Term Information

Effective Term	Summer 2026

General Information

Course Bulletin Listing/Subject Area	Biology
Fiscal Unit/Academic Org	Introductory Biology - D0326
College/Academic Group	Arts and Sciences
Level/Career	Undergraduate
Course Number/Catalog	3120
Course Title	Biology Research Laboratory Techniques: Genetic Engineering
Transcript Abbreviation	Bio Lab Techniques
Course Description	Introduces students to modern laboratory techniques for future career opportunities. Students will perform a series of experiments involving gene editing and DNA processing and data analysis linked with a focused research question. Through weekly laboratory sessions, students will produce a portfolio demonstrating mastery of course objectives through lab notebooks and video skill documentation.
Semester Credit Hours/Units	Fixed: 1

Offering Information

Length Of Course	14 Week, 7 Week
Flexibly Scheduled Course	Never
Does any section of this course have a distance education component?	No
Grading Basis	Letter Grade
Repeatable	No
Course Components	Laboratory
Grade Roster Component	Laboratory
Credit Available by Exam	No
Admission Condition Course	No
Off Campus	Never
Campus of Offering	Columbus, Lima, Mansfield, Marion, Newark, Wooster

Prerequisites and Exclusions

Prerequisites/Corequisites	(1112 or 1113.xx or 1113E or 1113H), and (1114.xx, 1114E or 1114H), or permission of instructor.
Exclusions	
Electronically Enforced	Yes

Cross-Listings

Cross-Listings

Subject/CIP Code

Subject/CIP Code	26.0101
Subsidy Level	Baccalaureate Course
Intended Rank	Sophomore, Junior, Senior

Requirement/Elective Designation

The course is an elective (for this or other units) or is a service course for other units

Course Details

Course goals or learning objectives/outcomes

- Employ safe laboratory practices
- Students will demonstrate micro pipetting specific volumes into centrifuge tubes and verifying accuracy through mass.
- Students will demonstrate centrifuge use by properly balancing the centrifuge to collect cell pellets.
- When provided a sample of liquid culture, students will be able to prepare a wet mount.
- Students will be able to identify the common laboratory research organisms (bacteria, yeast and mammalian) through visualizing with a light microscope.
- Students will be able to illustrate their observations through a light microscope to communicate their findings
- Students will be able to isolate and purify DNA plasmids from bacteria lysate using miniprep.
- Students will be able to identify collected DNA plasmids using restriction digest followed by gel electrophoresis.
- Students will be able to amplify collected DNA plasmids using PCR and confirm the identify of plasmids through selection of appropriate primers.
- Students will be able to transfect plant cells with DNA plasmids then visualize the efficiency of the transfection through fluorescent microscopy.
- Students will be able to explain the significance of GFP use in scientific research techniques such as cell labeling and flow cytometry.
- Using CRISPR Cas9, students will be able to cause a loss of function in the ADE2 gene in yeast cells.
- Students will be able to evaluate the efficiency of their gene editing through visualization of transformed colonies and basic statistical analysis.
- Students will evaluate the contribution of faculty at The Ohio State University through the search and reading of primary literature.
- Students will select a faculty member with interests compatible to their own to pursue further work and undergraduate research opportunities.
- Students will compose a cover letter to communicate their interests to the selected faculty member.

Content Topic List

- Molecular Techniques
- Microscopy
- Miniprep
- Restriction Enzymes
- CRISPR

Sought Concurrence

Yes

Attachments

- Bio 3120 MG Concurrence.pdf: MolGen Concurrence

  (Concurrence. Owner: Andrews,Adam Lee)

- Microbiology concurrence.pdf: Micro Concurrence

  (Concurrence. Owner: Andrews,Adam Lee)

- Biology BS Curriculum Map.pdf: Bio Major Curriculum Map

  (Other Supporting Documentation. Owner: Andrews,Adam Lee)

- Biology 3120 Syllabus.pdf: Updated 02/04/2026

  (Syllabus. Owner: Andrews,Adam Lee)

Comments

- Please see subcommittee feedback email sent 1/23/26. *(by Neff,Jennifer on 01/23/2026 12:43 PM)*

Workflow Information

Status	User(s)	Date/Time	Step
Submitted	Andrews,Adam Lee	11/13/2025 10:49 AM	Submitted for Approval
Approved	Kulesza,Amy Elizabeth	11/15/2025 03:26 PM	Unit Approval
Approved	Vankeerbergen,Bernadette Chantal	12/01/2025 02:56 PM	College Approval
Revision Requested	Neff,Jennifer	01/23/2026 12:43 PM	ASCCAO Approval
Submitted	Andrews,Adam Lee	02/04/2026 08:47 AM	Submitted for Approval
Approved	Kulesza,Amy Elizabeth	02/04/2026 12:23 PM	Unit Approval
Approved	Vankeerbergen,Bernadette Chantal	02/05/2026 02:55 PM	College Approval
Pending Approval	Jenkins,Mary Ellen Bigler Neff,Jennifer Vankeerbergen,Bernadette Chantal Wade,Macy Joy Steele,Rachel Lea	02/05/2026 02:55 PM	ASCCAO Approval

THE OHIO STATE UNIVERSITY

Biology 3120

Biology Research Laboratory Techniques: Genetic Engineering
Spring 2026 – 1 Credit Hour

Lecturer:
Email:
Office:
Student Hours:
other times scheduled by appointment

Course Coordinator:
Center for Life Sciences Education
Email:
Office:
Phone:

Class Meeting Schedule:
A 14-week course with weekly laboratory sessions lasting 110 minutes each

Prerequisites:
Prereq: Biology 1112 or 1113.xx or 1113E or 1113H, and 1114.xx, 1114E or 1114H, or permission of instructor.

