

Syllabus for BIOL 313L- Cell Biology Lab. Fall 2018. 08-24-2018.

- **COURSE TIME:** WEDNESDAY BIOL-313L-01, and THURSDAY BIOL-313L-03.
2 -5 pm in CofC's RITA LAB. 143.
- **INSTRUCTOR:** Dr. Richard Southgate. Biology PhD., U. Geneva, Switzerland, 1984.
- **OFFICE:** RITA 224.
- **OFFICE TEL.:** 843-953-0340 is not very reliable as I am largely not in this room due to my 12 hours of teaching per week, so it would be far better if you e-mail me at southgater@cofc.edu.
- **OFFICE HOURS:** 11:00 am – 12:30 pm on MONDAYs or an appointment (via by e-mail: southgater@cofc.edu) or setting up an appointment with me either before or after lab. sessions (also in the CB class as well).
I will inform you of any changes on OAKS and/or by an individual/bulk e-mail.
- **COURSE OBJECTIVES:** In this lab you will gain first-hand experience with techniques commonly used in cell biological research including quantitative microscopy, histochemistry, spectrophotometry, cell fractionation and centrifugation, organelle isolation, enzyme assays, and protein electrophoresis.
- **WHAT WILL STUDENTS LEARN IN THE LAB. SESSIONS:**
 - The ability to use modern analytical techniques to study cells & cellular processes.
 - The ability to use the scientific method in obtaining, analyzing and evaluating empirical evidence for cellular structure, processes and laboratory experiments/protocols.
 - The ability to evaluate and discuss pertinent scientific literature.The labs will also be fun (as long every one abides with the labs. strict safety rules).

Co-Requisite or Pre-Requisite: Biology 313 (Cell Biology).

There is no textbook required for the CB Lab., every you need will be posted on OAKS.

REQUIREMENTS:

- You **MUST** wear a lab coat in lab. There are **NO EXCEPTIONS!!!!** (CofC's safety rules).
- There is **ABSOTULTELY NO FOOD OR DRINKS** in the lab. rooms
- No sandals, perforated shoes, or high heels in the laboratory.
- Wear gloves and goggles when instructed to do so or you when you feel unsafe.
- Wash your hands when you leave the lab. (a good idea!).
- We follow strictly the College lab safety policy (see below). Please read the policy posted on OAKS and they will be discussed in the first laboratory, which will require your signature indicating that you have fully understood these policies and their implications before you can carry on in these labs.
- Lab procedures are available on the course website. Go to OAKS, select this lab. section class, click on CONTENTS. You need to download and read the lab **BEFORE** you come in. **Both two labs. for this semester have been cross-linked into one for convenience, so all details for each lab. will be identical.**

- It's a very good idea to put all your lab stuff in one notebook which will be audited later in the semester (mid-term and near the end).

HOW TO DO WELL IN THIS LAB:

- This is an upper division lab. so I expect you to come to lab PREPARED, work hard, and ACTIVELY PARTICIPATE IN THE EXPERIMENTS.
- Attendance at labs is REQUIRED and MANDATORY since it is virtually impossible to re-prepare a lab. activity. If you are ill, or had medical school interviews or sport activities etc. with "documented proof"! I will give you a make-up questionnaire, oral test etc. in my office at RITA 224 or even a modified lab. report so as to gauge your overall understanding of the missed lab's topic. If you miss 2 labs. With no documentation, you will have a "WA". (see below)
- **Your presence in this lab can also a lot of fun, within the lab. safety rules**
- A good way to come to lab prepared is to make a FLOW CHART in your notebook detailing the particular lab's chemical components, the purpose of the procedures, and its general goals. This is especially important in some of the later labs, where we will be running gels and isolating cell fractions i.e. really multitasking, with more than one protocol component at the same time, so you need to be well organized to do well....
- Collect your observations, results and all the material you saw in the particular laboratory section to make your laboratory report, and therefore, I will see your notebook at mid-term and near the end of the lab. for a grade. The idea is that you record your findings and conclusions in your notebook and these findings will be the basis for your report and therefore you will be graded for both sides of the same subject. **You can earn up to 5 extra points for excellent notebooks.**
- **GRADING:** Grades for this course are determined from lab quizzes, written reports and literature research, your literature presentation, and the final exam.
- **LAB QUIZZES:** (45 total points, 9 quizzes with 5 questions @ 1 pts. each in total, but one will be dropped). At the beginning of each lab., there will be a short quiz on that lab's PROTOCOL and concepts, to judge how well you are prepared for this specific lab. activity. Each quiz is worth 5 points. Lab 9 (analysis has no quiz) and one of your worst quizzes will be dropped, so in total you will have 8 quizzes for a grade, each at 5 pts. i.e. $9 \text{ labs} \times 5 \text{ pts} = 45 \text{ pts.}$ minus your worst quiz (5 pts) \rightarrow total grade: 40 points.

