

Abilene Approval Chart for Curriculum Changes

A = Approve I = Information Item R = Respond In Writing

Course Number: BIOL 352

or Degree Plan(s):

Open BIOL 352 Genetics Laboratory

BIOL 352 Description:

Introduction to analytical and laboratory techniques used by research and applied fields in transmission, molecular, and population genetics.

Lab Hours: 3

Credit Hours: 1

Corequisite: BIOL 351

		Dept./School	College	Dean	TEC	AUAC/Grad	Provost
	Campus-Level Academic Review¹						
	Change to a Course Include signatures from all chairs/program directors for cross-listed courses. ¹						
1.	Title (description unchanged)	A	A	A	I	I	I
2.	Description (not affecting content)	A	A	A	I	I	I
3.	Course term(s)	A	I	A	I	I	I
4.	Content (change of course outcomes)	A	A	A	I	I	A
5.	Number of credit hours	A	A	A	A	A	A
6.	Course number within the hundred	A	A	I	I	I	I
7.	Course number beyond the hundred	A	A	A	A	A	A
8.	Prerequisites	A	A	A	I	I	I
9.	Course restriction (e.g., majors only, junior standing)	A	A	A	A	A	A
10.	Level change (U to G or G to U)	A	A	A	A	A	A
11.	Cross list course	A	A	A	A	A	A
12.	Department of record	A	A	A	A	A	A
13.	<u>Open or close a course</u>	A	A	A	A	A	A
	Change to a Degree Plan						
14.	Educational Program — Revise	A	A	A	A	A	A
15.	Educational Program — Adopt/revise admission requirements	A	A	A	A	A	A
16.	GPA — Revise program-required GPA	A	A	A	A	A	A
17.	Minor — Revise	A	A	A	A	A	A

		Dept./School	College	Dean	TEC	AUAC/Grad	Provost	Campus Faculty	Senior VPAA	President
	Full Review									
	Change to Catalog Information (for Campus)									
18.	General requirements for Bachelor's and Associate Degrees	-	-	-	-	A	A	A	A	I
19.	Policies governing academic probation and suspension	-	-	-	-	A	A	A	A	I
20.	Requirements for graduating with honors	-	-	-	-	A	A	A	A	I
	Change to a Degree Plan									
21.	Educational Program — Add or Discontinue ^{2 3}	A	A	A	A	A	A	A	A	I
22.	Educational Program — Discontinue (Provost-proposed)	R	-	R	A	A	A	A	A	I
23.	Minor — Add or Discontinue	A	A	A	A	A	A	-	A	I
24.	Minor — Discontinue (Provost-proposed)	R	-	R	A	A	A	-	A	I
25.	Degree — Add or Discontinue	A	A	A	A	A	A	A	A	I
26.	Degree — Discontinue (Provost-proposed)	R	-	R	A	A	A	A	A	I

		Dept./School	College	Dean	TEC	AUAC/Grad	Provost	Campus Faculty	Senior VPAA	President
	Change to General Education Requirements for Undergraduates (System)									
27.	Change course outcomes of an included course	A	A	A	A	A	A	-	A	I
28.	Add or drop a required course from the General Education Requirements	A	-	A	-	A	A	A	A	I
29.	Add or drop a course from a menu within the General Education Requirements	A	-	A	-	A	A	-	A	I
30.	Comprehensive revision of General Education Requirements	-	-	-	-	A	A	A	A	I

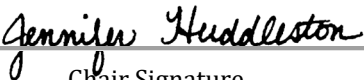
Notes

² Any change to a cross-listed course requires the signature of both department chairs or program directors overseeing the course to ensure that the courses stay in sync. This includes courses taught at other campuses (e.g. BIBL 101 and BIBO 101).

³ For undergraduate majors, a minimum of 30 hours is required. These programs must have a minimum of 6 elective hours, unless the requirements of external accrediting bodies make it impossible. Master's programs must include a minimum of 30 hours, and doctoral programs must include a minimum of 30 hours beyond the master's.

