

Glendale College

Course Outline of Record Report

Course ID 010806
Created - November 2025

BIOL141H : Honors Applied Biotechnology I with Laboratory

General Information

Author:	<ul style="list-style-type: none"> Karoline Rostamiani
Course Code (CB01) :	BIOL141H
Course Title (CB02) :	Honors Applied Biotechnology I with Laboratory
Department:	BIOL
Proposal Start:	Fall 2026
TOP Code (CB03) :	(0430.00) Biotechnology and Biomedical Technology*
CIP Code:	(41.0101) Biology/Biotechnology Technology/Technician.
SAM Code (CB09) :	C - Clearly Occupational
Distance Education Approved:	No
Will this course be taught asynchronously?:	No
Course Control Number (CB00) :	CCC000658701
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:	<p>BIOL 141H prepares students for the biotechnology industry by emphasizing the core concepts practiced in a bioscience laboratory. Topics include laboratory math, basic chemistry of buffers, laboratory safety, quality control, biological molecules, gene expression, cell structure and molecular biology techniques. This course introduces students to standard biotechnology laboratory skills including laboratory measurements, preparation of media and solutions, data collection and evaluation, basic separation methods, molecular techniques, aseptic techniques and documentation. Good communication and collaborative work are emphasized. This course is intended for, but not limited to, students preparing for a career in biotechnology. 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. Note: A material/lab fee may be required for this course.</p>
Justification:	New Course
Academic Career:	<ul style="list-style-type: none"> Credit
Mode of Delivery:	<ul style="list-style-type: none"> In-Person
Author:	<ul style="list-style-type: none"> Karoline Rostamiani
Course Family:	No value

Academic Senate Discipline

Primary Discipline:	<ul style="list-style-type: none"> Biological Sciences
Alternate Discipline:	<ul style="list-style-type: none"> Biotechnology

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

GCC General Education Requirements

Area 5: Natural Sciences

Area

Natural Sciences

Status

Pending

Approval Date

No value

Comparable Course

No Comparable Course defined.

C-ID

BIOT

Area

Biotechnology

Status

Pending

Approval Date

No value

Comparable Course

BIOT 150 X - Applied Biotechnology with Laboratory

Units and Hours

Summary

Minimum Credit Units (CB07)

4

Maximum Credit Units (CB06)

4

Total Course In-Class (Contact) Hours

144

Total Course Out-of-Class Hours 72

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)

This course was primarily developed using Economic Development funds.

Cooperative Work Experience Education Status (CB10)

Variable Credit Course

Weekly Student Hours

	In Class	Out of Class
Lecture Hours	2	4
Laboratory Hours	6	0
Studio Hours	0	0

Course Student Hours

Course Duration (Weeks)	18
Hours per unit divisor	54
Course In-Class (Contact) Hours	
Lecture	36
Laboratory	108
Studio	0
Total	144
Course Out-of-Class Hours	
Lecture	72
Laboratory	0
Studio	0
Total	72

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**Advisory**

Satisfactory completion of a course taught at or above the level of intermediate algebra.

AND**Advisory**

BIOL140 - Introduction to Biotechnology (in-development)

Objectives

- List the morphologic and chemical differences between prokaryotic and eukaryotic cells.
- Define and distinguish among atoms, molecules, compounds, chemical bonds, mechanisms of chemical bond formation, and components of biological molecules.
- Construct the flow diagram of gene expression from DNA to protein.
- Translate the triplet code of DNA into primary protein structure.
- Assess the role of basic Mendelian genetics.
- Compare and contrast current applications of biotechnology to the areas of medicine, agriculture, diagnostics, and the environment.
- Evaluate a recent development in the field of biotechnology from an ethical perspective.
- Demonstrate pipetting skills.
- Explain the importance of Good Laboratory Practices and record keeping.
- Perform bacterial transformation.
- Use of aseptic techniques in lab procedures, such as handling of bacteria, microbiology and molecular biology work.
- Demonstrate proficiency in basic molecular techniques (e.g. DNA and protein analysis techniques).
- Identify parts of a microscope.
- Use a microscope to view specimens.
- Employ a lab protocol and explain deviations from the protocol.

OR**Advisory**

BIOL101 - General Biology I

Objectives

- Identify the properties of lipids, carbohydrates, proteins, and nucleic acids.
- Describe the structure of prokaryotic and eukaryotic cells.
- Describe and identify the different stages in mitosis.
- 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**Advisory**

BIOL112 - Microbiology

Objectives

- 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.
- Perform proper aseptic techniques and illustrate proficiency in performing various staining procedures and biochemical tests on microorganisms.

