Glendale College

Course Outline of Record Report

Course ID 010808

Created - November 2025

BIOL298H : Honors Undergraduate Research in Microbiology and Molecular Biology

General Information

Author:	• Karoline Rostamiani
Course Code (CB01) :	BIOL298H
Course Title (CB02) :	Honors Undergraduate Research in Microbiology and Molecular Biology
Department:	BIOL
Proposal Start:	Fall 2026
TOP Code (CB03) :	(0430.00) Biotechnology and Biomedical Technology*
CIP Code:	(15.0401) Biomedical Technology/Technician.
SAM Code (CB09) :	C - Clearly Occupational
Distance Education Approved:	No
Will this course be taught asynchronously?:	No
Course Control Number (CB00) :	CCC000658703
Curriculum Committee Approval Date:	11/26/2025
Board of Trustees Approval Date:	01/13/2026
Last Cyclical Review Date:	11/26/2025
Course Description and Course Note:	BIOL 298H is intended to give students hands-on experience in microbiology and molecular biology research while working collaboratively in a laboratory setting with a faculty-led team of students on various projects. It allows the student to practice and apply various scientific techniques and methods (e.g. wet lab skills) and concepts learned in biology (e.g. molecular biology, microbiology, genomics, and bioinformatics). Students learn current Good Manufacturing Process (cGMP), Good Laboratory Practice (GLP), and Standard Operating Procedures (SOP's) in relation to these techniques, in preparation for careers in biotechnology and research. Students are expected to apply knowledge from prerequisite courses, to use their problem-solving skills in carrying out assigned projects, and to write up and present the results of their research on-campus. Note: A material/lab fee may be required for this course. The Honors course may be enhanced in one or more of the following ways: 1. enriched reading opportunities, such as scholarly sources, 2. enriched critical thinking opportunities, such as oral presentation of research and experiential learning.
Justification:	New Course
Academic Career:	• Credit
Mode of Delivery:	• In-Person
Author:	• Karoline Rostamiani
Course Family:	No value

Academic Senate Discipline

Primary Discipline:	• Biological Sciences

Alternate Discipline: No value

Alternate Discipline: No value

File Upload

File Upload

No Value

Course Development

Basic Skill Status (CB08)

Course is not a basic skills course.

☐ Allow Students to Gain Credit by Exam/Challenge

Course Special Class Status (CB13)

Course is not a special class.

Pre-Collegiate Level (CB21)

Not applicable.

Grading Basis

- Grade with Pass / No-Pass Option

Course Support Course Status (CB26)

Course is not a support course

General Education and C-ID

General Education Status (CB25)

Not Applicable

Transferability

Transferable to both UC and CSU

Transferability Status

Pending

Units and Hours

Summary

Minimum Credit Units (CB07)	4
Maximum Credit Units (CB06)	4
Total Course In-Class (Contact) Hours	162
Total Course Out-of-Class Hours	54
Total Student Learning Hours	216

Credit / Non-Credit Options

Course Type (CB04)

Credit - Degree Applicable

Noncredit Course Category (CB22)

Credit Course.

Noncredit Special Characteristics

No Value

Course Classification Code (CB11)

Credit Course.

Funding Agency Category (CB23)

Not Applicable.

☐ Cooperative Work Experience Education Status (CB10)

☐ Variable Credit Course

Weekly Student Hours

	In Class	Out of Class
Lecture Hours	1.5	3
Laboratory Hours	7.5	0
Studio Hours	0	0

Course Student Hours

Course Duration (Weeks)	18
Hours per unit divisor	54
Course In-Class (Contact) Hours	
Lecture	27
Laboratory	135
Studio	0
Total	162
Course Out-of-Class Hours	
Lecture	54
Laboratory	0
Studio	0
Total	54

Time Commitment Notes for Students

No value

Units and Hours - Weekly Specialty Hours

Activity Name	Type	In Class	Out of Class
No Value	No Value	No Value	No Value

Prerequisites, Corequisites, Recommended Corequisites, and Recommended Preparation

Prerequisite

BIOL101 - General Biology I

Objectives

- Identify the properties of lipids, carbohydrates, proteins, and nucleic acids.
- Describe the structure of prokaryotic and eukaryotic cells.
- Describe the processes of DNA replication, transcription, and translation.
- Explain the basic mechanisms of gene regulation in prokaryotes and eukaryotes.