⁴ When a department/school or dean proposes closing a program, approval routing follows the typical process beginning with the department/school. An administrative proposal by the provost or senior vice president for academic affairs would follow the "provost-proposed" routing on the chart.

Department/School(s)

	2/28/2025
Chair Signature	Date

Chair/Program Director Signature	Date
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College Academic Council(s)

	3/7/2025
Chair Signature	Date

Chair Signature	Date
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Dean(s)

	3/7/2025
Signature	Date

Signature	Date
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Teacher Education Council

Signature	Date
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Campus Academic Council:
Abilene Undergraduate or Abilene Graduate

Signature	Date
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Provost

Signature	Date
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University General Education Council

Signature	Date
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University Faculty

Abilene Faculty Senate Chair signature

Date

Dallas Faculty Council Chair signature

Date

Senior Vice President for Academic Affairs

Signature

Date

President

Signature

Date

Abilene New Course Application

You may delete the preceding instructional pages before submitting application.

Course ID (<i>Subject Code and Number</i>)	BIOL 352
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1. Systems and Catalog Information Complete each item.

A	Course Developer	Joshua Brokaw
B	Course Instructor	Joshua Brokaw
C	Course Title	Genetics Laboratory
D	Course Abbreviation for Banner if title is more than 30 characters	Genetics Laboratory
E	College	OSE - Onstead Science and Engineering ▾
F	Department or School	BIOL - Biology ▾
G	Number of Credit Hours	1 ▾
G1	Number of Lecture Contact Hours	0 ▾
G2	Number of Lab Contact Hours	3 ▾
H	Is the course for a fixed or variable number of credit hours?	Fixed ▾ If variable, explain rationale:
I	Is the course repeatable for additional credit?	No ▾
J	Maximum total number of credit hours a student can earn for this course	1
K	Course Schedule Type	Lab (LAB) ▾ See Schedule Type definitions in the Reference section.
L	Number of Faculty Workload Hours	3 ▾
M	Grading Mode	Standard ▾
N	Maximum Enrollment	20 per section (3 sections)

O	Catalog Description (50 words or less)	Introduction to analytical and laboratory techniques used by research and applied fields in transmission, molecular, and population genetics.
P	List any prerequisites (course/s, test scores, class standing, major, etc.)	None
Q	List any corequisites (these <i>must</i> be taken at the same time; note that a single requirement cannot be both a prerequisite <i>and</i> a corequisite)	Genetics (BIOL 351)
R	If the course is cross-listed, specify the subject code and course number of the other course	Not applicable
S	Does this course require any additional student course fees?	Yes ▾ Requires the standard laboratory fee If yes, attach a completed course fee form .
T1	Will the course be offered in fall terms?	No ▾
T2	Will the course be offered in spring terms?	Yes, every year ▾
T3	Will the course be offered in summer terms?	No ▾
U	First semester this course will be offered under new Course ID. <i>May not be earlier than the coming fall semester.</i>	Spring 2026
V	Is this course required for a program(s)?	Yes ▾ If yes, submit a separate completed curriculum proposal to change the program(s).
W	Should the addition of this course be retroactively applied to the degree plan it supports? <i>This is rare, and rationale should explain compelling extenuating circumstances.</i>	No ▾ If yes, provide rationale:

X	Has this course been offered as a Special Topics course? <i>New courses are not required to be taught as Special Topics courses prior to approval.</i>	No ▾ If yes, provide course ID, term, and enrollment:
Y	List any courses in which the content overlaps the proposed course. (Course ID and Name). <i>Attach a statement from the instructor/dept chair of the existing course justifying the new offering.</i>	BIOL 476 - Biotechnology CHEM 463 - Biochemistry Laboratory I

2. Curriculum

- A. Explain any effects of this course on any degree plans. If the addition of the course alters program requirements, submit a separate [Approval Chart for Curriculum Change](#) to update the program.

This course will support existing degree plans. It will be added to any plan that requires (Genetics) BIOL 351.

- B. Justify the addition of this course to the current curriculum, explaining the gap it meets.