Required Course Materials:
- Laboratory materials will be posted to Carmen for download.

Credit Hours and Work Expectation:
This is a 1-credit-hour laboratory course. According to Ohio State policy, students should expect around 3 hours per week of time spent on a combination of direct instruction and homework to receive a grade of C average. *ASC Honors* provides an excellent guide to scheduling and study expectations.

Course Description:
Introduces students to modern laboratory techniques for future career opportunities. Students will perform a series of experiments involving gene editing and DNA processing and data analysis linked with a focused research question. Through weekly laboratory sessions, students will produce a portfolio demonstrating mastery of course objectives through lab notebooks and video skill documentation.

Course Learning Outcomes:
Successful students will be able to…
- Employ safe laboratory practices
- Use standard lab equipment.
    - Students will demonstrate micro pipetting specific volumes into centrifuge tubes and verifying accuracy through mass.
    - Students will demonstrate centrifuge use by properly balancing the centrifuge to collect cell pellets.
- Use standard compound light microscopes.
    - When provided a sample of liquid culture, students will be able to prepare a wet mount.
    - Students will be able to identify the common laboratory research organisms (bacteria, yeast and mammalian) through visualizing with a light microscope.
        - Students will be able to illustrate their observations through a light microscope to communicate their findings
- Students will be able to perform transfections to introduce foreign DNA into cells using plasmids.
    - Students will be able to isolate and purify DNA plasmids from bacteria lysate using miniprep.

    - Students will be able to identify collected DNA plasmids using restriction digest followed by gel electrophoresis.
    - Students will be able to amplify collected DNA plasmids using PCR and confirm the identify of plasmids through selection of appropriate primers.
    - Students will be able to transfect plant cells with DNA plasmids then visualize the efficiency of the transfection through fluorescent microscopy.
    - Students will be able to explain the significance of GFP use in scientific research techniques such as cell labeling and flow cytometry.
- Students will be able to edit genes in a yeast model using CRISPR Cas9.
    - Using CRISPR Cas9, students will be able to cause a loss of function in the ADE2 gene in yeast cells.
    - Students will be able to evaluate the efficiency of their gene editing through visualization of transformed colonies and basic statistical analysis.
- Communicate with the scientific community
    - Students will evaluate the contribution of faculty at The Ohio State University through the search and reading of primary literature.
    - Students will select a faculty member with interests compatible to their own to pursue further work and undergraduate research opportunities.
    - Students will compose a cover letter to communicate their interests to the selected faculty member.

Grading and Evaluation:

Graded assignments may come in three forms, and students should note the expectations for each in the descriptions of our class assignments below:

- **Independent Work ( )**: Strictly non-collaborative, original-individual work. You may discuss this assignment only with your instructor. Discussions with other individuals, either in person or electronically, are strictly prohibited and constitute academic misconduct.
- **Required Collaboration ( )**: An explicit expectation for collaboration among students either in-class or outside (i.e., group work).
- **Optional Collaboration ( )**: Students are permitted, but not required, to discuss the assignment or ideas with each other. However, all submitted work must be one's original and individual creation.

Assignment	Points	Assignment Type
Laboratory Safety	5	
Laboratory Exercise Worksheets	115	
Laboratory Skills Assessments	100	
Reflections	25	
Lab Notebook	30	
ASC Career Services Consultation	5	
Final Writing Assignment	15	
SALG	5	
Total Points Possible	**300**	

Lab Safety:

On the first day of class, students will complete a safety sheet. Completion and signing the safety sheet is required for the student to continue in this course. By submitting the safety sheet, students are indicating that they understand and agree to the safety rules and policies of the course.

Lab Exercise Worksheets:

For each lab session there will be an associated lab exercise. Lab work will be conducted in a group of 4, all group members are expected to participate and contribute equally. All group members will submit one lab exercise assignment and will share the same grade. Lab assignments will be due 24 hours after the conclusion of the lab session. The exercise from week 1 is 15 points while the other 5 exercises are worth 20 points each for a total of 115 points. These exercises will include the reporting of lab results as well as a formal record of the experiment performed in the style of a lab notebook. Student proficiency will be assessed through these lab reports which may include students demonstrating lab skills to their instructor, written understanding of laboratory procedure including calculations and explanations of experimental designs and troubleshooting through problem solving scenarios when appropriate, written and graphical documentation of results and written explanation of whether the results were expected and why.

