BIOL3204 GENETICS – Fall 2013

Instructor: Dr. Melissa Philley Clauson
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Office Hours: MTW 7:30-8:20; MTWF 10:30-11:20; T 11:30-2:20 or by appointment (please email).

Course Description: A study of the major features of heredity, including patterns of transmission; the nature of hereditary information; the structure, replication, expression and the regulation of this information. Laboratory exercised focus on the patterns of transmission, the nature of RNA, DNA and chromosomes, and the regulation of gene expression. Modern genetic techniques such as gel electrophoresis, DNA transformation, and PCR will be employed. **Prerequisite: BIOL1204 and BIOL1214 with a "C" or above and one year of chemistry.**
This course is a writing intensive course according to the guidelines of LWC's QEP *Lindsey Writes!*

Required Texts: *Essential Genetics: Concepts and Connection,* 2nd Edition. Benjamin Pierce. W.H. Freeman and Company, NY, NY, 2013.
The Double Helix; A personal account of the Discovery of the Structure of DNA. James D. Watson. Edited by Gunther S. Stent. W.W. Norton Co., NY, NY, 1980.

Student Outcomes: The overall objective of the course is for students to understand and to be able to apply basic principles of genetics. The course student learning outcomes (SLOs) are aligned with Biology program SLOs (underlined):

1. Demonstrate a mastery of the course knowledge & content, including:
    a. construct and analyze monohybrid and dihybrid crosses.
    b. explain how the Mendelian laws emerge from the process of meiosis.
    c. explain how Mendelian inheritance patterns can be modified by linkage, sex chromosomes, gene interaction, and variable gene expression.
    d. map genes by recombination analysis.
    e. describe the molecular structure of DNA and the major events of DNA replication, transcription and translation.
    f. explain the structure and molecular basis of the genetic code and how genetic mutation alters gene function and interpret Mendelian patterns in molecular terms.
    g. describe and compare the structure of prokaryotic, eukaryotic and organellar chromosomes and genomes and explain selected models for regulation of prokaryotic and eukaryotic genes.
2. Demonstrate basic laboratory bench skills and an understanding and application of basic genetic laboratory techniques such as PCR, electrophoresis, & transformation.
3. Apply the scientific method through a semester long lab exercise.
4. Communicate in an acceptable scientific manner through a clear and concisely written laboratory report.

Education Program Preparation:
This course is required for content preparation in (Secondary, Middle Grades and / or Elementary include all that apply) Education Program(s) and prepares teacher candidates with the knowledge base for (insert content area) required in the Kentucky Core Academic Standards and the College Career Readiness Standards. The Conceptual Framework for the Education Program, "Teacher as Leader for the 21st Century", is incorporated. The Division of (insert division) works with the Education Program in preparing the teacher candidates with the knowledge base required to meet Kentucky Teacher Standard I and the Education Program Student Learning Outcome for Content Knowledge. Teacher candidates will be equipped to teach (insert grade level) students and meet requirements for Unbridled Learning.

Lab: Labs will be on Wednesdays from 12:30-2:20. Some aspects of lab will have to be taken care of outside of normal class time (fly observations). In class lab exercises **cannot be made up**. Lab Exercises will either be handed out by the instructor or posted on Blackboard. Information covered during lab time will be tested during the regular class exams. You are expected to **participate fully & come to lab prepared,** having read the provided information prior to coming to lab. A lab report will be due towards the end of the semester & information regarding this report will be supplied at a later date. Lab time may also be used for problem sessions and for taking exams as needed.

Written Assignments: Writing Intensive Student Learning Outcomes:

This course is a Writing Intensive (WI) course, a part of the Lindsey *Writes* Quality Enhancement Program. WI courses require the equivalent of 3,500 words of writing as part of the students' course curriculum and a portion of the student's grade in the course will be determined by the student's skill in writing. Faculty teaching WI courses have received specialized training in incorporating writing specific to their discipline. Students who have received specialized training as Writing Fellows will assist students and faculty. Lindsey Wilson students participating in WI courses will learn to:

- Write effectively using the conventions, style and vocabulary of their major disciplines.
- Be able to articulate and understand the elements of successful written communication in their major disciplines.

This course has a **writing fellow,** an experienced, trained student whose job is to aid students in with their scientific writing skills. There will be required meetings of each student and the writing fellow throughout the semester. These will be scheduled at a later date.