This course resolves a deficiency in the program for biology and biology-related degrees that most biology programs offer but ACU has lost during past program and personnel transitions. Genetics and associated technologies remain one of the most important fields of the 21st century for questions related to human medicine, food supply, social inequality, warfare, etc. It also enhances student exposure to genetics research and experiential learning.

3. Course Design

- A. Audience and Course Goal
1. Describe the intended audience, including prerequisite skills.

The intended audience is STEM majors with an interest in any biology-adjacent applied fields, including medicine, agriculture, biotechnology, forensics, conservation, etc. Prerequisite skills involve having a grasp of cells, DNA, and college-level math.

2. State the overarching course goal(s) in performance terms.

Students will develop an introductory-level understanding of applied transmission, molecular, and population genetics, including both biochemical laboratory techniques and bioinformatic computer technology.

- B. Student Learning Outcomes and Measurements

Genetics Society of America Genetics Learning Framework
 (<https://genetics-gsa.org/education/genetics-learning-framework/>):

Upon successful completion of this course, students should be able to:

	Student Learning Outcome	Measurement
1	Consistently <u>use</u> best practices in a laboratory setting by implementing safety protocols and accurately documenting data in lab notebooks.	The Technique and Completion grade is 30% of the semester average and assesses the students' preparedness for the labs and their performance during the lab. It will include pre-lab and post-lab notebook checks with signatures for completion, and will further assess the following behaviors: • participation in the experiment • accuracy in following protocols • data collection and storage (manual and/or electronic) • tidiness of the bench during and after lab • careful use of the lab supplies and materials These points will be assessed by the instructor with the help of the TAs at the time of weekly completion signatures.
2	<u>Execute</u> and master essential laboratory techniques such as DNA extraction, Polymerase Chain Reaction (PCR), and gel electrophoresis.	Accuracy in following these protocols is included in the assessment above as well as two in-depth laboratory notebook grades.
3	<u>Demonstrate</u> proficiency in genetic analytical reasoning.	Two exams covering: • Probability and Statistics in Genetics • Bioinformatics and Population Genetics
4	<u>Apply</u> principles of genetics, including Mendelian inheritance, molecular genetics, and population genetics, to analysis of real genetic data using statistical and bioinformatics tools.	This component will be covered by weekly quizzes covering data and methods in the laboratory notebooks as well as two in-depth laboratory notebook grades.

C. Text and Resources

Give the full publication information of the textbook/s and other required resources and outside readings. For **combined undergraduate/graduate** courses, make two lists:

No required texts.

4. Supporting Documentation

Required of all applications

1	Approval Chart for Curriculum Changes • Attached
2	Syllabus — Attach the syllabus for the course based upon the anticipated first-semester offering. • Attached
3	Adams Center Review Letter of Support • Attached
4	Library — Submit new course application and syllabus to the Library dean's office. Attach the Library's memo. • Attached
Attach if applicable	
5	Content Overlap — Include one document for each course you listed in Section 1Y. Attach statement from instructor/dept chair of existing course justifying the new offering. • Attached
6	Departmental Resources — List the resources that support the course and are available only through the department, if applicable. Attach the list of the holdings and the location(s). • Attached
7	Resources — List resources (other than library or departmental resources) that are needed to support this course (computers, lab equipment, other technology, etc.). Attach a complete list of all items and indicate possible sources or estimated cost of each. List the sources of any needed funds. • Attached
8	Expenses — List additional expenses needed to implement this course (full-time or part-time faculty, graduate or lab assistants, student employees, travel, special student costs, room renovation, storage facility, etc.). Attach a complete list of all items, the estimated cost of each and the source of the funds. • Attached
9	Justification — Attach any documents to which you refer in Section 2B. • None needed
10	Course Fee Form • Attached

GENETICS LABORATORY

Course Details

BIOL 352 Description:

Introduction to analytical and laboratory techniques used by research and applied fields in transmission, molecular, and population genetics.