Lab Skills Assessments:

Students will be individually assessed on their mastery of designated laboratory skills four times throughout the course. These skills will include microscope usage, micro-pipetting accuracy, DNA isolation and purification, restriction digests, PCR and CRISPR Cas9. Students will be asked to demonstrate and prompted to explain the rationale behind the role of relevant steps in the overall experiment. These assessments will be submitted electronically by video and reviewed by the instructor. Students will be provided time in class to prepare their video submission for each assessment demonstrating the skills they learned the previous week.

Reflections:

After each lab section there will be a reflection prompt to be completed individually that will be due at the start of the following session. Each reflection is to be completed individually and will focus on how laboratory research and the content applies to each student individually. There will be 5 reflections worth 5 points each for a total of 25 points. The reflections are meant to be brief assignments and should not exceed 100 words.

Lab Notebook:

Keeping a detailed record of experiments is a critical part of being a scientist. In this notebook, students should keep detailed records of their research methods and materials (procedure) as well as any troubleshooting they perform to get the experiment to work. Students should also keep records such as images or datafiles of their experimental results. Students will be allowed two submissions. The goal of this assignment is to provide students with a deliverable that they can use to demonstrate to a potential mentor or employer their understanding of the skills taught in this course.

ASC Career Service Consultation:

In preparation for final submission of the Final Writing Assignment, students must individually schedule and attend a consultation with the ASC Career Services office. Credit will be awarded for participation in this meeting.

Final Writing Assignment:

Students will search through the OSU faculty research directory to locate a faculty member that is doing scientific research that they are interested in. Students will then review primary research articles published by this research group and using this information students will prepare a cover letter to request to join the group. The purpose of this assignment is to produce a deliverable that students can immediately use upon the completion of the course to establish contact with a potential mentor. Students will be allowed to submit this assignment twice and will leave the course with the best final draft of this cover letter as possible.

Student Assessment of Learning Gains (SALG):

Students will be asked to complete this survey at the end of the course in order to measure individual perceptions of gains related to the course outcomes and value of the instructional approach to those gains. Full credit will be awarded for completion.

Your Final Grade:

Your final grade will be based on the percentage of the 300 points that you earn during the course of the semester as described above. Please note that we do not grade the course on a curve and Carmen does not round averages up to the next nearest percentage point, so 92.11% and 92.97% both earn the grade of A-. Final letter grades will be determined by the grade scale below:

Grade Scale:

A	A-	B+	B	B-	C+	C	C-	D+	D	E
100 – 93.0%	92.9 – 90.0%	89.9 – 87.0%	86.9 – 83.0%	82.9 – 80.0%	79.9 – 77.0%	76.9 – 73.0%	72.9 – 70.0%	69.9 – 67.0%	66.9 – 60.0%	59.9 – 0%

Posting of Grades:

All grades will be posted on Carmen. After grades are posted you have 10 working days to challenge any grade or inquire regarding an unposted or missing grade. **After that time, grades are final.** To challenge or inquire about a missing grade, contact your laboratory instructor.

*****IMPORTANT*****

Make sure that all of your grades are properly posted on Carmen as you receive them. Challenges about grades, particularly after the end of the semester, will not be entertained after the 10-day grace period.

Late Assignments:

All assignments are due on the date and time prescribed in the course schedule. Late work will not be accepted except in rare (and documentable) circumstances.

Attendance and Participation Requirements:

Since this is a laboratory-based techniques course, attendance will be required. **Students are allowed one absence only**. Missed work must be made up on the final week of the course (week 7). Students are expected to communicate their absence in a timely fashion as planning will be required to set up the make- up on the final day. Students must have attended and participated in each of the skill-based sessions to pass the course and obtain the letter certifying their experience of the lab skills featured in this course. Students are encouraged to thoroughly document their experimental procedure, troubleshooting and results of the course in a lab notebook to serve as an artifact to present to prospective mentors and employers. Students are expected to arrive to lab on time as it is difficult to catch up to an experiment in progress.

Disability Services:

The university strives to maintain a healthy and accessible environment to support student learning in and out of the classroom. If students anticipate or experience academic barriers based on a disability (including mental health and medical conditions, whether chronic or temporary), they should let their instructor know immediately so that they can privately discuss options. Students do not need to disclose specific

information about a disability to faculty. To establish reasonable accommodations, students may be asked to register with Student Life Disability Services (see below for campus-specific contact information). After registration, students should make arrangements with their instructors as soon as possible to discuss your accommodations so that accommodations may be implemented in a timely fashion.

If students are ill and need to miss class, including if they are staying home and away from others while experiencing symptoms of viral infection or fever, they should let their instructor know immediately. In cases where illness interacts with an underlying medical condition, please consult with Student Life Disability Services to request reasonable accommodations.

Please consult with Student Life Disability Services to request reasonable accommodations. You can connect with them at slds@osu.edu; 614-292-3307; or slds.osu.edu.

Counseling and Consultation Services / Mental Health:

As a student you may experience a range of issues that can cause barriers to learning, such as strained relationships, increased anxiety, alcohol/drug problems, feeling down, difficulty concentrating and/or lack of motivation. These mental health concerns or stressful events may lead to diminished academic performance or reduce a student's ability to participate in daily activities. The Ohio State University offers services to assist you with addressing these and other concerns you may be experiencing.

