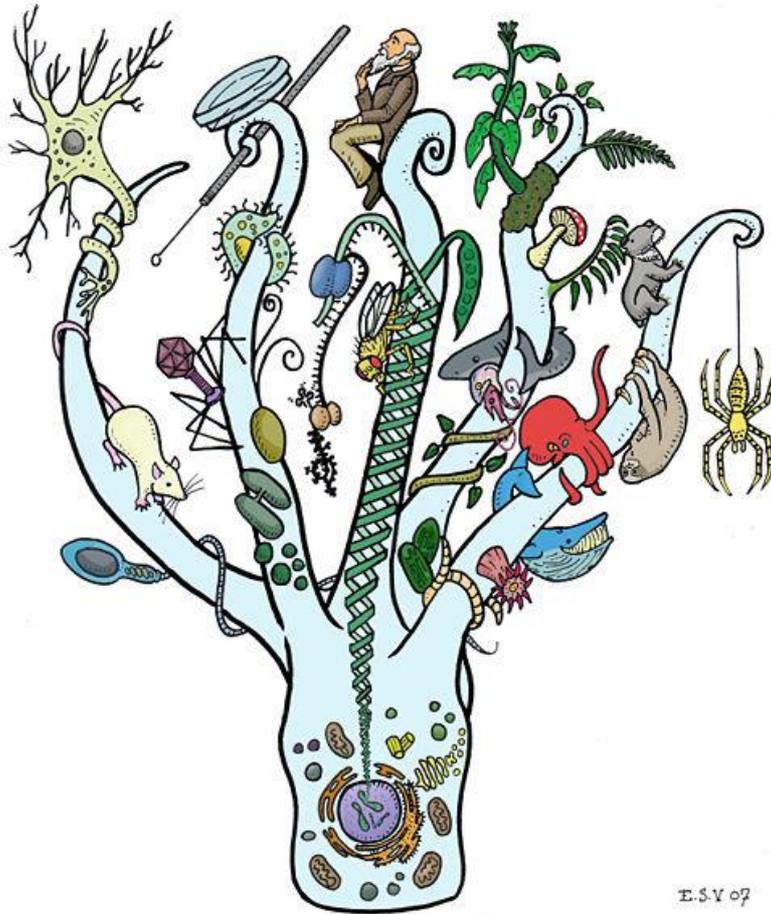


**CONCEPTS OF BIOLOGY**  
**BIOL 111**  
**Laboratory Manual**  
**Spring 2018**  
**Minot State University**



**Prepared by**  
**The Faculty of MSU Department of Biology**

**CONCEPTS OF BIOLOGY -- BIOL 111**  
Laboratory syllabus and schedule, Spring 2018  
Lab room: Swain Hall 304

You have been assigned a specific lab section. Please make every effort to attend the same section each week. If you find that once or twice, you find you have a very important conflict or minor illness, you may

attend a different lab section that week. Please use the contact information below to politely inform /ask both the instructor of your normal section and the alternate section you wish to join. It is the student's responsibility be sure that the lab report for that week is recorded by their regular instructor. (Check with them.)

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### Lab sections

Tuesday 10:00-11:50 (Dr. Keller)

Thursday 10-11:50 (Ms. Ihli)

Tuesday 1:00-2:50 (Dr. Keller)

Thursday 1-2:50 (Ms. Ihli)

Tuesday 3:00-4:50 (Ms. Ihli)

Thursday 3-4:50 (Dr. Shipunov)

Tuesday 5-6:50 (Ms. Ihli)

### Instructors

Dr. Keller [Christopher.keller@minotstateu.edu](mailto:Christopher.keller@minotstateu.edu)

Ms. Ihli [lori.ihli@minotstateu.edu](mailto:lori.ihli@minotstateu.edu)

Dr. Shipunov [alexey.shipunov@minotstateu.edu](mailto:alexey.shipunov@minotstateu.edu)

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The lab portion of this course is devoted to some key biological concepts and the methods by which biological information is discovered.

Biology is a huge topic. Those who study it must be familiar with the very small (e.g., the behavior of individual molecules, e.g., H<sub>2</sub>O) and the very large (e.g., how pods of whales interact or how forests affect global CO<sub>2</sub>). It can be easily argued that no other field of study encompasses such a broad range. In addition, no other area of science is so directly connected to humans and how we live our lives. Advances in technology are constantly causing humans to rethink about what is possible with increased understanding of the natural world. Courses like Concepts of Biology are perhaps more important than ever to help keep up with advances in biology. Hopefully this course will help you to understand topics such as personalized medicine, genetic testing, DNA analysis and sequencing, evolutionary relationships, and predictions for the future of living things (including you!) on planet earth.

