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American Public University System
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BIOL133 16

Course Summary

Course: BIOL133

Title: General Biology I with Lab

Length of Course : 16

Prerequisites: N/A

Credit Hours: 4

Description

Course Description:

This course provides a foundational basis for the study of basic biology. It is the first in a two- part biology series that is designed for students who intend to complete a degree that requires a majors-level biology course. Topics in in this course include an introduction to the molecular basis of life, biology of the cell, genetic and molecular biology, evolution and diversity of life on Earth. The laboratory portion of this course will include virtual laboratories that complement the topics and concepts covered in the lecture component.

Course Scope:

This course is the first in a two part biology series that is designed for students who intend to complete a degree that requires a majors' level biology course. It serves as an introduction to biology and will include the following specific modules: Part 1: the science of biology, the nature of molecules and the properties of water, and the chemical building blocks of life. Part II: cell structure, membranes, energy and metabolism, how cells harvest energy, cell communication and cell division. Part III: sexual reproduction and meiosis, patterns of inheritance, chromosomes, mapping and

meiosis, DNA, genes and how they work, control of gene expression, biotechnology and genomics. Part IV: genes within populations, the evidence for evolution, the origin of species, and systematic, phylogenies and comparative biology. Part V: the origin and diversity of life, viruses, prokaryotes and protists.

In addition to the lecture material, this course will contain both virtual laboratories that will enhance and supplement the readings.

Objectives:

After successfully completing this course, you will be able to:

CO-1: Identify the levels of organization of life, its diversity and the processes by which life has achieved its present form.

CO-2: Explain the importance of the biochemical building blocks and water.

CO-3: State energy pathways such as photosynthesis, respiration, and overall cellular metabolism.

CO-4: Explain scientific literacy by discussing real life applications of biology in the form of case studies.

CO-5: Identify the basic cell and its processes of mitosis and meiosis.

CO-6: Summarize the mechanisms of inheritance and the process by which protein and DNA are synthesized.

CO-7: Recall the various examples of life on earth including prokaryotes, viruses and protists.

CO-8: Demonstrate the role of the student-scientist to the public regarding the relevant and topical scientific issues.

Outline

Week 1:

- Chapter 1: The Study of Life
- Chapter 2: The Chemical Foundation of Life

Learning Objectives:

- CO-1
- CO-2

Readings: OpenStax Biology, 2e

- Chapters 1 & 2

Labs:

- Introduction to the Microscope

Deliverables:

- Discussion Post #1
- Lab Assignments
 - Introduction to the Microscope Lab
- Study Questions Ch 1-2

Week 2:

- Chapter 3: Biological Macromolecules

Learning Objectives:

- CO-2

Readings: OpenStax Biology, 2e:

- Chapter 3

Deliverables:

- Discussion Week 2
- Study Questions Ch 3

Week 3:

- Chapter 4: Cell Structure
- Chapter 5: The Structure and Function of Plasma Membranes

Learning Objectives:

- CO-2
- CO-5

Readings: OpenStax Biology, 2e

- Chapter 4 & 5

Lab:

- Chemistry of Life

Deliverables:

- Lab - Chemistry of Life
- Study Questions Ch 4 & 5

Week 4:

- Chapter 6: Metabolism

Learning Objectives:

- CO-3

Readings: OpenStax Biology, 2e

- Chapter 6

Deliverables:

- Discussion Week 4
- Study Questions Ch 6
- Exam 1: Weeks 1-4

Week 5:

- Chapter 7: Cellular Respiration
- Chapter 8: Photosynthesis

Learning Objectives:

- CO-3

Readings: OpenStax Biology, 2e

- Chapter 7 & 8

Lab:

- Diffusion and Osmosis

Deliverables:

- Lab - Diffusion and Osmosis

- Study Questions Ch 7 & 8

Week 6:

- Chapter 9 Cell Communication

Learning Objectives:

