*General Information:*

Course Title/Number: PRINCIPLES OF BIOLOGY/BSC120 (sections 104, 105, 106)

Semester/Year: FALL/2016

Days/Time: MWF/1:00 – 1:50 pm

Location: Science Building 374

Instructor: Herman L. Mays Jr., PhD

Office: Science Building 390

Phone: (304) 696-6692

Email: [maysh@marshall.edu](mailto:maysh@marshall.edu)

Office hours: Monday 10:00 am – 12:30 pm or by appointment

Credit: 4 hours

*University policies:*

By enrolling in this course, you agree to the University Policies listed below. Please

read the full text of each policy be going to [www.marshall.edu/academic-affairs](http://www.marshall.edu/academic-affairs) and clicking on “Marshall University Policies.” Or, you can access the policies directly by going to <http://www.marshall.edu/academic-affairs/policies>

Academic Dishonesty/ Excused Absence Policy for Undergraduates/ Computing Services Acceptable Use/ Inclement Weather/ Dead Week/ Students with Disabilities/ Academic Forgiveness/ Academic Probation and Suspension/ Academic Rights and Responsibilities of Students/ Affirmative Action/ Sexual Harassment

*Course description: 4 credit hrs:*

Study of basic principles common to all organisms through lecture and laboratory activities. Chemistry of life, cell biology, metabolism, heredity, and evolution. Intended for science majors and pre-professional students. (PR: 21 or better on Math ACT, or C or better in MTH 121 or higher).

*Student learning outcomes:*

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| **Student learning outcomes** | **Student learning outcomes: practice** | **Student learning outcomes: assessment** |
| Students will develop a solid foundation in biological science. | Students will be exposed to the terminology, empirical data and conceptual landscape of biology through lectures, laboratory exercises, class discussion and supplemental reading. | Students will be expected to recall the basic empirical findings of biology and be familiar with the terminology and identify key figures in the history of the life sciences on quizzes and exams. |
| Students will learn to integrate and evaluate information and think critically, analytically and conceptually. | Students will be exposed to fundamental concepts in the life sciences through a lecture format and in the laboratory and encouraged to discuss these concepts in the classroom and work through practice problems in lecture designed to illustrate the conceptual underpinnings of biology. | Students will be required to apply key concepts in novel situations in quizzes and exams through conceptual word problems and other problem solving exercises on quizzes and exams. |
| Students will be introduced to the scientific literature and learn to practice the scientific method. | Students will be expected to learn several of the fundamental research programs in the life sciences and be introduced to the primary literature in biology.  Students will obtain first-hand knowledge of the scientific method in the laboratory by learning basic scientific measurement, hypothesis testing and conducting hypothesis-based experiments. | Students will be expected to recall the methodology, rationale and key conclusions of key experimental and observational studies in biology on quizzes and exams in lecture.  Students will be evaluated on their understanding of the scientific method in the laboratory section through research papers and graded data sheets. |

*Required material:*

*Textbook - Biology*, 4th Edition, 2017, Brooker et al. (required) Connect Plus access (recommended)

*Lab manual - Principles of Biology Laboratory Manual*, Weinstein (required)

*Top Hat*:

A Top Hat account is required for the course including for participation in in-class quizzes. You should receive email instructions as to how to sign up for an account.

*Clicker:*

Clickers are not required for the course.

*Course requirements and due dates:*

For due dates see *Schedule* below.

*Grading policy:*

Lecture grade (75% of overall grade in the course)

Participation activities during lectures (scaled to 5% of overall grade)

Lecture quizzes (x3; 20 points each; 60 points total; 9% of overall grade)

Exams (x3; 100 points each; 300 points total; 46% of overall grade)

Final exam (cumulative; x1; 100 points; 15% of overall grade)

Lab grade (25% of overall grade in the course)

*Grading scale:*

100-90% = A; 89-80% = B; 79-70% = C; 69-60% = D; <60% = F

*Attendance:*

The best strategy for succeeding in the course begins with going to class. I may occasionally take attendance but will not penalize for missing class. However, missing class will invariably result in missing material that will be covered on class activities, quizzes and exams. The textbook is largely a supplement to the lectures and there may often be material in lectures that is not in the textbook. Also there will be material in the textbook that is not in the lectures. ***The lectures are your primary guide for highlighting the material you need to know for the exams and quizzes, which is why it is imperative that you attend class.*** The official MU attendance policy may be found here <http://www.marshall.edu/student-affairs/files/Excused-Absence-Policy-15-16.pdf>

