LAB SYLLABUS
LB144 Fall 2014: Introductory Organismal Biology

LAB OVERVIEW

About BioCore: BioCore I (lecture and lab combined) is formally an introductory biology course, but in reality is a wondrous exploration of life at all levels. It examines the interplay of genes, cells, and chemistry allowing organisms to live, survive, and interact with each other and the environment, all within a scientific framework. In BioCore I labs, you are junior scientists in training. LB144 LAB meets once a week as a combined 2 hour and 50 minute hour lab/recitation session. In this class, you are junior scientists in training. Therefore, lab/recitation is aimed at giving you hands-on experience ‘doing biology’ so that you gain the skills listed below in order to ‘think and act like scientists’.

Why integrate the sciences (including cell/molecular and organismal biology)? There are two main reasons we should be integrative in this course. First, over the past 50 years, research in biology has become more quantitative and interdisciplinary, relying more heavily on other sciences. To understand large, rapidly changing ecosystems, or to make sense of massive amounts of data from the Human Genome Project, today's biologists must be able to use modern mathematical, statistical, computational, and technological tools. Second, biology instruction has not kept pace with research into how people learn. Studies on learning reveal that: students learn best if they are actively engaged working both individually and in groups constructing their own knowledge [this is also how scientists work]. The textbook Integrating Concepts in Biology and this BioCore Lab course pack take advantage of these insights and enable you to better achieve your full learning potential by directly involving you in your own learning.

You will do a variety of activities in this lab that will ask you to construct your own knowledge. For example, you will analyze and interpret published data, you will learn and practice how to read text and scientific figures, you will complete a case study that provides a context within which you can connect new statistical information, and you will design, implement, and present your own research. As you gain knowledge, you will find you can learn more and retain new information more easily as well as make connections between knowledge and skills.

LAB LEARNING GOALS & PHILOSOPHY

Learning Goals. During 2011-2012, the LBC Biology faculty members (Drs. Cheruvelil, Fata-Hartley, Luckie, Murphy, Smith, Urquhart) developed a set of conceptual and skills learning goals for the LBC biology students. Although the content learning goals depend on the course, the skills learning goals are what we would like our students to learn by the end of the LBC144-145 biology sequence. Therefore, both classes are geared toward advancing these goals, such that by the end of the sequence, all students should excel at:

1. Science process skills, such as: observation, hypothesis formation and testing, inference, prediction, interpretation, and experimentation.
2. Effective and cooperative teamwork; examples: team building, communication and leadership.
3. Communication aimed at a variety of audiences important for scientists:
   a) Speaking: practice speaking and listening to others in large and small groups.
   b) Reading: practice careful and critical reading of text, identification of important points and ideas, as well as slow and deliberate reading and interpretation of figures and graphs.
   c) Writing: practice composition of text, writing hypotheses, building figures and graphs.
   d) Thinking: practice identifying data and using data in evidence-based arguments.
**Philosophy:** In general, we believe that it is our role to facilitate your learning and critical thinking. We hope to provide you with a solid foundation of concepts and skills with which you may understand the complexity of Earth’s organisms. Because knowledge is dynamic, we want you to develop the skills necessary for a lifetime of learning. We also believe that individuals perform best, enjoy the experience, and learn the most when working in a high-functioning cooperative, team-based environment. Therefore, we will work to facilitate such an environment in the lab. As your instructor and as a student in this class, it is our **shared responsibility** to develop and maintain a positive learning environment for everyone. We take this responsibility very seriously and will inform members of the class if their behavior is negatively affecting the learning environment. As a fellow learner, you are asked to respect the learning needs of your classmates and assist me in achieving this critical goal.

**OUR EXPECTATIONS OF YOU**
1) Work to your fullest potential to achieve the course learning goals.
2) Submit only your own work on independent assignments and that of the *entire* team for team assignments.
3) Attend and engage yourself in all lab/recitation meetings.
4) Arrive to lab/recitations on time, ready to learn and participate.
5) Finish and turn in assignments on time.
6) Work cooperatively in teams and respect the opinions and input of other students.