- CO-5

Readings: OpenStax Biology, 2e

- Chapter 9

Deliverables:

- Discussion Week 6
- Study Questions Ch 9

Week 7:

- Chapter 10: Cell Reproduction
- Chapter 11: Meiosis and Sexual Reproduction

Learning Objectives:

- CO-5

Readings: OpenStax Biology, 2e

- Chapters 10 & 11

Lab:

- Lab – Energy and Photosynthesis

Deliverables:

- Lab - Energy and Photosynthesis
- Study Questions Ch 10 & 11

Week 8:

- Chapter 12: Mendel's Experiments and Heredity

Learning Objectives:

- CO-6

Readings: OpenStax Biology, 2e

- Chapter 12

Deliverables:

- Discussion Week 8
- Study Questions Ch 12
- Exam 2: Weeks 5-7

Week 9:

- Chapter 13: Modern Understanding of Inheritance

Learning Objectives:

- CO-6

Readings: OpenStax Biology, 2e

- Chapter 13

Lab:

- Lab - Mitosis

Deliverables:

- Lab - Mitosis
- Study Questions Ch 13

Week 10:

- Chapter 14: DNA Structure and Function

Learning Objectives:

- CO-6

Readings: OpenStax Biology, 2e

- Chapter 14

Deliverables:

- Discussion Week 10
- Study Questions Ch 14

Week 11:

- Chapter 15: Genes and Proteins

Learning Objectives:

- CO-6

Readings: OpenStax Biology, 2e

- Chapter 15

Lab:

- Lab – Meiosis

Deliverables:

- Lab – Meiosis
- Study Questions Ch 15

Week 12:

- Chapter 16: Gene Expression

Learning Objectives:

- CO-6

Readings: OpenStax Biology, 2e

- Chapter 16

Deliverables:

- Discussion Week 12
- Study Questions Ch 16
- Exam 3: Weeks 8-11

Week 13:

- Chapter 17: Biotechnology and Genomics

Learning Objectives:

- CO-6

Readings: OpenStax Biology, 2e:

- Chapter 17

Lab:

- Lab – DNA & RNA

Deliverables:

- Lab – DNA & RNA
- Study Questions Ch 17

Week 14:

- Chapter 18: Evolution and the Origin of Species

Learning Objectives

- CO-7

Readings: OpenStax Biology, 2e:

- Chapter 18

Deliverables:

- Discussion Week 14
- Study Questions Ch 18

Week 15:

- Chapter 19: Evolution within Populations

Learning Objectives:

- CO-7

Readings OpenStax Biology, 2e:

- Chapter 19

Lab:

- Lab – Evolution

Deliverables:

- Lab – Evolution
- Study Questions Ch19

Week 16:

- Chapter 20: Phylogenies and the History of Life

Learning Objectives:

- CO-7

Readings OpenStax Biology, 2e:

- Chapter 20

Deliverables:

- Discussion Week16
- Study Questions Ch 20
- Exam 4: Weeks 12 - 16

Evaluation

Reading Assignments: There are weekly readings as described in the course outline, below. These readings are based out of the text, or will be provided to students within the resource in the electronic classroom.

Discussion Assignments:**Evaluation/Grading of your Discussion Assignment**

Postings will be evaluated on their quality and the degree to which the postings promote discussion. Participation in all Discussions is required. Points are allocated as follows based on the original posting and replies (Total of 100 points).

NOTE: Initial and reply posts submitted after the scheduled due dates may be assessed a penalty according to the late policy in the syllabus.

Initial Post (40 possible points)

- The post is on topic, clearly related to the thread, and addresses all components of the assignment with significant depth, analysis, and clarity.

- The post is written in your own words.

Reply Posts (30 possible points)

- Reply to at least two of your classmates' original posts with responses that are on topic, clearly related to the thread, and further the discussion of the original comment. For example, ask an interesting and related question, or share relevant information on the topic.
- The post is written in your own words.
- Please reply early enough in the week to allow time for your classmates and instructor to respond.