Introduction Section Draft: Once your fly cross has been identified, hypothesis formed and cross map out, you have sufficient information to complete the Introduction section of your lab report (50 points). Content, style, format information concerning this section of the lab report (and all sections) is available on Blackboard and will be discussed in class.

Lab Report Draft: A required draft (50 points) containing all parts of a scientific paper (IMRAD) is due approximately 2.5 weeks before the final version.

Lab Report: A clear & concisely written formal lab report of an indicated lab exercise is required (Fruit Fly Trait Inheritance). This signature assignment (100 points) will be used to assess most of the student learning outcomes indicated above. The format for the lab report, assessment rubrics & grading form are available on the Blackboard.

Double Helix Assignment: An in class writing on *The Double Helix; A Personal account of the Discovery of the Structure of DNA* will be completed on day announced in class (20 points).

Attendance: **Attendance is required for exams, quizzes, assignments and labs.** Daily attendance is highly encouraged for full success. Make-ups will be available only with an excuse deemed valid by the instructor (school-related, death in family, documented illness). It is the student's responsibility to make arrangements ***prior*** to the absence if at all possible. The LWC nurse is located in the Blue Raider Wellness Center in the basement of Phillips Hall. You can contact the center at 384.8238.

Exams: The 5 **lecture exams** (100 points each) during the semester and at finals will cover material presented in both lecture and lab. Exams will contain a mix of question types – multiple choice, short answer, fill in the blank, true/false, matching, essay – as well as genetics problems like those completed as homework or during lab time. Make-up exams will be given only for documented absences deemed excusable by the instructor & will be scheduled upon the student's return to class. If at all possible,

arrangements should be made prior to the absence. The **final exam will be half new material and half comprehensive**.

Quizzes: **Quizzes** will be announced in class and points possible will be indicated and calculated into the total points possible at the end of the semester.

Homework & Assignments:

Assignments are will be made available on Blackboard and are due on the indicated dates (variable points).

End of the chapter problems will be assigned for certain chapters of the textbook. You are highly encouraged to use these problems as practice for the exams. Questions concerning these problems will be entertained during lab and lecture time. These problems ***may*** be taken up for a grade (variable points).

Fly cross Punnetts – you will be required to write out your fly crosses through the F_2 generation (10points).

Fly Abstracts – you will be required to find a minimum of **two scientific references** indicating the function of the gene(s) you are following in your fruit fly cross (10 points)

Fly Lab Participation: As the fly lab experiment is a semester long lab completed by lab groups, full participation in all aspect of this lab is expected. Students will evaluation their fellow lab group member and give them a score out of 40 points. An average of these scores will be recorded in the grade book.

Grading: 5 Lecture Exams, Quizzes, Assignments (Lab & Lecture), Homework Fly Participation = **60% of your grade**

Introduction Draft, Lab Report Draft, Final Lab Report, Double Helix Report and any other written assignments = **40% of your grade**

Grading will be conducted on the standard 10pt scale with plus and minuses in accordance with the LWC catalog:

93-100%	A	77-79%	C+
90-92%	A-	70-76%	C
87-89%	B+	60-69%	D
83-86%	B	<60%	F
80-82%	B-		

Class Notes:

- We will cover a significant amount of material during this semester and you are encouraged to keep current with your reading & with your homework. **I expect a minimum 2 hours study time per lecture & lab class period.** It is most wise to spread out this time into 30-45 minute intervals. You will not be able to understand all the material presented in class & lab if you wait until the night before an exam to study – DO NOT do this – it will not work!!
- **Academic Integrity** – If I think you are cheating, you are cheating. Cheating=0. If I see you using a cell phone (for ANY reason) during an exam=0. No questions asked; no excuses accepted!
- EWS notices will be sent periodically throughout the semester regarding your attendance, grades, etc.
- Honors projects are available for this class.
- I do not keep your graded work. You need to pick up ALL of your graded work.

Academic Integrity

Academic integrity is essential to the existence of an academic community. Every student is responsible for fostering a culture of academic honesty, and for maintaining the integrity and academic reputation of Lindsey Wilson College. Maintaining a culture that supports learning and growth requires that each student make a commitment to the fundamental academic values: honesty, integrity, responsibility, trust, respect for self and others, fairness and justice.

