

SCI134 Introduction to Biodiversity fall 2018

**SCIENV1102 Introduction to biodiversity  
[Fall 2019]**



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**[fall 2019]**

**Classroom no: 2**

**Class times: Tuesdays 8:45-10:45, Fridays 13:45-15:45.**

**Instructor: Dr. I.A. Flaming**

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**Tel: 06-23242083**

**Office no. & location: E1.09**

**Office hours: Tuesdays + Fridays outside classroom hours**

**I. Track information**

- a) Prerequisites for this course: none
- b) This course serves as prerequisite for: SCIENV1233 Ecology, SCIENV1 Topics in Ecology, SCIENV1 Marine Biology. SCI131 introduction to life science also serves as a prerequisite for these courses.
- c) Other courses which are relevant to this course – e.g. as part of a minor: life science, premed, earth science

For further information about the track, please see the track document available on the UCR intranet.

**II. Course description**

The biosphere consists of millions of living species, and millions more have existed in the past. The total number of living species is still unknown, but current developments in paleontology, molecular biology, and sampling techniques, have totally reshaped our view of the classification of the living world. It is now recognized that plants and animals; traditionally the two groups defining the science of biology, are merely two branches on a giant tree of life. Many other independent and diverse groups exist, such as brown algae, fungi, diatoms, archaea and many different groups of bacteria.

The aim of this course is two-fold. Firstly, it will provide an overview of the living world. We will travel through the tree of life, starting with the prokaryote domains of bacteria and archaea. We will investigate different prokaryote groups, their ways of life, and their manifestations in the world around us. Next, we will explore the diversity of eukaryotes. There are countless single-celled eukaryotic groups that play important ecological roles, such as dinoflagellates that help create coral reefs, and apicomplexans that cause diseases like malaria. Finally, we will discuss the multicellular groups that shape the world around us: plants, seaweeds, fungi and animals. Methods for investigating biodiversity will also be discussed. The second aim of this course is to investigate the relevance of biodiversity for human society. The guideline for this will be the recently (spring 2017) published national research agenda "Nature4Life" (<http://www.repository.naturalis.nl/record/622815>). Nature4Life identifies a number of domains in which biodiversity is important, a.o. food and food security, (circular) economy, climate and health/well-being, (multifunctional) land use and biodiversity as an indicator for ecosystem health. These topics will be integrated in the course sessions. In

general, each session will consist of an “overview” part, in which a group of organisms will be discussed, and a number of examples and discussion items on the relevance of biodiversity for human society.

### III. Study Load

This course earns students four credits (equivalent to 7.5 ECTS). The class meets twice a week for 2 hours. Preparation time is approximately 10 hours per week.

### IV. Course materials

- a) Required books and literature: OpenStax biology textbook at [https://cnx.org/contents/GFy\\_h8cu@10.99:rZudN6XP@2/Introduction](https://cnx.org/contents/GFy_h8cu@10.99:rZudN6XP@2/Introduction)
- b) Recommended books and literature: extra reading and videos will be assigned during class
- c) Other materials: small (totaling <25 euro) excursion fees may be part of the course. To compensate for these expenses, we will make use of a free online textbook.

### V. Course organization and requirements

- a) General format of class meetings  
In total there are 30 2-hour sessions. The usual session will consist of an interactive lecture about a taxonomic group, plus some exercises, discussion assignments, video fragments etc. The assigned reading is mainly based on self-study. The last session will be devoted to a symposium on the effect of climate change on local biodiversity, in cooperation with the Young Energy Society Challenge.
- b) Students are expected
  - to study the subjects treated
  - to hand in the homework requested
  - to participate in group projects in a cooperative, pro-active and productive fashion
  - to accompany the group on excursions
  - To improve the course and optimize knowledge transfer the input of the students is required and highly appreciated.
- c) Rules for missing classes and deadlines
  - If absent, notify the instructor in advance and with a proper explanation of why class was missed.
  - A missed class will lead to 1% deduction of the final grade, starting from the 3th missed class.
  - missing 6 classes automatically makes you fail the course
  - Be on time. Lateness counts as ½ missed class.
  - Any excursions are a mandatory part of the course. If you have to miss an excursion, please notify the instructor in advance. You will be required to do a replacement assignment.
  - For those who have to miss an exam due to illness or personal reasons, a retake option will be offered on the Monday after the closure of the semester (Monday December 16). Students who want to use this retake option will have to file a formal extension request to the senior tutor. To compensate for the extra study time that these students have, the retake will be slightly more challenging.
  - Not making a deadline without a proper explanation may lead to grade deductions (typically 10% off the grade for this particular assignment per day).

