

Opasraportti

Courses in English for Exchange Students, 2014-15 (2014 - 2015)

BIOLOGY COURSES IN ENGLISH FOR EXCHANGE STUDENTS

This Weboodi Course Catalogue lists courses taught in English for exchange students at the Department of Biology during academic year 2014-2015.

When planning your exchange studies and the required learning agreement please use the information provided under the **Courses** tab in this catalogue. Please read carefully the information of each course you wish to take (language of instruction, target group, course content, timing, preceding studies, additional information etc.).

All exchange students must submit their exchange application through SoleMOVE.

Accepted exchange students are required to register to all courses. Course registration takes place once you have arrived in Oulu and received your University of Oulu login information. More information on registration will be provided during orientation. When registering you will be able to find detailed information on teaching and schedule under **Instruction** tab.

Individual course codes include information on the level of course.

xxxxxxP, xxxxxxY = basic, introductory level courses
 xxxxxxA = for 2-3 year students, Bachelor level courses
 xxxxxxS = for 4-5 year students, Master level courses

Some of the biology courses have both xxxxxxA and xxxxxxS course code. Exchange students can include these courses either to their Bachelor studies or Master's studies.

The courses are for biology exchange students who have studied for two years or more. Other departments' exchange students can take the courses if they have enough grounding studies in biology and if the course resources allow.

Any questions about courses at the Department Biology should be addressed to:

Minna Vanhatalo
 Minna.Vanhatalo(at)oulu.fi.

Further information on application process and services for incoming exchange students:

<http://www.oulu.fi/english/studentexchange>
 international.office(at)oulu.fi

Tutkintorakenteisiin kuulumattomat opintokokonaisuudet ja -jaksot

751635S: Advanced course in animal physiology, 8 op
 755318A: Animal physiology, exercises, 4 op

753314A: Basics in population genetics, 8 op
 750340A: Basics of bioinformatics, 3 op
 752321A: Conservation of Biodiversity, 3 op
 750347A: Ecological methods I, 6 op
 750343A: Ecological responses to global change and air pollution in the subarctic, 4 - 7 op
 752352A: Examination in optional topics, 2 - 6 op
 751354A: Examinations on optional topics, 2 - 6 op
 753351A: Examinations on optional topics, 2 - 6 op
 751307A: Field course in aquatic animals, 4 op
 752304A: Field course in ecological botany, 5 - 6 op
 751306A: Field course in terrestrial animals, 4 op
 751378A: Functional animal ecology, 6 op
 756625S: Genetic transformation of plants, 4 - 8 op
 753630S: Genetics research seminar, 2 op
 751373A: Identification of animals, 5 op
 752303A: Identification of plant species, 2 - 3 op
 750629S: Kaamos symposium, 2 - 4 op
 751690S: Lectures on special topics in zoology, 2 - 4 op
 752316A: Macro fungi, 3 op
 750645S: Molecular ecology, 2 - 5 op
 750699S: Optional examinations in environmental protection, 2 - 6 op
 756621S: Plant adaptations to herbivory, 2 op
 752300A: Plant ecology, 7 op
 756627S: Plant hormones, 5 op
 750613S: Research training, 2 - 15 op
 750313A: Research training, 2 - 15 op
 752695S: Seminar on special topics in botany, 2 op
 750646S: Symbiosis, 4 op
 750318A: Thursday seminar in biology, 2 op
 751368A: Wildlife management and game animal ecology, 6 op
 750625S: Winter ecology and physiology, 3 - 8 op

Opintojaksojen kuvaukset

Tutkintorakenteisiin kuulumattomien opintokokonaisuuksien ja -jaksojen kuvaukset

751635S: Advanced course in animal physiology, 8 op

Voimassaolo: - 31.07.2019

Opiskelumuoto: Advanced Studies

Laji: Course

Arvostelu: 1 - 5, pass, fail

Opettajat: Hohtola, Esa Juhani

Opintokohteen kielet: Finnish

ECTS Credits:

8 ECTS credits / 213 hours of work.

Language of instruction:

Finnish / (English).

Timing:

M.Sc. 1st autumn.

Learning outcomes:

After completing the course the student is able to plan and execute small physiological research projects as well as analyze, interpret and report the results in scientific format. The course thus trains the student for preparing his /her master's thesis.