OR**Advisory**

BIOL122 - Introduction To Biology**Objectives**

- Describe the structure of atoms, the properties of water and structure and function of biological macromolecules.
- Describe the flow of information from DNA to protein.
- Compare prokaryotic and eukaryotic cells, and describe the structure and function of eukaryotic organelles.

AND**Advisory****CHEM110 - Elements Of General Chemistry****Objectives**

- Clearly explain qualitative chemical concepts and trends.
- Perform laboratory experiments correctly using appropriate techniques and safety procedures.
- Describe, model, and analyze microscopic behavior to explain macroscopic properties as applied to such areas as chemical bonding, gas laws, atomic theory, acids, bases, nuclear chemistry, and oxidation-reduction.

OR**Advisory****CHEM120 - Fundamentals Of College Chemistry (Inorganic)****Objectives**

- Evaluate scientific statements and develop an opinion as to their validity.
- Identify and describe basic chemical data, rules, and laws.

AND**Advisory****ENGLC1000 - Academic Reading and Writing****Objectives**

- 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**

- 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**

- 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.

Entry Standards

Entry Standards	Description
No value	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	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	Guest Speakers
Methods of Instruction	Presentations
Methods of Instruction	Lecture

Out of Class Assignments

- Reading assigned chapters in course textbook(s), laboratory manual, and/or relevant scientific articles
- Homework assignment aimed at explaining and recognizing major concepts (e.g. making buffers, dilutions, constructing recombinant DNA, restriction enzyme analysis and gel electrophoresis)
- Maintaining lab notebook that contains laboratory protocols (e.g. a written protocol that includes the title, purpose, materials needed, procedures, and results) and test results
- Pre-lab quizzes
- Written lab report
- Enriched reading opportunities (Honors Enhancement)
- Oral presentation of research and experiential learning (Honors Enhancement)

Methods of Evaluation	Description of Activity/Interaction
Presentation (group or individual)	Class presentation
Activity (answering journal prompt, group activity)	Class and laboratory activities and experiments
Writing Assignment	Writing assignments that assess the ability to apply good laboratory practices to reports and lab notebooks (e.g. data collection and modifications to laboratory protocols, Standard Operating Procedures)
Activity (answering journal prompt, group activity)	Laboratory practica that assess the ability to prepare and analyze graphs, follow a protocol, demonstrate basic lab skills and workplace competency, and explain deviations from the protocol
Exam/Quiz/Test	Objective written examinations and quizzes that test for definitions and application of major concepts
Other	Field trips

Textbook Rationale

Newer updates of the books are not available. These are books commonly used in the biotechnology industry.

Textbooks				
Author	Title	Publisher	Date	ISBN
Simon, Eric J.	Campbell Essential Biology	Pearson	2018	978-0134812946

Thienman, Willian J.	Introduction to Biotechnology	Pearson	2018	978-0134650197
Brown, J. Kirk	Biotechnology: A Laboratory Skills Course	Bio-Rad	2018	9780983239635, 0983239630
Seidman, Lisa A.	Laboratory Manual for Biotechnology and Laboratory Science: The Basics. Boston	Pearson	2011	9780321644022
Other Instructional Materials (i.e. OER, handouts)				
No Value				

Learning Outcomes

Course Objectives

Describe cell structure.

Apply principals of basic chemistry of buffers and pH to biological molecules.

Define and distinguish among biological molecules.

Construct the flow diagram of gene expression from DNA to protein.

Explain recombinant DNA.

Convert between metric units.

Perform basic dilutions.

Perform calculations related to reagents, solutions and media formulations.

Demonstrate Good Laboratory Practices (as defined by industry) and record keeping in a laboratory notebook 10 Prepare and analyze graphs.

Grow cells using aseptic techniques.

Demonstrate ability to use measurement instrumentation properly.

Perform a concentration assay for DNA or Protein.

Successfully perform a basic bio-separation technique such as column chromatography.

Perform a molecular technique such as DNA sizing electrophoresis.

Demonstrate work-readiness skills.

Prepare and analyze graphs.

SLOs

Apply knowledge of cell, molecular, and microbiology to isolate, quantify, and study the important biomolecules of cells.

Expected Outcome Performance: 70.0

Properly record and document data and data analyses in an organized lab notebook.