- Demonstrate proper use of laboratory equipment including the microscope, spectrophotometer, and micropipettes.
- Demonstrate proficiency with data collection, analysis, and graphical representation.

OR

Prerequisite

BIOL112 - Microbiology

Objectives

- Explain a general understanding of the taxonomy and major characteristics of the various microorganisms.
- Illustrate general knowledge of the physical and chemical structure of prokaryotes and eukaryotes.
- Describe the biochemical processes of the cell, including cell respiration, DNA replication, genetic recombination, transcription, translation, and cellular transport.
- Examine the physical and chemical methods and mechanisms used to control microbial growth.
- Explain and discuss the disease process of various microorganisms.
- Perform proper aseptic techniques and illustrate proficiency in performing various staining procedures and biochemical tests on microorganisms.

AND

Advisory

ENGLC1000 - Academic Reading and Writing

Objectives

- Read analytically to understand and respond to diverse academic texts.
- Compose thesis-driven academic writing that demonstrates analysis and synthesis of sources as appropriate to the rhetorical situation.
- Demonstrate strategies for planning, outlining, drafting, revising, editing, and proofreading written work.
- Analyze stylistic choices in their own writing and the writing of others and the context in which readings were produced.
- Write timed, in-class essays exhibiting acceptable college-level control of mechanics, organization, development, and coherence.
- Integrate the ideas of others through paraphrasing, summarizing, and quoting without plagiarism.
- Find, evaluate, analyze, and interpret primary and secondary sources, incorporating them into written essays using appropriate documentation format.
- Proofread and edit essays for presentation so they exhibit no disruptive errors in English grammar, usage, or punctuation.

OR

Advisory

ENGLC1000E - Academic Reading and Writing

Objectives

- Read analytically to understand and respond to diverse academic texts.
- Compose thesis-driven academic writing that demonstrates analysis and synthesis of sources as appropriate to the rhetorical situation.
- Analyze stylistic choices in their own writing and the writing of others and the context in which readings were produced.
- Write timed, in-class essays exhibiting acceptable college-level control of mechanics, organization, development, and coherence.
- Integrate the ideas of others through paraphrasing, summarizing, and quoting without plagiarism.
- Find, evaluate, analyze, and interpret primary and secondary sources, incorporating them into written essays using appropriate documentation format.
- Proofread and edit essays for presentation so they exhibit no disruptive errors in English grammar, usage, or punctuation.

OR

Advisory

ENGLC1000H - Academic Reading and Writing - Honors

Objectives

- Read analytically to understand and respond to diverse academic texts.
- Compose thesis-driven academic writing that demonstrates analysis and synthesis of sources as appropriate to the rhetorical situation.
- Demonstrate strategies for planning, outlining, drafting, revising, editing, and proofreading written work.
- Analyze stylistic choices in their own writing and the writing of others and the context in which readings were produced.
- Write timed, in-class essays exhibiting acceptable college-level control of mechanics, organization, development, and coherence.
- Integrate the ideas of others through paraphrasing, summarizing, and quoting without plagiarism.
- Proofread and edit essays for presentation so they exhibit no disruptive errors in English grammar, usage, or punctuation.

- Find, evaluate, analyze, and interpret primary and secondary sources, incorporating them into written essays using appropriate documentation format.

