

# General Biology II - BIOL 1202 Laboratory Syllabus

SPRING SEMESTER 2014  
Department of Biology  
College of Arts and Sciences  
North Carolina Central University

## COURSE INFORMATION

**Class meeting times:** Monday, Wednesday & Friday 10:00am-10:50am  
Mary Townes Science Building, Room 1111

**Lab meetings:** For times and instructor, see your schedule.  
Mary Townes Science Building, Room 2161

## COURSE INSTRUCTOR INFORMATION

**Dr. Mabel Royal**  
Mary Townes Science Building  
[mroyal@nccu.edu](mailto:mroyal@nccu.edu)

### Office Hours

TBA

**Dr. Wendy H. Grillo**  
Mary Townes Science Building – Rm 2255  
[wheck@nccu.edu](mailto:wheck@nccu.edu)

### Office Hours

TBA

## POSTDOCTORAL FELLOW

**Dr. David McDonald**  
Mary Townes Science Building – Rm 2179  
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## POLICIES & REQUIREMENTS

### 1. General laboratory safety

- a. No eating, drinking, or placing food or drink on the lab bench, even if you aren't using it. Instead, store your items inside a bag in the cubbyholes at the front of the room or at your feet.
- b. Do not apply makeup, lip balm, or lotion while in lab.
- c. You must wear closed-toed shoes and clothing that does not show too much skin (no short shorts or midriffs showing).
- d. Every week you will wear a lab coat and possibly gloves as your personal protective equipment.
- e. Be aware of the locations of the lab safety equipment:
  - i. Fire extinguisher at the back of the classroom near the prep room
  - ii. Safety shower and eye wash station by the door at the front of the room
  - iii. First aid kit in the cabinet with the red + sign by the door at the front of the room
- f. No cell phones, MP3 players, or any other electronic devices, unless in use for an approved class activity. Otherwise, the devices must be OFF or SILENCED.
- g. Are rude or disrespectful to any person in the room will not be tolerated. This includes talking while the instructor or a classmate is addressing the class.
- h. If asked to leave the lab for any reason, you will receive a zero for that day's work.

## 2. Absences & Late Policy

- a. If you know that you will be absent from or late to lab on a particular day, notify your lab instructor ahead of time. **Excused absences with appropriate documentation will be handled appropriately.**
- b. If you arrive to lab more than 15 minutes late, you may be asked to leave and receive no credit for that day's work.
- c. **There will be NO make-up laboratories. Nor can you attend a different lab section for that week. If you miss laboratory without an excused absence, you will be given a grade of zero.**
- d. Completed assignments must be turned in **at a specified date and time.**
- e. Assignments turned in after the specified time will be considered late, resulting in these grading penalties:
  - i. More than 15 minutes late = 10 point deduction
  - ii. More than 24 hours (1 day) late = 20 point deduction
  - iii. More than 2 days late = 30 point deduction
  - iv. More than 3 days late = a grade of zero for the assignment
- f. If you are submitting a late assignment after your lab period, please place it in the designated dropbox outside of Mary Townes Science Building, Room 2189.
- g. Assignments may be submitted after the due date without penalty if official documentation is provided (**medical, legal, letter from the Dean, etc.**) regarding your absence or tardiness.

## 3. Collaboration, plagiarism and copying

- a. Lab activities require that students work together in groups of 2–4. These groups share **data** and are encouraged to discuss the experiment with each other or members of other groups.
- b. ANY written assignment you turn in must be your own unique work. Written assignments must contain only the ideas, thoughts and words of YOU, the author. Shared **data** and data analysis are the only exceptions.
- c. In cases of copying, both assignments will receive an automatic grade of ZERO.