**LEVELS OF SUPPORT**
This is a difficult course and we do not assume that you will understand all of the course material on your own. Below are the steps you should take when you do not understand something from the lab portion of the course (in addition to reading your lab manual, reviewing lab handouts and postings on the course website (LON-CAPA), and reviewing the notes you’ve taken in your lab notebook). At each step, even if the person you ask for help does not know how to help you understand the material, they can provide you with perspective and support. **At any time, you are encouraged to attend instructor open lab or office hours**; we offer these hours hoping that you will come and talk with us about the course and get to know us better (and vice versa!).
1) If you have a question during the lab/recitation period, raise your hand to ask it. Other students probably have the same question, and we often learn the most through thoughtful discussion.
2) Ask for help from your team members or other study buddies in the class. This strategy will help you and the person you ask learn the material because we learn best by teaching others.
3) Ask for help from a lab instructor during their open lab/office hours or at the end of lab/recitation. The undergraduate learning assistants (UGLAs) have taken the course previously (and succeeded!) and remember clearly what it is like to not understand some of the material, and all of the lead instructors (GTAs/Profs) have multiple semesters of experience teaching.
4) See an LB advisor to ask about help with study skills, test-taking tips, research opportunities, and peer tutoring opportunities.

**REQUIRED TEXTS AND SUPPLIES**
2. **A lab notebook:** Any bound notebook to record lab notes in. Composition style might be easiest, something like this: [http://www.amazon.com/Recycled-Composition-Sheets-College-4512305/dp/B00137DR4A/ref=sr_1_5?s=office-products&ie=UTF8&qid=1409149088&sr=1-5&keywords=composition+notebook](http://www.amazon.com/Recycled-Composition-Sheets-College-4512305/dp/B00137DR4A/ref=sr_1_5?s=office-products&ie=UTF8&qid=1409149088&sr=1-5&keywords=composition+notebook) that is $4.
## YOUR TEACHING TEAM

<table>
<thead>
<tr>
<th>Lead Lab Instructors, Title</th>
<th>Email</th>
<th>Open Lab/Office Hours Day, Time, Location</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kendra Cheruvelil, Ph.D., Associate Professor in LBC and Fisheries &amp; Wildlife, Affiliations with the Ecology, Evolutionary Biology &amp; Behavior and the Environmental Science &amp; Policy Programs</td>
<td><a href="mailto:ksc@msu.edu">ksc@msu.edu</a></td>
<td>Thurs 9-10am Holmes Hall Sparty's (Breakfast with the Prof!)</td>
</tr>
<tr>
<td>Angela De Palma-Dow, Fisheries &amp; Wildlife and Ecology, Evolutionary Biology &amp; Behavior M.S. Student</td>
<td><a href="mailto:depalmad@msu.edu">depalmad@msu.edu</a></td>
<td>Thurs 1-3pm in C-3</td>
</tr>
<tr>
<td>Dan Hulbert, Entomology and Ecological Food and Farming Systems Ph.D. Student</td>
<td><a href="mailto:hulbertd@msu.edu">hulbertd@msu.edu</a></td>
<td>Fri 10am-noon in C-3</td>
</tr>
<tr>
<td>Anthony Watkins, Pharmacology &amp; Toxicology M.S. Student</td>
<td><a href="mailto:watki155@msu.edu">watki155@msu.edu</a></td>
<td>Wed 1:30-3:30pm in C-3</td>
</tr>
</tbody>
</table>

### Undergraduate Learning Assistants, Major(s)/Minor(s) | Email
--- | ---
Ashley Brooks, Zoology & Neurobiology | brook234@msu.edu
Jessica Goldsworthy, Biochemistry & Pre-Pharmacology | goldswol7@msu.edu
Katy Keisler, Animal Science & Pre-Veterinary | keslerka@msu.edu
Anna Miller, Nutritional Sciences | mill2181@msu.edu
Joey Riedy, Fisheries and Wildlife | riedyjos@msu.edu
Ted Van Alst, Genetics | vanalsta@msu.edu