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- d) Procedures for communication and use of Moodle
- Emails will generally be answered within 24hours, except on weekends.
  - Office hours for questions and/or extra tutoring: Tuesdays and Fridays outside class time. Students are encouraged to make an appointment if they feel they could use some extra tutoring.
  - Course website: <http://moodle.ucr.nl/>

This course is subject to UCR academic rules and procedures. Both students and instructors are required to know and follow these rules and procedures.

### VI. Assessment

- 60% 3 in-class tests (tests are a combination of open questions and multiple choice)
- 12% Online tests (12 tests; multiple choice, on moodle). Each test will cover one content session. The tests will be made available after the session and should be completed within 2 weeks.
- 20% poster assignment. The topic needs to be biodiversity and climate change. The posters will be scheduled to be presented to the group during the course and be displayed at the YESC festival on December 12.
- 8% various homework assignments

### VII. Course schedule

| Time           | Topics to be discussed  |
|----------------|---|
| Tues<br>Aug 27 | - Biodiversity: definitions & principles                                      |
| Frid<br>Aug 30 | - Biodiversity: definitions & principles                                      |
| Tues<br>Sep 03 | - Viruses 1<br>-  |
| Frid<br>Sep 06 | - <b>Excursion to ter Hooge</b><br>- <b>Plant identification app</b>          |
| Tues<br>Sep 10 | - Viruses 2   |
| Frid<br>Sep 13 | - Bacteria and Archaea 1<br>-   |
| Tues<br>Sep 17 | - Bacteria and Archaea 2<br>-   |
| Frid<br>Sep 20 | - <b>Test 1 (chapter 20, 21,22 + all other materials covered so far)</b><br>- |
| Tues<br>Sep 24 | - Protists 1<br>-   |
| Frid<br>Sep 27 | - Protists 2<br>-   |

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|                |  |
|----------------|--|
| Tues<br>Oct 01 | -Protists 3  |
| Frid<br>Oct 04 | - Fungi  |
| Tues<br>Oct 08 | - Seedless plants<br>-   |
| Frid<br>Oct 11 | - Seed plants 1  |
| Tues<br>Oct 22 | - Seed plants 2  |
| Frid<br>Oct 25 | <b>- Test 2 (chapter 23-26 + all other materials covered so far)</b>             |
| Tues<br>Oct 29 | Introduction to animal diversity   |
| Frid<br>Nov 01 | <b><i>Moderation day – no class</i></b>  |
| Tues<br>Nov 05 | Invertebrates 1  |
| Frid<br>Nov 08 | Invertebrates 2  |
| Tues<br>Nov 12 | Invertebrates 3  |
| Frid<br>Nov 15 | Vertebrates 1  |
| Tues<br>Nov 19 | Vertebrates 2  |
| Frid<br>Nov 22 | Vertebrates 3  |
| Tues<br>Nov 26 | Vertebrates 4  |
| Frid<br>Nov 29 | Human evolution 1  |
| Tues<br>Dec 03 | Human evolution 2  |
| Frid<br>Dec 06 | Revision session (individual consultations)                                      |
| Tues<br>Dec 10 | Poster exhibition  |
| Frid<br>Dec 13 | <b><i>Test 3 (chapter 27 + 28 + 29 + all other materials covered so far)</i></b> |

### **VIII. Student learning outcomes**

#### ***General aim:***

The aim of this course is to provide students with a basic overview of the world's biodiversity and its relevance. Students should have a basic understanding of the tree of life, be able to describe the various organism groups and provide examples of their relevance, and have a basic understanding of their interrelatedness.

#### ***Learning outcomes:***

After following this course the students are able to:

1. Give several definitions of biodiversity, explain how it is measured, and explain that biodiversity can be measured on multiple levels
2. For each basic group of the living world, explain the fundamental characteristics, its evolutionary history and its relatedness to other groups.
3. Explain the relevance of biodiversity for food and food security, (circular) economy, climate and health/well-being, (multifunctional) land use and biodiversity as an indicator for ecosystem health.

Learning outcome 1 will be mostly covered in the first week. Learning outcome 2 and 3 constitute the core of the course and will both be covered in each subsequent session.