**Course Assessment: As indicated in your BIOL1202 course syllabus, your lab participation grade is 25% of your BIOL1202 grade. Of that 25% lab participation grade:**

Item	%age of Final Grade
Pre-lab Quizzes	5%
Lab Notebook	5%
Midterm Practical Exam	5%
Lab Reports (X3)	5%
Final Lab Report	5%
<b>Total</b>	<b>25%</b>

## 4. Quizzes

- a. **Online quizzes:** An online (Blackboard or Web-based) quiz will be given every week throughout the semester. The quizzes must be completed before **midnight** of the night before your lab section meets. Quizzes may be retaken up to 2 times and only the highest quiz grade will be recorded. **No late quizzes will be accepted.** No makeup quizzes will be given, unless you provide official documentation (**medical, legal, etc.**).
- b. **In-class quizzes:** Short quizzes may be given periodically throughout the semester in laboratory.

The quizzes will be given at the beginning of the class period, so you must be on time. If the quizzes have already been completely distributed by the time you arrive to class, you will *not* be allowed extra time to take the quiz. If you are absent, no makeup quizzes will be given, unless you provide official documentation (medical, legal, etc.) regarding your absence.

## 5. Laboratory Handouts

- a. The primary means of communication for this class will be through Blackboard and NCCU e-mail. Check both of these regularly.
- b. Each week in laboratory, you will be required to complete an experiment. The laboratory experiments will be posted on Blackboard or provided to you ahead of time. If the laboratory is posted on Blackboard, you are expected to print it out and bring it with you. In addition, you may be given a worksheet and/or assignment to complete for your laboratory notebook.
- c. **Do NOT wait until the last minute to print just in case the printer is low on ink or there is no paper. In addition, there is no computer lab in Mary Townes Science Complex where students can print.**

## 6. Laboratory Notebooks

- a. For this lab, you will maintain a laboratory notebook, which will be the primary location of your day-to-day lab work.
- c. Please use either a spiral-bound or composition notebook.
- d. Write in blue or black ink, and print legibly.
- e. Mistakes are okay only if you fix them. The notebook does not have to look perfect.
  - i. Correct mistakes by drawing a single line through them, and then write your initials and the date next to your correction
- f. Your first page is for a Table of Contents
  - i. Number your pages sequentially (front and back)
  - ii. Update your Table of Contents after every lab
- g. Each lab should start on a separate page with a date on it
- h. Don't tear out pages from your lab notebook
- i. Staple in any handouts or printed labs (include them in your table of contents)
- j. Divide each lab write-up in your notebook into the following sections
  - i. Title – descriptive about the experiment(s) performed
  - ii. Purpose/question
    1. State the purpose of the experiment or the question to be answered by the experiment in 1-2 sentences
    2. Focus on the scientific problem, not the tasks to be completed
  - iii. Variables – state which parts of your experiment fall into these categories
    1. Independent variable
    2. Dependent variable
    3. Control group
    4. Experimental group
  - iv. Hypothesis
    1. Predict what your results will look like
    2. Explain why you predicted those results (previous information, guess, etc.)
  - v. Materials & Methods
    1. Briefly summarize the experimental procedure you used. Do not copy it verbatim.

2. Include enough detail that a student from another class would be able to understand what you did
- vi. Data Tables
  1. Draw data tables with appropriate headings on columns
  2. Include a descriptive title and units (where appropriate)
- vii. Data Analysis
  1. Perform any necessary calculations, such as normalization, if necessary
  2. Calculate mean, standard deviation, and sample size for your data
- viii. Graphs
  1. Choose the appropriate graph type for your data (bar, scatterplot, line of best fit, line, pie)
  2. Include a descriptive title, axis titles, scales, units, and a key (if necessary)
- ix. Drawings (if applicable)
  1. Clearly label what is on the slide (yeast, E. coli, etc.) under what experimental conditions, including units
  2. Indicate the total magnification
  3. Make large, detailed drawings
  4. Label on your drawings where particular cells or structures are
- x. Results
  1. Describe in words all of your experimental results
  2. Be thorough and include all of the different groups you tested
  3. Include descriptions of the data in your
    - a. Data tables
    - b. Graphs
    - c. Drawings
    - d. Observations
  4. If you have calculated standard deviations, state which groups appear to be significantly different from other groups based on your graphs of means and standard deviation bars
- xi. Conclusions
  1. Complete sentences and grammatically correct
  2. Summarize your overall results in a few sentences
  3. Compare your results to your hypothesis
  4. What do your results mean for the problem/question that this experiment addresses?
  5. Discuss any problems you experienced along the way and how this experiment can be improved
- xii. Future Directions
  1. Based on your results/conclusions, what new questions do you have?
  2. What else about this experimental system do you want to study?
- xiii. Post-lab Questions: answer completely with lots of details
- k. A grading rubric for lab notebook entries is provided

