

## BIO205 Syllabus—Spring 2014

Fundamentals of Scientific Inquiry in the Biological Sciences IIA  
Stony Brook University  
Undergraduate Biology, College of Arts and Sciences

Course Director: Marvin O'Neal III, PhD

Office Hours are held in the Biology Learning Center (BLC), Room G10 in the Centers for Molecular Medicine and Biology Learning Laboratories (CMM/BLL) building. Semester schedules are posted on the door of the BLC and on Blackboard (Bb) under Course Documents. Any questions, email [introbiolabs@stonybrook.edu](mailto:introbiolabs@stonybrook.edu)

### UNDERGRADUATE BULLETIN COURSE DESCRIPTION:

Second course in the foundational laboratory sequence for all biology students and students in related fields. Students will experience the laboratory process, research process, a wide range of laboratory tools, methods, skills, learn to read and write scientific presentations, and collaborate in formal inquiry. This course has been designated as a High Demand/Controlled Access (HD/CA) course. Students registering for HD/CA courses for the first time will have priority to do so. Not for credit in addition to BIO207. This course has an associated fee. Please see [www.stonybrook.edu/coursefees](http://www.stonybrook.edu/coursefees) for more information.

*Prerequisite:* BIO204. *Pre- or Corequisite:* BIO201, BIO202, or BIO203. 2 credits.

### COURSE GOALS:

This course is a continuation of BIO204 and is designed to be an introduction to your career in the biological sciences and prepare you for upper division biology courses. ***The most critical aspect of this preparation is to develop scientific thought.*** In addition, you will be introduced to common laboratory practices and procedures, learn to conduct basic experiments, and practice experimental design using scientific reasoning. This course is divided into 13 labs: Experimental Design (5x), Managing Data (4x), and Molecular Techniques (4x). For each lab there are **learning goals** and for every activity there are **learning objectives**. Use these goals and objectives as the backbone of your learning. They should be the targets of your preparation, the focus for your progress during lab, and the fundamental components used by faculty for all assessments within the course including quizzes, exams, competencies, and assignments.

College laboratories are training grounds for your future work environment, and it takes more than the mastery of a topic to succeed as a professional. You are expected to become a good observer, listener, oral communicator, reader, and writer in the biological sciences. To excel in this course, you will be required to think critically and creatively, categorize concepts, make connections, understand and use new terminology, and efficiently manage your time. You will use computers and statistics to collect and analyze data. At times, you will be called upon to be a leader, at other times to be an independent self-starter or a team player. You will also be required to present your work in both oral and written formats. Upon completion we expect that you will have improved the 21st Century skills identified by The National Research Council's 2008 report: adaptability, complex communication/social skills, nonroutine problem solving, self-management/development, and systems thinking.

### COURSE LEARNING GOALS:

The following Learning Goals are further divided in your lab manual into specific Learning Objectives and placed at the beginning of each lab activity. Learning Goals and Objectives are used to construct all course activities, quizzes, assignments, competencies, and exams:

1. Explain and use fundamental principles of the scientific process to design basic experiments.
2. Access information using effective, well-designed search strategies and appropriate information sources.
3. Organize, synthesize, and communicate information from multiple sources.
4. Pose questions based on observations, record relevant information, and identify multiple approaches relative to contextual factors.
5. Extrapolate logical and accurate conclusions from scientific data.
6. Write in an appropriate scientific style using accurate and organized interpretations of literature and data.
7. Describe properties common to organisms including structural hierarchy and evolutionary history.
8. Constructively engage in teamwork to facilitate cohesive dynamics and a high quality group product.
9. Convert mathematical information between various forms including graphs/tables/equations/words and accurately perform calculations including appropriate statistical tests.
10. Discuss ethical issues in science with depth and clarity, presenting multilayered perspectives.
11. Design your own physiology experiment to address a biological question using accepted methodology.

### COURSE COMPONENTS:

#### Required Materials:

For your safety and maximal academic performance, please come to lab with 1) LabTutor access, 2) lab notebook, 3) dissecting kit, 4) gloves, 5) goggles, 6) clicker, and 7) flash memory. Details about each of these items are below.

-Online Materials: LabTutor access includes lab manual (*Fundamentals of Inquiry in the Biological Sciences IIA*) and remote data acquisition.