Lab Hours: 3

Credit Hours: 1

Corequisite: BIOL 351

Room: HAL 246

L1: Wednesday 2:00–4:50 pm

L2: Thursday 12:00–2:50 pm

L3: Thursday 3:00–5:50 pm

Instructor Info

Taught by Dr. Joshua Brokaw

- josh.brokaw@acu.edu
- Professor of Biology

Office: HAL 226

Office phone: 325-674-2168

Office hours: 10 a.m. (MWF),
12–2 p.m. (TR); other times by
appointment.

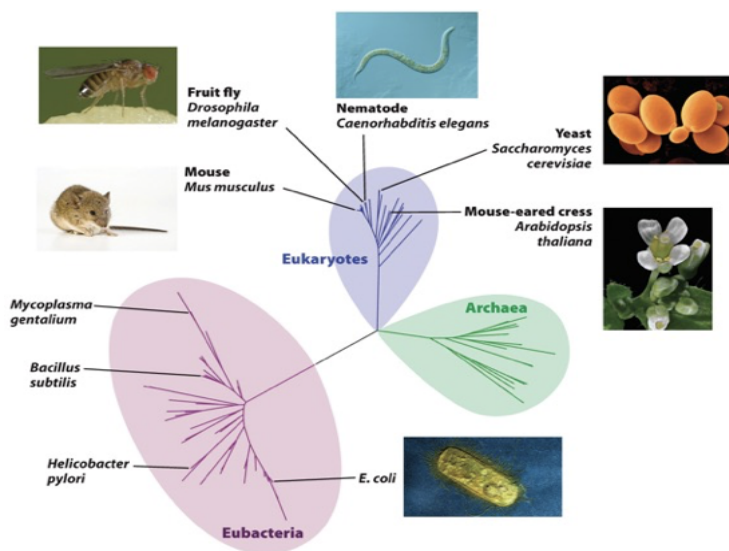
Make appointments by email.

What You Need for Class

Lab coat, long pants, and
closed-toe shoes

A secure spine-bound lab
notebook. Not spiral bound,
no tear-out page perforations.

Device that is compatible with
[LockDown Browser](#).



Course Description

This laboratory course is designed to provide foundational practical experience appropriate for STEM majors pursuing careers in research and all biology-adjacent fields, including health professions, agriculture, biotechnology, forensics, and conservation. Students will apply the theories of transmission and population genetics and the methods of molecular genetics through laboratory experiments and data analysis.

Course Outcomes

Upon successful completion of this course, students will be able to:

- Use best practices in a laboratory setting by implementing safety protocols and accurately documenting data in lab notebooks.
- Execute essential laboratory techniques such as DNA extraction, Polymerase Chain Reaction (PCR), and gel electrophoresis.
- Demonstrate proficiency in genetic analytical reasoning.
- Apply principles of genetics, including Mendelian inheritance, molecular genetics, and population genetics, to analysis of real genetic data using statistical and bioinformatics tools.

Faith and Inquiry

As with all areas worthy of inquiry, material in this course will challenge your understanding of the world. In particular, we hope to strengthen our faith resiliency to cognitive dissonance as we explore the connections between our spiritual experiences and scientific understanding of the world.

Course Outcomes Assessment

Successful course outcomes in Genetics Laboratory will be determined using four kinds of assessments listed below.

1. Weekly open-notebook quizzes.
2. Lab technique and completion grades.
3. Analytical reasoning exams twice per semester.
4. In-depth lab notebook checks twice per semester.

All quizzes and exams will be taken through Canvas and require LockDown Browser.

