Syllabus & Class Schedule
Bio5255 Genetics Lab: - Fall Semester 2019

Lecture: T Th, 12:25-1:45, JTB 120
Lab: M W F, 1:00-4:00, JTB 340
T Th, 2-4, JTB 340

Final: No final exam
Lab will commence Tuesday, October 15

Instructor:

Dr. Kelly T. Hughes  
*hughes@biology.utah.edu*  
LSB 308
Office hours Friday 8:30 - 9:30; after lectures and during lab Friday 1:00 - 4.

Course administrator:

Laurie Bagley  
LSB 205
Laurie will answer administrative questions about the course and return graded exams. Materials handed out in class will be posted in the room directly outside Laurie’s office.

Lab Administrator:

Mica McCarty-Glenn  
SB 201
Mica and her assistant will make sure all lab materials are prepared for each day's experiments.

Teaching Assistant(s):

Madison Schrock:  
madison.schrock@utah.edu

Madison will respond to e-mail queries and will arrange to meet with students individually or in small groups for personalized help sessions as time permits. We will also have help with lab write-ups from Dara Niketic in the Hughes lab.

Text:
Handouts. Online lecture materials

Course Objectives:

The goal of this course is immersion microbial genetics. The daily setting will attempt to give undergraduate students a real feel of what it is like to work in a research environment. It will give the graduate of this course a minimal training in modern microbial genetic methodologies that are fundamental to all cloning-related research they will do regardless of their final field of choice and is generally unavailable in any institution anywhere.

Expected Learning Outcomes

By the end of the course, in addition to having hands-on experience in a laboratory research setting, students will have acquired the following skills:
1. A feeling for working in a laboratory research environment.
2. A clear understanding of the difference between phenotype and genotype.
3. The selection versus screen approaches to obtaining mutants.
4. The process of gene transfer: conjugal, phage-mediated transduction, electroporation
5. The processes of inheritance by recombination: reciprocil versus non-reciprocil (gene conversion) events in homologous recombination, site-specific recombination and transposition.
6. The processes of complementation and recombination to distinguish between mutations that affect different genes (complementation) versus different regions of DNA (recombination).
7. The difference between dominant and recessive alleles and genetic processes used to distinguish between these mutant types.
8. The difference between cis-acting DNA sequences and gene products versus trans-acting.
9. The difference between dependent and independent mutations.
10. The use of genetic reporters to assay gene expression/regulation (the lac operon) and to perform cell biology with green fluorescent protein fusions and fluorescence microscopy.

Course Organization:

Biol5255 is a half-semester, 3 CR course. The lab portion of the course will be every afternoon excluding weekends and holidays. Lectures will be 1 hour 20 min in duration T&Th starting at 12:25 PM. The lab will be open immediately after lecture on T&Th and from 12:30 - 4 PM M-W-F. Because the lab space only accommodates 12 - 15 benches, students will work in groups of two - three. This allows for one of the partners to keep all experiments going if the other partner is unable to attend a session.

Grades:

Students will be graded on exams, homework, & lecture-lab attendance. Students will be graded on a curve over the A – F grade range. Full attendance in lecture & lab will be rewarded with a grade elevation (ex. B to B+). Five unexcused absences will result in a reduced grade. The grade will be 50% exams; 40% write-ups and lab results; 10% homework problems.

Withdrawals and audits:

This course will adhere to the University policy on withdrawals and incompletes, i.e., the instructor will not approve any course withdrawals. Students who have completed and passed at least 80% of the course material are eligible for an incomplete grade, if extenuating circumstances prevent them from completing the course.

Equal access provisions:

The University of Utah seeks to provide equal access to its programs, services and activities for people with disabilities. If you will need accommodations in the class, reasonable prior notice needs to be given to the Center for Disability Services, 162 Olpin Union Building, 581-5020 (V/TDD). CDS will work with you and the instructor to make arrangements for accommodations.

All written information in this course can be made available in alternative format with prior notification to the Center for Disability Services.

University Safety Statement:

The University of Utah values the safety of all campus community members. To report suspicious activity or to request a courtesy escort, call campus police at 801-585-COPS (801-585-2677). You will receive important emergency alerts and safety messages regarding campus safety via text message. For more information regarding safety and to view available training resources, including helpful videos, visit safeu.utah.edu.

Addressing Sexual Misconduct:
Title IX makes it clear that violence and harassment based on sex and gender (which includes sexual orientation and gender identity/expression) is a civil rights offense subject to the same kinds of accountability and the same kinds of support applied to offenses against other protected categories such as race, national origin, color, religion, age, status as a person with a disability, veteran’s status or genetic information. If you or someone you know has been harassed or assaulted, you are encouraged to report it to the Title IX Coordinator in the Office of Equal Opportunity and Affirmative Action, 135 Park Building, 801-581-8365, or the Office of the Dean of Students, 270 Union Building, 801-581-7066. For support and confidential consultation, contact the Center for Student Wellness, 426 SSB, 801-581-7776. To report to the police, contact the Department of Public Safety, 801-585-2677 (COPS).

Accommodations Policy:

The instructor does not grant content accommodation requests because the course content fulfills legitimate pedagogical goals.
Class Schedule

Genetics/BIOL 5255 (Gene Action)
Fall, 2019
Class Instructor: Kelly Hughes
TAs: Madison Schrock
Text: Handouts/Canvas
Lectures/ Exams T Th 12:25 – 1:45 JTB120
Lab sections: M T W Th F 12:25 – 4PM JTB340

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<tr>
<th>Week 1</th>
<th>10/15/18</th>
<th>Mutant isolation</th>
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<td>10/17/18</td>
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<td>Complementation/Genetic Fine Structure</td>
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Week 2
10/22/18 Plasmids & Conjugation
10/24/18 Hfr Mapping & Transduction

Week 3
10/29/18 Mechanism of Recombination/Lambda-Red
10/31/18 Transposition
Take-Home Exam I through 10/24/18 inclusive (due 11/05)

Week 4
11/05/18 Regulation of Gene Transcription
11/07/18 Lab Lecture

Week 5
11/12/18 Regulation of Gene Translation
11/14/18 Use of Gene & Operon Fusions
Take-Home Exam II through 11/15/18 inclusive (due 11/19)

Week 6
11/19/18 Complementation Revisited
11/21/18 Bacteriophage Lambda

Week 7
11/26/18 Genetics of Pathogenesis
11/28/18 Thanksgiving Holiday
Take-Home Exam III through 11/21/18 inclusive (due 12/05)

Week 8
12/03/18 Genomics
12/05/18 Catchup Lecture/Lab Summary

NO FINAL EXAM!!