Contents:

The course comprises of 2-3 extensive laboratory exercises that are carried out as small research projects. The exercises can be from any area of physiology. The students will themselves plan the schedule for the experiment, and write the results in the form of a scientific publication. The report will be presented in a concluding seminar either as an oral presentation or poster.

Mode of delivery:

Face-to-face teaching.

Learning activities and teaching methods:

Laboratory work, group meetings, report, writing, seminar.

Target group:

Compulsory to BSz, exchange students.

Prerequisites and co-requisites:

Animal physiology lectures and exercises (751388, 755318A), Comparative animal physiology (751x84A/S) and Laboratory, instrumentation and measurement techniques (750x22A/S).

Recommended optional programme components:

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Recommended or required reading:

The required scientific articles and other material will be distributed during the course.

Assessment methods and criteria:

Exercises, reports and final seminar.

Read more about [assessment criteria](#) at the University of Oulu webpage.

Grading:

Pass / Fail.

Person responsible:

Prof. Esa Hohtola.

Working life cooperation:

No.

Other information:

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755318A: Animal physiology, exercises, 4 op

Voimassaolo: 01.08.2011 - 31.07.2015

Opiskelumuoto: Intermediate Studies

Laji: Course

Arvostelu: 1 - 5, pass, fail

Opettajat: Saarela, Seppo Yrjö Olavi

Opintokohteen kielet: Finnish

Leikkaavuudet:

755327A Animal physiology exercises 5.0 op

ECTS Credits:

4 ECTS credits / 107 hours of work.

Language of instruction:

Finnish.

Timing:

B.Sc. 3rd autumn.

Learning outcomes:

Students know basic physiological methods and can design simple experiments.

Contents:

The laboratory course will familiarize students with the use of simple experimental trials, laboratory tests and computer aided measurements the physiological basic principles.

Mode of delivery:

Face-to-face teaching.

Learning activities and teaching methods:

32 h laboratory training, exam.

Target group:

BS compulsory, TEAbs optional.

Prerequisites and co-requisites:

Cell biology (750121P) and Animal physiology, lectures (751388A).

Recommended optional programme components:

This course is a prerequisite for the courses Comparative animal physiology (751x84A/S), and Advanced animal physiology (751635S).

Recommended or required reading:

Animal physiology course booklet.

Assessment methods and criteria:

Exam.

Read more about [assessment criteria](#) at the University of Oulu webpage.

Grading:

1-5 / Fail.

Person responsible:

Prof. Seppo Saarela.

Working life cooperation:

No.

Other information:

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753314A: Basics in population genetics, 8 op

Voimassaolo: - 31.07.2015

Opiskelumuoto: Intermediate Studies

Laji: Course

Arvostelu: 1 - 5, pass, fail

Opintokohteen oppimateriaali:

Hedrick, Philip W. , , 2005

Hartl, Daniel L. , , 2000

Opintokohteen kielet: English

Leikkaavuudet:

757313A Basics in population genetics 5.0 op

ECTS Credits:

8 ECTS credits / 213 h hours of work.

Language of instruction:

Finnish / English.

Timing:

B.Sc. 2nd or M.Sc. 1st autumn and spring.

Learning outcomes:

The students should know the basic theory and results of population genetics, and be able to apply these in analysis of data. They should also be able to use some basis experimental research methods.

Contents:

Basic theory of population genetics, measuring variation, mutation, genetic drift, inbreeding and selection, basic molecular population genetics.

Mode of delivery:

Face-to-face teaching.

Learning activities and teaching methods:

24 h lectures, 30 h mathematical exercises, 90 h exercises and 4 h seminar, final exam, take-home exam, work reports and an essay.

Target group:

Optional to BS in B.Sc. degree, compulsory to BSg in M.Sc. degree.

Suitable also for ecology students and molecular biology students.

Prerequisites and co-requisites:

Experimental course in general genetics (753104P) and Molecular evolution (753327A) or equivalent knowledge.

Recommended optional programme components:

Recommended before courses Seminar of ecological and conservation genetics (753692S) and Quantitative genetics and plant and animal breeding (753x94A/S). This course is a prerequisite to courses Experimental course in bioinformatics and molecular evolution (753624S), Bioinformatics (753629S), DNA analysis in population genetics, lectures (753616S) and DNA analysis in population genetics, exercises (753631S).