## LABS/ RECITATIONS (All in C-3)

<table>
<thead>
<tr>
<th>Section #</th>
<th>Day, Time</th>
<th>Instructors</th>
</tr>
</thead>
<tbody>
<tr>
<td>Section 1</td>
<td>T 3:00-5:50pm</td>
<td>Dr. C, Ted Van Alst, Anna Miller</td>
</tr>
<tr>
<td>Section 2</td>
<td>T 7:00-9:50pm</td>
<td>Anthony Watkins, Anna Miller, Joey Riedy</td>
</tr>
<tr>
<td>Section 3</td>
<td>W 4:00-6:50pm</td>
<td>Dan Hulbert, Jessica Goldsworthy, Ted Van Alst</td>
</tr>
<tr>
<td>Section 4</td>
<td>W 7:00-9:50pm</td>
<td>Anthony Watkins, Katy Keisler, Ashley Brooks</td>
</tr>
<tr>
<td>Section 5</td>
<td>T 3:00-5:50pm</td>
<td>Angela De Palma-Dow, Joey Riedy, Ashley Brooks</td>
</tr>
<tr>
<td>Section 6</td>
<td>T 7:00-9:50pm</td>
<td>Dan Hulbert, Katy Keisler, Jessica Goldsworthy</td>
</tr>
</tbody>
</table>
ADDITIONAL OPEN LAB HOURS
These open lab hours are held by the undergraduate learning assistants (UGLAs) in order for students to get help with lab assignments and exercises outside of their normal lab/recitation hours. Between the Lead Instructor Office/Open Lab Hours (listed on the previous page) and the UGLA Open Lab Hours, students have the opportunity to get into the labs on any given weekday. We encourage all students to make use of these times. The UGLAs have taken the course previously (and succeeded!) and remember clearly what it is like to not understand some of the material. They can also be used as a resource for career ideas, study skills, and general MSU-success.

<table>
<thead>
<tr>
<th>Open Lab Hours (held in C-3) Day &amp; Time</th>
<th>Undergraduate Learning Assistants (UGLAs)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mondays 3:30-5:30pm and 6-7pm</td>
<td>Ted Van Alst, Ashley Brooks, Katy Keisler</td>
</tr>
<tr>
<td>Tuesdays 1:30-2:30pm</td>
<td>Joey Riedy</td>
</tr>
<tr>
<td>Wed - see Lead Instructor office hours above</td>
<td>see Lead Instructor office hours above</td>
</tr>
<tr>
<td>Thurs - see Lead Instructor Office Hours above</td>
<td>see Lead Instructor office hours above</td>
</tr>
<tr>
<td>Fri 11:45am-1:45pm &amp; see Lead Instructor Office Hours above</td>
<td>Anna Miller, Jessica Goldsworthy &amp; see Lead Instructor office hours above</td>
</tr>
</tbody>
</table>

YOUR LEARNING ENVIRONMENT
Throughout this course, we will work together to create an inclusive learning environment in which all individuals are included, valued, and respected. Members of the teaching team and the student population come from a variety of educational and cultural backgrounds and hold diverse beliefs. We will encourage the exploration of and engagement in both divergent scientific approaches and diverse learning methods. Indeed, diversity is an essential component of scientific endeavor. Dr. Scott Miller, professor of political science sums up the value of diversity as follows.

