

Eukaryotic Cell Physiology Spring 2014 Syllabus

Course Name(s)/Number (s):

ST: Eukaryotic Cell Physiology (BIO445-B; BIO6545-Y)

Course Location & Times:

Medical Sciences Building 221; varies with some mandatory lab meetings.

Instructor:

Angela A. Reiken, Ph.D., Assistant Professor, Department of Biology
Medical Sciences Building 216, (601) 925-7783, reiken@mc.edu
Faculty Homepage: <http://www.mc.edu/faculty/reiken>

Prerequisite(s):

Instructor's consent.

Course Description from the University Catalog:

BIO 445 - Special Topics- Credits, 3 sem. hrs. Prerequisite(s): instructor's consent. Lecture/ Lab/ Field/ Meeting: Lecture and laboratory four to eight hours a week. A study of selected current topics in biology.

BIO 6545 - Special Topics- Credits, 3 sem. hrs. A. study of selected current topics in biology. Lecture and/or laboratory three hours a week.

Rationale:

The purpose of the Cellular Reactive Oxygen Species course is to prepare science students to design and carry out experiments to answer research questions while mastering necessary skills to perform experiments. This course involves proper usage of data analysis, interpretation of data, and presentation of results. Students should learn how science works, gain an appreciation of research as a means to find explanations for aspects pertaining to the world from a scientific perspective, understand the contexts of science, and utilize this understanding as a basis for ethics and future decisions consistent with the values of Mississippi College.

Methods of Instruction, Required Practices, and Instructional Materials:

- Methods of instruction include lab meetings with discussion format focused on content specific to syllabus, notebooks, information research, safety, skills, designing experiments, collecting and analyzing data, writing scientific reports, and preparing presentations. There will be practical hands-on training demonstration by the instructor as required.
- Required practices include students applying and practicing skills in the lab during experimentation, participation in team experiments, managing collection and analysis of data in a laboratory notebook, following safety and related procedures, reading, writing a scientific report, and preparing and presenting oral, written, and graphic presentations.
- Instructional materials include instructional videos, scientific papers, laboratory equipment, computer, marker board, and handouts.

Student Objectives and Outcomes:

Upon the completion of this course you will be able to:

- Understand peer-reviewed scientific papers
- Learn various scientific techniques related to a project
- Perform and trouble shoot experiments
- Collect and critically evaluate data
- Present findings in written report and oral formats

Methods of Evaluation:

- Lab notebook – it is imperative that you keep a complete and accurate lab notebook that is updated on a daily basis. This notebook should include methods, results, and any other information that is pertinent to the experiment. A rubric for notebooks will be provided prior to beginning experiments.
- Students will work individually and in small groups to complete experiments. You and your team members will work cooperatively while each is expected to contribute equally to the overall project. Each team member will be graded on an individual basis. The student team will present the instructor with an experimental plan schedule agreed upon and signed by each team member. A team member not completing his/her portion of the plan will not negatively affect the grade of other team members. Please note that if this occurs, the experiment may have to be repeated in full for that team member to obtain data for his/her portion of the work. This will not be the responsibility of the other team members!
- Lab meetings – Since one of the best ways to learn science is by discussing it with our peers, we will meet often. We will discuss designing experiments, techniques, data analysis, writing reports, and related scientific papers. Students will present the instructor with a schedule of their availability by the end of week 1 so that lab meetings may be scheduled to accommodate variable student schedules. Some training meetings with the instructor will be mandatory. Inform the instructor in advance if a mandatory meeting cannot be accommodated by your class schedule so that arrangements can be made. Be prepared to participate.
- Participation- see Attendance section below
- Scientific report and oral presentation– these are due at lab meetings
- There are no formal exams for this course. Assignments utilized for evaluation must be completed on time. See the class schedule at the end of this syllabus. If you miss completing an assignment on time, you must notify the instructor immediately and provide a medical, family emergencies, school/job interview, or other valid excuse and make up the work within 1 week. Failure to do so will negatively affect your grade.
- Other specific expectations are shown in the rubric under the Grading section.

Attendance:

Each semester hour of credit corresponds to 53+ clock hours. Therefore, for a 3 credit course, you are expected to complete at least 160 clock hours during the term. This is a **minimum**. You're always welcome complete more clock hours! However, accruing less than 160 clock hours will negatively affect your grade. For a full semester, the average is 10 hours per week. You may be in the lab more or less than 10 hours per week as long as you complete 160 hours for the full term. Please note that all items in the Methods of Evaluation section are required, even if you have already completed 160 clock hours.