- **Quizzes (30%).** During the first 10 minutes of most weekly labs, **open notebook** quizzes will cover the current week's pre-lab preparation and the previous lab's principles and results. Students who come prepared with a well-organized notebook and who are conscientious in their notebook entries will do well on the quizzes. **Only hand-written entries in lab notebooks are allowed for reference during quizzes.** Quizzes are 10 multiple-choice questions.
- **Technique and Completion (30%).** The Technique and Completion grade applies 10 points per lab to assess the students' preparedness for the labs and their performance during the lab.
 - You will be assessed 5 points for pre-lab and post-lab notebook checks with signatures for completion (see guidelines below).
 - The remaining 5 points will assess:
 1. participation in the experiment
 2. accuracy in following protocols
 3. data collection and storage (manual and/or electronic)
 4. tidiness of the bench during and after lab
 5. careful use of the lab supplies and materials
 - These points will be assessed by the instructor with the help of the TAs at the time of weekly completion signatures. Students are expected to fill time of the lab period with experimentation and writing the lab notebook entries. Your seriousness about these observations counts towards the lab technique grade.
- **Exams (20%).** Exams will be administered on dates noted in the schedule.
 - Exam 1: Probability and Statistics in Genetics
 - Exam 2: Bioinformatics and Population Genetics

Accommodations: ACU's [University Access Program](#) facilitates accommodations based on ADA guidelines. If you wish to discuss accommodations, please email alpha@acu.edu or call 325-674-2667.

SOAR (Student Opportunities, Advocacy, and Resources): SOAR partners with faculty, staff, parents and students to support ACU student success. For information or to make a SOAR recommendation, see <https://acu.edu/soar-program/>

Bias Education and Response Team: For information about reporting bias incidents, see <https://acu.edu/about/diversity-and-inclusion/bert/>

Anti-Harassment Policy: I am required to share with the Title IX Coordinator information regarding sexual misconduct or harassment, dating/domestic violence or stalking that you report to me. If you prefer a confidential setting, I encourage you to speak with someone in the [ACU Counseling Center](#). See ACU's policies [here](#).

Dress Code: See ACU's full dress code policy [here](#).

Academic Integrity Policy: As a community of Christians, we should expect behaviors from each other that are not only consistent with the nature of God, but also that demonstrate respect for the community and ourselves. Having integrity also requires action against violations in spite of peer pressure, loyalty, or compassion.

Please read ACU's [Academic Integrity Policy](#) to understand the consequences of violations or to learn how to file an appeal.

Examples of academic dishonesty include, but are not limited to, the following:

- Submitting for credit, in whole or in part, the work of others.
- Receiving, giving, or using unauthorized aid on a quiz, test, or exam.

- **Notebook (20%).** The laboratory notebook of a scientist is a legal document that outlines the daily progress of experiments.
 - Lab notebooks will be graded in-depth twice during the semester based on the following rubric (**green percentages**). Graders will check for entries in your own wording.
 - Follow the specific instructions outlined below for writing in lab notebooks. Legibility and neatness are crucial to prevent loss and mishandling of information.
 - Notebooks should be written in ink: calculations, notes, and results should be recorded directly into the notebook.
 - Nothing should be erased or obliterated. Mistakes are crossed out with a single line so the original work is still visible.
 - **Table of Contents:** at the beginning of your notebook, dedicate a few pages for a table of contents, including the title of each experiment and the page numbers. Keep up to date.
- **Pre-laboratory notebook entries (50%):** Written before lab in student's wording and not copied from the handouts or from any other students/sources. This will help you on quizzes and to finish labs on time.
 - **Title & Date:** this section should be written before class. The title of each experiment should be descriptive yet concise. Record the date (and what time, if applicable) the experiment was (will be) carried out.
 - **Introduction (25%):** This section should be written with your own wording before the lab period. Word-for-word transcription from the pre-lab Canvas document is NOT allowed. The introduction must contain:
 - the theory or background behind the experiment (not more than 2 to 3 sentences).
 - the question to be investigated based upon the background (one sentence).
 - the hypothesis AND the predicted results (one to two sentences maximum).
 - the objectives of the experiment that will test the hypothesis (one to two sentences).
 - **Materials & Methods (25%):** This section should be written before the lab period and then modified as needed with clear editing during the execution of the experiment.
 - You are required to write this section as a flow chart of the protocol to avoid lengthy write-ups. You should be able to follow the outlined steps easily and allow others to repeat the experiment using only the protocol you have charted in your notebook.
 - Instructor or TA **pre-lab signature** (for completion).
- **In-laboratory notebook entries (50%):** In research labs, and for legal reasons, the raw data should go directly into the notebook. The following should be accomplished during or immediately following the lab while memory is still fresh.
 - **Results (25%):** This section should include hand-written outcomes of the experiment.
 - Graphs and Images: these will be computer-/machine-generated documents.
 - Space should be left in the lab notebook to physically attach printed images.
 - Common examples include gel images and fragment analysis graphs.
 - **Reflective Notes and Discussion/Conclusions (25%):** This section is written immediately after each experiment is completed to explain the meaning of the results, including explanation for why things happened as they did. It must be in your own wording and include:
 - A brief interpretation of the results.
 - Significance of the findings.
 - What you learned from this experiment.
 - How the objectives were or were not achieved.
 - Future directions that suggest what to do next and why.
 - Instructor or TA **post-lab signature** (for completion).