“*The problems we face in the world are very complicated. Any one of us can get stuck. If we’re in an organization where everyone thinks in the same way, everyone will get stuck in the same place. But if we have people with diverse tools, they’ll get stuck in different places. One person can do their best, and then someone else can come in and improve on it. …Breakthroughs in science increasingly come from teams of bright, diverse people.*”

To create an environment that appeals to a variety of learners, the scientific material in this course will be presented in a variety of formats. A range of teaching methods shown through educational research to be effective for student learning will be used including various active learning methods, group learning, and guided, inquiry-based laboratory investigations. Despite diligent efforts, these methods will not necessarily appeal to all learners. If you find you are struggling with the material, even with the different approaches employed, you are encouraged to discuss your difficulties with Dr. C or another member of the teaching team. *We want everyone to succeed.*

Another significant component of an inclusive learning environment includes classroom conduct. It is essential that students are respectful of other students as well as the teaching team (and vice versa). Students are expected to refrain from behaviors that disrupt other students and the teaching team. Please respect and abide by the following in order to ensure a positive learning environment:

- Lab/recitation begins promptly at the start time, and will take the entire 2 hours and 50 minutes. You should be seated and ready to begin lab/recitation at the start time and refrain from leaving early or noisily packing up before everything is completed at the end of your lab/recitation.
• Use computers or other electronic devices only for class activities. Silence your cell phone during lab. Students engaged in Facebook, Twitter, texting, emailing, etc., will be asked to leave.
• Listen and remain silent when the teaching team and your classmates are presenting material or asking/answering questions.
• Respect the opinions and input of your classmates. Ideas, questions, or responses from your peers should never be met with disapproving or mocking gestures or comments.
• Respect your instructors. Pay attention and participate during labs. Full participation by all creates a more inclusive learning environment and improves learning.

In return, the teaching team will be respectful of the LB144 students. We will:
• Begin recitation/labs on time and end on time.
• Respect the work and input of students. We will not demean or degrade students.
• Be prepared and organized for labs.
• Follow the syllabus and the course schedule. If any changes are necessitated, students will be given advance warning.
• Maintain a respectful and inclusive lab environment.

LAB POLICIES
1) Accommodations: We strive to create an inclusive learning environment. However, it is your responsibility to let your lab instructor know right away if you have a disability, religious observance, or other situation that requires accommodation. MSU is committed to providing equal opportunity for participation in all programs, services, and activities. Requests for accommodations by persons with disabilities may be made by contacting the Resource Center for Persons with Disabilities at 517-884-RCPD or on the web at rcpd.msu.edu. Once your eligibility for an accommodation has been determined, you will be issued a verified individual services accommodation (“VISA”) form. Please present this form to me at the start of the semester and/or two weeks prior to the accommodation date (test, paper, etc…). Requests received after this date will be honored whenever possible.

2) Lab/recitation Attendance: Attendance in lab/recitation is MANDATORY. Missing a lab/recitation will most definitely result in decreased learning (and a corresponding lower grade for the class), and will negatively impact your entire team. No in-lab activities can be made up if missed. If an emergency occurs and you are unable to attend lab/recitation it is YOUR responsibility to contact your lead instructor before-hand, to provide documentation of the emergency, and to make sure that you understand the work missed and meet all agreed-upon deadlines and responsibilities. The burden of staying current in this class rests on your shoulders.

3) Expectations outside of class: Expect to spend a minimum of 2 hours of out-of-class time preparing for lab/recitation each week. Come to class having already read for class (lab manual, primary literature) – this will greatly increase your understanding (and result in a better grade).

4) Student teams: The purpose of long-term teams is to provide students the support, encouragement, and assistance needed to succeed in this course and beyond. During lab/recitation, you will be part of a team (3-5 students). These teams will be assigned during the second week of lab/recitation based on background and skills and will be maintained for the semester. Within the team, each student will take on particular roles to balance the workload, and assessment of team functioning will occur regularly. The members of your team should exchange phone numbers, room numbers, and information about schedules as you may wish to meet outside of class. This information should be used only for professional purposes and should not be shared with others. Your team should be a resource for preparing for class, sharing course materials, and studying for exams. If a team member must arrive late or leave early on occasions, the team can provide information about what
that student missed. You must sit with your team members during lab/recitation sessions. If you experience difficulty working effectively as a team, please see your lab instructor right away so that we can help resolve any problems and get your group back on track.