Writing Center:

The Mississippi College Writing Center, supervised by Dr. Steve Price, offers writing consultations free-of-charge to MC students. The Center is staffed by highly-qualified undergraduate tutors who conduct interactive, one-on-one sessions with students of all disciplines. The goal is to help writers at any stage of their writing process, from choosing topics to organizing their thoughts, from deep revision to grammar. To schedule an appointment, drop by the LRC area on the first floor of the Leland Speed Library; call 601.925.7289; or email WritingCenter@mc.edu. Walk in visits are also available.

Grading:

All Students:

Students will be assigned a project for which they are responsible. There will be two formal evaluations of the project. These evaluations will be at midterm and the end of the semester. Each evaluation is worth a maximum of 50 points and will follow the rubric shown below:

	Superior (5 points)	Excellent (4 points)	Moderate (3 or 2 points)	Unsatisfactory (1 or 0 points)
Background Research	Thorough. Identifies credible sources of information. Independently finds relevant literature. Searches for answers to their questions.	Can identify credible sources of information, but sometimes relies on professor. Some attempts to answer their questions.	Cannot identify credible sources of information. Usually relies on professor to identify relevant literature or does not attempt to answer their questions	Cannot identify credible sources of information. Always relies on professor to identify relevant literature. Does not attempt to answer their questions
Techniques and Protocols	Technically proficient in benchwork. Can perform assays independently. Follows lab safety rules. Attentive, engaged and professional. Can explain procedures correctly and succinctly to others.	Technically proficient. Can perform assays independently. Follows lab rules. Fails to accurately explain procedures to others.	Has trouble completing experiments and performing assays independently or continuously repeats mistakes. Cannot explain procedures to others.	Does not complete experiments, cannot work independently, continuously repeats mistakes. Cannot explain procedures to others.
Critical Thinking	Can trouble shoot experiments independently. Asks thoughtful questions about project. Thinks of new experiments that are logical to try. Synthesizes information from literature. Formulates questions, hypotheses, and explanations.	Can trouble shoot their experiments with guidance . With prompting , asks thoughtful questions about project, synthesizes information from literature, and formulates questions, hypotheses, and explanations.	Even with guidance , cannot trouble shoot their experiments or has trouble asking thoughtful questions about project, synthesizing information from literature, and formulating questions, hypotheses, and explanations.	Does not attempt to understand, question or put information together.
Notebook and Lab Math	Has an accurate, well kept, thorough notebook. Performs basic lab calculations with ease and uses the correct units.	A well kept lab notebook but needs assistance with basic lab math.	Lab notebook missing a few items. Math remains a challenge.	Lab notebook incomplete and cannot perform basic calculations.
Lab Meeting	Prepared, organized and rehearsed. Provided appropriate graphs/images to support presentations. Stated the hypothesis, summarized the procedure, analysis, and conclusions with ease. Attempted to provide insight for other projects and added to the lab discussions.	Prepared, organized and rehearsed. Provided the appropriate graphs/images to support presentations. With assistance , stated the hypothesis, summarized the procedure, analysis, and conclusions with ease or minimally participated in lab meetings.	Not completely prepared, organized and rehearsed or did not provide appropriate graphs/images to support presentations. Had trouble stating the hypothesis, summarizing the procedure, analysis, and conclusions or was present but did not participate in lab meetings.	Not prepared, organized and rehearsed or did not provide graphs/images to support presentations. Did not state the hypothesis, summarize the procedure, analysis, and conclusions or was not present for lab meetings.

YOUR FINAL GRADE WILL BE LOWERED BY 10 POINTS FOR EVERY 16 HOURS BELOW THE REQUIRED 160 CLOCK HOURS (lowered by 5 points for every 8 hours below, etc.). SEE ATTENDANCE SECTION ABOVE!

Graduate students:

Each graduate student will be required to write a paper about as assigned aspect of their research topic that will include a historical background and review of the literature. This assignment will account for 10% of the final grade. Each point earned = 1%.

