Syllabus

Course Overview

BIO 375: Genetics and Molecular Biology

3 Credits

In this course, we will investigate the transmission of heritable material in prokaryotes and eukaryotes. We will cover topics in classical genetics (including patterns of inheritance, linkage, and chromosome mapping), molecular biology (including DNA structure and function, gene expression, biotechnology), and population genetics.

Course Outcomes

The primary outcome of this course is to gain an understanding of basic genetics principles. To achieve this outcome, we will focus on the following general topics:

- the inheritance patterns that describe how traits are transmitted from parents to their offspring
- the structure of DNA and chromosomes
- the processes by which the information stored in the genetic material is converted into an observable trait
- the laboratory methods used by scientists to examine the function of the genetic material.

In addition, you will learn to critically analyze scientific information, develop problem-solving skills, and apply genetics principles to real-life laboratory and clinical problems.

Course Materials

Required Materials

The following textbook is optional, but it is strongly recommended that you purchase one, as the textbook contains additional information and sample genetics problems that will likely help you in this class:

Brooker, Robert J. (2015). *Genetics: Analysis and Principles*, 5th edition. New York, NY: McGraw-Hill. ISBN 978-0-07-352534-1

You can compare prices for your textbooks through the BYU-Idaho University Store price comparison site. They will show you all of the options from the University Store plus several online options to help you find the best prices.

Technology

Mozilla Firefox is the recommended Internet browser for I-Learn courses. Videos, readings, and course functionality will work best when you use Firefox.

You will need to obtain your own computer or have consistent access to a computer. You need to have the appropriate permissions on your computer to download lesson content, access websites, and update or download software as needed along with consistent, reliable access to an Internet connection. Visit the Orientation to Online Learning page in the first lesson of our course to verify that you have your computer set properly.

You will use Microsoft Office products in this course. If you do not yet have the Microsoft Office Suite (Word, Excel, PowerPoint) on your computer, you may use this free download to obtain the software (note: the free download is available only for BYU-Idaho students who have a current login.

Keys to Success

BYU-Idaho Learning Model

All courses, including online courses at BYU-Idaho, follow a pattern of learning that enables students to take more responsibility for your learning and for helping to teach one another. This pattern is called the Learning Model. Here are two pages to help you better understand the Learning Model:

- Take Charge of your education by applying the Learning Model
- Learning Model interactive tutorial

Tips for Success in this Course

For a three-credit course, you should expect to spend around 9–12 hours per week (3–4 hours per credit-hour) completing course activities and assessments. Wisely plan your weekly schedule to set aside adequate study time that will allow you to work at a healthy, steady pace throughout the course.

Read the announcements your instructor will post on the course landing page each week before beginning the lesson. Your instructor will provide timely information about changes, expectations, and other important information as you begin the lesson.

How to Navigate this Course

Lesson Activities

Prepare

Videos. The videos included in the weekly preparation materials will introduce the lesson topic for each week. You will need to watch and study all of the provided videos before working on your weekly group problems.

PowerPoint slides and notes. Slides and instructor notes are included as part of your weekly preparation materials. The PowerPoint slides include key figures from the optional text and other outside materials, which are intended to be used alongside the instructor notes. The notes and slides also serve as the study guides for the course. These materials will prepare you for the other activities in the course.

Teach One Another

Group Problems (25 points). Each week, you will individually study the prepare materials and complete a problems worksheet (due by Day Three). Then, you will meet online with your assigned problems group using Google Hangouts. You will record this meeting as you review and discuss the problems worksheet. At the end of the week (Day Six), you will submit a link to your hangout recording.

Your instructor will create your official problem groups after the BYU-Idaho Last Day to Add deadline. Until then, you will create your group based on the contacts you make during the Getting to Know You discussion in the Introduction Lesson.

Ponder/Prove

Applying Genetics Problems (AGPs) (25 points each). The AGPs are individual homework assignments that will help you apply the genetics principles that you have learned during the week to real-life scenarios and to help you prepare for the exams. Each AGP will consist of questions similar to the Group Problems worksheet. You will work individually on these questions and submit your answers. You may use the textbook, class notes, and slides to help you answer these questions. Your instructor will give you general guidance on these questions but will not give you any answers. The AGPs are completed each week (see schedule). Each AGA assignment is worth 25 points.