-Lab Notebook (NCR, carbonless)

-Dissecting Kit (scalpel, scissors, forceps, blunt probe, ruler, and dissecting needle)

-Gloves (nitrile, polyurethane, latex, neoprene, polyethylene, or vinyl will all protect you from the chemicals used in this course. If you are concerned with comfort, then latex, neoprene, and polyurethane are best—unless you have a Type I latex allergy. If you have a Type IV allergy, try N-DEX hypoallergenic gloves.

-Goggles (impact resistant, UV protection; ANSI certified)

-Clicker (Turning Technologies)

-Flash Memory (USB; at least 512 MB)

Optional: Recommended text is *Writing in Biology*. Knisely, Stony Brook Edition, 2008

### Grades:

Check the Blackboard course website regularly for information regarding grade components, administrative changes, lab instructor communication, and course updates.

**-Quizzes** will be given at the beginning of each laboratory utilizing the university-approved clicker. Quizzes are designed to determine if you have prepared for lab by testing your knowledge of the online lecture (vodcast), and lab manual. You are encouraged to take notes in your lab notebook. No make-up quizzes will be given.

**-Lab Performance** is based on each week's preparation (submitted copy of your notebook) and participation during experiments, data collection, group discussion, and scientific inquiry. Full participation is expected as well as your ability to field instructor questions during lab. At the end of each lab, at least one group will be required to discuss their findings for that day with the class. Unexcused absences will result in a zero. Repeated unexcused absences (3 or more) will result in failure of the course.

**-Lab Assignments** will be graded based on a uniform rubric across all sections. All written assignments are due before the start of the Quiz. See "Calculating Penalties for Late Work" to determine how your grade will be calculated.

**-Exams** include the Competency (75 pts) and Final (200 pts) **NO ONE WILL BE ADMITTED LATE TO THESE EXAMS.** We are forced to adhere strictly to this policy to deter cheating schemes. Even if you have a valid excuse, you will not be allowed to take the exam if you come late. Do not risk getting a zero for an exam! If you have a valid, documented excuse, see Susan Hayden immediately. If you wish to protest a question or the answer on an exam, then your reasoned argument must be submitted in writing to [introbiolabs@stonybrook.edu](mailto:introbiolabs@stonybrook.edu). The answer keys will be posted to Blackboard.

**Letter Grades** are assigned by the Course Director at the end of the semester after all points have been submitted by each instructor. Letter grades are based on your final point total. The table to the right will help you determine the MINIMUM letter grade that you will receive based on accumulated points. We sometimes curve the class based on the performance of individual sections due to variance in the instructors. Therefore, your letter grade may be higher than this scale (for example, in BIO 204 fall 2008, a score of 875–1000 received an "A" and the "F" range was 0–499 points). Historically, the average letter grade in this course has been approximately a C+. While course grades are commonly curved up, they are never curved down. If every student accumulates at least 933 points by the end of the semester, then everyone will receive an "A". If a Challenge Exam and/or Extra Credit is/are given, then the letter grade will still be calculated based on the 1000-point scale and not a percent score, even if the point total exceeds 1000 points.

Point Total	Letter Grade
933-1000	A
900-932	A-
867-899	B+
833-866	B
800-832	B-
767-799	C+
733-766	C
700-732	C-
667-699	D+
600-666	D
0-599	F

### CLASS PROTOCOL

**-Do not bring food or drink into the labs.** Students who choose to eat and drink in lab will be asked to leave and will receive a zero for their Lab Performance score.

**-Computers are to be used for lab activities only.** Students are not allowed to download programs, change shortcuts, or alter any settings on the lab computers. Please remember to log off of all lab computers and do not share accounts or passwords with fellow students. Students are welcomed to bring their own laptops or tablets to lab if they are used for professional activities. Unless asked to do so by your instructor, do not engage in any social media, video calls, games, or activities unrelated to laboratory.

**-Full lab participation is expected.** Your lab performance grade is based on participation during experiments and data collection, group involvement, inquiry, cooperation, and techniques. Tardiness will adversely affect your grade. Zeros are given for unexcused absences. Repeated unexcused absences (3 or more) will result in failure of the course.