Criteria	Superior (5 points)	Excellent (4 points)	Adequate (3 points)	Poor (2 points)	Unacceptable (0-1 point)
Resources:	A superior historical and literature search. Utilized a minimum of 10 resources having a variety of sources. Citations correct and complete. Quality, peer reviewed empirical research resources. Scholarly references used.	A reasonable historical and literature search. Utilized 7-9 resources having a variety of sources. Citations correct and complete. The majority of resources were scholarly, peer reviewed, and a reasonable number of empirical research studies were used.	A limited historical and literature search. Utilized 4-6 resources having a variety of sources. Citations correct and complete. A limited number of scholarly, peer reviewed resources were presented or there were too few empirical reviewed resources or the	Few resources or a lack of variety of resources or both on the topic were used. The review of the literature did not show awareness of specialized sources. The majority of resources are superficial or weak.	No resources or variety of resources available or both on the topic were used. The review of the literature did not show awareness of specialized sources. All resources are superficial or weak.
Citations and Variety of Resources					
Scholarliness, Understanding, and Relevancy	Written with superior clarity and understanding. Sources are supportive or pertinent to the topic.	Written with clarity and understanding. Sources generally support or pertain to the topic.	Written with clarity and understanding. Most sources specifically relate or pertain to the topic.	Written with some lack of clarity and understanding. Few sources specifically relate or pertain to the topic.	Written with a lack of clarity and understanding. No sources specifically relate or pertain to the topic.

Calculation of Final Course Grade:

Undergraduates:

$[(\text{Midterm Evaluation} \times 50\%) + (\text{Final Evaluation} \times 50\%)] - [\text{hour deductions}] = \text{Final Grade}$
Undergraduate Grading Scale: 90-100% = A, 80-89% = B, 70-79% = C, 60-69% = D, and <60% = F.

Graduates:

$[(\text{Midterm Evaluation} \times 45\%) + (\text{Final Evaluation} \times 45\%) + (\text{Paper})] - [\text{hour deductions}] = \text{Final Grade}$
Graduate Grading Scale: 90-100% = A, 85-89% = B+, 80-84% = B, 75-79% = C+, 70-74% = C, 60-69% = D, and <60% = F.

Academic Honesty:

You are members of an institution that is dedicated to scholarship and spiritual growth. This institution is part of the larger academic community, the foundation of which is based on personal honesty. The success of this community depends on the commitment of both students and faculty to this principle and therefore cheating and plagiarism cannot and will not be tolerated. More importantly, Mississippi College is dedicated to empowering its students to develop the skills necessary for “making responsible, moral choices,” and therefore, the University will accept nothing less than scrupulous honesty from its students. We will follow the University policy on Academic Honesty (Policy 2.19), which can be found in the student handbook, The Tomahawk, pp. 35-36. <http://www.mc.edu/publications/handbook/academic.pdf>

Special Accommodations at Student Counseling Services:

In order for a student to receive disability accommodations under Section 504 of the Americans with Disabilities Act, he or she must schedule an individual meeting with the Director of Student Counseling Services immediately upon recognition of their disability (if their disability is known they must come in before the semester begins or make an appointment immediately upon receipt of their syllabi for the new semester). The student must bring with them written documentation from a medical physician and/or licensed clinician that verifies their disability. If the student has received prior accommodations, they must bring written documentation of those accommodations (example Individualized Education Plan from the school system). Documentation must be current (within 3 years). The student must meet with SCS face-to face and also attend two (2) additional follow up meetings (one mid semester before or after midterm examinations and the last one at the end of the semester). Please note that the student may also schedule additional meetings as needed for support through SCS as they work with their professor throughout the semester. Note: Students must come in each semester to complete their Individualized Accommodation Plan (example: MC student completes fall semester IAP plan and even if student is a continuing student for the spring semester they must come in again to complete their spring semester IAP plan). Student Counseling Services is located in Alumni Hall Room #4 or they may be contacted via email at: mbryant@mc.edu or rward@mc.edu or by phone at [601-925-7791](tel:601-925-7791).

Other Training and Certification Opportunities

There are many inexpensive or free training opportunities available for researchers. Some of these even provide certificates of completion or certifications. There are also many inexpensive or free memberships for scientific organizations. Additional opportunities will be added as they are discovered. A list of these known to the instructor will be provided to students, and students are encouraged to share by adding to the list. Students should take advantage of these opportunities!