FOUR STUDENT LAB REPORTS (200 total points).

- Reports demonstrate your real understanding of the lab material.
- Lab reports are due at the beginning of the following lab and are worth 20 points each.
- **YOU WILL LOSE A GRADE A DAY IF THE REPORT IS SEND TO ME AFTER THE DUE DAY**
- The plan is that each table has 4 students (or 3?) and the whole table will work together and do 2 experiments per table. The report will be split between 2 parts: 1) the report and 2) a 10 – 12 slide power point presentation that explains the concepts and explanations of the topics involved in each lab. session. All four students will be graded for 20 points and in week one the first alphabetical students of the 4 team will be mainly responsible for the report *per se* and the other students will be responsible for the

- checking the report contents, setting up the presentation and in the following week, the student team members will switch. At the end of 10 reports, each student will make 5 reports and 5 power point presentations.

The lab. report will use the details of the two student teams per table i.e. the 2 x 2 student teams do the same protocol. The Abstract, Introduction and Material and Methods will be written for the four students. The Report section will be made from both teams and in the Discussion, the two teams observations will be shared.

The Power Point presentation should be created by the other table students but it is encouraged that all 4 students work together to create the report and the PPT presentations. The PPT can include scientific descriptions of the concepts involved with each lab. section as well as images / short movies describing the various steps of the protocol. The hope is to let students to generate a great report covering all the aspects of each lab. section so as to extract a better understanding of each protocol and create an excellent report.

LITERATURE PRESENTATION (35 points).

- Each student will make a 10-minute presentation on a topic in cell biology based on the primary research literature. Details on this project will be discussed in the labs and your paper has to be approved by me in LAB 8. I will post a list of the accepted publishers for cell biology articles on OAKS.

LAB FINAL EXAM (75 points). The cumulative lab final will test your understanding of labs by asking you to design experiments and analyze results. You will NOT do well on the exam if you routinely come to lab unprepared and let your lab partner do all the work

SUMMARY: Q 40 pts. + Reports: 200 pts. + Talk: 40 pts., Final: 70 pts. = Total: 350 points = 40 [~11%] + 200 [~57% or 5.7% per report] + 40 [~11%] + 70 [~21%] of the total grade = 350 in total [100%].

You can earn up to 5 extra points for excellent notebooks (the notebook's contents will be inspected in mid-term and at the end for the extra credit if you made the effort.

I-pads, laptops and cell phones on a lab. bench are considered "endangered" toys/tools" due to a very high chance of water spills..... so keep them close for calculations etc. but in a safe area.

GRADES: Your final grade is determined as a percentage of the 350 total points as follows:

A	93-100	min. 325 pts.	C	73-75.9	min. 266 pts.
A ⁻	90-92.9	min. 315 pts.	C ⁻	70-72.9	min. 245 pts.
B ⁺	86-89.9	min. 280 pts.	D ⁺	66-69.9	min. 231 pts.
B	83-85.9	min. 290 pts.	D	63-65.9	min. 220.5
B ⁻	80-82.9	min. 280 pts.	D ⁻	60-62.9	min. 210 pts.
C ⁺	76-79.9	min. 266 pts.	F	59 & less	

If you have 92.9 points, this is an A-, if your grade is 93 or higher, you will have an A etc.