**-Electronic communication devices,** including cellular phones, beepers, speakers, and headphones must be secured in a closed container (and not, for example, worn on a belt or around the neck) and must be turned off (and not, for example, set on vibration mode) during laboratory. If you have a cell phone or beeper that goes off during lab, you will be asked to leave and receive a grade penalty. *You are NOT allowed to make calls or talk on a cell phone during lab.*

### BIO 205 Spring 2014 Syllabus

Week	Lab #	Lab	Performance (drop lowest)	Quiz (drop lowest)	Assignments	Points
27-Jan	14	Data I: Standard Curves and Controls (Photosynthesis)	15	AIQ (5), CURE (15)		
3-Feb	15	Design IA: Fermentation Experiments	15	20		
10-Feb	16	Design IB: Fermentation Experiments	15	20	Lab Report (due next week)	150
17-Feb	17	Data II: Rates and Analysis (Osmosis)	15	20		
24-Feb	18	Data III: Data Acquisition (Physiology)	15	20		
3-Mar	19	Design II: Cardiovascular Physiology	15	20	Physio Design Methods (due during lab)	
10-Mar	20	Data IV: Skeletal Muscle Physiology	15	20	Physio Design Final Methods (due during lab)	20
17-Mar	Spring Break - NO LAB					
24-Mar	21	Design IIIA: Design your own Physiology Experiment			Data Analysis (due during lab)	25
31-Mar	22	Design IIIB: Design your own Physiology Experiment			Poster (50) and Video (75) (due in 2 weeks)	125
7-Apr	23	Molecular Techniques I: Bioinformatics	15	20		
14-Apr	24	Molecular Techniques II: DNA I	15	20		
21-Apr	25	Molecular Techniques III: DNA II	15	20	DNA Worksheet (Individual)	30
28-Apr	26	Molecular Techniques IV: Proteomics	15	20	Proteomics Worksheet (Group Assignment)	25
5-May	Competency Exam - sign up during lab, BLC closed (no office hours)					75
16-May	Final Exam @ 8:00 - 10:45 AM					200
1000 Total Points :			150	200		650

## ABSENCES

-Lab attendance is required. You are expected to attend and participate in every lab for the full period. **If you miss 3 normally scheduled labs, for any reason (excused or unexcused), you will automatically fail this course.** When in lab, you should be working. Lab participation and performance (professionalism, technical skills, and analytical skills) are used to determine your letter grade. Tardiness is not acceptable and incurs an automatic performance grade penalty of no credit. Quizzes are given throughout lab and you are responsible to answer questions at any time during lab--no make-up quizzes will be given.

**-Excused Absences:** An *unavoidable* absence from lab that is due to sudden illness or a death in the family may be excused. Documentation must be submitted to Susan Hayden in room 109 CMM/BLL, 632-8541. Students are only excused from the performance and quiz component for that week. Excused students are still responsible for all written work. Written assignments are due within one week of returning to lab (or two days for summer session). There are no make-up quizzes. For excused absences, the quiz grade will be calculated as an averaged percent of the remaining quizzes. Requests to make up an exam should be submitted, in writing, to the Course Director and should be accompanied by an excused absence form from Susan Hayden. Permission to make up exams and practicals will be decided on a case-by-case basis.

**-Note:** Religious Holidays (<http://www.stonybrook.edu/commcms/provost/category/faculty/policies.html>) or if you have an official, pre-scheduled university event such as an athletic competition or an exam conflict in another class, then ALL make-ups should be scheduled by the second week of classes.

**-Make-up Laboratories:** There are no make-up labs. In rare circumstances, you may be permitted to attend another lab section within the regular lab schedule if space is available, you bring in a valid excuse, AND are approved by the Course Administrator, Susan Hayden (109 CMM/BLL, 632-8541). A "Bio Student Absence Form" must be completed, signed by the Course Administrator, and presented to the Lab Instructor of the make-up lab section that you attend. **Making up a laboratory does not negate an unexcused absence.**

**-Unexcused Absences:** Zeros will be given for all lab work including quizzes, lab performance and in-class activities if you are absent (unexcused). Work that is missed due to lateness will not be excused. Lab work that is due on the day of an unexcused absence should be submitted electronically by the beginning of lab to be accepted as "on time." At most, half credit will be given for all written work (such as lab exercises, worksheets, and reports) that are assigned on the day of the unexcused absence.

**-Calculating Penalties for Late Work:** For assignments to be accepted on time, they must be submitted by the beginning of lab before the quiz on the day that they are due. Assignments handed in late will be penalized 10% of the total point value per day; except for late work due to an unexcused absence (see above). For example, an assignment worth 100 points that is one day late will receive a grade no higher than 90, 2 days late, no higher than 80, etc. Assignments are graded based on a rubric and the percent score is multiplied by the late penalty score. If you received 78% based on the rubric and were two days late, your final grade would be 62.4%. No assignments will be accepted more than 7 days after the due date.