Entry Standards

Entry Standards	Description
Critically read materials from a variety of perspectives in order to identify arguments and develop analytical response based on textual evidence.	No Value
Write and revise thesis-driven essays that demonstrate critical thinking skills through a variety of rhetorical and analytical strategies appropriate to the academic context, including appropriate use of sources, evidence, tone, style, and semantics.	No Value
Prepare and revise writing projects that select, evaluate, synthesize, and apply source material gathered through academic research methods, employing quotation, paraphrase, summary, and analysis as effective means of support and development of the writer's ideas, cited and formatted according to academic conventions.	No Value

Course Limitations

Cross Listed or Equivalent Course	Description
No value	No value

Requisite Validation

Upload Statistical Validation and/or other documents (if necessary)

No Value

Specifications

Methods of Instruction

Methods of Instruction	Lecture
Methods of Instruction	Laboratory
Methods of Instruction	Discussion
Methods of Instruction	Multimedia
Methods of Instruction	Collaborative Learning
Methods of Instruction	Demonstrations
Methods of Instruction	Field Activities (Trips)
Methods of Instruction	Presentations
Methods of Instruction	Guest Speakers

Out of Class Assignments

- Data analysis (e.g. analysis of experimental results)
- Individual project (e.g. creation of a gene annotation notebook)
- Written critique (e.g. of relevant scientific articles)
- Group project (e.g. writing a peer-reviewed scientific article)
- Enriched reading opportunities, such as scholarly sources (Honors Enhancement)
- Oral presentation of research and experiential learning (Honors Enhancement)

Methods of Evaluation	Description of Activity/Interaction
Exam/Quiz/Test	Quizzes
Evaluation	Instructor analysis of student work
Presentation (group or individual)	Presentations

Activity (answering journal prompt, group activity)	Laboratory practices record keeping in lab notebook
Activity (answering journal prompt, group activity)	Gene annotation notebook
Activity (answering journal prompt, group activity)	Effective participation in team assignments
Report	Group paper and formal presentation of results

Textbook Rationale

No Value

Textbooks

Author	Title	Publisher	Date	ISBN
Lodish, Harvey, et al	Molecular Cell Biology	WH Freeman	2021	978-1319208523
Hillis David M.. et al	Life: The Science of Biology	Life: The Science of Biology	2020	978-1319017644

Other Instructional Materials (i.e. OER, handouts)

Description	Assigned peer-reviewed scientific research articles
Author	No value
Citation	No value
Online Resource(s)	No value

Description	Biology 298 Lab Manual
Author	No value
Citation	No value
Online Resource(s)	No value

Learning Outcomes

Course Objectives

Demonstrate aseptic laboratory techniques and safe laboratory practices.

Communicate effectively in a collaborative work environment.

Apply chemical formulas to make appropriate media.

Troubleshoot problems when carrying out experiments.

Keep meticulous daily records of lab activities, experimental procedures, outcomes of experiments, and creative thoughts in a lab notebook.

Demonstrate competence in use and application of various equipment and techniques used in molecular biology and microbiology.

Read and analyze peer-reviewed articles in the field of study.

Present results of project to student peers and professors.

Write a peer-reviewed article using proper citation format and documentation style.

Demonstrate work-readiness skills.

SLOs

Demonstrate proficiency in use of various molecular and microbiology techniques to complete the assigned project. Expected Outcome Performance: 70.0

Exhibit industry standards of current Good Manufacturing Practice (GMP), and Standard Operating Practice (SOP) while carrying out the laboratory procedures and experiments. Expected Outcome Performance: 70.0

Additional SLO Information

Does this proposal include revisions that might improve student attainment of course learning outcomes?

No

Is this proposal submitted in response to learning outcomes assessment data?

No

If yes was selected in either of the above questions for learning outcomes, explain and attach evidence of discussions about learning outcomes.