SYLLABUS: A TENTATIVE CBL SYLLABUS for FALL 2018 (BIOL-313L-01 and -03).

DATE	TOPIC	LAB REPORTS
W Aug 29 and Th Aug 30 2018	Lab 1 – safety rules, - description of the lab. and microscopy, - stage micrometer and determining cell - sizes, looking at Δ slides and videos	Q1,
W Sep 5 and Th Sep 6 2018	Lab 2 – Histochemistry, Extra: Various Life Organisms.	Lab 1 report Q2,
W Sep 12 and Th Sep 13 2018	Lab 3 – Enzyme activity in mitochondria,	Lab 2 report Q3,
W Sep 19 and Th Sep 20 2018	Lab 4 – Photosynthesis in chloroplasts,	Lab 3 report Q4,
W Sep 26 and Th Sep 27 2018	Lab 5 – Spectrophotometry of DNA,	Lab 4 report Q5,
W Oct 3 and Th Oct 4 2018	Lab 6 – Cell Fractionation,	Lab 5 report Q6,
W Oct 10 and Th Oct 11 2018	Lab 7 - Gel electrophoresis (SDS-PAGE),	Q7,
W Oct 24 and Th Oct 25 2018	Lab 8 Western (Immuno) Blot,	Lab 6 & 7 Reports, 40 pts Q8,
W Oct 31 and Th Nov 1 2018	Lab 9 Analyzing results of lab. 6–9, Lab 10 Mitosis,	Q9,
W Nov 7 and Th Nov 8, 2018	Student literature presentations, part 1	Labs 8 & 9 reports, 40 pts
W Nov 14 and Th Nov 15 2018	Student literature presentations, part 2	lab 10 report
W Nov 21 and Th Nov 22 2018	THANKSGIVING HOLIDAY	
W Nov 28 and Th Nov 29 2018	FINAL COMPREHENSIVE EXAM, 75 POINTS.	The End

STUDENTS WITH DISABILITIES

who have the proper documentation through SNAP services for extended exam times will be required to take the exams through the SNAP services (assuming you want to use the additional time, if not, you are welcome to take the exam with your classmates). Those students who wish to take exams in the SNAP office must schedule their exams and inform me when they will be taken before the event.

See Center for Disability Services (SNAP) for more info.

<http://disabilityservices.cofc.edu>

Please contact me at southgater@cofc.edu or in person ASAP to make sure you receive all the help you receive from the law as a SNAP student.

- **LAB SAFETY:**

A list of safety policy and procedures will be discussed in the first class. The document will be posted on OAKS for review and a lab safety quiz will need to be PASSED before you are allowed to work in the lab. Observance of all safety regulations is expected. There will be NO EXCEPTIONS. **Failure to follow the safety guidelines will debar you from performing the experiment** on the given day and you will **not** receive any grades for the same.

- **ATTENDANCE.**

You are expected to do your share of the work. Many of the labs can get tedious, and it's unfair to expect your lab partner to do all the work if you miss a lab. So if you're sick, please **send me and your partner an e-mail** so that arrangements can be made. Most of the investigations may be impossible to make up.

- **EXCESSIVE ABSENCE**

Missing 2 laboratories will result in a "WA" grade (withdrawn excessive absence) at midterm and/or final grade. At midterm WA can still be changed to a regular final (F) grade. A final "WA" grade is calculated as an "F" in your GPA. This is College policy but it does not apply if the absences are due to a SERIOUS medical or personal reason and VERIFICATION IS PROVIDED.

- **LAB PERFORMANCE EVALUATION:**

- It is important to clean the lab after your experiment by putting away the materials used in the right place, cleaning your culture bottles/apparatus used and keeping the area tidy. Failure to do so will be reflected in your team lab work evaluation. Do not let your partner do all the work.
- You are also expected to either print the protocols for that day or have them available on your computer/tablet. Do not rely on your partner to do so.
- Bring your notebook for each lab to record data and experiment details. We will talk about the format of the notebook during the first lab.

