

**General Biology II – BSC 1011**  
**Guidelines for your success**  
**(Syllabus)**

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**Why should I care about biology?**

“I like to define biology as the history of the earth and all its life — past, present, and future. To understand biology is to understand that all life is linked to the earth from which it came; it is to understand that the stream of life, flowing out of the dim past into the uncertain future, is in reality a unified force, though composed of an infinite number and variety of separate lives.” - Rachel Carson.

This quotation encapsulates the flow and interconnectedness of life at all scales of time and space. In this course we will explore the history of life on earth in the context of the great tree of life and seek to answer many fascinating questions. What was the Earth like before there was life? How did the conditions on Earth change as a result of the presence of living organisms? Could we live on another planet? Why do you have to eat? How did life on Earth change when organisms started eating each other? Why do we need organ systems? How was the invasion of land similar and different for animals as compared to plants? Why are there so many species on Earth? What is your relationship to other animals and plants? Can we live in a human-engineered world completely separated from nature?

By mastering skills such as evolutionary tree thinking and analysis of energy flow, you will be able to understand and address these and many more intriguing puzzles. We will use principles of anatomy, physiology, evolution and ecology to understand patterns of biological diversity and the processes that generate that diversity.

## **What will I be able to do after successfully completing this course?**

General Biology II is fundamentally a class about diversity: how it is generated, maintained, and constrained. By the end of the class you will be able to explain many features of organismal diversity using the following list of specific skills.

- 1) List all features that distinguish life from non-life and describe the conditions that led to the origin of life on Earth and how conditions on Earth changed as a result of biological processes.
- 2) Represent the diversity and evolutionary history of life on earth using a tree diagram and demonstrate that all life is united in a single great tree of life.
- 3) Describe and diagram principles of energy flow in organisms and ecosystems.
- 4) Compare and contrast unicellular and multicellular life from a physiological and ecological perspective and predict the consequences of large body size.
- 5) Analyze the transition from water to land in all groups that made this transition in terms of physiological requirements and body support.
- 6) Locate your position in both a graphical representation of the tree of life as well as in a traditional classification system.
- 7) Evaluate the impact of human behavior on all other organisms and make informed predictions about the future of life on Earth.

## **How will I learn to do all this?**

Education, the process of transmitting knowledge, values and information, is going through a transformation from a teaching oriented process towards an active learning process where students engage in an active, challenging role in each class session. Results from empirical studies indicate that knowledge is better retained and used by students when acquired through active, participatory learning rather than a passive receptive process (Fink 2003).

Following those findings, this course is centered in an active learning rather than a passive-teaching process. The structure of the course is designed to motivate and engage students in active learning processes promoting critical thinking through the solution of concrete problems. The course will be composed of short lectures, in-class group activities, online quizzes, and home assignments.

This course embraces ACTIVE LEARNING and emphasizes DEEP LEARNING rather than superficial memorization of facts that will be promptly forgotten. *You will learn from this course in proportion to the*

*amount of effort you put into it.* You will be expected to work actively both in and out of class to construct your own understanding of the topics at hand, with the readily available help of the class community (professors, LA's, and fellow students). Many of the problems and concepts will be new to you and ask you to stretch your thinking. You will experience frustration and failure before you experience understanding. This is part of the normal learning process. Many students believe that if material does not come easily to them, they are just not good at the subject, but in fact, **deep learning never occurs without effort** no matter how good a student you are. If you feel as if you “know everything” without having really worked at it, you have not gained the level of understanding that we expect. Your viability as a professional in the modern workforce depends on your ability to embrace this learning process and make it work for you. You will be supported on all sides by the learning community. No student is exempt from the process and the hard work it entails.

To maintain a productive learning environment for all members of the class community ***there will be absolutely no use of any electronic devices during class time*** with the exception of iClickers. In a class of this size the temptation is too great to text, shop, facebook, etc. which not only pulls you away from your learning activities, but is also a distraction to other students' concentration. Because of this, we will not enable the use of the REEF app for iClicker. If you are seen using a device during class you will receive a warning, if you are seen again your device will be taken away for the remainder of the class.

To allow time for active learning activities in class, much of the content delivery will occur outside class through readings, videos, and web lectures. To help you prepare for each class session, you will complete a preparation assignment that will guide you through extracting the most important concepts from the reading and/or video. This course has several active learning components, in which you are the driver of your education rather than a passive recipient of knowledge. Active learning tools include written preparation assignments, in-class activities, the use of iClickers, Peer-Led Team Learning (PLTL) sessions, the construction of weekly concept maps, weekly quizzes, and end of unit exams. Please see the course website under “Descriptions of Learning Activities” for full details about each of these activities. Because science is an increasingly collaborative field, this course takes a team-based learning approach. For most of the in-class activities, you will work in groups of 3-5 (4 is ideal). You are also strongly encouraged to work in small groups outside of class, although all assignments will be submitted individually and must be your own work. Facts can be memorized, but **understanding is not downloadable**. The key to learning is *engagement*. In this class you will

be an active learner and you will only master the material if you take all available opportunities to participate and engage with it.

