INSTRUCTORS:
Dr. Katrin Kellner, Office – HPR 104, kbellner@uttyler.edu
Katherine (Kat) Beigel, Office – BEP 263, office hours: M 2:00 – 4:00 pm & W 3:15 – 4:15 pm, kbeigel@uttyler.edu

MEETING TIME AND PLACE: Wednesday section (W 12:20 – 3:10 pm) & Friday section (F 12:20 – 3:10 pm) in BEP 129


COURSE DESCRIPTION: An introduction to experimental and quantitative laboratory techniques fundamental to genetic analysis.

STUDENT LEARNING OBJECTIVES: Upon completion of BIOL 3133, the student should be able to:

- outline the basic procedures for culturing and experimenting with Drosophila melanogaster
- recognize and interpret Drosophila that illustrate Mendel’s law of segregation
- recognize and interpret F2 data that illustrate Mendel’s law of independent assortment
- list the necessary conditions for obtaining independent assortment
- define and give an example of what is meant by the concept of chance
- use probability principles in solving problems concerning independent events occurring simultaneously, binomial expansion, and mutually exclusive events
- apply probability concepts to the analysis of human pedigrees
- calculate X² to determine whether a given set of data approximates a theoretically expected ratio
- compare and contrast the mitotic process in plant and animal cells
- list the unique features of meiosis that set it apart from mitosis
- diagram how an X-linked gene is transmitted from parents to F1 and F2 generations
- extract DNA from tissue
- outline a procedure for conducting the polymerase chain reaction
- use Gel electrophoresis to visualize DNA
- genetically transform E. coli
- use Hardy-Weinberg equilibrium theory to determine gene and allele frequencies in populations
- use NCBI Genbank and other software to download and align DNA sequences and to construct a phylogenetic tree

GRADING POLICY
Attendance & Participation – 100 points
Prelab Quizzes – 100 points
Drosophila Laboratory Report – 100 points
Lab practical – 100 points

Letter grades will be assigned according to the following scale:

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

Attendance & Participation
You MUST attend all lab days to be successful in this class. There will be no make-up labs. If you miss for a valid (university-related events, death in the family, serious illness) reason, with documentation, your participation points for the day will be waived. You must still complete the corresponding quiz! If you miss a lab day, it is YOUR responsibility to get notes from class mates. Even if you miss a lab, the missed material will be covered in the practical. You also must actively participate in the lab, which not only includes going through the investigations/experiments, but also keeping up with/maintaining your lab equipment throughout the semester AND cleaning up after yourself at the end of each lab. Worksheets will be checked off at the end of the lab.

**Prelab Quizzes**
There will be a 10-point quiz each week. The quizzes will cover the lab we will do that week (so you need to read in advance – the point is to make sure that you know what to expect in class and come prepared). Prelab quizzes are either assigned through Canvas (and will close at the beginning of each the lab) or are online assignments with a work sheet, which has to be turned in at the beginning of the lab. **Quizzes submitted after the deadline count 0.**

**Lab Practical**
There is a lab practical (exam) scheduled for the week before Thanksgiving. Everything covered in the lab course is material for the exam. If you miss the exam, I can only offer you a make up exam if you have a valid reason with written documentation.

**DROSOPHILA Laboratory Report**
During the semester, you will be performing *Drosophila* breeding experiments as a group assignment (2-4 students max). The experiment will require a full laboratory report. Each student group will hand in one report through TurnItIn! on Canvas, and each student within that group will receive the same grade. A guide to writing your lab report will be available on Canvas. You are expected to write a full introduction, materials and methods, results, discussion and references. We will have several check points throughout the semester, and of course you can ask questions anytime.

**A NOTE ABOUT Drosophila CROSSES**
Crosses take about 10 to 14 days to get countable results for accurate analysis. Therefore, if you have to make a series of sequential crosses, say 3, it will take you 30 to 43 days to get results (that's 4.3 to 6.1 weeks); plan, plan, plan! **You will need to spend time outside of scheduled laboratory time** to be successful with the crosses, i.e., checking cultures, preparing cultures, counting flies, etc. This means you and your group members need to arrange a schedule! If you do not obtain results at the end of the semester (for example, because all of your flies died), you can write your lab report on a set of data provided by the instructor. There will be a clean up in the last week of classes. Attendance and participation is required.

**A NOTE ABOUT YOUR GENERAL RESPONSIBILITY IN THE LAB**
Clean up after yourself. If you use it, put it back; if you dirty it, clean it up; at all times practice safe laboratory practices. Do not bring any food or drink into the laboratory. No open shoes! All students are required to take part in the general safety introduction!

