

BIO 130LEC Perspectives in Human Biology

Spring Semester 2018

T/Th 12:30-1:50pm

NSC 225

Academic Credit: 3 Credits

Instructor: Dr. James LaFountain
Office: Cooke 657
Telephone: 645-4965 e-mail: jrl@buffalo.edu
Office hours: 2-3pm T/Th

Administrative instructor: Erica Xu
e-mail: bio130@buffalo.edu

Contact the administrative instructor about all matters related to course administration, i.e., problem solving, grading, etc. Use this address for contact: bio130@buffalo.edu
For issues regarding course content, contact Dr LaFountain.

Course Description

BIO 130LEC is a lecture course that covers the chromosomal basis of human heredity. It introduces principles of Mendelian genetics, DNA as genetic material, expression of genes, genetic mutation, and transmission of genes from generation to generation. Credit for BIO 130LEC is approved in fulfilling the scientific literacy requirement specified by the UB curriculum. BIO 130LEC is a separate standalone course from its companion lab course, BIO 130LAB. Enrollment in this course (BIO 130LEC) does not automatically get enrollment in the lab (BIO 130LAB). Please note that credits for BIO 130LEC do not fulfill requirements toward a Biological Sciences major.

Course Plan (note: specific lecture topics are given on the course schedule provided at the end)
The course is organized into four blocks, each block consisting of five lectures, a review session and a test. The lectures will be given by Dr. LaFountain, who will assess student progress in mastery of the material covered in lectures on lecture tests. A test is given at the end of each block. There is no comprehensive final exam.

Plan for Block 1 Topics to be covered include the basics of chromosome structure and function, cell cycle (mitosis) and DNA structure and function. Questions addressed will be: what are genes? How was the scientific method used to determine that DNA is genetic material? Where are genes found in the cell? How they are packaged? What is the relationship between genotype and phenotype?

Plan for Block 2 Topics include the genetic basis of inherited characteristics of both normally and in the cases of diseases. Questions: how are genes inherited (meiosis and gametogenesis)? What are the differences between sex-linked and autosomal genes?

Plan for Block 3 Coverage will concentrate on gene products: i.e. proteins. What is the functional importance of proteins in the cell? What are the processes that the cell uses to produce proteins? How was the scientific method used to crack the genetic code? How do mutations affect protein function associated with inherited disease states.

Plan for Block 4 In this capstone block of the semester, knowledge will be applied to the molecular basis of sex determination and the genetic origins of cancer. Includes consideration of chromosome instability.

Student activities

- (1) Attend lectures, digest what is presented on power-point slides
- (2) Read assigned sections of textbook and match study of the material with material presented in lectures
- (3) Review study guide provided by instructor
- (4) Attend office hours and ask the instructor questions about anything that may need clarification.
- (5) Take tests that cover the material presented in lectures and readings

Textbook: *Human Heredity* Michael R. Cummings (11th Edition, Cengage Learning)

Choose the acquisition method that you prefer:

(1) Bookstore: purchase printed access card to the book and accompanying material through MindTap, an online resource put out by Cengage Publishing:

ISBN number for online access is 9781305270305. Cost \$117

For this option, you will need this code: MTPN-6KKP-HKFZ or just click on this link:

Course Link URL: <https://studentdashboard.cengagebrain.com/#/course-confirmation/MTPN6KKPHKFZ/initial-course-confirmation>

(2) Online purchase of MindTap: www.cengagebrain.com/course/2665724 (Cengage Microsite for this course)

Option 1: purchase of access code to MindTap textbook (includes study tools) over internet: \$115

Option 2: purchase of eBook of Cummings text only (not additional study tools provided by MindTap)

<https://www.cengagebrain.com/shop/isbn/9781305683952>

This option is \$34.49 for access until 5/17/18

Assessment

A test of student mastery of the lecture material in each block of the course will be given during scheduled lecture time at the completion of each block. Each test will consist of 40 computer-scored multiple-choice questions. There will be ample time to do the test during the scheduled class time.

Test Schedule:

Block 1 test	February 20, 2018	12:30pm in 225 NSC	covers Block 1 lecture material
Block 2 test	March 15, 2018	12:30pm in 225 NSC	covers Block 2 lecture material
Block 3 test	April 17, 2018	12:30pm in 225 NSC	covers Block 3 lecture material
Block 4 test	May 10, 2018	12:30pm in 225 NSC	covers Block 4 lecture material

Make-up Tests

For students who were absent at a scheduled test due to illness. Please notify Dr. LaFountain on or before the day of the scheduled test and provide documentation of illness to show that the request for a make-up test is valid.

Make-up Test Schedule:

Block 1 make-up test	Saturday February 24, 2018	9:00am in 310 Hochstetter
Block 2 make-up test	Saturday March 31, 2018**	9:00am in 310 Hochstetter
Block 3 make-up test	Saturday April 21, 2018	9:00am in 310 Hochstetter
Block 4 make-up test	Saturday May 12, 2018	9:00am in 310 Hochstetter

** note make-up test is after Spring Recess

Grading

Each test will be evaluated with a letter grade -- A through F -- (including + and - when applicable). The determination of letter grades will take into account such factors as (1) degree of difficulty of the test, (2) the class average on the test, and (3) the statistical curve of the overall performance of the class in on the test.