To foster commitment to academic integrity, faculty are asked to require each student to place and sign the following Honor Code on tests, exams and other assignments as appropriate: **On my honor as a student, I have neither given nor received any unauthorized aid on this assignment/exam.**

Violations of the academic integrity policy include cheating, plagiarism or lying about academic matters. Plagiarism is defined as any use of another writer's words, concepts, or sequence of ideas without acknowledging that writer by the use of proper documentation. Not only the direct quotation of another writer's words, but also any paraphrase or summary of another writer's concepts or ideas without documentation is plagiarizing that writer's materials. Academic dishonesty is a profoundly serious offense because it involved an act of fraud that jeopardizes genuine efforts by faculty and students to teach and learn together. It is not tolerated at Lindsey Wilson College.

Students who are determined to have plagiarized an assignment or otherwise cheated in their academic work or examinations may expect an "F" for the activity in question or an "F" for the course, at the discretion of the instructor. All incidents of cheating or plagiarism are reported by the instructor to the Academic Affairs Office along with copies of all relevant materials. Each instance of cheating or plagiarism is counted separately. A student who cheats or plagiarizes in two assignments or tests during the same semester will be deemed guilty of two offenses. If the evidence is unclear, or if a second offense occurs, the VP for Academic Affairs or Associate Dean will work in cooperation with the Dean of Students to move the student before the campus Judicial Board for review. Violations will ordinarily result in disciplinary suspension or expulsion from the College, depending on the severity of the violation involved. **Note:** The College has purchased Turnitin.com, a web product used to detect plagiarized documents.

Questioning a Grade -- The Student Academic Complaint Policy
A student, who wishes to question **an assignment grade, or other academic issue**, should follow the procedure below:

1. Whenever possible, the student will first go to the faculty member who has assigned the disputed grade. Complaints regarding grades should be made within seven (7) days of receipt of the disputed grade and, if possible, will be decided by the faculty member within seven (7) days of receipt. If the disputed grade is the final grade for the course, "receipt" is defined by when the final grade is posted online by the registrar. (Please refer to the next section for appealing a final grade.)
2. Unless there are extenuating circumstances, the student may, within seven (7) days request in writing a review of such decision by the Chair of the division in which the grade was assigned. Upon receipt of such request, that Chair will direct the faculty member and the student to each submit, within seven (7) days, if possible, a written account of the incident, providing specific information as to the nature of the dispute.
3. Upon receipt of these written accounts, the Chair will meet, if possible, within seven (7) days with the faculty member and the student in an effort to resolve the dispute and will render his or her decision in writing.
4. If either the student or the faculty member desires to appeal the decision of the Division Chair, the student or faculty member may, within seven (7) days by written request to the chair, ask that the matter be reviewed by a Grade Appeals Panel convened by the Academic Affairs Office.
5. If the disputed grade is assigned at the end of a fall or spring semester and the student and faculty member cannot meet to resolve the issue, the student should contact the faculty member by e-mail within seven (7) days of receipt of the disputed grade. If the issue cannot be resolved by e-mail within the time limit, steps 2, 3 and 4 of the appeal may extend into the beginning of the semester immediately following receipt of the disputed grade by following the timeline above.

A student who wishes to question a **final grade** should follow the procedure below:

1. Confer with the faculty member who assigned the disputed grade.
2. If the disputed grade cannot be resolved, a written request for a grade appeal must be submitted to the Academic Affairs Office before the first day of the semester following the one in which the grade was issued. The written request must include the specific basis for the appeal.
3. The Academic Affairs Office will convene a Grade Appeals Panel, comprised of the Vice President for Academic Affairs, the Associate Academic Dean, and the chair of the academic unit which houses the course for which the grade is appealed. If one of the members is the faculty member who issued the grade, an alternate will be appointed. The student and the faculty member may appear separately before the panel to explain their positions. The hearing is non-adversarial. Neither the faculty member nor the student may be accompanied by other individuals to the meeting of the Grade Appeals Panel. The Grade Appeals Panel will notify the student of its decision, if possible, within seven (7) days of the meeting.

Policy for Verification of Student Identity and Protection of Privacy
In compliance with United States Federal Higher Education Opportunity Act (HEOA), Public Law 110-315, all credit-bearing courses and programs offered through distance learning methods must verify that the student who registers for a distance education course or program is the same student who participates in and completes the course or program and receives academic credit. One or more of the following methods must be used:

a) A secure login and pass code;
b) Proctored examinations; and/or
c) Remote proctoring of one of more examinations using Tegrity or other technologies

Verification of student identity in distance learning must protect the privacy of student information. Personally identifiable information collected by the College may be used, at the discretion of the institution, as the basis for identity verification. For instance, a student requesting that their learning system password be reset may be asked to provide two or more pieces of information for comparison with data on file. It is a violation of College policy for a student to give his or her password to another student.