Quizzes (10 points). At the end of each week, you will take a ten question quiz that will cover the Prepare reading material (instructor notes and PowerPoint slides). These quizzes are **closed book**—you may not use your textbook, the notes, or slides when taking the quizzes.

Exams (100 points). We will have four unit exams this semester each worth 100 points. The final exam of the semester will not be comprehensive.

Course Outline

Lesson 01	Overview and Review of Basic Genetics Principles	Lesson 08	Changes in Chromosome Number and Structure
Lesson 02	Beyond Basic Mendelian Inheritance	Lesson 09	DNA Replication
Lesson 03	The Influence of Sex on Inheritance and Epigenetics	Lesson 10	Transcription and RNA Modification

Lesson 04	Analyzing Inheritance	Lesson 11	Translation
Lesson 05	Linkage and Chromosome Mapping	Lesson 12	The *lac* operon
Lesson 06	Population Genetics	Lesson 13	Molecular Biology Techniques
Lesson 07	DNA and Chromosomes	Lesson 14	Course Conclusion

Grading

Grading Scale

A	93100%	C	73-76%
A-	9092%	C-	70-72%
B+	8789%	D+	67-69%
B	8386%	D	63-66%
B-	8082%	D-	60-62%
C+	7779%	F	Below 60%

Due Dates

Please refer to the course schedule for specific due dates for each assignment. Late assignments will not be accepted. If you have an extenuating circumstance, discuss it with the instructor in advance or as soon as possible; the instructor may make an exception to this policy at his or her discretion.

Setting your correct time zone is especially important when you are taking an online class away from campus. Due dates in I-Learn 2.0 allowed assignments to be turned in at your local time, but I-Learn 3.0 does not have this capability. All assignments are due at Mountain Time. Follow this tutorial to set your time zone, which will automatically adjust all I-Learn due dates to the time zone in which you live.

Help

Tutoring

Tutoring options for online students are available through the Academic Support Centers. There may be course-specific tutoring available. Check the details in the link provided.

Online Support Center

The Online Support Center (OSC) is available to help students with problems in online courses. If you have questions about this course, the instructor, technical difficulties, or your online learning experience, please contact the OSC.

OSC Contact Information

Phone: (208) 496-1800
Toll-free Phone: (866) 672-2984
Email: onlinelearning@byui.edu
Live Chat: To access the chat feature, please visit the OSC website
Website: OSC

Policies

Course Questions

Post questions about the course to the ***Questions and Conversations*** discussion forum linked to each lesson. Your instructor will answer these questions promptly. Questions or concerns of a personal nature should be emailed directly to the instructor.

University Policies

BYU-Idaho students are responsible for abiding by all established university policies and standards, which include, but are not limited to, the Honor Code, Academic Honesty, Dress and Grooming Standards, and Sexual Harassment. All students are strongly encouraged to read, become familiar with, and strive to live these policies, which can be accessed through the University Policies page located within the Course folder. See information on this course page: Welcome > University Policies.

Academic Honesty

As followers of Christ, all BYU-Idaho students, staff, and faculty are expected to be honest in all their dealings. This honesty also applies and extends to behavior and actions related to academic work. It is critical for you to understand the seriousness of academic dishonesty and misconduct, which are not tolerated by the university, and strive to produce and submit only the results of their own effort and original work.

Remember: **there is never an acceptable excuse for plagiarism or cheating**.

Do not place quiz and test questions online. You are welcome to use websites that generate flashcards and such (Quizlet, etc.); they can be powerful study tools. However, placing quiz and test questions on these sites or any other accessible place is a violation of the honor code and a violation of copyright laws. It is also a violation to use any material that may have been posted by someone else. Any violations of this sort will be reported directly to the honor code office.

Penalties for Academic Dishonesty

Although the Academic Honesty section of the University Policies explains what constitutes each of the many forms of academic dishonesty as well as procedures and guidelines for handling such incidents, the specific application of consequences is left up to each instructor.

In this course, instructors will be responsible for creating and applying their own policy regarding penalties for academic dishonesty, which may vary from point deductions up to the score of a zero on the entire assignment, and clearly communicating that policy to students at the beginning of the semester. Cases will be analyzed on an individual basis and penalties applied according to the severity of the misconduct.

Disclaimer

This syllabus and the course schedule may be changed at any time before or during the semester as the need arises, based on circumstances. Any changes will be available to view on the course documents.