Lab Schedule*

Lab	Week	Topic
1	Jan. 14/15	Introduction to Model Organisms and Laboratory Safety - Overview of model organisms (<i>Arabidopsis thaliana</i> and zebrafish (<i>Danio rerio</i>)) - Laboratory safety protocols and proper handling of biological materials - Introduction to the course structure and expectations
2	Jan. 21/22	Mendelian Genetics with Probability and Statistics Part 1 - Simulating Mendelian crosses with probability models - Chi-square test for Mendelian ratios
3	Jan. 26/27	Mendelian Genetics with Probability and Statistics Part 2 - Basic principles of biostatistics - Chi-Square test variations and other common statistical tests
4	Feb. 4/5	Exam 1: Mendelian Genetics with Probability and Statistics
5	Feb. 11/12	DNA Extraction and Quantification - Extraction of genomic DNA from plant and animal tissues - Quantification and assessment of DNA purity using spectrophotometry
6	Feb. 18/19	Polymerase Chain Reaction (PCR) and Gel Electrophoresis - Designing primers for a target gene - Performing PCR amplification of the target gene - Analyzing PCR products using agarose gel electrophoresis
7	Feb. 25/26	Bacterial Transformation and Plasmid Analysis - Introduction to plasmid vectors and their role in gene cloning - Transforming bacteria with recombinant plasmids - Selecting and analyzing transformants
8	Mar. 4/5	Gene Expression Analysis & Lab Notebook Submission - Isolating RNA from cells or tissues - Performing reverse transcription to synthesize cDNA - Quantitative PCR (qPCR) to assess gene expression levels
	Mar. 11/12	No Lab - Spring Break
9	Mar. 18/19	Bioinformatics and Genomic Data Analysis - Introduction to bioinformatics tools and databases - Sequence alignment and gene annotation exercises - Exploring genetic variation using online resources
10	Mar. 25/26	Population Genetics Simulation - Simulating genetic drift, selection, and migration using computational models - Analyzing allele frequency changes over generations
11	Apr. 1/2	Population Genetics Research Project Part1 Molecular techniques: microsatellite variation from real-world populations
12	Apr. 8/9	Exam 2: Bioinformatics and Population Genetics
13	Apr. 15/16	Population Genetics Research Project Part2 Data collection: microsatellite variation from real-world populations
14	Apr. 22/23	Population Genetics Research Project Part3 Data analysis: microsatellite variation from real-world populations
15	Apr. 29/30	Research Project Recap and Discussion & Lab Notebook Submission

*lab schedule may be modified if necessary

Grading Scale and Schedule

Quizzes		30%
Technique and Completion Checks		30%
Exam 1	Feb. 4/5	10%
Major Notebook Assessment 1	Mar. 4/5	10%
Exam 2	Apr. 8/9	10%
Major Notebook Assessment 2	Apr. 29/30	10%
TOTAL		100%
A ≥ 89.5%; B ≥ 79.5%; C ≥ 69.5%; D ≥ 59.5%; F < 59.5%		

If You Have to Miss Class

If you have to miss lab for an **excused** reason (see below), let your instructor know **ahead of time**, and we will work with you to get the lab quiz and lab notebook check made up. For the make-up, you will come to the lab at an alternate time to complete the lab notebook. **You must make up a lab within one week** of the latest date on your documentation, or you'll receive a zero on missed assignments.