If you or someone you know are suffering from any of the aforementioned conditions, you can learn more about the broad range of confidential mental health services available on campus via the Office of Student Life's Counseling and Consultation Service (CCS) by visiting ccs.osu.edu or calling 614-292-5766. CCS is located on the 4th floor of the Younkin Success Center and 10th floor of Lincoln Tower. You can reach an on-call counselor when CCS is closed at 614-292-5766 and 24-hour emergency help is also available through the 24/7 by dialing 988 to reach the Suicide and Crisis Lifeline.

Religious Accommodations:

Ohio State has had a longstanding practice of making reasonable academic accommodations for students' religious beliefs and practices in accordance with applicable law. In 2023, Ohio State updated its practice to align with new state legislation. Under this new provision, students must be in early communication with their instructors regarding any known accommodation requests for religious beliefs and practices, providing notice of specific dates for which they request alternative accommodations within 14 days after the first instructional day of the course. Instructors in turn shall not question the

sincerity of a student's religious or spiritual belief system in reviewing such requests and shall keep requests for accommodations confidential.

With sufficient notice, instructors will provide students with reasonable alternative accommodations with regard to examinations and other academic requirements with respect to students' sincerely held religious beliefs and practices by allowing up to three absences each semester for the student to attend or participate in religious activities. Examples of religious accommodations can include, but are not limited to, rescheduling an exam, altering the time of a student's presentation, allowing make-up assignments to substitute for missed class work, or flexibility in due dates or research responsibilities. If concerns arise about a requested accommodation, instructors are to consult their tenure initiating unit head for assistance.

A student's request for time off shall be provided if the student's sincerely held religious belief or practice severely affects the student's ability to take an exam or meet an academic requirement **and** the student has notified their instructor, in writing during the first 14 days after the course begins, of the date of each absence. Although students are required to provide notice within the first 14 days after a course begins, instructors are strongly encouraged to work with the student to provide a reasonable accommodation if a request is made outside the notice period. A student may not be penalized for an absence approved under this policy.

If students have questions or disputes related to academic accommodations, they should contact their course instructor, and then their department or college office. For questions or to report discrimination or harassment based on religion, individuals should contact the Civil Rights Compliance Office.

Policy: Religious Holidays, Holy Days and Observances

Intellectual Diversity:

Ohio State is committed to fostering a culture of open inquiry and intellectual diversity within the classroom. This course will cover a range of information and may include discussions or debates about controversial issues, beliefs, or policies. Any such discussions and debates are intended to support understanding of the approved curriculum and relevant course objectives rather than promote any specific point of view. Students will be assessed on principles applicable to the field of study and the content covered in the course. Preparing students for citizenship includes helping them develop critical thinking skills that will allow them to reach their own conclusions regarding complex or controversial matters.

Weather or Other Short-Term Closing:

Should in-person classes be canceled, students will be notified as to which alternative methods of teaching will be offered to ensure continuity of instruction for this class. Communication will be via Carmen announcements and course-wide email.

Instructor Feedback and Response Expectations

- **Email response**: The CLSE's expectation of instructors is that emails will be responded to within one business day. If your email is sent during the evening or over the weekend, you may not receive a response until the next business day.
- **Class announcements**: I will send important class-wide messages through the Announcements tool in Carmen. Please check your notification preferences (go.osu.edu/canvas-notifications) to ensure you receive these messages.
- **Graded assignments:** Assignments will be graded and returned to you within one week after they were due. All scores are posted on Carmen no later than the day the graded assignment is returned.

Course Technology

For help with your password, university e-mail, Carmen, or any other technology issues, questions, or requests, contact the OSU IT Service Desk. Standard support hours are available at https://ocio.osu.edu/help/hours, and support for urgent issues is available 24x7.

- **Self-Service and Chat support:** http://ocio.osu.edu/selfservice
- **Phone:** 614-688-HELP (4357)
- **Email:** 8help@osu.edu
- **TDD:** 614-688-8743

Carmen

- Carmen, Ohio State's Learning Management System, will be used to host materials and activities throughout this course. To access Carmen, visit Carmen.osu.edu. Log in to Carmen using your name.# and password. If you have not setup a name.# and password, visit my.osu.edu.
- Help guides on the use of Carmen can be found at https://resourcecenter.odee.osu.edu/carmen
- **This online course requires use of Carmen (Ohio State's learning management system) and other online communication and multimedia tools. If you need additional services to use these technologies, please request accommodations with your instructor.**
- Carmen accessibility

CarmenZoom

- Office hours will be held through Ohio State's conferencing platform, CarmenZoom. A separate guide to accessing CarmenZoom and our office hours is posted on the course Carmen page under Files.
- Students may use the audio and video functions if a webcam and microphone are available. If not, there is still a chat function within CarmenZoom for the student to live chat with the professor or TA in the virtual office hours room.
- Carmen Zoom help guide

