

BIOL 362**Principles of Genetics, Spring 2009, 4.0 credits**

<u>Date</u>	<u>Lecture topic</u>	<u>Chapter</u>
26 Jan-Mon	Introduction	1
28 Jan-Wed	DNA: The genetic material	2
02 Feb-Mon	DNA replication	3
04 Feb-Wed	Gene function	4
	<i>06 Feb-Fri: Last day for student- and faculty-initiated withdrawals (course does not appear on academic record)</i>	
09 Feb-Mon	Gene expression: Transcription	5
11 Feb-Wed	Gene expression: Translation	6
16 Feb-Mon	DNA mutation, DNA repair, and transposable elements	7
18 Feb-Wed	Recombinant DNA technology	8
23 Feb-Mon	Exam 1 (chapters 1 to 7) - Study Questions	
25 Feb-Wed	Applications of recombinant DNA technology	9
02 Mar-Mon	Genomics	10
04 Mar-Wed	Mendelian genetics	11
09 Mar-Mon	Spring break	
11 Mar-Wed	Spring break	
16 Mar-Mon	Chromosomal basis of inheritance	12
18 Mar-Wed	Extensions of Mendelian genetic principles	13
23 Mar-Mon	Quantitative genetics	14
25 Mar-Wed	Gene mapping in eukaryotes	15, 16
	<i>27 Mar-Fri: Last day for student- and faculty-initiated withdrawals (W grade given for course)</i>	
30 Mar-Mon	Variation in chromosome structure and number	17
01 Apr-Wed	Genetics of bacteria and bacteriophages	18
06 Apr-Mon	Exam 2 (chapters 8 to 16) - Study Questions	
08 Apr-Wed	Regulation of gene expression in bacteria and bacteriophages	19
13 Apr-Mon	Regulation of gene expression in eukaryotes	20
15 Apr-Wed	Genetic analysis of development	21
20 Apr-Mon	Genetics of cancer	22
22 Apr-Wed	Non-Mendelian inheritance	23
27 Apr-Mon	Population genetics 1	24
29 Apr-Wed	Population genetics 2	24
04 May-Mon	Molecular Evolution	25
08 May-Fri	Exam 3 (chapters 17 to 25) - Study Questions 10:15 AM - 12:15 PM – Elvey Auditorium	

Location and time:

Mon & Wed 11:45 AM - 1:15 PM, Elvey Auditorium - Geophysical Institute

Textbook:

Peter J. Russel. 2006. iGenetics: A Molecular Approach. Pearson Education, San Francisco, California. ISBN 0-8053-4665-1

Laboratory notebook:

Provide your own lab notebook and bring it to your first lab.

Web content:

Course web site (UAF): http://mercury.bio.uaf.edu/~kevin_mccracken/genetics/

iGenetics web site: <http://www.geneticsplace.com>

Web site includes: iActivities, animations, practice quizzes, glossary, and solutions to end-of-chapter problem sets.

Grading:

Exam 1 20%

Exam 2 25%

Exam 3 25%

Lab grade 20%

Paper* 10%

*One 5-page lab paper (double-spaced). This may be turned in anytime after spring break, but no later than the last day of lab (4 May). Topics should focus on a theme of modern 21st century genetics that is of personal or professional interest. Examples might include an overview of recent technological developments in molecular genetic technology (e.g., new methods of DNA sequencing, PCR, gene discovery & isolation etc.); or genetics of a particular disease or public health problem. Please confirm your topic with the instructor prior to writing.

*Study questions will be provided online so that you have the opportunity to work through difficult concepts prior to your exams. These will not be graded, but your instructors will discuss these questions and answers during scheduled review sessions.

*3% bonus added to final grade for 100% lecture attendance (attendance will be sampled randomly).

*Exams in this course are purposely designed to be challenging, and it is not uncommon for raw scores to be low (e.g., means of 45-65%)—exam and final grades will be adjusted appropriately based on the overall means for each exam and the final grade distribution.

Exam make-up policy:

Make-up exams are very strongly discouraged. If circumstances are dire or grievous enough that you are unable to take the exam, please contact me by phone (w: 907-474-6419, h: 907-452-2827) or e-mail (fnkgm@uaf.edu) in advance of the exam. Otherwise, no make-up exam will be given and your grade will be zero for that exam. Your make-up exam may be oral!

Incomplete policy:

Incomplete grades are strongly discouraged and will only be authorized under difficult circumstances. Your performance and participation in the course will factor into this decision.

Student code of conduct:

Students are subject to the UAF [Student Code of Conduct](#). Plagiarism, cheating, and other forms of academic dishonesty will be not tolerated, and will result in immediate failure of the course (not just the assignment). Students that participate in these types of activities will be withdrawn from the course and turned over to the Dean of Student Affairs.

Other policies:

Needs of students with disabilities will be accommodated following university policies. Please talk to the instructor privately if you have questions or require assistance. The [UAF Center for Health and Counseling](#) also provides disability services.

Contact information:

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Department of Biology and Wildlife
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Fairbanks, Alaska 99775
office (907) 474-6419 Rm. 028 UA Museum
email: fnkgm@uaf.edu

Office hours:

Monday & Wednesday 3:30 to 4:30 pm or by appointment.

Lab Syllabus: BIOL 362 Principles of Genetics, Spring 2009

Lab protocols will be provided online. Please download these from the course web site each week before lab.

<u>Date</u>	<u>Lab activity</u>
26/27/28 Jan	Introduction Pipette techniques & lab safety Meiosis & mitosis
02/03/04 Feb	DNA extraction: QIAGEN protocol & Onion/Banana DNA extraction
09/10/11 Feb	Polymerase chain reaction (PCR) DNA replication, transcription, and translation
16/17/18 Feb	Review Session for Exam #1 on 23 Feb (chapters 1 to 7)
23/24/25 Feb	Electrophoresis & DNA purification
02/03/04 Mar	DNA cycle-sequencing (meet in WRRB lobby) Tour West Ridge Research Building (WRRB) & IAB Core Facility for Nucleic Acid Research
09/10/11 Mar	Spring break
16/17/18 Mar	Contig construction & data analysis
23/24/25 Mar	Online Genbank tutorial, Protein Modeling
30/31/01 Mar	Review Session for Exam #2 on 06 Apr (chapters 8 to 16) Genetic diseases Lab #1
06/07/08 Apr	Cloning and gene transformation #1
13/14/15 Apr	Cloning and gene transformation #2 Genetic diseases Lab #2 - presentations
20/21/22 Apr	Tour UA Museum Bird, Mammal, and Genetic Resources Collection
27/28/29 Apr	Review Session for Exam #3 on 08 May (chapters 17 to 25)
04/05/06 May	No lab final exam - Turn in notebook to TA

Lab make-up policy:

Lab activities flow consecutively from one week to the next; i.e., you will use your DNA extract for PCR, your purified PCR product for cycle-sequencing, and your sequence for contig construction and data analysis, etc. If you miss one step, you miss the next step. Labs should not be missed. Make-ups are at the discretion of your TA, but must be coordinated in advance and completed prior to the next lab. Missed labs will be subtracted from your lab notebook grade (20% of overall grade).

Lab sections (location and time):

F01 Mond 2:15 - 5:15 PM BUNN 408

F02 Tue 2:00 - 5:00 PM BUNN 408

F03 Wed 2:15 - 5:15 PM BUNN 408

TA contact information (office hours by appointment):

Mariana Bulgarella

ftmb3@uaf.edu

Matthew Campbell

fsmac30@uaf.edu