- **COLLEGE POLICIES**

- **DISABILITY SERVICES**

The College will make reasonable accommodations for persons with documented disabilities. Students should apply at the Center for Disability Services / SNAP, located on the first floor of the Lightsey Center, Suite 104. If there is a student in the class who has a documented disability and has been approved to receive accommodations

through the Center for Disability Services / SNAP, please come and discuss this with me during my office hours.

- **HONOR CODE AND ACADEMIC INTEGRITY**

Lying, cheating, attempted cheating, and plagiarism are violations of our Honor Code that, when identified, are investigated. Each incident will be examined to determine the degree of deception involved.

Incidents where the instructor determines the student's actions are related more to a misunderstanding will be handled by the instructor. A written intervention designed to help prevent the student from repeating the error will be given to the student. The intervention, submitted by form and signed both by the instructor and the student, will be forwarded to the Dean of Students and placed in the student's file.

Cases of suspected academic dishonesty will be reported directly by the instructor and/or others having knowledge of the incident to the Dean of Students. A student found responsible by the Honor Board for academic dishonesty will receive a XXF in the course, indicating failure of the course due to academic dishonesty. This grade will appear on the student's transcript for two years after which the student may petition for the XX to be expunged. The F is permanent. The student may also be placed on disciplinary probation, suspended (temporary removal) or expelled (permanent removal) from the College by the Honor Board.

Students should be aware that unauthorized collaboration--working together without permission-- is a form of cheating. Unless the instructor specifies that students can work together on an assignment, quiz and/or test, no collaboration during the completion of the assignment is permitted. Other forms of cheating include possessing or using an unauthorized study aid (which could include accessing information via a cell phone or computer), copying from others' exams, fabricating data, and giving unauthorized assistance.

Research conducted and/or papers written for other classes cannot be used in whole or in part for any assignment in this class without obtaining prior permission from the instructor.

Students can find the complete Honor Code and all related processes in the *Student Handbook* at <http://studentaffairs.cofc.edu/honor-system/studenthandbook/index.php>

In the case of classroom / lab. disruption:

<http://deanofstudents.cofc.edu/policies-and-procedures/classroom-disruption.php>

FINAL: THE BOTTOM LINE TO DO WELL IN THIS LAB.

- 1) You need to be ORGANIZED,
- 2) Understanding the protocol BEFORE coming to the lab. for the same day quiz,
- 3) During the lab. experiments, please remember the SAFETY RULES (below) and THINK FIRST before potentially messing up your (and your partner's) experiment, it happens but if you know the concepts and the major features of the protocol, you and your partner will do so much better. Team work is not so bad if it is organized!.
- 4) Prepare a good report in old-style flowing English and grammar (bad grammar often causes considerable lower points and can easily be minimized with a word-speller...), and too short or very unpolished and/or choppy sentences and fact/spelling errors will all result in lower points.
- 5) Create creative and helpful power point presentations (TIPs in OAKS CONTENTS)..

ALL THE LAB. SECTION REPORTS AND THE POWER POINT PRESENTATION WILL BE COPIED ONTO OAKS FOR ALL THE LAB. STUDENTS TO SEE AND LEARN. IF THERE IS TIME, IT MAY BE WORTH TAKING A FEW MINUTES TO TALK ABOUT THE FINAL LAB. SECTION RESULTS AS IT CAN HELP WITH THE CBL FINAL.

LOGIC: every career requires good communication skills and apart the proper biological learning and understanding in these labs, you also have the real opportunity to improve your writing skills by practice.

- 6) To answer the quiz questions and the final correctly requires Sherlock Holmes's logic.
TIP: read aloud out your team's report with your partner or others to hear how the "report" actually sounds, because if it is not easily flowing, you can immediately understand it feels ugly and how you can lose soo many points.