### **How will I know if I am “getting it”?**

No matter what you do in life, your ability to assess your own performance will be critical. You will be given many opportunities to learn and practice this skill in this course. It is critical to your professional preparation that you exercise this skill by taking advantage of all opportunities to self-assess your understanding and critically examine your learning process. We enthusiastically welcome you to come to our office hours so that we may help you with any concepts with which you are struggling.

In addition to your self-assessments, there will be regular, graded components of the course that will help you to keep track of how you are doing.

Homework: 30% of course grade

Prep assignments: 10%

Concept Maps: 10%

Weekly quizzes: 10%

Classwork: 30% of course grade

Clicker questions: 15%

Written activities: 15%

Exams: 40% of course grade

Four midterms: 6% each

Final exam: 16%

Homework and classwork scores will be computed as a percentage of the total number of available points. For example, imagine on a certain class day there were 4 clicker questions and 3 written activities. Suppose you responded to all of the clicker questions and answered two of them correctly and did two written activities completely, but wanted to leave class early, so you did the bare minimum for the third. For that day you would get two clicker points for the incorrectly answered questions and four points for the two answered correctly out of a total of 4 clicker questions, giving you a score of  $(6/4) \times 100 = 150\%$  for clickers that day. For written work you would get 2 points each for the 2 activities you did completely and one point for the one you did minimally out of a total of 6 possible points for the day, giving you a score of  $(5/6) \times 100 = 83.3\%$ . These would each be weighted to 15% when calculating the total grade.

Other optional programs are available to improve your learning process with an impact on your final performance in the class as described below.

### **PLTL**

PLTL (Peer-led team learning) is a program that provides a setting for students to work outside class on course concepts in small groups under the guidance of a peer leader who has successfully completed the class. We have expended great effort to make sure the activities you will work on in these sessions strongly reinforces what we are working on in class and we will work closely with the peer leaders to ensure that these sessions provide a useful opportunity to actively engage with core concepts. **We consider PLTL to be a critical part of your active learning process. Although this program is optional, we urge you to make every possible effort to participate.** Through years of experience, we have seen that students who engage in PLTL perform better in class, gain better understanding of material and get better grades. If you choose to participate in PLTL, your PLTL score will become 10% of your final grade and each of your midterm scores will be worth 3% instead of 5% of your final grade. The grade distribution then becomes as follows.

Homework: 30% of course grade

Prep assignments: 10%

Peer response: 10%

Weekly quizzes: 10%

Classwork: 30% of course grade

Clicker questions: 15%

Written activities: 15%

Exams: 40% of course grade

Four midterms: 3.5% each

PLTL score: 10%

Final exam: 16%

You may not use your PLTL score to replace the final exam. Information on how to sign up for PLTL will be provided on the first day of class. Information about PLTL is also available on the course website.

### **TLC**

In addition to PLTL, you may also participate in the learning center's study skills development program, which is described in full on the course website. Participation in this program will be worth 5 points added to your mid-term exam scores.

## Final Grades

Your final score will be the average of the individual component scores, weighted as described above. Final grades will be computed as a percentage of the maximum number of points:

Score	Grade
95-100%	A
90-94%	A-
86-89%	B+
83-85%	B
80-82%	B-
76-79%	C+
70-75%	C
66-69%	D+
63-65%	D
60-62%	D-
Below 58%	F

## What resources will I have available?

### Your Learning Community

Your most important resource in this class will be all of the people around you. This class heavily emphasizes group work and peer-to-peer teaching. In addition to your classmates, you have an enthusiastic team of learning assistants (LA's) who are eager to help you both in class and out. The learning assistants are undergraduate students who have been successful in this course in a previous semester and have returned out of a strong desire to help you succeed as well. Last, but certainly not least, I am absolutely committed to seeing every student do very well in this class. I am available before and after class, during office hours (or by appointment), and by email and am very happy to help you out with anything.

### Textbooks and Supplies

Everything listed below is available from the FIU Bookstore.

Required textbook:

*Biology, 10<sup>th</sup> Edition*, Raven, Johnson, Mason, Losos, and Singer

iClickers will be required for each class session. The bookstore lists iClicker2 as required, but if you already have an iClicker1 it will work. REEF polling for iClicker will not be enabled for this class (see no-devices policy under "Learning Community" above).

