**IB Biology II (HL)**

**Instructor Information**

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Off Blocks: 3rd & 4th period

**Course Overview**

IB Biology at Littleton High School is a 2-year, higher-level course that is designed to provide students with an opportunity to develop a conceptual framework for modern biology through an extensive look at the major principles of biological science as outlined by the International Baccalaureate Organization.

Students have opportunities to design investigations, collect data, develop manipulative skills, analyze results, collaborate with peers and evaluate and communicate their findings. The investigations may be laboratory based or they may make use of simulations and data bases. Students develop the skills to work independently on their own design, but also collegiately, including collaboration with schools in different regions, to mirror the way in which scientific research is conducted in the wider community .Students should expect class time to be spent in lecture, discussion, writing, and lab work.

During senior year of the course, the emphasis will be on macro biology, focusing on the topics of plant science, human health and physiology, ecology, and evolution.

**Course Goals**

1. To develop a conceptual framework for modern biology.
2. To develop an understanding and appreciation for the complexity of the living world.
3. To learn how to correlate the material presented in each new unit with material presented in subsequent units, constructing a comprehensive network of biological information.
4. To develop necessary study skills and educational tools to insure success at LHS, on the IB examination, and beyond.
5. To learn how to correctly correlate data and be able to make sound, valid conclusions from that data.
6. To build a substantial science information base with which to solve unfamiliar problems.

**Course Outline**

In order to accomplish the course goals, each unit is organized and taught based on the higher-level syllabus and assessment objectives of the Diploma Programme biology course. The IB Biology year two syllabus is as follows:

**Plant Biology**

 9.1 Transport in the xylem of plants

 9.2 Transport in the phloem of plants

 9.3 Growth in plants

 9.4 Reproduction in Plants

**Human (“Animal”) Physiology + Option D**

 6.1 Digestion and absorption

H1 Hormonal control

 H2 Digestion

 H3 Absorption of digested foods

 H4 Functions of the liver

6.2 The blood system

 6.3 Defense against infectious disease

 6.4 Gas exchange

H6 Gas exchange

 H5 The transport system

 6.5 Neurons and synapses

 6.6 Hormones, homeostasis and reproduction

H.1 Hormonal control

11.1 Antibody production and vaccination

 11.2 Movement

 11.3 The kidney & Osmoregulation

 11.4 Sexual reproduction

**Ecology**

 4.1 Species, Communities and Ecosystems

 4.2 Energy Flow

 4.3 Carbon cycling

 4.4 Climate change

**Evolution and Biodiversity**

 5.1 Evidence for Evolution

 5.2 Natural Selection

 5.3 Classification of Biodiversity

 5.4 Cladistics

 10.3 Gene pools and speciation

**Statistical analysis**

 1.1 Statistics

**Student Expectations**

In order to be successful in IB Biology every student will be expected to:

1. Print out all powerpoints (available online until the end of each unit) and take copious notes during lecture
2. Read, highlight, and take notes on **all** reading material (pages posted online until end of each unit)
	1. If students choose, they *may* create an outline of each assigned reading to be turned in at the end of each six-weeks grading period for **extra credit** (up to 5 points per outline)
3. Maintain an organized and detailed science notebook and sketchbook (it is recommended to organize your notebook by topic, beginning each section/ sub-section with the appropriate assessment statements and powerpoint(s))
4. Be respectful and responsible and participate positively and productively
5. Study and memorize a wealth of biological information and diagrams
6. Come to every class prepared and on time
	1. **Absences**: It is your responsibility to pick up make up work (make up folder on wall by door). You have as many days as absences to complete and turn in your work.
	2. **Late work**: Automatically receives a 10% deduction and is only accepted during the current unit of study

**Required Materials**

1. Three-ring binder (3” or larger)
2. Dividers
3. Loose leaf, lined notebook paper and graph paper
4. Scientific calculator
5. Pencils, pens, and highlighters (a **BLACK-INK PEN is MANDATORY**)
6. Colored pencils
7. 1” expandable file (for lab portfolio)
8. Sketchbook (MUST be SPIRAL bound) – **continued from junior year**

***Note\*: You will need to purchase lab materials for your IA/Group 4 project***

**Textbooks**

1. Biology (Oxford), 2014 ed, by Allot and Mindorff
2. Higher Level Biology (Pearson or Heinemann) by Damon, McGonegal, Tosto, and Ward

**Course Evaluation (Grading)**

1. ***Tests and Quizzes (50%)***
	1. Students may choose to complete **test/ quiz corrections**. Corrections enable a student to “keep” the class curve (if corrections are not completed the actual grade received by the student will be recorded in the grade book, without the curve included). Corrections must be completed within one week of receiving a test/ quiz back.
2. ***Labs and Sketchbooks (40%)***
3. ***Homework and Class work (10%)***

Note: ***Late lab work will NOT be accepted***. All other late work will receive a 10% deduction per day to a maximum of 3 days.

