Course Description

International Baccalaureate

Course Information

Name	Level (SL/ HL)	Both Years Mandatory (HL only)	Frequency (Years/ Dates)
BIOLOGY IB HL 1	HL	No (but you must take yr 1 prior to 2)	11th /12th grade: M-F
BIOLOGY IB HL 2	HL	No (but you must take yr 1 prior to 2)	12th grade: M-F

General Information

Description

IB Bio 1 will be the first part of a two-year sequence that will prepare students for the HL IB exam in Biology.

Credit: 10 credits UC/CSU Category: d-Lab Science

Prerequisite: Taken or taking Chemistry and have taken Biology, preferably Advanced Biology.

IB Bio 2 is the 2nd year Credit: 10 credits

UC/CSU Category: d-Lab Science

Prerequisite: Passing Biology IB HL1

IB Bio 1 explores concepts and themes in microbiology and biochemistry that build into larger scale phenomena. Core units studied include basic biochemistry, cell biology, photosynthesis and cellular respiration, cell division, genetics, and molecular genetics. While the content of the course is truly college level we recognize we are teaching to a high school audience. For this reason, this course places a significant focus on metacognition and self-awareness.

IB Biology 2 builds upon the themes explored in IB Bio 1 by placing them in a variety of contexts. This class explores human physiology, plant biology, ecology and evolution and classification and biotechnology as they would be in a college course.

Expectations and Goals

What to expect : Reading notes, lab design and evaluation, technical writing, new exam preparation strategies

Year 1: building lab design skills, practice technical writing skills, practice exam preparation skills

Year 2: Application of lab skills, designing and conducting independent research, formal technical paper

Biochemistry specific study skills, excel data processing/management, experimental design and evaluation, proper use of scientific tools, evaluating accuracy and precision, reading from freshman college level texts, time management, work life balance, professional collaboration and empathetic communication, technical writing, selective independent learning, nature of science, international mindedness,

Learning Outcomes

- Collegiate level technical writing ability
- Comfortability reading college level texts
- Familiarity with concepts presented in a college general biology series
- Preparedness for IB Biology HL Exam
- Experience planning, conducting, analyzing, evaluating and communicating independent research
- Understanding of individual learning style

Materials

Refer to individual course syllabi for teacher organizational guidelines.

Required Text

School Provided

Course Outline

Topic/ Unit	Topic	Year	Exercises
Unit 1	Water	1	Osmosis Investigation, drawings of properties of water
Unit 2	Organic Chemistry Basics	1	Chemical Naming, Drawing of monomers and polymers
Unit 3	General Cell Biology	1	Organelle Co-Operation, History of the Cell Theory, estimation of cell size
Unit 4	Cell Membranes and The Nervous System	1	Drawing of the action potential
Unit 5	Cellular Respiration and Photosynthesis	1	Drawings of Glycolysis, Krebs Cycle, Electron Transport Chain, Light Reaction, Light Independent Reaction. Chlorophyll chromatography, Enzyme rate estimations

Topic/ Unit	Topic	Year	Exercises
Unit 6	Cell Division	1	Mitotic Index Lab, Cell regulation drawings, stages of cell division miniPoster
Unit 7	Genetics and Molecular Biology	1	Pedigrees, DNA replication drawing, Protein Synthesis

Topic/ Unit	Topic	Year	Exercises
Unit 1	Evolution	2	Microevolution investigation
Unit 2	Classification	2	Classical and modern bioinformatic analysis
Unit 3	Internal Assessment-designated worktime for research project	2	Proposal, Peer review, exploration of mathematical analysis opportunities, work time, drafts, final 6-12 pg paper
Unit 4	Biotechnology	2	Gram staining, bioinformatics
Unit 5	Plant biology	2	Cloning; Measurement of transpiration rates using potometers
Unit 6	Ecology	2	Save the world for humanity, mesocosm Setting up sealed mesocosms to try to establish sustainability
Unit 7	Human physiology	2	Monitoring of ventilation in humans at rest and after mild and vigorous exercise

Types of Assessments

Date	Assessment
Year 1	Unit Exams, Experimental Design Proposal, Data Analysis, Experiment Evaluation, Drawing Quizzes
Year 2	Unit Exams, quizzes, Data based practice, and Internal Assessment: 6-12 pg technical write up of their independent research project

Additional Information and Resources

IB Biology Standards

IB study resources:
https://ib.bioninja.com.au/

https://www.youtube.com/user/drott1722

https://www.youtube.com/user/misterleescience

http://www.bozemanscience.com/