## 7. Laboratory Reports

- a. Lab reports are more formal write-ups of the class' experimental results
- b. Lab reports must be typed. Calibri, Ariel, and Times New Roman are the preferred fonts. Calculations, graphs, and data tables may be neatly hand drawn or made in Word/Excel.
- c. Your lab report will be similar to your lab notebook, except you will often include data from the rest of the class as well
- d. Divide your lab reports into the following sections:
  - i. Title – descriptive about the experiment(s) performed
  - ii. Introduction
    1. Write background information (from lab handouts and the Internet) to introduce the topic you are studying
    2. State the purpose of the experiment or the question to be answered by the experiment in 1-2 sentences
    3. Focus on the scientific problem, not the tasks to be completed
  - iii. Variables – state which parts of the class experiments fall into these categories
    1. Independent variable
    2. Dependent variable
    3. Control group
    4. Experimental group
  - iv. Hypothesis
    1. Predict what your results will look like
    2. Explain why you predicted those results (previous information, guess, etc.)
  - v. Materials & Methods
    1. Briefly summarize the experimental procedure you used. Do not copy it verbatim.
    2. Include enough detail that a student from another class would be able to understand what you did
  - vi. Data Analysis
    1. Perform any necessary calculations, such as normalization, if necessary
    2. Calculate mean, standard deviation, and sample size for the class data set
  - vii. Summary Data Tables
    1. Make data tables to show the summary data for the class data set
      - a. Means
      - b. Standard deviations
      - c. Sample sizes
    2. Draw data tables with appropriate headings on columns
    3. Include a descriptive title and units (where appropriate)
  - viii. Graphs
    1. Choose the appropriate graph type for the data (bar, scatterplot, line of best fit, line, pie)
    2. Graph the class data set
    3. Include a descriptive title, axis titles, scales, units, and a key (if necessary)
  - ix. Results
    1. Describe in words all of your experimental results for the class data set
    2. Be thorough and include all of the different groups you and other groups tested
    3. Include descriptions of the data in your
      - a. Data tables
      - b. Graphs

4. State which groups appear to be significantly different from other groups based on your graphs of means and standard deviation bars
- x. Conclusions
    1. Complete sentences and grammatically correct
    2. Summarize your overall results in a few sentences
    3. Compare your results to your hypothesis
    4. What do your results mean for the problem/question that this experiment addresses?
    5. Discuss any problems you experienced along the way and how this experiment can be improved
  - xi. Future Directions
    1. Based on your results/conclusions, what new questions do you have?
    2. What else about this experimental system do you want to study?
  - xii. A grading rubric for lab reports is provided

## LABORATORY NOTEBOOK GRADING RUBRIC

**RATIONALE:** This notebook allows someone else to fully understand the goals, rationale, materials, methods, results, and conclusions of each experiment.