**CANVAS**
Students should log onto Canvas ASAP and carefully read all announcements. Canvas and student email should be checked DAILY for new announcements or messages. All course grades will be in Canvas, so students will be able to view and calculate their current course grade at any time.
LABORATORY SCHEDULE (subject to change)

<table>
<thead>
<tr>
<th>WEEK OF</th>
<th>Activities</th>
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<tbody>
<tr>
<td>Aug 26</td>
<td>Lab safety, Microscopy, Cell Reproduction: Mitosis &amp; Meiosis (Investigation 4 and 5)</td>
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<td>Sept 2</td>
<td>Genetic Counseling: Genetic Problems, Pedigrees and Principles of Probability (Investigation 2)</td>
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<td>Sept 9</td>
<td>Stereomicroscopes, <em>Drosophila</em> Experiments in Genetics (Investigation 1), The Chi-Square Test (Investigation 3)</td>
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<td>Sept 16</td>
<td>Sex Chromatin in Human Cells (Investigation 9) &amp; Human Chromosomes (Investigation 10), Genetic Problems with sex-linked inheritance</td>
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<td>Sept 23</td>
<td>Genetic mapping (Investigation 11), Linkage and crossover; Genetics of Ascospore Color in <em>Sordaria</em> (Investigation 12) – Experiment set-up;</td>
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<td>Sept 30</td>
<td>Recombinant DNA technology, DNA Exchange in Bacteria; Transformation of <em>Escherichia coli</em> (Investigation 17): – Experiment set-up; Collect data from <em>Sordaria</em></td>
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<td>Oct 7</td>
<td>DNA Extraction Methods and quantification; Collect data from <em>E. coli</em> transformation</td>
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<td>Oct 14</td>
<td>DNA replication and PCR technology (Investigation 16), PTC tasting– Experiment set up, Collect data from <em>E. coli</em> transformation</td>
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<td>Oct 21</td>
<td>DNA visualization: Agarose Gel Electrophoresis (Investigation 15): Collect data from PTC PCR</td>
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<td>Oct 28</td>
<td>DNA Forensics: Crime Scene Lab – Experiment set up, PCR</td>
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<td>Nov 4</td>
<td>DNA Forensics: Crime Scene Lab: Collect data: electrophoresis and blood typing</td>
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<td>Nov 11</td>
<td>Evolutionary Genetics: Phylogenies</td>
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<td>Apr 17</td>
<td>Evolutionary Genetics: Population Genetics (Investigation 23)</td>
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<td>Nov 18</td>
<td>Lab Practical <em>Drosophila</em> experiment wrap up and lab clean up</td>
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<td>Nov 25</td>
<td>Thanksgiving week!</td>
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<td>Dec 2</td>
<td>Lab report wrap up and lab clean up</td>
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UNIVERSITY POLICIES

UT Tyler Honor Code
Every member of the UT Tyler community joins together to embrace: Honor and integrity that will not allow me to lie, cheat, or steal, nor to accept the actions of those who do.

Students Rights and Responsibilities
To know and understand the policies that affect your rights and responsibilities as a student at UT Tyler, please follow this link: http://www.uttyler.edu/wellness/rightsresponsibilities.php

Campus Carry
We respect the right and privacy of students 21 and over who are duly licensed to carry concealed weapons in this class. License holders are expected to behave responsibly and keep a handgun secure and concealed. More information is available at http://www.uttyler.edu/about/campus-carry/index.php

UT Tyler a Tobacco-Free University
All forms of tobacco will not be permitted on the UT Tyler main campus, branch campuses, and any property owned by UT Tyler. This applies to all members of the University community, including students, faculty, staff, University affiliates, contractors, and visitors. Forms of tobacco not permitted include cigarettes, cigars, pipes, water pipes (hookah), bidis, kretekts, electronic cigarettes, smokeless tobacco, snuff, chewing tobacco, and all other tobacco products. There are several cessation programs available to students looking to quit smoking, including counseling, quitlines, and group support. For more information on cessation programs please visit www.uttyler.edu/tobacco-free.

Grade Replacement/Forgiveness and Census Date Policies
Students repeating a course for grade forgiveness (grade replacement) must file a Grade Replacement Contract with the Enrollment Services Center (ADM 230) on or before the Census Date of the semester in which the course will be repeated. (For Fall, the Census Date is Sept. 12.) Grade Replacement Contracts are available in the Enrollment Services Center or at http://www.uttyler.edu/registrar. Each semester’s Census Date can be found on the Contract itself, on the Academic Calendar, or in the information pamphlets published each semester by the Office of the Registrar.

Failure to file a Grade Replacement Contract will result in both the original and repeated grade being used to calculate your overall grade point average. Undergraduates are eligible to exercise grade replacement for only three course repeats during their career at UT Tyler; graduates are eligible for two grade replacements. Full policy details are printed on each Grade Replacement Contract.

The Census Date (Sept. 12th) is the deadline for many forms and enrollment actions of which students need to be aware. These include:

- Submitting Grade Replacement Contracts, Transient Forms, requests to withhold directory information, approvals for taking courses as Audit, Pass/Fail or Credit/No Credit.
- Receiving 100% refunds for partial withdrawals. (There is no refund for these after the Census Date)
- Schedule adjustments (section changes, adding a new class, dropping without a “W” grade)
- Being reinstated or re-enrolled in classes after being dropped for non-payment
- Completing the process for tuition exemptions or waivers through Financial Aid

State-Mandated Course Drop Policy
Texas law prohibits a student who began college for the first time in Fall 2007 or thereafter from dropping more than six courses during their entire undergraduate career. This includes courses dropped at another 2-year or 4-year Texas public college or university. For purposes of this rule, a dropped course is any course that is dropped after the census date (See Academic Calendar for the specific date).
Exceptions to the 6-drop rule may be found in the catalog. Petitions for exemptions must be submitted to the Enrollment Services Center and must be accompanied by documentation of the extenuating circumstance. Please contact the Enrollment Services Center if you have any questions.