Expected Outcome Performance: 70.0

Apply and demonstrate good laboratory safety and aseptic techniques to make appropriate solutions and culture media to grow cells.

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

Scientific Method (1.5 hours)

Biotechnology Overview (1.5 hours)

Molecular and Cell Biology (18 hours)

- Biological molecules (proteins, carbohydrates, lipids, nucleic acids)
- Cell structures (prokaryotes and eukaryotes)
- Gene expression
- DNA technology and analysis
- Cell culture and fermentation
- Bioseparation (protein purification, agarose gel, etc.)

Bacterial Cell Culture Methods (1.5 hours)

- Preparation and sterilization of bacterial media
- Growth and maintenance of bacterial cultures

Mammalian Cell Culture Method (1.5 hours)

- Preparation and sterilization of media for mammalian cells
- Growth and maintenance of mammalian cultures

Laboratory Math (6 hours)

- Units of measurement and converting between units (metric system)
- Graphical methods of analysis and data display
- Various methods for expressing concentration
- Calculation for molar and percent solution
- Dilutions
- Reagents, solutions and media formulations

Basic Chemistry of Buffers and pH (1 hour)

Common Laboratory Measurements (2 hours)

- Weight
- Volume
- pH
- Temperature
- Spectrophotometry

Health and Safety (1 hour)

- MSDS/SDS
- Personal Protection Equipment
- Contamination

Work-readiness Skills (2 hour)

- Oral communication, presentation
- Written communication
- Teamwork, team building exercises
- Industry expert and/or career counselor workshops
- Resume writing
- Interview skills
- Job searching

Total hours: 36

Laboratory/Studio Content

Laboratory Basic Sills (3 hours)

- Application of laboratory math

Laboratory Basic Skills (4 hours)

- Micropipetting and serological pipetting skills

Laboratory Basic Skills (2 hours)

- Laboratory safety practices

Laboratory Basic Skills (3 hours)

- Aseptic techniques

Laboratory Basic Skills (3 hours)

- Good manufacturing practices

Laboratory Basic Skills (6 hours)

- Preparation of various solutions at different concentrations

Laboratory Basic Skills (3 hours)

- Proper dilution of solutions, media

Laboratory Basic Skills (3 hours)

- Preparation and analysis of buffers

Laboratory Basic Skills (6 hours)

- Preparation of biological solutions (media preparation, autoclaving, pH determination and adjustments, measuring, balances, volumes)

Laboratory Basic Skills (3 hours)

- Agarose gels testing

Laboratory Basic Skills (3 hours)

- Uses of polyacrylamide gels

Laboratory Basic Skills (3 hours)

- Spectrophotometry

General Biotechnology and Molecular Techniques Used in Industry: DNA (3 hours)

- Bacterial cell transformation

General Biotechnology and Molecular Techniques Used in Industry: DNA (3 hours)

- Plasmid isolation

General Biotechnology and Molecular Techniques Used in Industry: DNA (3 hours)

- Chromosome isolation

General Biotechnology and Molecular Techniques Used in Industry: DNA (3 hours)

- Electrophoresis

General Biotechnology and Molecular Techniques Used in Industry: DNA (3 hours)

- Restriction digestion and analysis

General Biotechnology and Molecular Techniques Used in Industry: DNA (6 hours)

- Cloning

General Biotechnology and Molecular Techniques Used in Industry: DNA (3 hours)

- PCR

General Biotechnology and Molecular Techniques Used in Industry: Proteins (3 hours)

- Protein isolation

General Biotechnology and Molecular Techniques Used in Industry: Proteins (2 hours)

- Protein quantification

General Biotechnology and Molecular Techniques Used in Industry: Proteins (6 hours)

- Western blot

General Biotechnology and Molecular Techniques Used in Industry: Proteins (3 hours)

- Column chromatography

General Biotechnology and Molecular Techniques Used in Industry: Antibodies (3 hours)

- ELISA (enzyme-linked immunosorbent assay)
- Western Blot

Inoculation/Growth of Cell Cultures (6 hours)**Lab Safety (2 hours)****Documentation and record keeping (3 hours)**

- Physical lab notebook
- E-notebook (e.g. Benchling.com)

Data collection and evaluation (3 hours)**Standard operating procedures (SOP) (3 hours)****Work-readiness skills (8 hours)**

- Oral communication, presentation
- Written communication
- Teamwork, team building exercises
- Industry expert and/or career counselor workshops
- Resume writing
- Interview skills
- Job searching

Total hours: 108**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/liasons>):

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 Value

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

No Value