Katedralskolan Skara
IB Diploma Programme

Biology course outline (first exam 2016) both Standard and Higher Level (SL and HL)

General course description

Biology (from greek words “bio” and “logia”) is the science of life. Stretching from the smallest molecules to the large biomes of the earth, students in biology will learn that all that they see and observe is connected to each other. These interactions between living organisms and non-living factors change over time and will also change organisms and their environment. The changes in the organisms are the processes of evolution. The theory of evolution is one of the key concepts in biology. In biology the students will learn about living organisms, their structures, function and evolution. By doing a lot of practical moments (observations, simulations, experiments and excursions) the students will learn the scientific way of working. They will learn how to state research questions and testing hypothesis.

Topics / Core / AHL (additional higher level) / Options

Core (95 hours)	Hours
Topic 1: Cell biology	15
Topic 2: Molecular biology	21
Topic 3: Genetics	15
Topic 4: Ecology	12
Topic 5: Evolution and biodiversity	12
Topic 6: Human physiology	20
Additional higher level (AHL) (60 hours)	Hours
Topic 7: Nucleic acids	9
Topic 8: Metabolism, cell respiration and photosynthesis	14
Topic 9: Plant biology	13
Topic 10: Genetics and evolution	8
Topic 11: Animal physiology	16
Options (15 hours (SL)/25 hours (HL))	Hours
A: Neurobiology and behaviour	
B: Biotechnology and bioinformatics	
C: Ecology and conservation	
D: Human physiology	

All options can be given at Katedralskolan. The option studied will be decided by the teacher, together with the students and can change between different classes and years.

The time spent on the different topics is:
SL = core + option + practicals = 95 + 15 + 40 = 150 hours
HL = core + AHL + option + practicals = 95 + 60 + 25 + 60 = 240 hours

Methods

In biology a wide range of techniques are being used. Theoretical and practical moments are closely integrated and used together for giving the students a better understanding of the subject. The teaching in biology will give the students:

1. Knowledge about concepts, models and theories in biology. Also that models and theories can change and develop over time.
2. The ability to analyze and search for answers in the different topics of biology. They should also be able to identify and solve problems.
3. The ability to plan, perform, conclude and evaluate different kinds of investigations, experiments and excursions.
4. The ability to present their knowledge, findings and results in a good manner. They should get used to communicate in different ways to present objective answers and their ideas.

Some of the concepts of the IB-learner profile (open-minded, risk taker, inquirer, thinker and communicator) are easily found in the methods of the IB biology courses of Katedralskolan.

Link to core (Theory of Knowledge (TOK))

Biology is part of everyday life, and when you look at life you may sometimes start asking questions about how things work in nature and in our bodies. But how do we know the things we know about nature? How do we come up with models on how things work? Can we be sure that we have the “right” answers to different questions about nature/life? With a TOK-approach the students will start thinking about these and other questions concerning knowledge and the world around us. Hopefully they will start asking questions about knowledge. They will most likely understand that knowing things about knowledge is important in science and will give them a better understanding of the subject studied.

Examples of TOK question that will be discussed during the course (core). Questions taken from the Biology Guide (first assessment 2016), International Baccalaureate Organization, 2014.

Topic 1: Cell biology, The history of the microscope and its new discoveries.
"The world that we inhabit is limited by the world that we see. Is there any distinction to be drawn between knowledge claims dependent upon observations made by sense perception and knowledge claims dependent upon observations assisted by technology?"(IBO, 2014)

Topic 2: Molecular biology, the history of discovery of the DNA molecule.
"To what extent is research in secret 'anti-scientific'? What is the relationship between shared and personal knowledge in the natural sciences?"(IBO, 2014)

Topic 3: Genetics, new discoveries in science.
"What factors would encourage the acceptance of new ideas by the scientific community?" (IBO, 2014)

Topic 4: Ecology, can you be really sure of anything?
"Is certainty ever possible in the natural sciences?"(IBO, 2014)

Topic 5: Evolution and biodiversity, should you as a scientist be responsible for all your findings?
"How does the social context of scientific work affect the methods and findings of research? Is it necessary to consider the social context when evaluating ethical aspects of knowledge claims?"(IBO, 2014)

Topic 6: Human physiology, natural sciences vs social sciences and imagination and intuition?
"Is knowledge based on science more valid than knowledge based on intuition?"(IBO, 2014)

Assessment

Internal

In biology there is one compulsory internal assessment. The internal assessment (10 hours), where the student designs an investigation of their own that later performs it, evaluates and presents it. This is an individual piece of work, and the report written by the student will be internally assessed by the teacher and externally moderated by the IB at the end of the course and makes 20% of the final grade.
There is also the group 4 project (10 hours) which is the same for all group 4 subjects. The group 4 project is an activity where the students learn to interact with other people and to solve problems together in a group to come up with solutions to given problems.

External
The SL exam consists of:
Paper 1, with 30 multiple choice questions based on the core syllabus. Contributing 20% of the final grade.
Paper 2, consists of data based questions, connected to the core. Contributing 40% of the final grade.
Paper 3, consists of questions on experimental skill and techniques connected to the core, and questions on the option studied. Contributing 20% of the final grade.

The three papers are sent for external marking by the IB.

The HL exam consists of:
Paper 1, with 40 multiple choice questions based on the core and the AHL syllabus. Contributing 20% of the final grade.
Paper 2, consists of data based questions, connected to the core and AHL. Contributing 36% of the final grade.
Paper 3, consists of questions on experimental skill and techniques connected to the core and AHL, and questions on the option studied. Contributing 24% of the final grade.

The three papers are sent for external marking by the IB.

Textbook
A. Damon, R. McGonegal, P. Tosto & W. Ward, Biology – developed specifically for the IB Diploma (2007). Pearson Education Limited

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Further information
Link to Diploma Programme Curriculum briefs