Creates Conversation and Community (15 possible points)

- Respond to follow-up questions and comments posted to your initial post by your classmates and instructor during the week.
- All posts are written in a constructive and respectful tone.

Terminology, Sources, and Attribution (15 possible points)

- All posts accurately apply scientific concepts and use scientific terminology correctly (including spelling).
- Posts include background information based on credible sources of scientific information, where applicable, to support discussion. *
- All sources used are attributed to the original author with a citation or URL so that your classmates and instructor can locate and refer the source. *
- If a post is based on an opinion, the post offers a well phrased and thought out position.

**Please review Academic Honesty Policies.*

Formative Assessments/Homework Assignments: Each week students will complete formative assessments that are designed to help students review and revise the material for the given week. Assessments will have multiple formats, which may include matching, true/false, short answer, and multiple choice. These assessments can be done 2 times, and students will receive nominal credit for each assessment upon completion.

Exams: There will be four exams throughout this course, during Weeks 4, 8, 12 and 16. Exams will be open book, open note. Different exams will be weighted differently depending upon the number of chapters or supplemental readings covered. The exams will mostly include application questions in multiple formats, including multiple choice as well as short answer.

- Exam 1 will cover six chapters.
- Exam 2 will cover five chapters.
- Exam 3 will cover four chapters.
- Exam 4 will cover five chapters. Therefore, Exam 4 will not be cumulative.

Laboratories: There will be eight labs due throughout the course. The laboratories will be conducted online (virtually). There will also be internet based exercises that will apply the concepts learned in the course.

Please see the Student Handbook to reference the University's grading scale.

Grading:

| Grade Item | Grade % | Points |
|------------------------|------------|------------|
| Discussions | 22% | 800 |
| Week 1 | 6.25% | 50 |
| Week 2 | 12% | 100 |
| Week 4 | 12% | 100 |
| Week 6 | 12% | 100 |
| Week 8 | 12% | 100 |
| Week 10 | 12% | 100 |
| Week 12 | 12% | 100 |
| Week 14 | 12% | 100 |
| Week 16 | 6.25% | 50 |
| Study Questions | 8% | 200 |
| Chapter 1 | 5% | 10 |
| Chapter 2 | 5% | 10 |
| Chapter 3 | 5% | 10 |
| Chapter 4 | 5% | 10 |
| Chapter 5 | 5% | 10 |
| Chapter 6 | 5% | 10 |
| Chapter 7 | 5% | 10 |
| Chapter 8 | 5% | 10 |
| Chapter 9 | 5% | 10 |
| Chapter 10 | 5% | 10 |

| | | |
|--------------|------------|------------|
| Chapter 11 | 5% | 10 |
| Chapter 12 | 5% | 10 |
| Chapter 13 | 5% | 10 |
| Chapter 14 | 5% | 10 |
| Chapter 15 | 5% | 10 |
| Chapter 16 | 5% | 10 |
| Chapter 17 | 5% | 10 |
| Chapter 18 | 5% | 10 |
| Chapter 19 | 5% | 10 |
| Chapter 20 | 5% | 10 |
| Exams | 40% | 400 |
| Exam 1 | 25% | 100 |
| Exam 2 | 25% | 100 |
| Exam 3 | 25% | 100 |
| Exam 4 | 25% | 100 |
| Labs | 30% | 800 |
| Lab 1 | 12.50% | 100 |
| Lab 2 | 12.50% | 100 |
| Lab 3 | 12.50% | 100 |
| Lab 4 | 12.50% | 100 |
| Lab 5 | 12.50% | 100 |
| Lab 6 | 12.50% | 100 |
| Lab 7 | 12.50% | 100 |
| Lab 8 | 12.50% | 100 |

Materials

Book Title: Bio Principles 2nd ed - available online, link provided inside the classroom

Author: OpenStax

Publication Info: OpenStax

ISBN: NTMO

Book Title: Science Interactive Online Laboratories

Author: Science Interactive

Publication Info: eScience

ISBN:

Required Technology

- See the Technology Requirements section of the undergraduate catalog for the minimum hardware and software requirements.
- Microsoft Office 365 is available to APUS students for free. If you have questions about accessing the software, please contact Classroom support at classroomsupport@apus.edu.