Disability Services
In accordance with Section 504 of the Rehabilitation Act, Americans with Disabilities Act (ADA) and the ADA Amendments Act (ADAAA) the University offers accommodations to students with learning, physical and/or psychiatric disabilities. If you have a disability, including non-visible disabilities such as chronic diseases, learning disabilities, head injury, PTSD or ADHD, or you have a history of modifications or accommodations in a previous educational environment you are encouraged to contact the Student Accessibility and Resources office and schedule an interview with the Accessibility Case Manager/ADA Coordinator, Cynthia Lowery Staples. If you are unsure if the above criteria applies to you, but have questions or concerns please contact the SAR office. For more information or to set up an appointment please visit the SAR office located in the University Center, Room 3150 or call 903.566.7079. You may also send an email to cstaples@uttyler.edu

Student Absence due to Religious Observance
Students who anticipate being absent from class due to a religious observance are requested to inform the instructor of such absences by the second class meeting of the semester.

Student Absence for University-Sponsored Events and Activities
If you intend to be absent for a university-sponsored event or activity, you (or the event sponsor) must notify the instructor at least two weeks prior to the date of the planned absence. At that time the instructor will set a date and time when make-up assignments will be completed.

Social Security and FERPA Statement:
It is the policy of The University of Texas at Tyler to protect the confidential nature of social security numbers. The University has changed its computer programming so that all students have an identification number. The electronic transmission of grades (e.g., via e-mail) risks violation of the Family Educational Rights and Privacy Act; grades will not be transmitted electronically.

Emergency Exits and Evacuation:
Everyone is required to exit the building when a fire alarm goes off. Follow your instructor’s directions regarding the appropriate exit. If you require assistance during an evacuation, inform your instructor in the first week of class. Do not re-enter the building unless given permission by University Police, Fire department, or Fire Prevention Services.

Student Standards of Academic Conduct: Disciplinary proceedings may be initiated against any student who engages in scholastic dishonesty, including, but not limited to, cheating, plagiarism, collusion, the submission for credit of any work or materials that are attributable in whole or in part to another person, taking an examination for another person, any act designed to give unfair advantage to a student or the attempt to commit such acts.

(i) “Cheating” includes, but is not limited to:
- copying from another student’s test paper;
- using, during a test, materials not authorized by the person giving the test;
- failure to comply with instructions given by the person administering the test;
- possession during a test of materials which are not authorized by the person giving the test, such as class notes or specifically designed “crib notes”. The presence of textbooks constitutes a violation if they have been specifically prohibited by the person administering the test;
- using, buying, stealing, transporting, or soliciting in whole or part the contents of an unadministered test, test key, homework solution, or computer program;
- collaborating with or seeking aid from another student during a test or other assignment without authority;
- discussing the contents of an examination with another student who will take the examination;
• divulging the contents of an examination, for the purpose of preserving questions for use by another, when the instructors has designated that the examination is not to be removed from the examination room or not to be returned or to be kept by the student;

• substituting for another person, or permitting another person to substitute for oneself to take a course, a test, or any course-related assignment;

• paying or offering money or other valuable thing to, or coercing another person to obtain an unadministered test, test key, homework solution, or computer program or information about an unadministered test, test key, home solution or computer program;

• falsifying research data, laboratory reports, and/or other academic work offered for credit;

• taking, keeping, misplacing, or damaging the property of The University of Texas at Tyler, or of another, if the student knows or reasonably should know that an unfair academic advantage would be gained by such conduct; and

• misrepresenting facts, including providing false grades or resumes, for the purpose of obtaining an academic or financial benefit or injuring another student academically or financially.

(ii) “Plagiarism” includes, but is not limited to, the appropriation, buying, receiving as a gift, or obtaining by any means another’s work and the submission of it as one’s own academic work offered for credit.

(iii) “Collusion” includes, but is not limited to, the unauthorized collaboration with another person in preparing academic assignments offered for credit or collaboration with another person to commit a violation of any section of the rules on scholastic dishonesty.

(iv) All written work that is submitted will be subject to review by SafeAssign™, available on Blackboard.

UT Tyler Resources for Students:

• UT Tyler Writing Center (903.565.5995), writingcenter@uttyler.edu, http://www.uttyler.edu/writingcenter/

• UT Tyler Tutoring Center (903.565.5964), tutoring@uttyler.edu, https://www.uttyler.edu/tutoring/

• The Mathematics Learning Center, RBN 4021, This is the open access computer lab for math students, with tutors on duty to assist students who are enrolled in early-career courses.

• UT Tyler Counseling Center (903.566.7254) https://www.uttyler.edu/counseling/