Recommended or required reading:

Hedrick 2005: Genetics of populations 3. or 4. ed. or Hamilton 2009: Population Genetics.
The availability of the literature can be checked from [this link](#).

Assessment methods and criteria:

Exam, take-home exam, essay, reports, seminar and student activity.
Read more about [assessment criteria](#) at the University of Oulu webpage.

Grading:

1-5 / Fail.

Person responsible:

Dr. Tanja Pyhäjärvi.

Working life cooperation:

No.

Other information:

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750340A: Basics of bioinformatics, 3 op

Voimassaolo: - 31.07.2016

Opiskelumuoto: Intermediate Studies

Laji: Course

Arvostelu: 1 - 5, pass, fail

Opintokohteen kielet: English

Leikkaavuudet:

757314A Basics of bioinformatics 5.0 op

ECTS Credits:

3 ECTS credits / 80 hours of work.

Language of instruction:

Finnish / English.

Timing:

B.Sc. studies, 2nd spring.

Learning outcomes:

After the course the student knows and is able to use the basic methods for handling the nucleotide and protein sequences. The aim is that the student learns how to use the databases, understands the background and principles of the analytic methods, is able to take up a critical attitude towards the used methods and gets a good background for applying new methods that are developed continuously.

Contents:

Searching of material from the databases, inferring the function of a gene and structure of a protein based on sequence data, comparing the sequences and evaluating the differences between them as well as examining the evolution history of the genes.

Mode of delivery:

Face-to-face teaching.

Learning activities and teaching methods:

12 h lectures, 2 h seminar, 20 h exercises, independent work.

Target group:

BT: compulsory, recommended for all biologists. Suitable also for biochemists.

Prerequisites and co-requisites:

Course Concepts of genetics (753124P) compulsory, also Molecular evolution (753327A) is recommended.

Recommended optional programme components:

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Recommended or required reading:

Pevsner, Jonathan 2009: Bioinformatics and Functional Genomics. Wiley-Blackwell, cop. 2009.
The availability of the literature can be checked from [this link](#).

Assessment methods and criteria:

Reports or exam, exercises, seminar presentation, independent work and student activity.
Read more about [assessment criteria](#) at the University of Oulu webpage.

Grading:

1-5 / Fail

Person responsible:

Dr. Tanja Pyhäjärvi.

Working life cooperation:

No.

Other information:

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752321A: Conservation of Biodiversity, 3 op

Voimassaolo: - 31.07.2015

Opiskelumuoto: Intermediate Studies

Laji: Course

Arvostelu: 1 - 5, pass, fail

Opettajat: Jari-Heikki Oksanen

Opintokohteen kielet: Finnish

Leikkaavuudet:

756347A Conservation of biodiversity 5.0 op

ay752321A Conservation of Biodiversity (OPEN UNI) 3.0 op

ECTS Credits:

3 ECTS credits / 80 hours of work.

Language of instruction:

English.

Timing:

B.Sc. 3rd autumn. NNE.

Learning outcomes:

Students know the central concepts of biodiversity, threats to biodiversity, and methods of conservation of biodiversity.

Contents:

Biodiversity and its components. Major theories of the ecological control of biodiversity. Habitat fragmentation and habitat destruction and their consequences. Metapopulation theory and networks of nature reserves. Current issues in the conservation of biodiversity.

Mode of delivery:

Face-to-face teaching.

Learning activities and teaching methods:

14 h lectures, literature, exam.

Target group:

Biology students. Students who are participating in environmental conservation or tourism minor.

Prerequisites and co-requisites:

No.

Recommended optional programme components:

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Recommended or required reading:

Hanski I. 2005: The Shrinking World. International Ecology Institute, Oldendorf/Luhe, Germany.

The availability of the literature can be checked from [this link](#).

Assessment methods and criteria:

Exam.

Read more about [assessment criteria](#) at the University of Oulu webpage.

Grading:

1-5 / Fail.

Person responsible:

Prof. Jari Oksanen.

Working life cooperation:

No.