IF YOU SEE A MISTAKE IN THIS SYLLABUS PLEASE LET ME KNOW, thanks.

COLLEGE of CHARLESTON

SCHOOL OF SCIENCES
AND MATHEMATICS

SAFETY POLICY AND PROCEDURES

the school of sciences and mathematics of the college of charleston understands that the safety of our students, staff and faculty is of paramount importance. engendering a safety culture is an important part of our mission in teaching and doing science. each department, course of instruction, or research lab may require higher standards or procedures. the policies and procedures set forth below are understood to be minimum requirements across our departments.

in this document, the term "laboratory" is meant for a work space/facility where chemicals, biological agents, or equipment is used for research and/or instruction.

no one (student, staff, faculty, or visitor) will be allowed in a laboratory (teaching or research) to perform experiments or where experiments may be in progress unless these regulations are followed.

students dismissed from a teaching lab due to violations of the safety procedures will not be allowed to re-enter the laboratory until authorized to do so by their supervisor (instructor) and, in the case of research laboratories, by the department chair or designee. any course work missed because of a violation of these guidelines cannot be made up at another time (or by an extension of the lab period) and will be treated as an unexcused absence.

1. you are responsible for knowing the biological, chemical, electrical, ergonomic, mechanical, and physical hazards associated with the equipment and materials that are being utilized in the laboratory. listen to all instructions and ask questions about that which you do not understand.
2. know the location of safety equipment: telephones, emergency shower, eyewash, fire extinguisher, fire alarm pull.
3. know the appropriate emergency response procedures. if there is an injury or emergency, call 953- 5611.
4. do not work alone in the laboratory if you are working with hazardous materials or equipment.
5. use hazardous chemicals, equipment, and biological agents only as directed and for their intended purpose.
6. do not engage in horseplay, pranks or other acts of mischief while in lab.
7. drinking, eating, and application of cosmetics is forbidden in laboratories where chemicals or biohazards are present. smoking is forbidden in all college buildings.
8. appropriate personal protective equipment shall be worn. the dress code for laboratory work when using chemicals, biological or physical hazards, or when instructed to do so by the laboratory supervisor is as follows:
 - a) wear safety glasses or goggles at all times.
 - b) no exposed skin on arms, legs or torso.
 - c) wear lab coats or other approved protective garments.
 - d) wear gloves or other personal protective equipment (ppe) as directed by the instructor or

mandated by prudent practices based on the chemicals being handled. if in doubt, wear appropriate gloves. latex is not permitted. avoid cross-contamination.

e) remove ppe (gloves and lab coat) when exiting the laboratory.

f) wash your hands, even if gloves were used, before leaving a lab where you did any lab work.

g) closed toe shoes are required. the heel and top of foot must be covered. high heeled shoes, sandals, and perforated shoes are not permitted.

h) confine long hair and loose clothing.

9. inspect equipment or apparatus for damage before adding chemical reagents or biological samples or energizing electrical equipment. do not use damaged equipment.

10. never remove chemicals, biological samples, or laboratory equipment from a lab without proper authorization.

11. presume that all chemicals and biological samples used in the laboratory are hazardous for you and the environment, unless instructed otherwise.

12. never leave an experiment unattended unless proper safety precautions are in place.

13. read all labels on chemicals twice before using them in the lab. read all instructions twice for the operation of any equipment or machinery.

14. properly and safely dispose of all waste materials.

15. treat sharps and broken glassware containers carefully.

a) broken glass should be disposed of in properly marked safety containers. all sharps (needles, razor blades, etc.) used for any purpose must be disposed of in specially labeled sharps containers.

b) do not place contaminated glass in the broken glassware container. consult your supervisor. c) waste chemicals and contaminated ppe should be discarded as directed.

16. when using a reagent, replace the lid immediately. never return unused reagents to stock bottles. take only the amount needed for your experiment.

17. all chemicals and biological samples/media are to be disposed of in appropriately labeled containers. specific instructions for each material will be provided. pay attention to waste container labels before adding the material to be discarded.