Detailed information on privacy may be located at:
http://www.lindsey.edu/media/319883/Online%20Services%20Privacy%20Policy%204.20.12.pdf

Institutional Review Board (IRB) Policies
The Lindsey Wilson College Institutional Review Board (IRB) safeguards the rights and welfare of human participants in research and other research activities. Lindsey Wilson College faculty, staff, and students, which comprise its academic unites, and facilities, are subject to the IRB policies. This includes any research for which a research agreement (e.g. MOU) identifies Lindsey Wilson College Institutional Review Board (IRB) as the IRB of record. All student-led human subject research mush have a LWC faculty sponsor. All faculty members and students conducting human subject research are required to submit documentation of training on research involving human subjects that has been completed within two years of the onset of the proposed research. Online training is available at http://php.nihtraining.com/users/login.php.

Statement on Learning/Physical Disabilities
Lindsey Wilson College accepts students with learning disabilities and provides reasonable accommodation to help them be successful. Depending on the nature of the disability, some students may need to take a lighter course load and may need more than four years to graduate. Students needing accommodation should apply as early as possible, usually before May 15. Immediately after acceptance, students need to identify and document the nature of their disabilities. It is the responsibility of the student to provide to the College appropriate materials documenting the learning disability, usually a recent high school Individualized Education Program (IEP) and results from testing done by a psychologist, psychiatrist, or qualified, licensed person. The College does not provide assessment services for students who may be learning disabled. Although LWC provides limited personal counseling for all students, the College does not have structured programs available for students with emotional or behavioral disabilities. For more information, call Ben Martin at 270-384-7479.

Academic Success Center
The Academic Success Center, located in the Everett Building, offers peer tutoring to aid students in completing class assignments, preparing for exams and improving their understanding of content covered in a particular course. In addition, computers are available for student use.

Students are encouraged to utilize this Center as a resource for improving study strategies and reading techniques. The Center also offers assistance with other academic problems resulting from documented learning disabilities. All services are free of charge to all Lindsey Wilson College students (students with learning disabilities are responsible for providing documentation from an appropriate outside professional source such as a professional evaluation or school IEP). Please contact Maretta Garner, Tutor Coordinator at 384-8037 for further information and assistance.

Writing Center and Mathematics Center
The Writing Center (located in the Slider Humanities & Fine Arts Building), and the Mathematics Center (located in the Fugitte Science Building) are available for specialized tutoring at no charge to students. Please contact Jared Odd, Writing Center Coordinator, at 384-8209 or Linda Kessler, Math Tutor Coordinator, at 384-8115 for further information and assistance.

Final Exams
Final Exams for day classes are scheduled for the Fall 2013 semester on **December 9-13 and May 5-9** for the Spring 2014 semester. The academic calendar, which contains the schedule for finals, is in the College Catalog and course schedule listing. Please make any necessary flight arrangements **after** the final exam week. **Students will not be permitted to take early finals** unless extenuating circumstances exist. "Extenuating circumstance" means illness, a verified family emergency or participation in officially sponsored travel in support of an event arranged by the College.

Travel arrangements must be made in sufficient time that tickets may be obtained after final exams and the semester is officially over. All requests for early finals must be made in person to the Academic Affairs Office.

Email Policy
All Lindsey Wilson College students are required to communicate with LWC faculty and staff via LWC (Lindsey.edu) email addresses only. Alternative email addresses should not be used when communicating with LWC faculty and staff.

Cell Phone Policy
Student cell phones will be off during class time unless prior arrangement is made with the instructor.

Adding/Dropping a Course
Students enrolled in the following courses cannot drop these classes during the semester: READ 0713, 0723, 0733, 0903, 1013 and 1023; STSK 1003; ENGL 0903 and 0904; and ESL 0803, 0804 and 0854.