Other information:

-

750347A: Ecological methods I, 6 op

Voimassaolo: - 31.07.2015

Opiskelumuoto: Intermediate Studies

Laji: Course

Arvostelu: 1 - 5, pass, fail

Opettajat: Kari Koivula

Opintokohteen kielet: Finnish

Leikkaavuudet:

755325A Methods in ecology I 5.0 op

ECTS Credits:

6 ECTS credits / 160 hours of work.

Language of instruction:

Finnish / English.

Timing:

B.Sc. 3rd autumn.

Learning outcomes:

Students are familiar to scientific method and can separate scientific information from other contents of culture. Students have learned to assess the uncertainty of information and can evaluate the quality of information with respect to its applied value. Students also learn the build a valid theoretical or empirical strategy to solve scientific problems.

Contents:

The aim of the course is to introduce the students in scientific modes of argumentation and research methods in modern ecology. Both the empirical and theoretical methods and their relationship in theory formation are discussed. Hypothesis testing; observational method, experimental method and comparative method are the empirical methods introduced. Autumn period ends in a seminar where scientific publications are analysed.

Mode of delivery:

Face-to-face teaching.

Learning activities and teaching methods:

Lectures, seminar, exercises and exam.

Target group:

Compulsory to ECO.

Prerequisites and co-requisites:

No.

Recommended optional programme components:

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Recommended or required reading:

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Assessment methods and criteria:

Exam.

Read more about [assessment criteria](#) at the University of Oulu webpage.

Grading:

1-5 / Fail.

Person responsible:

Dr. Kari Koivula, Dr. Seppo Rytönen and Prof. Juha Tuomi.

Working life cooperation:

No.

Other information:

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750343A: Ecological responses to global change and air pollution in the subarctic, 4 - 7 op

Voimassaolo: 01.08.2011 - 31.07.2015

Opiskelumuoto: Intermediate Studies

Laji: Course

Arvostelu: 1 - 5, pass, fail

Opettajat: Kari Taulavuori

Opintokohteen kielet: English

Leikkaavuudet:

756348A Ecological responses to global change and air pollution in the subarctic 5.0 op

ECTS Credits:

4-7 ECTS credits / 107-187 hours of work.

Language of instruction:

Finnish / English.

Timing:

B. Sc. / M. Sc. / Ph.D.

Learning outcomes:

Student can identify the ecological and environmental effects of climate change and air pollution in the subarctic area. In addition, the student may learn basic research methods related to topic, and how to use the facilities provided by the subarctic research stations in the research.

Contents:

Lectures deal the ecological responses of global change and air pollution. The content is focused on the environmental effects and their ecological significance in the northern areas. During excursion the student familiarizes with the special features of northern areas and explores the action and research carried out in the northern research stations.

Mode of delivery:

Face-to-face teaching.

Learning activities and teaching methods:

(1) 24 h lectures with exam, and 15 h independent studies (essay and seminar work) (4 cp); (2) 4-5 days summer excursion and closing seminar (3 cp); participation in excursion necessitates accepted credits in the first part (lectures, independent studies).

Target group:

Ecology students.

Prerequisites and co-requisites:

No.

Recommended optional programme components:

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Recommended or required reading:

-ACIA (2005) Arctic Climate Impact Assessment, Cambridge University Press, 1042 p.

-AMAP Assessment 2006: Acidifying Pollutants, Arctic Haze, and Acidification in the Arctic. Arctic Monitoring and Assessment Programme (AMAP), Oslo, Norway. Xii + 112pp. Bell JNB & Trehov M (eds.) 2002. Air pollution and plant life. Wiley. 2nd edition. 480 pages.

The availability of the literature can be checked from [this link](#).

Assessment methods and criteria:

Lectures, essay and seminar, excursion, closing report and seminar.

Read more about [assessment criteria](#) at the University of Oulu webpage.

Grading:

1-5 / Fail

Person responsible:

Dr. Kari Taulavuori.

Working life cooperation:

No.

Other information:

Field excursion is arranged if resources allow.

752352A: Examination in optional topics, 2 - 6 op

Voimassaolo: - 31.07.2015

Opiskelumuoto: Intermediate Studies

Laji: Course

Arvostelu: 1 - 5, pass, fail

Opintokohteen oppimateriaali:

Körner, Christian , , 2003

Opintokohteen kielet: Finnish

Leikkaavuudet:

750349A Examinations on optional topics in biology 2.0 op

ay752352A Examination in optional topics (OPEN UNI) 2.0 op

Voidaan suorittaa useasti: Kyllä

ECTS Credits:

2-6 ECTS credits / 53-160 hours of work.

