

BBIO101 Animal & Plant Physiology 1: Transport, Immunity and Gas Exchange

ECTS Value: 5 ECTS

Module Description

This module is the first of three modules tackling animal (mostly human) and plant (exclusively angiosperm) anatomy and the relationship with physiology, mode of life, and habitat. This module will focus on understanding life mechanisms pertaining to the human cardiovascular system, vascular transport systems in flowering plants (angiosperms), the human respiratory system and gas exchange in plants. Apart from covering a fundamental, comprehensive and in-depth body of knowledge about the above-mentioned topics, this module will seek to make links with everyday-life biology as well as the context of the Maltese Islands wherever applicable. The depth of knowledge, concepts, competencies and processes covered and assessed by this module, will be more than adequate so as to ensure that participants are not only ready to plan lessons covering content and processes about these topics with their prospective students at secondary and post-secondary level, but also to be able to answer impromptu higher-order questions about biological phenomena as they may arise in class.

Sub-topics to be tackled will include:

- a. A brief introduction to vertebrate circulatory systems.
- b. Major features and functions of the human heart, blood and blood vessels.
- c. The immune system.
- d. Structure and functions of the lymphatic system.
- e. An introduction to plant body organization.
- f. Transport of water, minerals and sugars in plants.
- g. An introduction to evolutionary adaptations of gas exchange.
- h. Major features and functions of the human respiratory system.

Overall Objectives and Outcomes

By the end of this module, the learner will be able to:

Competences

- a) illustrate in detail the anatomy of the human cardiovascular system, the internal and external structure of root and stem in flowering plants, the anatomy of the human respiratory system and the typical leaf structure in flowering plants;
- b) associate structural adaptations of the human cardiovascular system, the root and stem in flowering plants, the human respiratory system

- c) convey knowledge, concepts and scientific processes about the human cardiovascular system, the root and stem in flowering plants, the human respiratory system and the leaf in plants to a group of students at secondary or post-secondary educational level.
- d) Engage critically with literature.

Knowledge

- a. recall and develop detailed knowledge of the anatomy and physiology of the human cardiovascular system, the root and stem in flowering plants, the human respiratory system and the leaf in plants;
- b. detail knowledge of the biological phenomena related to the human cardiovascular system, the root and stem in flowering plants, the human respiratory system and the leaf in plants;
- c. consolidate and extend knowledge about the human cardiovascular system, the root and stem in flowering plants, the human respiratory system and the leaf in plants, gathered through prior learning.

Skills

- a. organise, order and present information drawn from textbooks, journals, videos and online sources while building on prior learning;
- b. evaluate research and investigative observations and make inferences about biological processes accordingly;
- c. draw, label and annotate diagrams depicting biological phenomena;
- d. employ simple laboratory techniques during a practical investigation to research and report about one or more aspects of animal and/or plant physiology covered in this module;
- e. foster collaboration and contribute effectively within a group, wherever the number of course participants allows for effective group work.

Mode of Delivery

This module adopts a blended approach to teaching and learning. Information related to the structure and delivery of the module may be accessed through the IfE Portal. For further details, kindly refer to the Teaching, Learning and Assessment Policy and Procedures found on the Institute for Education's website.

Assessment Methods

This module will be assessed through: Research Assignment and Online Tasks/Reflections.

Suggested Readings

Core Reading List

1. Fox S.I., (2016), Human Physiology, 14th Edition, McGraw-Hill.
2. Raven P.H, Evert R.F. & Eichhorn S.E., (2012), Biology of Plants, 8th Edition, W. H. Freeman.

Supplementary Reading List

1. Campbell N.A., Reece J.B., (2008) Biology, 8th Edition, Pearson.
2. Audesirk T., Audesirk G., & Byers B.E., (2017), Biology: Life on Earth with Physiology 11th Edition, Pearson.
3. Randall D., Burggren, W. & French, K., (2001), Eckert Animal Physiology - Mechanisms and Adaptations, 5th edition, W.H. Freeman.
4. Taiz L. & Zeiger E., (2010), Plant Physiology, 5th Edition, Sinauer Associates.