Enrollees must take all four tests and each test will count as 25% of the final letter grade.

Block 1 test = 25% of final grade

Block 2 test = 25% of final grade

Block 3 test = 25% of final grade

Block 4 test = 25% of final grade

Grade computation

This will be done using the **Grade calculator** that is posted on UBlearns (Course Documents). It takes the standard quality point value (i.e. A = 4.0, A- = 3.67, B+ =3.33, etc) for each letter grade achieved on the four tests and computes the average QPA. That numerical QPA is then converted into a final letter grade.

If you would like to keep track of your overall grade as the semester progresses, download the **Grade calculator** Excel grading spreadsheet from UBLeans and put in your letter grades over the course of the semester. The program will give your cumulative letter grade.

Incomplete grades

Incomplete grades are permissible only in cases when a student is unable to complete the course due to severe unforeseen problems. The student must be receiving a passing grade in the class at the time the 'I' is issued. The student then will be allowed up to 15 months to complete only that portion of the work that was not completed.

An 'I' grade cannot be used as a way to "start over" next year.

The website for UB's policy on receiving an 'I' (incomplete) grade is found here:

<http://undergrad-catalog.buffalo.edu/policies/grading/explanation.shtml#incomplete>

Disabilities

If you have a disability (physical or psychological) and require exceptional accommodations to enable you to participate in this course, such as note takers, readers, or extended time on tests and assignments, please contact the Office of Accessibility Resources, 25 Capen Hall, 645-2608. OAR will provide you with information and review appropriate arrangements for reasonable accommodations. Your disability and intended use of OAR for tests must be reported to the Administrative Instructor, who will act as a liaison between Dr. LaFountain (who will provide the tests) and the OAR office (which will administer tests).

The url for UB's accessibility services can be found here:

<http://www.student-affairs.buffalo.edu/ods/servc.php>

Important Deadlines

Last day to drop a course without it showing on your transcript: end of 7th day that classes are in session (February 5th)

Last day to resign from a course: end of the 11th week of classes (April 20th)

Specific learning outcomes

Specific learning outcomes	Student activities aimed at achieving Specific learning outcomes	Assessment instrument
(1) Relate concepts of human genetics to three levels of biological organization: (1a) micro level, (1b) individual human level, and (1c) population level.	Student activities listed above (i.e., (1) through (5)) apply to achieving all of the specific learning outcomes.	All assessments for BIO 130 will be multiple choice tests administered during normal class hours at the completion of each block
(2) Understand what the scientific method is and its application to establishing foundations of human genetics	Student activities (1) through (5)	Multiple choice testing
(3) Recognize how the understanding of genetics has changed over time, the study of human heredity is a continuous process and new discoveries depend on enduring discovery through history	Student activities (1) through (5)	Multiple choice testing
(4) Consider how genetics plays a role in everyday life	Student activities (1) through (5)	Multiple choice testing
(5) See how genetics impacts ethical issues in society	Student activities (1) through (5)	Multiple choice testing
(6) Distinguish scientific information from pseudo-scientific information	Student activities (1) through (5)	Multiple choice testing
(7) Evaluate views on controversial Issues in the field of genetics	Student activities (1) through (5)	Multiple choice testing

BIO 130LEC Tentative course outline			
Class meeting	Lecture number	Topic	Readings in Cummings <i>Human Heredity</i> (11 th Edition):
1	1	Genomics, genetics and society	Ch 1: (pp2-16), Ch 6: 6.1 (p116) – 6.4 (p125), Ch 8: 8.1 (p172) – 8.7 (p187), Ch 9: 9.4 (p196) – 9.5 (p198), Ch 13: 13.3 (p289) – 13.5 (p294), Ch 15: (pp324-339).
2	2	DNA structure and basic biochemistry	
3	3	Chromosomes/DNA packing	
4	4	DNA replication	
5	5	Cell cycle/chromosome cycle	
6		Review session Block 1	
7	Block 1 test		
8	6	Gene transmission: somatic cell mitosis: diploid to diploid	Ch 2: (pp18–37), Ch 3: (pp42-62). Ch 4: (pp68-86), Ch 7: 7.1(p144-145)-7.4 (p156-157), Ch 16: (pp344-362)
9	7	Diploid to haploid: gametogenesis	
10	8	Human reproduction	
11	9	Mendelian genetics	
12	10	Connecting genotype and phenotype	
13		Review session Block 2	
14	Block 2 test		
SPRING RECESS			
15	11	Molecular biology: overview The genetic code	Ch 9: (pp192-210), Ch 10: (pp214-234), Ch 11: (pp238-257), Ch 16: 16.5 (pp352-356), Ch 18: 18.5 (p398)
16	12	Transcription: expression of genes	
17	13	Translation: converting messages to protein	
18	14	Mutations; altered chemistry of DNA	
19	15	Inborn errors of metabolism	
20		Review session Block 3	
21	Block 3 test		
22	16	Chromosomal instability	Ch 6: 6.5 (p126) – 6.10 (p139), Ch 7: 7.5(p158) – 7.9 (p168), Ch 8: 8.7 (pp185-187), Ch 12: (pp262-281)
23	17	Sex determination	
24	18	Mitogens and Cell cycle controls	
25	19	Cell cycle genes in cancer	
26	20	Telomeres	
27		Review session Block 4	
28	Block 4 test		