Biology is studied by scientists. This method of knowing (i.e., science) provides the most efficient and direct means of understanding the breadth and complexity of the natural world. It is our central goal that we communicate how scientists think about and approach biological problems. Experiment-based evidence leads to evidence-based understanding and decision-making. There are other "ways-of-knowing" but few if any are broadly applicable to the natural world. (My "belief" may not be exactly your "belief", whereas everyone can apply the scientific method in exactly the same way.)

The lab portion of this course will show you how to approach biology using science. Because of the influence and underlying significance of biology and science, this course is intended make you a better citizen in this world where scientific breakthroughs can outpace the capacity of the general public to make informed decisions about these breakthroughs. Our goal is to increase that capacity!

### Attendance & Missed Classes

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Attendance at, and participation in, every lab is simply expected. If exceptional circumstances prevent you from attending your chosen lab section, make every effort to attend one of the other labs. (See first paragraph of this document). If you will miss lab entirely one week, your absence may be excused ONLY with a doctor's signed explanation or other official document or communication from an authority. The determination of "excused" (or not) is left up to your lab instructor. Since each lab gives you the opportunity to earn 15 points toward your grade, a missed lab will likely lower your overall grade. Perfect attendance to labs will reward you with 15 extra points!

### Folders—if your instructor uses folders

The “requirements” section (and only the requirements section) of each lab must remain in your folder. The folder will be turned in at the end of each lab period. Keeping all your work in a single folder ensures that we can examine your work each week and will allow us to ascertain your progress and detect problems in understanding. Make your current lab requirements page easy for your instructor to find each week.

## Lab Requirements / Grading

**YOU MUST HAVE THE LAB PRINT OUT WHEN YOU ARRIVE IN LAB. THIS IS YOUR RESPONSIBILITY. READ THE LAB CAREFULLY BEFORE YOU ARRIVE IN LAB. YOU FORFEIT 5 POINTS IF YOU DO NOT BRING YOUR OWN LAB PRINT OUT.**

The lab and lecture grades are combined to equal one overall score for the course. This means that attending, and doing well in lab can considerably improve your overall grade. To determine your overall grade, simply add your earned lecture points to your earned lab points and divide by the total points available (lecture earned + lab earned/lecture available + lab available).

There are a total of 12 labs. Each lab is worth 15 points. Therefore the lab portion of the course is worth a total of 180 points (12 labs X 15 points each = 180 points). Please keep in mind that it is not easy to get full credit on each lab. In order to earn full credit, students must have a solid understanding of the lab material and outcomes of the lab. **READ YOUR LAB BEFORE ARRIVING. BE FAMILIAR WITH WHAT WILL BE EXPECTED. YOUR GRADE WILL LIKELY REFLECT YOUR PREPARATION EFFORT.**

Since this is a science class, so you are expected to write in a scientific way. This means that simple answers (e.g. Yes, No, 5, It didn't work, etc.) are unacceptable and will be graded as such. All answers/hypotheses must be thoroughly explained. All equations and mathematical work must be shown. All units must be defined. Below is list of rules for writing good labs. It would be a good idea to review this list prior to turning in each lab.

1. Use complete sentences. This is essential to show you have a complete understanding.
2. Proofread what you have written—look it over before you turn it in!
3. Even though you are working with a partner/partners, write your own answers in your own words. Lab requirements that are identical in wording will receive zero credit—This is a form of plagiarism. Discuss concepts/answers with your partners, then write on your own.
4. Some labs ask you to provide a hypothesis and to provide a basis for choosing that hypothesis. Use proper wording. “I hypothesize that.....because...” Or...my hypothesis is....because..... In addition, scientists never write “We proved our hypothesis.” As humble and careful scientists, when we find information that indicates our hypothesis might be valid, we write, “We failed-to-reject our hypothesis” instead. Or...if we find evidence that clearly conflicts with our hypothesis, we write...”We reject our hypothesis.”
5. Answers must be specific. Explain, explain, and explain some more. Someone who has never taken biology should understand your answer.

## *Lab Schedule*

Lab #      Dates

Topic

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**1** Jan. 16/18 **Science & the Scientific Method**  
**2** Jan. 23/26  
**3** Jan 30/Feb. 1  
**4** Feb 6/8  
**5** Feb 13/15

**Feb 20/22** **No Lab—Assessment day Feb. 20**

**6** Oct 27/March 1  
**7** March 6/8

**March 13/15** **No labs---spring break**

**8** March 20/22

**March 27/29** **No labs—Instructor unavailable**

**9** April 3/5  
**10** April 10/12  
**11** April 17/19  
**12** April 24/26

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