No Value

SLO Evidence

No Value

Course Content

Lecture Content

Aseptic Laboratory Techniques and Safe Laboratory Practices (3 hours)
- Proper handling of bacterial cultures
- Proper preparation of bacterial growth media

Bacterial Genetics and Gene Regulation (4 hours)
- Structural and regulatory genes in an operon
- Gene regulation in bacteria
- Transposon mutagenesis
- Bacterial genomics

Basic Wet Laboratory Skills and Recombinant DNA Technology (6.5 hours)
- Proper use of pipettor
- Preparation of various bacterial growth media and stock solutions
- Preparation of antibiotics (e.g. kanamycin)
- DNA gel electrophoresis
- Extraction of plasmids using miniprep kits
- Methods for streaking bacteria
- Bacterial mating and mutagenesis
- Selection of and screening for mutants
- Genomic DNA isolation
- Restriction digestion
- DNA ligation
- Bacterial transformation via electroporation

Bioinformatics (3.5 hours)
- DNA sequencing and sequence analysis
- Basic local alignment search tool (BLAST) gene annotation

Analysis of Peer-Reviewed Scientific Research Articles (3 hours)
- Analyze and critique relevant peer-reviewed articles
- Class presentation of analysis

Final Presentation and Documentation (3.5 hours)
- Analyze results of experiments
- Troubleshoot obstacles faced during execution of experiments
- Produce collaborative research paper detailing scope and result of project
- Collaborative oral presentation of project

Industry Practices (3.5 hours)
- Good Laboratory Practice (GLP)
- Current Good Manufacturing Practice (cGMP)
- Standard Operating Procedures (SOP's)
- Use of lab notebooks or other laboratory documentation methods (e.g. e-notebook, Benchling)
- Regulatory policies
- Quality Control
- Validation

Total hours: 27

Laboratory/Studio Content

Students will be using these concepts/techniques in the lab portions.
Aseptic Laboratory Techniques and Safe Laboratory Practices (10 hours)
- Proper handling of bacterial cultures
- Proper preparation of bacterial growth media

Bacterial Genetics and Gene Regulation (8 hours)
- Structural and regulatory genes in an operon
- Gene regulation in bacteria
- Transposon mutagenesis

- Bacterial genomics

Basic Wet Laboratory Skills and Recombinant DNA Technology (60 hours)
- Proper use of pipettor
- Preparation of various bacterial growth media and stock solutions
- Preparation of antibiotics (e.g. kanamycin)
- DNA gel electrophoresis
- Extraction of plasmids using miniprep kits
- Methods for streaking bacteria
- Bacterial mating and mutagenesis
- Selection of and screening for mutants
- Genomic DNA isolation
- Restriction digestion
- DNA ligation
- Bacterial transformation via electroporation

Bioinformatics (15 hours)
- DNA sequencing and sequence analysis
- Basic local alignment search tool (BLAST) gene annotation

Analysis of Peer-Reviewed Scientific Research Articles (13 hours)
- Analyze and critique relevant peer-reviewed articles
- Class presentation of analysis

Final Presentation and Documentation (17 hours)
- Analyze results of experiments
- Troubleshoot obstacles faced during execution of experiments
- Produce collaborative research paper detailing scope and result of project
- Collaborative oral presentation of project

Industry Practices (12 hours)
- Good Laboratory Practice (GLP)
- Current Good Manufacturing Practice (cGMP)
- Standard Operating Procedures (SOP's)
- Use of lab notebooks or other laboratory documentation methods (e.g. e-notebook, Benchling)
- Regulatory policies
- Quality Control
- Validation
- Execution of experiments
- Produce collaborative research paper detailing scope and result of project
- Collaborative oral presentation of project

Total hours: 135

Additional Information

Repeatability

Not Repeatable

Justification (if repeatable was chosen above)

No Value

Is it possible this course will have a material fee?

Yes

I have contacted my library liaison (https://campusguides.glendale.edu/faculty/liaisons):

No

What term(s) will this course be offered?

Fall/Spring

Will any additional resources be needed for this course? (Click all that apply)

- No

If additional resources are needed, add a brief description and cost in the box provided.

No Value