Lab Notebook Item	Criteria	Points Possible	Points Earned
Table of contents	-Up-to-date -Pages numbered	5	
For Each Lab			
Purpose/Question	-State why we're doing the experiment(s)	5	
Variables	-Independent, dependent, control group, experimental group	5	
Hypothesis	-What do you expect the results to look like? -Why?	10	
Materials & Methods	-Briefly summarized	5	
Data Tables	-Your data are organized and neat -Complete -Appropriate labels and units	10	
Data Analysis	-Data calculations (if necessary) -Mean, standard deviation, and sample size	10	
Graphs	-Appropriate graph used -Titles, axis titles, scales, units, key	10	
Drawings (if applicable)	-Large and detailed -Appropriate labels and units -For microscope drawings, include total magnification	10	
Results	-Detailed descriptions of the results from your data tables, graphs, drawings, and observations	10	
Conclusions	-Complete sentences & grammatically correct -Summarize results -Compare your results to your hypothesis -What do your results mean for your purpose/question? -Discuss any problems experienced	10	
Future Directions	-From your results, what new questions do you have?	5	
Post-lab Questions	-Answers detailed and complete	5	
<b>Total</b>		<b>100</b>	

### LABORATORY REPORT GRADING RUBRIC

**RATIONALE: Publication of results is how scientists share their findings with each other and with the public.**

Lab Notebook Item	Criteria	Points Possible	Points Earned
Introduction	-Write background information to introduce the topic under study -State the major purpose/question to be studied in this experiment (s)	10	
Variables	-Independent, dependent, control group, experimental group	5	
Hypothesis	-What do you expect the results to look like? -Why?	10	
Materials & Methods	-Briefly summarized	5	
Data Analysis	-Data calculations (if necessary) -Mean, standard deviation, and sample size calculated for class data set	10	
Summary Data Tables	-Only showing the summary data for the class data set: means, standard deviations, and sample sizes -Organized and neat -Complete -Appropriate labels and units	10	
Graphs	-Class data used (not just group data) -Appropriate graph used -Titles, axis titles, scales, units, key	15	
Results	-Detailed descriptions of the results from the class data and graphs -Statements about which groups are significantly different from each other	15	
Conclusions	-Complete sentences & grammatically correct -Summarize the class results -Compare the class results to your hypothesis -What do the class results mean for your purpose/question? -Discuss any problems experienced	15	
Future Directions	-What new questions do you want to answer?	5	
<b>Total</b>		<b>100</b>	



**Lab Schedule: Section 01 (Wednesday, 1:00pm-2:50pm); Section 02 (Wednesday, 3:00pm-4:50pm)**

<b>Week Date</b>	<b>Lab</b>	<b>Assignment(s) Due</b>
1 1/15/2014	Introductions	
2 1/22/2014	Lab Notebooks Lab 1: Scientific Method	-Pre-lab quiz: syllabus & lab safety
3 1/29/2014	Lab 2: Data Analysis	-Pre-lab quiz: scientific method & graphing -Lab notebook check
4 2/5/2014	Lab 3: Volumetric Measurement	-Pre-lab quiz: cumulative, measurement
5 2/12/2014	Lab 4: Plop Plop Fizz Fizz	-Pre-lab quiz: cumulative
6 2/19/2014	Lab 5: Micropipetting	-Pre-lab quiz: cumulative -PPFF lab report
7 2/26/2014	Lab 6: Microscopy	-Pre-lab quiz: research organisms to be studied
8 3/5/2014	Lab 7: Yeast Survival Skills Assessment Practice	-Pre-lab quiz: -Microscopy lab report
9 3/12/2014	Spring Break – No Lab	
10 3/19/2014	Skills Assessment (Practical Exam) External Assessment	-Lab notebook check
11 3/26/2014	Yeast Fermentation 1 -Glucose vs. water -Yeast experiment proposal	-Pre-lab quiz: fermentation
12 4/2/2014	Yeast Fermentation 2 -Glucose vs. other sugars and “deadly” agents	-Pre-lab quiz: scientific method -YF1 lab report -Yeast experiment proposal 1 -Lab notebook check
13 4/9/2014	Yeast Fermentation 3 -Student-proposed experiments	-Pre-lab quiz: scientific method -Yeast experiment proposal 2
14 4/16/2014	Yeast Fermentation 4 -Student-proposed experiments	-Pre-lab quiz: scientific method
15 4/23/2014	No Lab -Lab report help session (TBD)	-Work on final lab report
16 4/30/2014	Class discussion External assessment	-Final lab report -Turn in lab notebook