Language of instruction:

Depends on the book.

Timing:

B.Sc. 2nd - 3rd or M.Sc. 1st -2nd year.

Learning outcomes:

Student independently concerns him/herself to special issues in plant physiology or plant ecology.

Contents:

Examinations on books, which are not compulsory in any other course unit.

Mode of delivery:

Face-to-face teaching.

Learning activities and teaching methods:

Book exam in biology public exam day.

Target group:

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Prerequisites and co-requisites:

No.

Recommended optional programme components:

-

Recommended or required reading:

BS: Literature chosen in agreement with the responsible person.

ECO: Literature chosen in agreement with the responsible person. For example Körner 1999: Alpine Plant Life, Functional Plant Ecology of High Mountain Ecosystems. Springer-Verlag (2 cr.) ja Pohjoinen luontomme <http://www oulu.fi/northnature/Northnature.html> (2 cr.)

The availability of the literature can be checked from [this link](#).

Assessment methods and criteria:

Book exam in biology public exam day.

Read more about [assessment criteria](#) at the University of Oulu webpage.

Grading:

1-5 / Fail.

Person responsible:

Prof. Jari Oksanen or Prof. Hely Häggman.

Working life cooperation:

No.

Other information:

-

751354A: Examinations on optional topics, 2 - 6 op

Voimassaolo: - 31.07.2015

Opiskelumuoto: Intermediate Studies

Laji: Course

Arvostelu: 1 - 5, pass, fail

Opintokohteen kielet: Finnish

Leikkaavuudet:

750349A Examinations on optional topics in biology 2.0 op

Voidaan suorittaa useasti: Kyllä

ECTS Credits:

2-6 ECTS credits / 53-160 hours of work.

Language of instruction:

Depends on the book.

Timing:

B.Sc. 2nd - 3rd or M.Sc. 1st -2nd year.

Learning outcomes:

Student independently concerns him/herself to special issues in animal physiology or animal ecology.

Contents:

Examinations on books, which are not compulsory in any other course unit.

Mode of delivery:

Face-to-face teaching.

Learning activities and teaching methods:

Book exam in biology public exam day.

Target group:

-

Prerequisites and co-requisites:

No.

Recommended optional programme components:

-

Recommended or required reading:

ANIMAL ECOLOGY

Aquatic ecology:

Allan, J.D., & Maria M. Castillo 2007: Stream Ecology: Structure and function of running waters. - Springer, 341 s. (3 ECTS).

Lampert, W., Sommer, U. Limnoecology: The Ecology of Lakes and Streams - Oxford Univ. Press. 285 p. (3 ECTS).

Wootton, R.J. 1998: Ecology of teleost fishes. - Kluwer Academic Publishers, 320 p. (3 ECTS).

Behavioural and evolution ecology:

Clutton-Brock, T. 1991: The evolution of parental care. - Princeton Univ. Press. 265 p. (2 ECTS).

Danchin, E., Giraldeau, L-A. & Cézilly, F. 2008: Behavioural ecology. Oxford, 726 p. (7 ECTS).

Stearns, S.C. & Hoekstra, R.F. 2000: Evolution. An introduction. - Oxford Univ. Press. 340 p. (3 ECTS).

Applied zoology:

Sinclair, A.R.E., Fryxell, J.M. & Caughley, G. 2006: Wildlife ecology, conservation and management. - Blackwell, 400 p. (4 ECTS).

Huttu-Hiltunen, V., Nieminen, M., Valmari, A. & Westerling, B. 1993: Porotalous. - Opetushallitus, 220 s. (1 ECTS).

Leader-Williams, N. 1988: Reindeer on South-Georgia. The ecology of the introduced population. - Cambridge Univ. Press. 319 p. (2 ECTS).

Woodroffe, R., Thirgood, S. & Rabinowitz, A. (eds.) 2005: People and wildlife. Conflict or coexistence? - Cambridge University Press, Cambridge, 400 p. (4 ECTS).