TurnItIn

- Students at The Ohio State University are accountable for the integrity of the work they submit. Therefore, you should be familiar with the guidelines provided by the Committee on Academic Misconduct (COAM) and Section A of OSU's Code of Student Conduct in order to meet the academic expectations concerning appropriate documentation of sources. In addition, OSU has made TurnItIn, a learning tool and plagiarism prevention system, available to instructors. For this class, you will submit your papers to TurnItIn from Carmen. When grading your work, I will interpret the originality report, following Section A of OSU's Code of Student Conduct as appropriate. For more information about TurnItIn, please see the vendor's guide for students. Note that submitted final papers become part of the OSU database.
- Please know that I view TurnItIn first and foremost as a teaching tool to make you a better writer. You will see in your individual originality reports exactly what the instructors see. We WANT you to look at this report as soon as you submit your assignments. If you see an issue, please correct it right away, before we start grading the assignment. You can resubmit without penalty as many times as you want prior to the established due date for any assignment. After the due date, the late policy is in effect.

Discussion and Communication Guidelines

The following are expectations for how we should communicate as a class. Above all, please remember to be respectful and thoughtful.

- **Tone and civility**: Let's maintain a supportive learning community where everyone feels safe and where people can disagree amicably. Remember that sarcasm doesn't always come across online and is not always appreciated in-person. The instructional team work very hard to provide a positive learning experience. Please keep this in mind and remain civilized and respectful in your class communications.
- **Citing your sources**: When we have academic discussions, please cite your sources to back up what you say.

Grievances and Solving Problems:

According to University Policies, if you have a problem with this class, you should seek to resolve the grievance concerning a grade or academic practice by speaking first with the instructor or professor. Then, if necessary, take your case to the department chairperson, college dean or associate dean, and to the provost, in that order. Specific procedures are outlined in Faculty Rule 3335-8-23. Grievances against graduate, research, and teaching assistants should be submitted first to the supervising instructor, then to the chairperson of the assistant's department.

The CLSE believes that student concerns are usually most effectively addressed by the staff closest to the situation. Therefore, students are ordinarily expected to address issues or concerns first with their instructors. If the issue cannot be resolved by your instructor, or for some reason you feel that you absolutely cannot address your concern with your instructor, please feel free to contact the Course Coordinator or Assistant Director Adam Andrews (andrews.171@osu.edu).

Building Emergency Action Plan:

Each building on campus has a Building Emergency Action Plan (BEAP) outlining that specific building's specific procedures to be followed in the event of a range of emergency situations, including fire, weather, terrorism, chemical spills, etc. It is the role of every Buckeye to help keep each other safe and to be aware of these procedures. You can find all of the campus BEAPs at https://dps.osu.edu/beap.

Lyft Ride Smart:

Lyft Ride Smart at Ohio State offers eligible students discounted rides, inside the university-designated service area, from 7 p.m. to 7 a.m. Prices may be impacted by distance, traffic, time of day, special events and prime time surcharges. To qualify for program discounts, users must select "shared ride" when booking in the Lyft app. For more information, visit: https://ttm.osu.edu/ride-smart.

Creating an Environment Free from Harassment, Discrimination, and Sexual Misconduct:

The Ohio State University is committed to building and maintaining a welcoming community. All Buckeyes have the right to be free from harassment, discrimination, and sexual misconduct. Ohio State does not discriminate on the basis of age, ancestry, color, disability, ethnicity, gender, gender identity or expression, genetic information, HIV/AIDS status, military status, national origin, pregnancy (childbirth, false pregnancy, termination of pregnancy, or recovery therefrom), race, religion, sex, sexual orientation, or protected veteran status, or any other bases under the law, in its activities, academic programs, admission, and employment. Members of the university community also have the right to be free from all forms of sexual misconduct: sexual harassment, sexual assault, relationship violence, stalking, and sexual exploitation.

To report harassment, discrimination, sexual misconduct, or retaliation and/or seek confidential and non-confidential resources and supportive measures, contact the Civil Rights Compliance Office (CRCO):

Online reporting form: http://civilrights.osu.edu/

Call 614-247-5838 or TTY 614-688-8605

civilrights@osu.edu

The university is committed to stopping sexual misconduct, preventing its recurrence, eliminating any hostile environment, and remedying its discriminatory effects. All university employees have reporting responsibilities to the Civil Rights Compliance Office to ensure the university can take appropriate action:

- All university employees, except those exempted by legal privilege of confidentiality or expressly identified as a confidential reporter, have an obligation to report incidents of sexual assault immediately.
- The following employees have an obligation to report all other forms of sexual misconduct as soon as practicable but at most within five workdays of becoming aware of such information: 1. Any human resource professional (HRP); 2. Anyone who supervises faculty, staff, students, or volunteers; 3. Chair/director; and 4. Faculty member.

Academic Misconduct:

Academic integrity is essential to maintaining an environment that fosters excellence in teaching, research, and other educational and scholarly activities. Thus, The Ohio State University and the Committee on Academic Misconduct (COAM) expect that all students have read and understand the University's Code of Student Conduct, and that all students will complete all academic and scholarly assignments with fairness and honesty. Students must recognize that failure to follow the rules and guidelines established in the University's Code of Student Conduct and this syllabus may constitute Academic Misconduct.