## CLASS RESOURCES

For HELP, follow these procedures to get your questions answered quickly and accurately:

1. Ask **your** instructor or teaching assistant (TA) for help. All instructors are required to hold one office hour each week in the BLC.
2. Ask **any** instructor or TA for help. All office hours with any instructor are open to all students taking BIO205.
3. Email faculty to schedule an appointment at [introbiolabs@stonybrook.edu](mailto:introbiolabs@stonybrook.edu) Three faculty members are dedicated to this course and can answer any question you may have about content, grades, or instructors: Joan Miyazaki (G04, 2-7278, [joan.miyazaki@stonybrook.edu](mailto:joan.miyazaki@stonybrook.edu)), Debbie Spikes (G05, 2-1044, [deborah.spikes@stonybrook.edu](mailto:deborah.spikes@stonybrook.edu)), and Mike Cressy, PhD (G05, 2-2181, [michael.cressy@stonybrook.edu](mailto:michael.cressy@stonybrook.edu)).
4. Visit room G05 of CMM/BLL and ask for help. Appointments are first come, first serve.

## DISABILITY SUPPORT SERVICES (DSS)

If you have a physical, psychological, medical or learning disability that may impact your course work, please contact Disability Support Services, ECC (Educational Communications Center) Building, room128, (631) 632-6748. They will determine with you what accommodations, if any, are necessary and appropriate. All information and documentation is confidential. Letters of notification should be addressed to Dr. Marvin O'Neal Z=5110. Students who require assistance during emergency evacuation are encouraged to discuss their needs with their professors and Disability Support Services. For procedures and information go to the following website: <http://www.stonybrook.edu/ehs/fire/disabilities>

## USE OF ANIMALS

Biology is the science of life, and learning biology requires the study of living organisms. In this course, you will be required to handle live plants and animals. You will also be expected to dissect preserved animals in some of the laboratory exercises. In every case, you are expected to properly handle all organisms based on federal and local guidelines as well as observe all instructions in the lab manual. If you have objections to these requirements, you must submit your objections in writing to [introbiolabs@stonybrook.edu](mailto:introbiolabs@stonybrook.edu) within the first two weeks of this course.

## ACADEMIC INTEGRITY STATEMENT:

Each student must pursue his or her academic goals honestly and be personally accountable for all submitted work. Representing another person's work as your own is always wrong. Faculty are **required** to report any suspected instances of academic dishonesty to the Academic Judiciary. For more comprehensive information on academic integrity, including categories of academic dishonesty, please refer to the academic judiciary website at <http://www.stonybrook.edu/uaa/academicjudiciary/>

Academic honesty and integrity are fundamental to all aspects of academic and scholarly work. Definition: "Academic dishonesty includes any act that is designed to obtain fraudulently, either for oneself or for someone else, academic credit, grades, or other recognition that is not properly earned or that adversely affects another's grade." The following represents examples of this but does not constitute an exhaustive list:

- Cheating on exams or assignments by the use of books, electronic devices, notes, or other aids when these are not permitted including collusion or copying from another student.
- Submitting the same paper in more than one course or repeatedly within the same course without permission of the instructors.
- Plagiarizing: copying someone else's writing or paraphrasing it too closely, even if it constitutes only some of your written assignment.
- Falsifying documents or records related to credit, grades, status (e.g., adds and drops, P/NC grading), or other academic matters.

- Altering an exam or paper after it has been graded in order to request a grade change.
- Stealing, concealing, destroying, or inappropriately modifying classroom or other instructional material, such as posted exams, laboratory supplies, or computer programs.
- Preventing relevant material from being subjected to academic evaluation.

**Action:** The strongest action allowed by University guidelines will be followed for each incident. Without exception, all incidents will be submitted in writing to the University Academic Judiciary Committee.

**Result:** All students found guilty of academic dishonesty are required to take the University's course on academic integrity (the "Q" course); however, additional penalties may also be levied. These penalties could range from receiving a "0" on an assignment or exam, failure of a course, and possibly suspension or expulsion from the University. Once reported, students are subject to the ruling and findings of the Academic Judiciary Committee. Information about the procedures for hearings and other functions (including appeals) can be found on the website referenced below as well as in the Office of Undergraduate Academic Affairs ([www.stonybrook.edu/uaa/](http://www.stonybrook.edu/uaa/)).

**CRITICAL INCIDENT MANAGEMENT:**

Stony Brook University expects students to respect the rights, privileges, and property of other people. Faculty are required to report to the Office of Judicial Affairs any disruptive behavior that interrupts their ability to teach, compromises the safety of the learning environment, or inhibits students' ability to learn.