Excused reasons to miss lab:

- Illness (requires doctor's note covering date of absence)
- Death in immediate family (documentation required)
- Official university business (with appropriate approvals)

Missing lab for an **unexcused** reason will result in a zero for that lab's Technique and Completion grade and pre-lab quiz.

- **Falsification of excused absences is officially recognized as a form of academic misconduct** and must be documented and pursued following ACU's [Academic Integrity Policy](#).

If a student accumulates **two unexcused absences**, they will be dropped from lab and lecture with a 'WF'. If a student accumulates **three absences, whether excused or unexcused**, we reserve the right to drop that student from lab and lecture with a 'W' or 'WF', depending on circumstances.

Please note that while there are firm course policies in place for a reason, we are always happy to work with students that find themselves in extraordinary circumstances that may dictate exceptions to regular course policies. Communicating early and often is critical if you believe you are in this situation.

Mission Statements:

ACU: The mission of Abilene Christian University is to educate students for Christian service and leadership throughout the world.

Science and Engineering College: The mission of the Onstead College of Science and Engineering is to explore and understand God's creation in the natural world and apply the acquired knowledge and principles to address its issues and challenges.

Biology Department: The Department of Biology educates students for Christian service and leadership by preparing them to become biological scientists, pre-college teachers, and health care professionals.



February 26, 2025

Dr. Joshua Brokaw
Abilene Christian University
Professor
Department of Biology
Halbert-Walling Research Center (HAL) 214
(325) 674-2168
jmb97t@acu.edu

Re: Genetics Laboratory (BIOL 352)

Dear Dr. Brokaw

Thank you for submitting Genetics Laboratory (BIOL 352) to us for review. I have reviewed it based on the ACU Syllabus Guidelines. I found the syllabus to meet all aspects of the checklist. Please note that this letter is intended as a reference, which will be read by the department chair and council members, who may also have questions or comments of their own. If you have any questions, please feel free to let me know.

Please also let me know if we can help in the design and facilitation of this course.

Sincerely,

A handwritten signature in black ink, appearing to be "S. Hamm", followed by a long horizontal line.

Dr. Scott E. Hamm,
Assistant Director, Adams Center

ABILENE CHRISTIAN UNIVERSITY

LIBRARY

M E M O R A N D U M

DATE: February 24, 2025
TO: Dr. Josh Brokaw
FROM: Mark McCallon, Associate Dean for Library Services
RE: Course Application for BIOL 352 – Genetics Laboratory

After reviewing the course application, the library should be able to support the proposed course. If additional library resources in support of the course are required, please contact James Wiser, Librarian Liaison for the Department of Biology, at jaw20b@acu.edu . Thank you for letting the library review the course application and syllabus.

ABILENE CHRISTIAN UNIVERSITY

Educating Students for Christian Service and Leadership Throughout the World

Abilene, Texas 79699 • www.acu.edu • 325-674-2000



February 24, 2025

To Whom It May Concern:

The proposed Genetics Laboratory provides a distinct experience from Chem 463 Biochemistry Laboratory I. While about 25% of the experiments may be similar in procedure, the goals of the lab are teaching different aspects of the fields of Molecular Biology and Biochemistry. This lab is focusing on using these techniques to explore the principles of genetics while Biochemistry lab is focusing on learning about the molecules themselves. I believe this lab adds to the overall education of our students.

Autumn Sutherlin, Ph.D.
Chair and Professor
Department of Chemistry and Biochemistry
Abilene Christian University

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February 25, 2025

Re: Statement in Support of BIOL 352 - Genetics Laboratory

Dear Josh,

Thank you for reaching out regarding the proposed Genetics Laboratory course (BIOL 352). I am in full support of offering this lab, as it will provide students with essential hands-on experience in fundamental genetic techniques.