## **Course Website**

Our course website will be in the Blackboard Learn platform. Please log on as soon as possible to make sure you have access. All course materials including extra readings, lecture handouts, videos, etc. will be distributed electronically and it is your responsibility to retrieve these materials. In addition, all written work will be submitted through the course web page, so you don't want to wait and find out that you can't get in when you have something due. When you login to Blackboard Learn from the [ecampus.fiu.edu](http://ecampus.fiu.edu) site using your my account credentials, you will see your Blackboard Learn Courses listed at the top of the page. Click on a course to go into the course.

NOTE: You will not see a Blackboard Learn course in the My Courses block until your instructor makes it available to the students. If you don't see your class in My Courses when you login,

- Check with your instructor to find out if he or she has made the course available to students. Most instructors will do this the first week of class, but this is up to your instructor.
- If you recently registered for the course in the PantherSoft class schedule, it may take a few hours or overnight until you see the course in the My Courses block.

If you still don't see a Blackboard Learn course you believe you should have, call the UTS Support Center at 7-2284 for assistance.

## **Class Facebook page**

This is an optional forum where you can post questions, resources, interesting articles, cartoons, or anything relating to biology. We will share all of the extra videos, web tutorials, and other helpful resources on the web that we find here, so it can be a really great resource. In addition, we periodically will hold virtual office hours in the Facebook group, so it is a great way to get questions answered quickly without having to go to physical office hours. To join, search under [Gen Bio II - Bishop and Collado-Vides](#) (or use this link) and request to join. This is a closed FIU group, which means that you have to join FIU groups (search "FIU groups and follow the prompts) and join using an FIU email address before you can see it.

## **Respecting your learning process and that of others Aka "Academic Integrity"**

Professionals in any field are expected to maintain the highest standards of ethics, integrity, and personal responsibility at all times. The best way to make these standards a matter of habit is to use them consistently at

all times. This course is designed to be highly interactive and collaborative; a culture of trust is essential for it to work well. We are all honest people here – be your best self.

Studies have shown that the majority of cases of plagiarism are unintentional mistakes. You will submit all of your prep assignments through TurnItIn to self-check for plagiarism or copying from other students. We will always set assignments for unlimited submissions and allow you to view your originality report so that you can self-correct any inadvertent matches. We do not have a set matching percentage that we use to determine copied work, but we look at each originality report and make a judgment call. Avoid any matches that exceed four words in length (except for names of things that have multiple words) and consecutive matches from the same source. If we determine that an assignment has an unacceptable similarity to other sources, it will not be accepted. In the case of matches to another paper from the class, both papers will receive a zero. If there is any chance that another student has had access to your paper, it is in your interest to check your originality report repeatedly until the due date. If you are the first to turn it in, you will see low similarity, but once the other student has submitted their paper, it will go up.

Although you are an honest student, there may be times when you are tempted to help another student cheat. Any student seen with more than one iClicker in class will have all clickers confiscated, to be returned after their numbers are recorded, and all clicker numbers involved will receive a zero for participation for the course. If you are in this situation, involved students will automatically lose 15% of their grade.

We will follow strictly the “Student Handbook” regarding cheating. Procedures for both formal and informal disciplinary actions can be found under the section “Academic Misconduct” in the “Conduct & Policies” chapter.

*“Florida International University is a community dedicated to generating and imparting knowledge through excellent teaching and research, the rigorous and respectful exchange of ideas, and community service. All students should respect the right of others to have an equitable opportunity to learn and to honestly demonstrate the quality of their learning. Therefore, all students are expected to adhere to a standard of academic conduct, which demonstrates respect for themselves, their fellow students, and the educational mission of the University. All students are deemed by the University to understand that if they are found responsible for academic misconduct, they will be subject to the Academic Misconduct procedures and sanctions, as outlined in the Student Handbook.”*

## **Schedule of topics and exam dates**

Unit 1 – Origin of life and process of diversification

Life vs. nonlife

Conditions for the origin of life

Origin of metabolic pathways

Speciation

Interpreting an evolutionary tree

Unit 2 – Viruses, Prokaryotes, Eukaryotes

Tree of life – early diversification

Energy flow in a unicellular world

Asexual *vs.* sexual reproduction

*Exam 1 – Tuesday, September 13*

Unit 3 – Multicellularity and Trophic levels

The multiple origins of multicellularity

Organ systems and the challenges of being large

Ecological consequences of multiple trophic levels

*Exam 2 – Thursday, October 6*

Unit 4 – From sea to land

Multiple colonizations of land

Transformation of earth

Changes to organ systems as a result of life in air

Changes to support systems as a result of gravity

Ecology of invasions – adaptive radiation

*Exam 3 – Tuesday, November 8*

Unit 5 – Biosphere and Anthropocene

Human origins

Human influence on carbon cycles

Biodiversity changes

Global change

*Exam 4 – Tuesday, November 29*

Final Exam: Tuesday, December 6