5) Requesting Review of an Assignment for Possible Grade Change: Upon receipt of any graded assignment, it is in your best interest to review your work. If you feel that your assignment was not graded properly, you must submit your complaint in writing (on paper, not via email). You must concisely explain why you object to the assigned grade and what elements of your work demonstrate you mastered the material. Please be advised that if you submit a formal grade appeal about one element of an assignment, we always re-grade your entire exam, paper or quiz and the score may increase, decrease or stay the same. For group assignments, all authors must sign the written request. How much and how well you provide evidence to support your argument is assessed and students who provide good logical arguments supported well by solid relevant evidence will earn approval (you may cite pages of textbooks or even better published research papers). Avoid emotional arguments that blame others or arguments based on hearsay, e.g. “I heard from a student” “A GTA told me this was correct.” If you neither make logical arguments nor provide thoughtful evidence to support them, your appeal will not gain traction or be approved. All discussion concerning score changes must be completed within 10 days from the date the grade was officially posted online. No grade changes will be considered after this time. Any disputes brought to our attention verbally or via email will not be considered.

6) Late assignments: All assignments must be turned in on time. Assignments that are due in lab/recitation, are due at the beginning of the session indicated (at time of entering room) unless otherwise specified. If an assignment is 1 day late, 1 point will be deducted from the final score. After this 24 hr grace period, the penalty becomes more severe: 10% off for two days late, 20% off for three days late, and so on. After 5 days, you will receive a “0” for the assignment. Note that weekend days are still "days". Students may turn hard-copy assignments in on the weekend in person to a TA or LA, or slide it under the Profs office door and send them an email saying “It’s there!”. If an assignment is deemed incomplete by an instructor (Example: you do not follow the instructions), it is considered late, and 1 point is deducted. If illness or an emergency occurs and you are absent on the day that an assignment is due, you are still expected to turn the assignment in on time unless an alternative deadline was arranged and agreed on with the instructors before the absence, and if that alternative deadline is not met, then the normal late policy begins.

7) Class communication: We will make announcements regarding the labs/recitations on the course website (LON-CAPA) and with email. Therefore, please be sure to check the course website and your MSU email frequently (preferably once daily, but at least twice per week). Supplemental lab/recitation materials will be made available through the course website.

8) Email correspondence: We would like to remind students that emails are permanent records of communication; therefore emails should be written professionally. A professional email includes a proper greetings (i.e., Dear Dr C,) and signature (i.e., Thank you, Mary), a descriptive subject (i.e., Question about a difficult concept in LB144 lab), and is written using complete words and sentences and all appropriate punctuation. We will only respond to student emails that come from MSU accounts. We will try to respond promptly, but do not expect us to respond immediately or over weekends (often we will not be able to respond until at least 24 hours after you send us an email).

9) Academic Integrity: Academic integrity means being honest about your intellectual work. Working with a learning partner and as a member of a cooperative team is an effective method of learning biology or any subject. Interacting with other people is a natural way for humans to learn, but each person must construct her or his own knowledge in the process. In Briggs Biology, we encourage you to work and study together both in and out of a more formal classroom setting. The written materials you alone produce as homework assignments, in-class exercises and projects will be an
outcome of these interactions, while also being a means of evaluating your personal knowledge. This is when the topic of academic integrity becomes an issue. LBC has the following honor code, developed by your peers: "As a member of the Lyman Briggs College community, I vow to hold myself and my peers to the highest measures of honesty and integrity. I understand that this benchmark is set forth to advance the credibility and pride associated with our College. I will neither give nor receive any unauthorized assistance in completing my work, which includes, but is not limited to: papers, reports, exams, group-work, and classroom conduct." In addition, MSU has an all university policy concerning Academic Honesty and Integrity: Article 2.3.3 of the Academic Freedom Report states that "The student shares with the faculty the responsibility for maintaining the integrity of scholarship, grades, and professional standards." In addition, LB adheres to the policies on academic honesty as specified in General Student Regulations 1.0, Protection of Scholarship and Grades; the all-University Policy on Integrity of Scholarship and Grades; and Ordinance 17.00, Examinations. (See Spartan Life: Student Handbook and Resource Guide and/or the MSU Web site: www.msu.edu.). Therefore, unless authorized by your instructor, you are expected to complete all course assignments, including homework, lab work, quizzes, tests and exams, without assistance from any source. You are expected to develop original work for this course; therefore, you may not submit course work you completed for another course to satisfy the requirements for this course. Also, you are not authorized to use the http://www.allmsu.com web site to complete any course work in LB144. Students who violate MSU rules may receive a penalty grade, including--but not limited to--a failing grade on the assignment or in the course. Contact your instructor if you are unsure about the appropriateness of your course work. (See also http://www.msu.edu/unit/ombud/honestylinks.html ). As a student of MSU, it is your responsibility to become familiar with, understand, and abide by the General Student Regulations which protect both you and the university if an infraction has occurred. Ignorance of these regulations is not a defense in cases of infringement.