Lab Attire:

Since our research labs are BSL-2, **we are responsible** for requiring the use of the appropriate personal protective equipment. These items include the use of closed-toe shoes and lab coats. Lab coats must be mid-thigh length (not short coats). They may be purchased in Jackson at TCs or UMC or ordered online (if you order it online, please note that you may not begin work until you have a lab coat—you may borrow one from a friend, if necessary).

UMC Bookstore

(on UMC's Campus)

<http://umcbookstore.com/>

TC's Uniforms, Inc.

2715 North State Street

Jackson, MS 39216

[\(601\)981-9274](tel:(601)981-9274) or [\(800\)981-9274](tel:(800)981-9274)

[\(601\)982-9024](tel:(601)982-9024) fax

sales@tcsums.com

Hours: Monday - Friday 8:00am - 5:30pm

Saturday 9:00am - 5:00pm

<http://www.tcsums.com/>

ONLINE RESOURCES

Amazon has some for as low as \$10

<http://www.amazon.com>

Just labcoats

<http://www.justlabcoats.com>

Important College Dates:

January 20, Monday: Martin Luther King Holiday, No Day or Night Classes; Offices Closed

January 21, Tuesday, 5pm: Last Day To Enroll or Add A Full Semester Class

January 23, Thursday: Last Day To Drop a Full Semester Class with 100% Tuition Only Refund

March 10-16, Monday through Sunday: Spring Break

March 21, Friday: LAST DAY TO DROP A FULL SEMESTER CLASS (No Tuition Refund)

April 21, Monday: Easter Holiday - Offices Closed (No day classes; night classes will meet)

April 28-30, Monday-Wednesday: Dead Days (April 30, Wednesday: Last day of classes; night exams begin)

May 1, Thursday: Study Day

May 2- May 7, Friday, Saturday, Monday, Tuesday, Wednesday: Final exams

Early Alert System:

Mississippi College has adopted the practice of finding students early in the semester who may be exhibiting behaviors that could ultimately have a negative impact on their academic progress. These behaviors are often called “red flag” behaviors and include, but are not limited to, excessive absences, poor test grades, and lack of class participation or evidence of non-engagement. Identifying these behaviors early gives the instructor the opportunity to raise the “red flag” on behalf of a particular student so that the student can take the appropriate action to redirect his/her progress. The system alerts the student, the student’s advisor, and the Office of Student Success. These messages are intended to help a student recognize an area of concern and to encourage him/her to make some choices to improve the situation. When a student receives an Early Alert message, the student should quickly make an appointment to talk with his/her professor about the situation. Also, students can make full use of the Office of Student Success to set academic goals and connect to campus resources.

Course Topics and Tentative Schedule:

Varies by project and success of experiments. A general schedule is shown below. Specific meeting times and additional presentation opportunities will be added as needed!

Week of...	Topics and Important Dates
1-13 to 1-17	First Lab Meeting: Friday, January 17 Review of Syllabus and Signed Syllabus Due Overview of Research Topics and Techniques Handbook
1-20 to 1-24	Martin Luther King Holiday- no class- Monday, January 20 Tuesday, January 21-last day to enroll or add a full semester class Thursday, January 23-last day to drop a class- 100% tuition refund Lab Organization, Safety, and Learning Techniques
1-27 to 1-31	Experiments and Analysis
2-03 to 2-07	Lab Meeting
2-10 to 2-14	Experiments and Analysis
2-17 to 2-21	Experiments and Analysis
2-24 to 2-28	Experiments and Analysis
3-03 to 3-07	Midterm Lab Meeting: Friday, March 7 Midterm Evaluations Experiments and Analysis
3-10 to 3-14	Spring Break- no class
3-17 to 3-21	Experiments and Analysis March 21- last day to drop a class -zero tuition refund
3-24 to 3-28	Preparation of Data
3-31 to 4-04	Preparation of Data
4-07 to 4-11	Preparation of Data
4-14 to 4-18	Preparation of Data Graduate Papers Due
4-21 to 4-25	Easter Holiday- April 21, Monday Final Lab Meeting: Friday, April 25
4-28 to 5-02	Notebooks and Complete Experimental Reports Due Final Evaluations Study Day- May 1, Thursday

I have read and understand all expectations outlined in this Spring 2014 Researcher's Syllabus.

Name (print): _____ Name (signature): _____ Date: _____