: Fermented Milk Products  pages 162 - 170
Due: 8:30 AM  Friday, May 2
April 28/29  Lab Day 26
LON-CAPA: Prelab – 13 Yogurt and Cheese, The Nitrogen Cycle – due at 1 PM, Mon. 4/28/14
LAB PRACTICAL EXAM Parts C & D Viable Plate Count, Dilution Calculations
Experiment 18B Yogurt Production – Set Up page 168
Experiment 19 Soil Bacteria and the Nitrogen Cycle: pages 171 - 186
Introduction and Set Up

April 30/May 1  Lab Day 27
Experiment 18 Fermented Milk Products - part B – Yogurt: Results page 168 – 169
- part C – Cottage Cheese set up page 169
Experiment 19 Soil Bacteria and the Nitrogen Cycle pages 171 – 186 day 2

May 2 Lecture 12 Soil Bacteria
LON-CAPA Quiz -11 Due at 8:30 AM
ICES Evaluations for Dr. Chapman and TAs are now on-line.

May 5/6  Lab Day 28
Experiment 18 Fermented Milk Products – part C Cottage Cheese – Results pages 169 - 170
Experiment 19 Soil Bacteria and the Nitrogen Cycle day 3 finish
Lab Clean Up, Drawer Inventory, ICES Evaluations for Dr. Chapman and TAs are now on-line.

EXAM – 3 The Final Exam
The final exam will be during finals week. May 9 - 16
Time and place TBA.
About three quarters of the exam covers experiments 15 – 20, while the rest covers earlier material.

Pre-lab exercises are on LON-CAPA and are worth 10 points each. They should be completed BEFORE lab work begins. The purpose of the pre-lab is to ensure that you have prepared properly for the lab and have a good grasp of its purpose and, perhaps, the expected results. No late pre-labs will be accepted. No Pre-lab scores will be dropped.

Quizzes are on LON-CAPA and are worth 10 points each. They should be completed before lecture each Friday. The purpose of the quiz is to encourage you to review the background material and to acquire a good grasp of the reasons why the expected results are expected. Quizzes are timed. Study the material before taking the quiz. Make sure you have a good internet connection and electrical power before starting. No late quizzes will be accepted. No Quiz scores will be dropped.

Lab Worksheets: Worksheets are used for recording your observations and presenting your data and analysis. Perforated worksheet pages are located at the end of the lab manual and can be torn out when they are due.
Experiments in MCB101 Spring 2014

Experiment 1     Basic Techniques in Microscopy
Experiment 2     Microscopy: Preparing Smears and the Simple Stain
Experiment 3     The Gram Stain
Experiment 4     Microscopy: Bacterial Endospores, Capsules and Flagella
Experiment 5     Aseptic Technique
Experiment 6     Growth Media and Streak Plates
Experiment 7     Bacterial Nutritional Requirements
Experiment 8     Enzymes and Adaptations
Experiment 9     Biochemical Tests for Bacterial ID
Experiment 10    Bacterial ID
Experiment 11    on LON-CAPA  ID of Bacteria in the family Enterobacteriaceae
Experiment 12    Spread Plate
Experiment 13    Bacterial Recombination – Trans-Species Conjugation
Experiment 14    on LON-CAPA  Bacterial Growth
Experiment 15    Antibiotics and Disinfectants
Experiment 16    Food Preservatives, Mold Inhibition
Experiment 17    Control of Bacteria in Milk - Pasteurization
Experiment 18    Fermented Milk Products - Yogurt and Cheese
Experiment 19    Soil Bacteria and the Nitrogen Cycle

Lab Worksheets  (290 points nominal)

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**LON-CAPA Quizzes**

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**LON-CAPA Pre-Labs**

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