

**NPLK13002U Human Benefits From Insects****Volume 2015/2016****Course information**

Language	English
Credit	7,5 ECTS
Level	Full Degree Master
Duration	1 block
Placement	Block 3
Schedule	B

Course capacity²⁵**Continuing and further education****Study board** Study Board of Biology and Animal Science**Contracting department**

- Department of Plant and Environmental Sciences

Course responsible

- Annette Bruun Jensen (abj@plen.ku.dk)
Main person responsible

Saved on the 27-04-2015

Content

The course will cover various ways, that human have benefitted from insects, with emphasis on present and future perspectives. Today only a few, yet very important, insect species have been domesticated in big scale. Insects are, however, a tremendous natural resource, as direct products or due to their beneficial ecosystem functions.

The course will consist of the following major components:

- Insect diversity, structure and function
- Honeybee breeding and honey production
- Insects as model systems: social structures, immunity and disease transmission
- Insect rearing, maintenance and insect disease control
- Insects as producers of chemical compounds and silk
- Insects as a source of food and feed, nutritional and socio-economic values
- Insects as inspiration for innovation for bio-inspired engineering and industrial design
- Insects in ecosystem services: pollination and biological control
- Insects in medical services: curing diseases and a tool in forensic
- Ethical, cultural and public aspects: awareness and acceptance

The major groups of insects and other selected terrestrial arthropods (spiders and mites) will be presented but focus will be given to the groups with highest potential for use. Morphology, life cycles, metabolic pathways and ecology will be dealt with in particular where relevant for human utilization. The course will have world wide coverage of examples.

Learning Outcome

The course provides knowledge about the how insects and other arthropods can be utilized as a natural resource directly, as bioproducts or for their beneficial functions. It will give the students a broad coverage of insect biology with detailed descriptions of those biological systems and processes that are most relevant to humans and which could be utilised as livestock animals.

After completing the course the students will be able to:

Knowledge:

- understand insect (arthropod) biology, including diversity, structure and function
- categorize and describe the main types of benefits insects can provide for our society
- describe methods used for collection and rearing of relevant model organisms

Skills:

- read and interpret subject-specific articles and textbook chapters
- analyze and decide about improvements of and potential threats of insects as model organisms both in specified systems and in a general context
- observe and interpret features in live arthropods

Competences:

- explain adaptation to environmental variation
- explain resistance to diseases
- transfer knowledge for use in studies of human and domesticated vertebrates
- evaluate ethical issues concerning insects and other animals

Literature

Selected book chapters, scientific articles and reviews as well as the Internet

Teaching and learning methods

The course will include various teaching and learning methods. Lectures: overview on insect and other arthropod diversity, structure and function, focus of beneficial insect organisms and their main impact of human societies, human health and production systems. Theoretical exercises: discussion of original scientific literature with emphasis on conceptual elements and case studies. Practicals: Limited experimental work in teams, by selecting from a set of options. Excursion: Visit a company and/or a professional beekeeper. Problem-based project work that will be conducted in teams and will be presented and discussed in Colloquia. Preparation: For theoretical exercises, colloquia and practicals, preparation in term of reading the literature is needed. Lectures will also be given by external experts.

Academic qualifications

The course is planned for SCIENCE students (e.g. Animal Sciences, Biology-Biotechnology, Biology, Natural Resources) and international students. Therefore, the recommended prerequisites as written as named courses can be difficult to specify. A basic course about animals is, however, a prerequisite.

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Exam

Credit 7,5 ECTS

Type of assessment Oral examination, 30 min
Description of Examination: The exam will consist of individual oral presentation (15 min) of a drawn topic /question. 2-3 weeks before the examination 5 topics will be announced allowing the student to prepare for each of the topics. One topic will be presented at the exam based on lottery. Duration 30 minutes (15 minutes for the presentation followed by 15 minutes questioning). Each student will be asked questions directly related to the presentation and also questions related to the overall curriculum of the course

Aid All aids allowed

Marking scale 7-point grading scale

Censorship form No external censorship
Several internal examiners

Criteria for exam assesment

The assesment will be based on the learning outcome.

Workload

Category	Hours
Lectures	22
Theory exercises	16
Practical exercises	10
Colloquia	30
Project work	40
Excursions	8
Exam	4
Preparation	76
Total	206

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