10) Intellectual property rights and social media: As members of the LB144 learning community, students are expected to respect the intellectual property of course instructors. All course materials presented to students are the copyrighted property of the course instructor and are subject to the following conditions of use: Students may not record any classroom activities without the explicit and prior consent of their lab instructors and classmates. If permission is granted, students may not share the recordings with other students enrolled in the class - recordings can be used only for their own course-related purposes. Students may not post these recordings, or other course materials online, or distribute them to anyone not enrolled in the class without the advance written permission of the course instructor and, if applicable, any students whose voice or image is included in the recordings. Any student violating the conditions described above may face academic disciplinary sanctions.

**EVALUATION OF YOUR WORK**

Your lab/recitation grade will be based on a combination of assignments, some that are graded per individual and some that are graded for each team. For example, surveys, lab notebook checks, lab quizzes, and performance-based assessments are graded individually. On the other hand, ecology proposals and posters will mainly be graded as a team. Lab exercises found in the BioCore course pack are a mix of individual and team assignments. There will be **no extra credit assignments given at any time during the semester**, so complete each assignment accordingly. We will provide more detailed schedules and point breakdowns throughout the semester.
Lab assessments:

<table>
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<tr>
<th>Description</th>
<th>Points</th>
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<tbody>
<tr>
<td>BioCore Exercises 1-22* (pts total)</td>
<td>385</td>
</tr>
<tr>
<td>Lab Notebook Checks (4X5 pts each; dates randomly decided)</td>
<td>20</td>
</tr>
<tr>
<td>Lab Performance-Based Assessments (4X5 pts each; dates randomly decided)</td>
<td>20</td>
</tr>
<tr>
<td>Lab Quizzes (10X5 pts each; 11 quizzes wks of Sept 8-Nov 21, lowest quiz dropped)</td>
<td>50</td>
</tr>
<tr>
<td>Surveys (5X5 pts each**)</td>
<td>25</td>
</tr>
<tr>
<td><strong>Lab Total (50% of total LB144 grade)</strong></td>
<td>500</td>
</tr>
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</table>

* Ex 20 and 22 will be posted on the course website.

** The five surveys are as follows: Lab pre-test (Survey Monkey) - week 1, Team Maker Survey - week 2, CATME Survey 1 - ~1/3 of way thru semester, CATME Survey 2 - ~2/3 of way thru semester, and Lab post-test (Survey Monkey) - week 15.

**Grading:** Your grade in BioCore (LB144) is based on the total number of points earned in the both the lecture portion and the laboratory portion of the course. The course will be graded on a flat scale. This means all students can earn a 4.0 grade and you know in advance that someone else's performance on an assignment cannot affect your grade. Thus, there is no reason to resist or hesitate in helping other students learn.

<table>
<thead>
<tr>
<th>90-100% =4.0</th>
<th>75-79.9%=2.5</th>
<th>60-64.9%=1.0</th>
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<tr>
<td>85-89.9%=3.5</td>
<td>70-74.9%=2.0</td>
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<td>80-84.9%=3.0</td>
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