Biodiversity and restoration ecology:

Falk, D.A., Palmer, m., Zedler, J. & Hobbs, R.J. 2006: Foundations of Restoration Ecology (The Science and Practice of Ecological Restoration Series). - Island Press. 346 p. (3 ECTS).

Primack, R.B. 2006: Essentials of conservation biology. 2006. - Sinauer Associates, 530 p. (5 ECTS).

Subject, credit amount and literature chosen in agreement with the responsible professor!

Kurssikirjojen saatavuuden voi tarkistaa [tästä linkistä](#)

ANIMAL PHYSIOLOGY

Subject, credit amount and literature chosen in agreement with the responsible professor!

Assessment methods and criteria:

Book exam in biology public exam day.

Read more about [assessment criteria](#) at the University of Oulu webpage.

Grading:

1-5 / Fail.

Person responsible:

Prof. Esa Hohtola or Prof. Markku Orell.

Working life cooperation:

No.

Other information:

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753351A: Examinations on optional topics, 2 - 6 op

Voimassaolo: - 31.07.2015

Opiskelumuoto: Intermediate Studies

Laji: Course

Arvostelu: 1 - 5, pass, fail

Opintokohteen kielet: Finnish

Leikkaavuudet:

750349A Examinations on optional topics in biology 2.0 op

Voidaan suorittaa useasti: Kyllä

ECTS Credits:

2-6 ECTS credits / 53-160 hours of work.

Language of instruction:

Depends on the book.

Timing:

B.Sc. 2nd - 3rd or M.Sc. 1st -2nd year.

Learning outcomes:

Student independently concerns him/herself to special issues in genetics.

Contents:

Examinations on books, which are not compulsory in any other course unit.

Mode of delivery:

Face-to-face teaching.

Learning activities and teaching methods:

Book exam in biology public exam day.

Target group:

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Prerequisites and co-requisites:

No.

Recommended optional programme components:

-

Recommended or required reading:

Literature chosen in agreement with the responsible professor.

Assessment methods and criteria:

Book exam in biology public exam day.

Read more about [assessment criteria](#) at the University of Oulu webpage.

Grading:

1-5 / Fail.

Person responsible:

Prof. Outi Savolainen.

Working life cooperation:

No.

Other information:

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751307A: Field course in aquatic animals, 4 op

Voimassaolo: - 31.07.2015

Opiskelumuoto: Intermediate Studies

Laji: Course

Arvostelu: 1 - 5, pass, fail

Opettajat: Kaisa-Leena Huttunen

Opintokohteen kielet: Finnish

Leikkaavuudet:

755321A Aquatic ecology field course 5.0 op

ECTS Credits:

4 ECTS credits / 107 hours of work.

Language of instruction:

Finnish / English.

Timing:

B.Sc. 1st summer.

Learning outcomes:

To learn basic methods in identifying and sampling of freshwater animals.

Contents:

Identification of the most important freshwater fishes and invertebrates. Demonstrations of the most frequently-used sampling methods.

Mode of delivery:

Face-to-face teaching.

Learning activities and teaching methods:

Summer: 6 h lectures in Oulu and 70 h of field work and demonstrations at the Oulanka research station.

Target group:

Compulsory (4 cr) to ECO. TEAeco: either Field course in aquatic animals 4 cr or Field course in terrestrial animals 4 cr is compulsory for biology major, the other field course can be included to the ecology minor. TEAbs, alternatively compulsory to TEAbs either Field course in aquatic animals 4 cr or Field course in terrestrial animals 4 cr (at least 9 cr compulsory, two field courses, one animal and other botany field course).

Prerequisites and co-requisites:

Basic identification of animals (751373A) or equivalent knowledge (if necessary, selection to the course 751307A can be based on success in course 751373A).

Recommended optional programme components:

This course is a prerequisite for the following: Winter ecology and physiology (750325A), Special course in aquatic invertebrates (751648S), Assessment and monitoring of the ecological status of water bodies (754613S), Field methods in freshwater biomonitoring (754616S), Research seminar in fish ecology (754618S), Special course in fish ecology (754619S).

Recommended or required reading:

Handouts and lectures given during the course.

Assessment methods and criteria:

On the final course day species identification exam on the species met during the course, practical exam on the sampling methods and theoretical exam based on the literature and demonstration material.