For undergraduate classes at the Columbia campus, adding a course, dropping a course, or changing from one section of a course to another section of the same course requires the approval of the advisor and the instructor for each course involved as indicated on the Add/Drop Form. The change must be reported to the Business Office and the Registrar's Office on an Add/Drop Form, which may be obtained from the Registrar's Office. For AIM courses, adding a course, dropping a course, or changing from one section of a course to another section of the same course requires the approval of the Director of the Evening Program. For courses taught at Community sites, adding a course, dropping a course, or changing from one section of a course to another section of the same course requires the approval of the Site Coordinator for the campus. Permission to add courses will not be given after the last date for late registration. Authorization for dropping a course will not be approved after more than 75% of the instructional days for a course are completed, as outlined below:

Course	Deadline	Submitted by the Student to
Columbia undergraduate and graduate full semester courses	Not later than 30 days before the end of the semester	Registrar
AIM courses	By the sixth week of class	Registrar
Courses at Community Campuses	By the third weekend of class	Site Coordinator or the Registrar

If changes are not properly approved and officially reported as stated above, students will receive a grade of F in the courses for which they are officially registered, and they will be charged for all such courses. Students will not receive credit for changed or added courses unless they officially register for those courses.

Any changes to the syllabus will be announced in class.

Important Dates:

Aug. 27 -- Last Day to Register or Add a Class
Sept. 2 -- Labor Day Holiday (No Classes)
Oct. 14 -- Mid-Term Grades Due
Oct. 14-18 -- Fall Break (No Classes)
Nov. 11 -- Last Day to Drop a Class or Withdraw
Nov. 28-29 -- Thanksgiving Holiday (No Classes)
Dec. 6 -- Last Day of Fall Classes

Tentative Lecture Schedule: Please Keep Up With Your Reading!!!!

This schedule is subject to change as we are using a new textbook.

Week Of:	Topic	LAB – Wednesday 12:30-2:20
8/21 W F	*Ch1 –Introduction to Genetics: (Read on your own!!)* & Genetics Terms (see last page of syllabus) **Genetics Terms Quiz;** Ch 2 – Chrs and Cellular Reproduction	
8/26 W F	Ch 3 – Basic Principles of Heredity	Fruit Fly Introduction
9/2 W F	**NO CLASS – LABOR DAY** Ch 4 – Extensions/Modifications of Basic Principles	Fruit Flies
9/9 W F	 **Exam 1 – Ch1-4**	PTC-PCR Lab
9/16 W F	Ch 5 – Linkage, Recombination and Euk Gene Mapping	PTC-PCR Lab
9/23 W F	Fly abstracts due Ch6 – Chromosome Variation; Chapter 6 Assignment Due	RNA Interference Experiment of Restriction Mapping of λ DNA Lab (Ch14 Textbook)
9/30 W F	Ch7 – Bacterial/Viral Genetic Systems; Ch7 Assignment Due	Restriction Mapping of λ DNA Lab
10/7 W F	**Exam 2 – Ch. 5-7 & Lab Information** Ch 8 – DNA: The Chemical Nature of the Gene	Restriction Mapping of λ DNA Lab
10/14	FALL BREAK	
10/21 W F	Ch9 – DNA Replication/Recombination	Race for the Double Helix
10/28 W F	Ch10 – Transcription & RNA Processing	pGLO Transformation
11/4 W F	**Exam 3 – Ch 8-10 & Lab Information** Ch11 – Translation	pGLO Chromotography
11/11 W F	Ch12 – Control of Gene Expression **Fly Paper DRAFT DUE** Ch13 – Gene Mutations, etc Ch13 Assignment Due	pGLO SDS-PAGE
11/18 W F	 **Exam 4 – Ch 11-13 & Lab Information** Ch 14 – Molecular Analysis	Lecture/Exam
11/25 W	**THANKSGIVING**	**NO LAB**
12/2 W F	Ch15 – Genomics & Proteomics; Assignment Due: **Final Reports DUE**	Epigenetics Video
Finals Week	**FINAL EXAM (Ch, 14-16 & Lab)**	

Genetic Terms – Quiz FRIDAY 8/23/2013

Chapter 2: Chromosomes & Cellular Reproduction

1. Genome
2. Prokaryote
3. Eukaryote
4. Eubacteria
5. Archaea
6. Histone
7. Chromatin
8. Homologous pair
9. Bivalent
10. Tetrad
11. Diploid
12. Haploid

Chapter 3: Heredity

13. Gene
14. Allele
15. Locus
16. Phenotype
17. Genotype
18. Homozygous
19. Heterozygous
20. Reciprocal Cross
21. Dominant
22. Recessive
23. Monohybrid cross
24. Dihybrid cross