The Ohio State University's Code of Student Conduct (Section 3335-23-04) defines academic misconduct as: Any activity that tends to compromise the academic integrity of the University or subvert the educational process. Examples of academic misconduct include (but are not limited to) plagiarism, collusion (unauthorized collaboration), copying the work of another student, and possession of unauthorized materials during an examination. Ignorance of the University's Code of Student Conduct is never considered an excuse for academic misconduct, so please review the Code of Student Conduct and, specifically, the sections dealing with academic misconduct.

Generative artificial intelligence (GenAI) tools should not be used in the completion of course assignments unless an instructor for a given course specifically authorizes their use, and then only in the ways allowed by the instructor. Students are not to submit their work without acknowledging any word-for-word use and/or paraphrasing of writing, ideas, or other work that is not their own. These requirements apply to all students, whether undergraduate, graduate, and professional.

If an instructor suspects that a student has committed academic misconduct in this course, the instructor is obligated by University Rules to report those suspicions to the Committee on Academic Misconduct. If COAM determines that a student violated the University's Code of Student Conduct (i.e., committed academic misconduct), the sanctions for the misconduct could include a failing grade in the course and suspension or dismissal from the University.

If students have questions about the above policy or what constitutes academic misconduct in this course, they should contact the instructor.

- Unless otherwise specified for a particular assignment, all submitted work should be a student's own unique effort. Collaborative efforts are not permitted unless expressly sanctioned for a particular assignment.
- Unless otherwise specified for a particular assignment, use of AI-generated materials for course submissions is not permitted.
- Reusing past work: In general, you are prohibited in university courses from turning in work from a past class to your current class, even if you modify it. If you want to build on past research or revisit a topic you've explored in previous courses, please discuss the situation with me.
- Using others' verbatim words without the use of quotation marks *and* citation is plagiarism. Paraphrased work requires citation to denote the use of others' ideas. Copying other's words without quotation while using citations is still considered plagiarism.

- Use of any technology during a quiz or exam (including but not limited to cell phones, smart watches, headphones, electronic dictionaries, etc.) is strictly prohibited.

Copyrighted Class Materials:

Course Schedule: Spring 2026

Schedule and assignments subject to change with as much advance notice as possible

	Lab Experiment/Topic	Reflection Prompt	Assignment Due
Week 1	Lab equipment: Pipettes, centrifuge		
Week 2	Microscopy Review and cell counting		Pipetting Skill Assessment- End of class week 2
Week 3	Miniprep	Reflection 1: What do you believe "scientific research" means?	Microscopy Skill Assessment- End of class week 3
Week 4	Restriction Digests/Electrophoresis		Reflection 1- Before start of class week 4
Week 5	PCR of miniprep plasmids	Reflection 2: Describe a problem that you believe can be solved with a biological sciences experiment and how would you approach solving this problem?	
Week 6	Lab Practical Problem Solving Assessment Part 1 (Miniprep)		Reflection 2- Before start of class week 6
Week 7	Lab Practical Problem Solving Assessment Part 2 (Restriction Digest)	Reflection 3: Describe a study that you are interested in and how you can use cell modeling in an experiment to address this study.	
Week 8	Lab Practical Problem Solving Assessment Part 3 (PCR Verification)		Reflection 3- Before start of class week 8
Week 9	GFP Plasmid Transfection into Plant Cells	Reflection 4: You have just used science to solve a problem. Discuss the strengths (and weaknesses if you encountered any) when using the scientific process. Describe any troubleshooting issues and how you worked to solve the,	Lab Practical Assessment- Before class week 9
Week 10	Visualization of Transfection (Fluorescent Microscopy)/Application of GFP		Reflection 4- Before start of class week 10

Week 11	CRISPR Cas Part 1	Reflection 5: Describe a disease (human or non-human) that you are interested in that has a genetic basis. Briefly discuss whether CRISPR Cas can be used to fix the disease and whether this process would be ethical.	
Week 12	CRISPR Cas Part 2		Reflection 5- Before the start of class week 12 Final Project Draft Due- Before start of class week 12 for Peer Review
Week 13	CRISPR Cas Assessment Part 1		
Week 14	CRISPR Cas Assessment Part 2		Final Project- Due before the class of Week 14 CRISPR Cas Assessment- End of class week 14
Week 15	Make Up Day/Remediation		SALG

Subject: Re: 2 Curricular Questions
Date: Wednesday, October 22, 2025 at 11:24:01 AM Eastern Daylight Time
From: Dobritsa, Anna
To: Andrews, Adam, Cole, Susan
CC: Sabel, Jaime
Attachments: image001.png

Hi Adam,

The department of Molecular Genetics gives concurrence for Biology 3120 - *Biology Research Laboratory Techniques*.