18. use good personal hygiene. keep your hands and face clean. wash hands thoroughly with soap and water after handling any chemical or biological agent.

19. keep the work area clean and uncluttered with chemicals and equipment. clean up the work area on completion of an operation or an experiment. before leaving the laboratory, you are responsible for making sure your lab area is clean and organized.

20. never store a chemical or biological specimen in an unlabeled container.

20. always have your college of charleston identification and insurance information with you when working in a laboratory. medicalert identification must be worn if you have any potential life-threatening chemical sensitivities or medical conditions.

21. report any accident or injury, however minor, to your teaching assistant, instructor, or lab supervisor immediately. an accident report form must be completed and forwarded to the department chair, dean, and to the director of environmental health and safety.

If you have questions/concerns about safety in the lab please first consult your instructor. If these are not answered, please see the department chair. Finally, you may consult the director of Environmental Health and Safety, Randy Beaver at 3-6802 or beaverr@cofc.edu

Adopted: March 7, 2012

CougarAlert Display Information

When you receive an emergency message from the College of Charleston's CougarAlert System, the return e-mail address will be displayed as cougaralert@cofc.edu, and Caller ID will be displayed as 843.725.7246 (this is the College's Emergency Information Hotline).

Testing and Implementation

Testing will be conducted each semester to verify all systems are operating properly. The campus community will be notified via e-mail and web page postings when testing of the system will be conducted.

Blackboard Connect Software

Blackboard Connect is an emergency communication software that sends notification before, during and after an emergency. With this new system, the College will be able to communicate in many modes, including voice messages to home, work and cell phones; text messages to cell phones, PDAs and other devices; written messages to e-mail accounts; and messages to teletypewriters and telecommunication devices (TTY/TDD) for the hearing impaired. In combination with our existing communications methods and emergency response plans, this new notification system will significantly enhance the College of Charleston's ability to maintain a learning environment in which students are safe, secure and comfortable.

In an emergency, communications to the campus will be issued in the following priority order:

- 1 Message to the **Blackboard Connect** Emergency Notification System (phone and e-mail).
- 2 Recorded message to the College's Emergency Information Hotline, 843.725.7246.
3. Update to the Website.
4. Printed update sheets to be distributed and posted on campus (if necessary).

The CougarAlert system will only be used to notify you in the event of a campus crisis or emergency.

CougarAlert

The College of Charleston has an agreement with the Blackboard Connect Inc. [formerly The NTI Group, Inc. (NTI)] to use its Connect-ED communication software to provide an emergency notification system that is capable of reaching students, faculty, staff and parents within minutes of a campus crisis. This system is called **CougarAlert**.

Information for Students

The CougarAlert emergency notification system will contact up to six phone numbers for the student. Students may include family member numbers in their address and phone number information.

All students should log on to MyCharleston to review their address and telephone information and update as needed.

To access the address and telephone information, follow these steps:

1. Log on to MyCharleston
2. Click on the Academic Services tab
3. Click on the Banner Self-Service link in the third column
4. Click on the Personal Information link
5. Click on the Update Address and Phones and Cougar Alert link

The CougarAlert system will pull the phone number in the following order – cell phone with text messaging option, cell phone without text messaging option, residence hall room phone number, mailing phone number, home phone number, parent phone number and parent 2 phone number.

If you do not have one of these numbers in your student record, the system will select the next number on the list. To avoid issues related to timely communication of emergency messages to the proper places, every student must update his or her contact information in MyCharleston with current accurate information.

SAMPLE Laboratory Safety Agreement (this will be provided in lab. and to have to sign ...).

Course name: _____ Instructor: _____

Section number: _____ Semester: _____

I have read and fully understand the rules, safety practices and regulations governing my conduct in the laboratory. I will abide by these rules and regulations for my own safety and that of others. I understand that failure to follow the rules and safety practices presented may result in dismissal from the laboratory session (receiving no credit for the experiment).

Last Name	First Name	Signature	Date