Read more about [assessment criteria](#) at the University of Oulu webpage.

Grading:

1-5 / Fail.

Person responsible:

M.Sc. Kaisa-Leena Huttunen.

Working life cooperation:

No.

Other information:

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752304A: Field course in ecological botany, 5 - 6 op

Voimassaolo: - 31.07.2015

Opiskelumuoto: Intermediate Studies

Laji: Course

Arvostelu: 1 - 5, pass, fail

Opettajat: Annamari Markkola

Opintokohteen oppimateriaali:

Eurola, Seppo , , 1994

Eurola, Seppo , , 1992

Hämet-Ahti, L., Suominen, J., Ulvinen, T. & Uotila, P., , 1998

Opintokohteen kielet: Finnish

Leikkaavuudet:

756343A Plant ecology field course 5.0 op

ECTS Credits:

5-6 ECTS credits / 133-160 hours of work.

Language of instruction:

Finnish / English.

Timing:

B.Sc. 1st summer. NNE.

Learning outcomes:

Student is able to identify most common boreal plant species in the field, to plan and conduct ecological field experiments and use basic methods in vegetation analyses.

Contents:

Vegetation in the coast of Bothnian Bay (4 days) and basics of boreal forest and mire vegetation classification and types at Oulanka Research Station (8 days).

Mode of delivery:

Face-to-face teaching.

Learning activities and teaching methods:

Lectures 10 h, field demonstrations and exercises ca. 84 h. Field exams for plant identification and mire ecology. Seminar, report.

Target group:

Compulsory to ECO (6 cp) and TEAeco (5 cp), alternatively compulsory to TEAbs (at least 9 cp compulsory, two field courses, one animal and other botany field course).

Prerequisites and co-requisites:

Identification of plant species (752303A) 3 cr. or equivalent knowledge.

Recommended optional programme components:

Course has capacity for 32 or 40 students. Possible elimination of the candidates is done by study success and Plant identification (752303A) grade. This course is a prerequisite for courses Plant ecology (752300A), Mire ecology (752692S) and Field course in Arctic-Alpine ecology and vegetation (752642S).

Recommended or required reading:

Laitinen et al. 2012: Field course in ecological botany; Hanhela, P. & Halonen, P. 1995: Plant identification; Huttunen, A. 1995: Introduction to forest types; Eurola, S., Hicks, S. and Kaakinen, H. 1994: Key to Finnish mire types, pp. 12-117 in: Moore, P. D. (ed.), 1994 European mires, London Academic Press, London, 367 p. The availability of the literature can be checked from this link.

The availability of the literature can be checked from [this link](#).

Assessment methods and criteria:

Reports, field exams.

Read more about [assessment criteria](#) at the University of Oulu webpage.

Grading:

1-5 / Fail.

Person responsible:

Dr. Annamari Markkola.

Working life cooperation:

No.

Other information:

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751306A: Field course in terrestrial animals, 4 op

Voimassaolo: - 31.07.2015

Opiskelumuoto: Intermediate Studies

Laji: Course

Arvostelu: 1 - 5, pass, fail

Opettajat: Seppo Rytkönen

Opintokohteen kielet: Finnish

Leikkaavuudet:

755322A Terrestrial animals field course 5.0 op

ECTS Credits:

4 ECTS credits / 107 hours of work.

Language of instruction:

Finnish / English.

Timing:

B.Sc. - 1st summer. NNE.

Learning outcomes:

The aim of the course is to learn the basics of field identification and ecology of terrestrial animals in northern Finland. The student will understand that proper skills in species identification and knowledge of species' ecology are the basis of ecological research.

Contents:

The fauna in different kinds of terrestrial habitats is studied using several ecological sampling and research methods. The course is held at the Oulanka Research Station, Kuusamo, and deals with identification and ecology of invertebrates, mammals (especially small mammals), gallinaceous birds and birds of prey. The exercises take place partly in the field and partly in the laboratory. Data gained during the course is analyzed. The results are reported (in PowerPoint) and presented in the final seminar in Kuusamo.

Mode of delivery:

Face-to-face teaching.

Learning activities and teaching methods:

70 h demonstrations and practicals, one species and theory exam, seminar.