Thanks,
Anna

****

Anna Dobritsa
Associate Professor, Department of Molecular Genetics
and Center for Applied Plant Sciences
The Ohio State University
Aronoff Laboratory, Rm. 570
318 W. 12th Ave, Columbus, OH 43210
(614) 688-2197

From: Andrews, Adam <andrews.171@osu.edu>
Sent: Wednesday, October 15, 2025 1:20 PM
To: Cole, Susan <cole.354@osu.edu>; Dobritsa, Anna <dobritsa.1@osu.edu>
Cc: Sabel, Jaime <sabel.12@osu.edu>
Subject: 2 Curricular Questions

Susan & Anna,

I'm writing with two curricular questions. The first is regarding MG 2500x. We're wondering what the timeframe looks like to submit the course for TAG review. I'm presuming once the course is approved as the TAG that the transfer equivalent to CSCC's Bio 2500 will be updated at that time? Advisors are getting a number of questions from students about taking the course at CSCC, so we're just trying to gauge how to direct students.

The second question involves the course that was proposed last spring, Biology 3120 - *Biology Research Laboratory Techniques*. This was the course developed by one of our lecturers, Dr. Lenny Wang, through a grant from and in conjunction with ASC's Career Services. The concern at the time was that this 1 credit hour lab may take enrollment away from MG 4501. In discussion with the Biology Advisors, we are going to propose that the course be allowed to count toward the Major hours but *not* be allowed to fulfill the

Subject: RE: Biology 3120 - version 2
Date: Friday, April 18, 2025 at 2:00:54 PM Eastern Daylight Time
From: Ruiz, Natividad
To: Andrews, Adam
Attachments: image001.png

Hi Adam,

I looked over the proposal and discussed it with Kurt. It is good! We appreciate the changes that Dr. Wang made to prevent concurrence issues.

Natacha

Natividad Ruiz, PhD
Professor
Vice Chair for Teaching & Undergraduate Affairs
Department of Microbiology
The Ohio State University

From: Andrews, Adam <andrews.171@osu.edu>
Sent: Thursday, April 17, 2025 5:09 PM
To: Ruiz, Natividad <ruiz.82@osu.edu>
Subject: Biology 3120 - version 2

Natacha,

Dr. Wang has revised his proposal for Biology 3120: Advanced Biology Laboratory Research techniques. Before I put it back on the agenda for the Curriculum Committee, I would like to ask for your concurrence review.

Thank you,
Adam

THE OHIO STATE UNIVERSITY
CENTER FOR LIFE SCIENCES EDUCATION

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Biology BS Curriculum Map

B = beginning, I = intermediate, A = advanced

Required Prerequisites for the Biology Major				Biology BS Learning Outcomes															
Semester Course Number		**Course Title**	**Sem. hrs.**	**1.1**	**1.2**	**1.3**	**1.4**	**1.5**	**1.6**	**1.7**	**2.1**	**2.2**	**2.3**	**3.1**	**3.2**	**3.3**	**3.4**	**3.5**	**4**
BIO Req. #1	BIOL 1113xx	*Biological Sciences: Energy Transfer and Development*	4-7	B	B	B	B	B				B		B	B	B	B	B	B
	or																		
	Bio 1111 + 1112	*Foundations of Biology 1 & 2* (3 + 4 hours)																	
BIOL 1114xx		*Biological Sciences: Form, Function, Diversity, and Ecology*	4-5		B		B	B	B	B				B	B	B	B	B	I
MATH Req. #1	MATH 1151	*Calculus 1* (5 Hrs.)	5-8																
	or																		
	Math 1140 + 1141	*Calculus with Review 1 & 2* (4 hours each)					B		B		B							B	
	or																		
	MATH 1156	*Calculus for Biol. Sciences* (5 Hrs.)																	
MATH Req. #2	MATH 1152	*Calculus 2* (5 Hrs.)	3 - 5																
	or																		
	MATH 1157	*Math. Modeling for Biol. Sciences* (5 Hrs.)																	
	or																		
	STATS 1450	*Intro. to the Practice of Statistics* (3 Hrs.)					B	B	B	B	B	B	B	B	B	B		B	B
	or																		
	STATS 2450	*Intro. to Statistical Analysis* (3 Hrs.)																	
	or																		
	STATS 2480	*Statistics for the Life Sciences* (3 Hrs.)																	
CHEM Req. #1	Chem 1210	*General Chemistry 1*	5-7	B		B						B		B	B		B		
	or																		
	Chem 1206 + 1208	*Foundations of Chemistry 1 & 2* (3 + 4 Hrs.)																	
CHEM 1220		*General Chemistry 2*	5	B		B						B		B	B		B		
CHEM 2510		*Organic Chemistry 1*	4	B		B						B							
CHEM 2520		*Organic Chemistry 2*	4	B		I						I							
CHEM 2540		*Organic Chemistry Lab 1*	2	B		B						I		B	B		B		
CHEM 2550		*Organic Chemistry Lab 2*	2	B		B						I		B	B		B		
PHYS Req. #1	Phys 1200	*Mechanics, Thermal Physics, Waves*	5-7	B		B							B	B	B		B		
	or																		
	Phys 1248 + 1249	*Mechanics, Work and Energy* (4 Hrs) + *Rotational Dynamics, Thermal Physics, and Vibrational Motion* (3 Hrs.)																	
	or																		