**Student Sketchbooks (SPIRAL BOUND)**

As IB Biology is a 2-year course, student sketchbooks will also be a 2-year, ongoing assessment. For each unit students will be expected to complete the following in their sketchbooks:

1. Draw (accurately) and label important diagrams (use IB assessment statements)
2. List/ highlight/ underline relevant vocabulary terms (Note: these are terms that are NOT included in diagrams – defining these terms is optional)
3. Outline (see command terms) – detailed and organized. Includes significance to life.

Grading for student sketchbooks is as follows:

1. Graded as assigned throughout each six-week grading period
2. Points are counted as part of the **lab** grade
3. Graded as 5 points for each page

5 = Original work, scientifically accurate, relevant additional vocabulary terms included, accurate/ relevant/

 thorough outline, significance to life, descriptive title, assessment statement written/ numbered

Example Sketchbook Page:

**Title**

**Assessment Statement (with number included)**

**Vocabulary**

**Diagram**

**Outline**

**Significance to Life:**

**Evaluation**

Evaluation of higher-level biology students is based on external as well as internal assessments.

**External Assessment (80% of final mark)**

1. Consists of 3 different papers (exams) which are completed in May at the end of the second year of the course
2. “Command terms” are used to direct the writing of these papers (pay close attention to them and KNOW what they mean)
3. Specifications of each of these three papers are as follows:

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Component** | **Overall Weighting (%)** | **Approximate weighting of objectives (%)****1+2 3** | **Duration (hrs)** | **Format and Syllabus Coverage** |
| Paper 1 | 20 |  10 10 | 1 | 40 multiple-choice questions(+/- 15 common to SL plus about five more on the core and about 20 on the AHL) |
| Paper 2 | 36 | 18 18 | 2 ¼ | Data-based questionsShort-answer & extended response (must complete 2 of 3 extended response) on core & AHL |
| Paper 3 | 24 | 12 12 | 1 ¼ | Section A: answer all questions (2-3 short-answer based on experimental skills/techniques, anaylysis & evaluation using unseen data on core & AHLSection B: pick Option D ONLY and answer all questions (short answer & extended response) |

**Internal Assessments (20% of final mark – 48 points possible)**

1. Consist of **labs** that are completed by students with minimal guidance
2. Include a total of 60 hours of practical work (NOT including write-up time)
3. Graded according to the IBO mandated rubric (by your instructor and an external moderator)
4. Maintained in an organized lab portfolio in the classroom (as some of your write-ups will be submitted to IBO moderators for additional assessment)
5. Written up completely and **individually** (regardless of the criteria being assessed)
6. Documented accurately (hours and details) on individual 4PSOW forms

A variety of labs will be completed throughout the 2-year biology course. Some of these labs will be used for learning the subject matter and laboratory skills, while others will be assessed by IBO criteria. It is the **student’s responsibility** to meet the required lab hours and to earn enough marks to satisfy criteria of the IBO. For higher-level biology:

1. You will complete 3-4 IA labs in this class
	1. Dates will be posted well in advance
	2. Write-ups MUST BE **INDIVIDUALLY** COMPLETED
	3. Each, or part of each, lab will be graded in three aspects (**see online rubric**): Design (D), Data collection and processing (DCP), and Conclusion and evaluation (CE). Each criterion can earn you a maximum of 6 points each (2 points per aspect), and you will be required to select and submit two of each criterion to the IBO in February/ March of your senior year. Total points available for IA Labs are as follows:

**D (6 points) x 2………….………12 points possible**

**DCP (6 points) x 2………………12 points possible**

**CE (6 points) x 2………………...12 points possible**

1. Manipulative Skills
	1. Assessed at all times
	2. Involve how well you follow directions, how competent you are in material/ method/ equipment usage, and how well you follow safety guidelines
	3. Worth **6 points** (Note: Those students who are mature, confident, educated leaders score the highest in this IBO category)
2. Group IV Project
	1. Completed with SL chemistry students during the senior year (second semester) of biology
	2. Worth **6 points** (of overall IB Biology evaluation)