*Students with disabilities:*

Marshall University is committed to equal opportunity in education for all students, including those with physical, learning and psychological disabilities. University policy states that it is the responsibility of students with disabilities to contact the Office of Disabled Student Services (DSS) in Prichard Hall 117, phone (304) 696-2271 to provide documentation of their disability.  Following this, the DSS Coordinator will send a letter to each of the student’s instructors outlining the academic accommodation he/she will need to ensure equality in classroom experiences, outside assignment, testing and grading.  The instructor and student will meet to discuss how the accommodation(s) requested will be provided. For more information, please visit <http://www.marshall.edu/disabled> or contact DSS Office at Prichard Hall 11, phone (304) 696-2271.

*Schedule:*

**Tentative** Lecture Schedule\*

**Week Date General Lecture Topics Readings (Brooker 4th ed)**

1 8/22-8/26 Course overview

An Introduction to Biology Chapter 1

The Origin and History of Life Chapter 22

2 8/29-9/2 An Introduction To Evolution Chapter 23

The Chemical Basis Of Life I: Atoms, Molecules & Water Chapter 2

3 9/5 **LABOR DAY – NO LECTURE on 9/5 and NO LABS FOR THE WEEK**

9/7-9/9 The Chemical Basis Of Life II: Organic Molecules Chapter 3

4 9/12-9/16 A Tour of the Cell Chapter 4

Membrane Structure, Synthesis & Transport Chapter 5

5 9/19 Introduction To Energy, Enzymes & Metabolism Chapter 6

**9/21** **Quiz I and review**

**9/23 Exam I**

6 9/26-9/30 Cellular Respiration, Fermentation & Metabolism Chapter 7

Photosynthesis Chapter 8

7 10/3-10/7 Cell Communication Chapter 9

Multicellularity Chapter 10

8 10/10-10/14 Nucleic Acid Structure, DNA Replication & Chromosomes Chapter 11

Gene Expression at the Molecular Level Chapter 12

Gene Regulation Chapter 13

9 10/17 Mutation, DNA Repair & Cancer Chapter 14

10/19 **Quiz II and review**

**10/21 Exam II**

10 10/24-10/28 The Eukaryotic Cell Cycle, Mitosis & Meiosis Chapter 15

Simple Patterns of Inheritance Chapter 16

11 10/31-11/4 Complex Patterns of Inheritance Chapter 17

Genetics Of Viruses & Bacteria Chapter 18

Developmental Genetics Chapter 19

12 11/7-11/11 Genomes, Proteomes & Bioinformatics Chapter 21

Population Genetics Chapter 24

Origin of Species & Macroevolution Chapter 25

13 11/14 Taxonomy & Systematics Chapter 26

11/16 **Quiz III and review**

**11/18 Exam III**

14 11/21-11/25 **Thanksgiving/Fall Break** **NO LABS or LECTURE FOR THE WEEK**

15 11/28-12/2 Catch up on any leftover topics and review

16 12/5-12/12/9 **NO LABS FOR THE WEEK** and review in lecture

**Final Exam** (cumulative): Friday 12/16 – 12:45PM – 2:45PM in SCI BLD 374

**\*-Subject to change – we may start specific topics earlier or later than outlined here, depending on how things progress through the term.**

Week of… Lab Topic

8/22 Laboratory safety

8/29 Scientific measurement

9/5 **LABOR DAY NO LABS**

9/12 Hypothesis testing

9/19 Biological molecules

9/26 Microscope and cells

10/3 Diffusion and osmosis

10/10 Blood glucose

10/17 Enzyme kinetics

10/24 Column chromatography

10/31 Photosynthesis

11/7 Gene expression, mutation and RNAi

11/14 Mendelian genetics

11/21 **FALL/THANKSGIVING BREAK NO LABS**

11/28 Micorevolution

12/5 **DEAD WEEK NO LAB**