	Phys 1250	*Mechanics, Work and Energy, Thermal Physics (5 Hrs.)*																	
PHYS Req. #2	Phys 1201	*E&M, Optics, Modern Physics*	5	B		B						B	B	B		B		
	or																		
	Phys 1251	*E&M, Waves, Optics, Modern Physics*																	
Total Hrs.			**48-61**																

Core Electives for the Major			**Biology BS Learning Outcomes**																
Sem. Course Number	**Course Title**	**Sem. hrs.**	**1.1**	**1.2**	**1.3**	**1.4**	**1.5**	**1.6**	**1.7**	**2.1**	**2.2**	**2.3**	**3.1**	**3.2**	**3.3**	**3.4**	**3.5**	**4**
MICRBIOL 4000 or 4100	*General Microbiology*	4/5	A	I	I	I	I	I	I				A	A	I	A	I	I
BIOCHEM 4511 or 5613 AND 5614	*Biochemistry*	4/6	A	I	A		I								I		I	I
MOLGEN 3300	*General Plant Biology*	4	A	I	I	I	I	I	I				A	A	I	A	I	I
MOLGEN 4500 or 4606	*General Genetics*	3 / 4	A	I	A	A	I	I							I		I	I
EEOB 2510 or 2511	*Human Anatomy*	3 / 4	I														I	B
EEOB 2520	*Human Physiology*	3	I														I	B
EEOB 3510 or MOLGEN 4700	*Cell Biology*	3	A	A	I	I	I						I					I
EEOB 3310	*Evolution*	4	A	I		I	A	I	I						I		I	I
EEOB 3410	*Ecology*	4	I	I			I		A				A	I	I	I	I	I
EEOB 3520	*Microscopic Anatomy*	3	I	I	I												I	I
EEOB 4510	*Comparative vertebrate anatomy*	3	I	I														I
ANTHRO 2200	*Physical Anthropology* (Additional Prereq)	4				B	B	B	B				B	B		B	B	B
BIO 3401 or 3501	*Integrated Biology* or *Integrative Skills in Biology*	4/3	I	I	I	I	I	I	I				I	B	I	I	I	I
BIO 4901	*Biological Capstone*	2	A	A	A	A	A	A	A	A	A	A	A	B	A	I	I	A

Additional Biology Electives			**Biology BS Learning Outcomes**																
Sem. Course Number	**Course Title**	**Sem. hrs.**	**1.1**	**1.2**	**1.3**	**1.4**	**1.5**	**1.6**	**1.7**	**2.1**	**2.2**	**2.3**	**3.1**	**3.2**	**3.3**	**3.4**	**3.5**	**4**
BIO 2200	*Genome Biology*	1		I		I							I	I	I	I	I	B
BIO 2750	*Scientific Thought in an Anecdotal World*	3													B		I	I
BIO 3001	*Jurassic Biology*	3	I		I	I	I	I	I	I		I			I	I	I	I
BIO 3050	*Current Events in Biology*	1													I	I	I	I
Bio 3120	*Biology Research Laboratory Techniques*	1		I		I				I	I		I	I	I		I	I
BIO 3730	*Humans vs Germs*	3	I			I	I		I						I	I	I	I
BIO 3870	*Evolution of Sex*	3	I	I		I	A		I						I	I	I	I
BIO 4210	*Undergraduate Research in Biology Education*	4											A	A	A	A	A	A
BIO 4798	*Scientific Roots in England*	3	I					I									I	I
BIO 5001	*Topics in Biology Teaching*	1															A	A

BS outcomes

1. Explain major biological concepts and discuss how these are connected with various areas of the biological and physical sciences.

    1.1. Describe the hierarchical relationship between structure and function at all levels: molecular, cellular, and organismic.

    1.2. Diagram, explain, and contrast the major cellular processes in Archaea, bacteria, and eukaryotes.

1.3. Differentiate types of biological macromolecules and compare their contributions to cellular structure and function.

1.4. Apply the principles of genetics and describe the flow of genetic information.

1.5. Explain changes in organisms through time by applying the principles of evolutionary biology.

1.6. Demonstrate how relationships among living things are understood through taxonomy and phylogenetic analysis.

1.7. Describe ecological relationships between organisms and their environment.

2. Apply concepts from mathematics and other science disciplines for the analysis of processes in living organisms.

2.1. Apply quantitative skills in the analysis of biological processes.

2.2. Apply concepts from chemistry in the analysis of biological processes.

2.3. Apply concepts from physics in the analysis of biological processes.

3. Demonstrate problem solving, analytical, and communication skills that will provide the foundation for lifelong learning and career development.

3.1. Apply the scientific process, including designing and conducting experiments and testing hypotheses.

3.2. Use laboratory equipment, employ safe laboratory practices, and adapt tools such as laboratory notebooks and spreadsheets to organize and analyze data associated with scientific processes.

3.3. Retrieve information from the life sciences literature; read, understand, and critically review scientific papers.

3.4. Prepare oral and written reports following a recognized scientific format.

3.5. Develop an awareness of the careers and professions that rely on knowledge of biological sciences.

4. Value biology as an integral part of society and everyday life.