While there is a small percentage of overlap with BIOL 476 - Biotechnology in terms of experimental approaches, I see this as a positive aspect. The foundational skills acquired in Genetics Laboratory will better prepare students for the more advanced experiments and applications in BIOL 476. By reinforcing key laboratory techniques earlier in their academic journey, students will be more confident and proficient when they advance to Biotechnology.

Please let me know if you need any additional details.

Many blessings,

Qiang "John" Xu, Ph.D.
Professor and Director
Department of Biology
ACU Bioanalytics Laboratory (CLIA# 45D2318293)
Abilene Christian University
ACU Box 27868
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325-674-4883
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qxu@acu.edu

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Dr. Jennifer R. Huddleston
Associate Professor
Department Chair
Department of Biology
Abilene Christian University
ACU Box 27868
Abilene, Texas 79699-7868
jennifer.huddleston@acu.edu

February 26, 2025

Dear Josh Brokaw and Council Members:

The content of BIOL 352 Genetics Lab does not overlap significantly with the content of BIOL 476 Biotechnology. While there are some basic technological tools that are in common, such as PCR, the approach and applications are different. BIOL 352 will teach students how to think about genetics concepts while using common biological technology.

Sincerely,

Jennifer Huddleston, Ph.D.

Departmental Resources Used by Genetics Laboratory (BIOL 352)

HAL 246: Laboratory shared with Introductory Biology Laboratory (BIOL 122 and BIOL 124) courses.

- Gel electrophoresis equipment
- Gel imaging equipment
- Micropipettes
- Thermal cyclers for PCR
- Incubators
- Compound microscopes
- Centrifuges
- Vortexers
- Freezer
- Refrigerator
- Microwave

OSC 215: The ACU Living Lab and equipment therein

- Animal and plant growth facilities

Additional IT Resources Needed by Genetics Laboratory (BIOL 352)

HAL 246: Laboratory shared with Introductory Biology Laboratory (BIOL 122 and BIOL 124) courses.

- Desktop computer for imaging equipment **\$1000**
- Laser printer for imaging **\$400**

Additional Expenses for Genetics Laboratory (BIOL 352)

Genetics Laboratory will utilize undergraduate teaching assistants funded by laboratory fees following the model of other biological laboratory courses in the Department of Biology.

However, we have requested an additional \$75 fee to cover this cost combined with the cost of molecular laboratory chemicals and perishable supplies.



Request to Add or Change Course Fees

Course fees or changes to existing course fees must be approved and published in the ACU Catalog for the following year in order for them to be assessed on a student's account. Course fees which are not processed by February 1st will not be included in the fall catalog.

Request Date 02/23/2025

Amount of Fee \$150.00

Department Making Request Biology

Contact Person Joshua Brokaw

Semester and year for fee to begin Spring 2026

Check the appropriate fee category below:

FOAP: 100000 20720 4026 10

☒ Fee is the same for every section and every student

☐ Fee applies to certain sections only

If fee applies to certain sections only, please specify below if it is a one-time fee for a single section or a repeating fee that will be applied on a regular schedule (e.g., a fee charged each time the course is taken in a summer session but not in the fall or spring).

This request applies to the following course (one per form):

Course Number / Section

Course Title

BIOL 352

Genetics Laboratory

State the justification for your request below. You will be notified of final approval or denial.

The typical science laboratory fee is \$75 with \$63 of that total transmitted to the department facilitating the lab. Due to the much higher costs of laboratory supplies and guidance from teaching assistants associated with individual lab students performing molecular genetic experiments, we request a total of \$150 fee with \$138 of that total transmitted to the department for laboratory expenses.

The following signatures must be obtained before any request is approved.

Approved

Declined

Jennifer Huddleston

Department Chair

Date



College Dean

Date



Provost

Date



Vice President for Finance

Date



If approved by all above, route to:

Controller

FOAP

Date Completed

Finance

Fee Code for use on course

Date Completed

Registrar's Office

Date Completed

2/9/2021 KMW