Web Sites

In addition to the required course texts, the following public domain web sites are useful. Please abide by the university's academic honesty policy when using Internet sources as well.

Note web site addresses are subject to change.

Crash Course in Biology

<http://www.youtube.com/course?list=EC3EED4C1D684D3ADF>

Science Friday

<http://www.sciencefriday.com/topics/biology/>

BioSciEdNet

<http://www.biosciednet.org/portal/index.php>

Howard Hughes Institute free mobile app
Select and Learn for use on iPhones and iPads

KhanApp all smart phones

Course Guidelines

Citation and Reference Style

Attention Please: Students will follow the APA Format as the sole citation and reference style used in written work submitted as part of coursework to the University.

Assignments completed in a narrative essay or composition format must follow the citation style cited in the APA Format.

Tutoring

Tutor.com offers online homework help and learning resources by connecting students to certified tutors for one-on-one help. AMU and APU students are eligible for 10 free hours* of tutoring provided by APUS. Tutors are available 24/7 unless otherwise noted. Tutor.com also has a SkillCenter Resource Library offering educational resources, worksheets, videos, websites and career help. Accessing these resources does not count against tutoring hours and is also available 24/7. Please visit the APUS Library and search for 'Tutor' to create an account.

Late Work

The University encourages all work to be completed according to the course schedule. The University Late Work Policy can be found in the Student Handbook [here](#).

Turn It In

Faculty may require assignments be submitted to Turnitin.com. Turnitin.com will analyze a paper and report instances of potential plagiarism for the student to edit before submitting it for a grade. In some cases professors may require students to use Turnitin.com. This is automatically processed through the Assignments area of the course.

Academic Dishonesty

Academic Dishonesty incorporates more than plagiarism, which is using the work of others without citation. Academic dishonesty includes any use of content purchased or retrieved from web services such as CourseHero.com. Additionally, allowing your work to be placed on such web services is academic dishonesty, as it is enabling the dishonesty of others. The copy and pasting of content from any web page, without citation as a direct quote, is academic dishonesty. When in doubt, do not copy/paste, and always cite.

Submission Guidelines

Some assignments may have very specific requirements for formatting (such as font, margins, etc) and submission file type (such as .docx, .pdf, etc) See the assignment

instructions for details. In general, standard file types such as those associated with Microsoft Office are preferred, unless otherwise specified.

APUS offers students free access to the Microsoft Office Suite. More information can be found [here](#)

Disclaimer Statement

Course content may vary from the outline to meet the needs of this particular group.

Communicating on the Discussion

Discussions are the heart of the interaction in this course. The more engaged and lively the exchanges, the more interesting and fun the course will be. Only substantive comments will receive credit. Although there is a final posting time after which the instructor will grade comments, it is not sufficient to wait until the last day to contribute your comments/questions on the discussion. The purpose of the discussions is to actively participate in an on-going discussion about the assigned content.

“Substantive” means comments that contribute something new and hopefully important to the discussion. Thus a message that simply says “I agree” is not substantive. A substantive comment

contributes a new idea or perspective, a good follow-up question to a point made, offers a response to a question, provides an example or illustration of a key point, points out an inconsistency in an argument, etc.

As a class, if we run into conflicting view points, we must respect each individual's own opinion. Hateful and hurtful comments towards other individuals, students, groups, peoples, and/or societies will not be tolerated.

University Policies

[Student Handbook](#)

[Drop/Withdrawal policy](#)

[Extension Requests](#)

[Academic Probation](#)

[Appeals](#)

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