Target group:

Compulsory (4 cr) to ECO. TEAeco: either Field course in terrestrial animals 4 cr or Field course in aquatic animals 4 cr is compulsory for biology major, the other field course can be included to the ecology minor. TEAbs: alternatively compulsory to TEAbs either Field course in terrestrial animals 4 cr. or Field course in aquatic animals 4 cr (at least 9 cr compulsory, two field courses, one animal and other botany field course).

Prerequisites and co-requisites:

Basic identification of animals (751373A) or equivalent knowledge.

Recommended optional programme components:

This course is a prerequisite to course Winter ecology and physiology (750325A). Recommended course after this is Special course in ornithology (755614S).

Recommended or required reading:

Compulsory at Oulanka: 1) Rytkönen, S. ym. 2003: 751306 Maaeläimistön tuntemus ja ekologia. - Biologian laitoksen monisteita 3/2003. Oulun yliopisto, Oulu. 2), Itämies, J. & Viro, P. 1995: Eläinten lajintuntemus, selkärangattomat. Eläintieteen laitoksen monisteita 1/1995, Oulun yliopisto, Oulu. Insect book recommended: Chinery, M. 1988 Pohjois-Euroopan hyönteisheimojen määrittäminen, Tammi, Helsinki, 2. painos.

The availability of the literature can be checked from [this link](#).

Assessment methods and criteria:

Exam, seminar presentation.

Read more about [assessment criteria](#) at the University of Oulu webpage.

Grading:

1-5 / Fail.

Person responsible:

Dr. Seppo Rytkönen.

Working life cooperation:

No.

Other information:

Binoculars, bird identification book, suitable outfit. Preparation knife, preparation scissors and sharp cusp tweezers.

751378A: Functional animal ecology, 6 op

Voimassaolo: - 31.07.2015

Opiskelumuoto: Intermediate Studies

Laji: Course

Arvostelu: 1 - 5, pass, fail

Opettajat: Seppo Rytkönen, Kari Koivula

Opintokohteen kielet: Finnish

Leikkaavuudet:

755324A Functional animal ecology 5.0 op

ECTS Credits:

6 ECTS credits / 160 hours of work.

Language of instruction:

Lectures in Finnish, exercises in Finnish / English.

Timing:

B.Sc. 2nd spring or M.Sc. 1st spring. NNE.

Learning outcomes:

The aim of the course is to understand the relationship between morphology and function by the means of general ecomorphological model. The student will get both theoretical and practical basics for ecomorphological (and general scientific) research procedures: scientific hypothesizing, sampling, data analysis and reporting and interpreting the results.

Contents:

The course focuses on the relationship between phenotype and function, especially the correlation between animal morphology and behaviour. The course consists of two parts: A) Lectures in Finnish. However, articles about each subject are available for foreign students, including ecomorphological models and correlations,

measurement error, allometry, fluctuating asymmetry and phylogenetic analyses. B) Exercises consisting of miniature studies, field and laboratory work, and seminar. The results of the mini studies, in form of PowerPoint presentations, are presented in the seminar. Before the exercises, students write a home essay (or take an exam).

Mode of delivery:

Face-to-face teaching.

Learning activities and teaching methods:

12 h lectures, 40 h exercises, seminar and essay or exam.

Target group:

Recommended for ECOe.

Prerequisites and co-requisites:

Recommended Evolution, systematics and morphology of animals, practicals (755312A) and Basics of statistics I (806109P).

Recommended optional programme components:

-

Recommended or required reading:

-

Assessment methods and criteria:

Essay or exam.

Read more about [assessment criteria](#) at the University of Oulu webpage.

Grading:

1-5 / Fail.

Person responsible:

Dr. Seppo Rytönen.

Working life cooperation:

No.

Other information:

-

756625S: Genetic transformation of plants, 4 - 8 op

Voimassaolo: - 31.07.2015

Opiskelumuoto: Advanced Studies

Laji: Course

Arvostelu: 1 - 5, pass, fail

Opettajat: Häggman, Hely Margaretha

Opintokohteen kielet: Finnish

Leikkaavuudet:

756652S Genetic transformation of plants 5.0 op

ECTS Credits:

4-8 ECTS credits / 107-212 hours of work.

Language of instruction:

Finnish / English.

Timing:

M.Sc. 1st or 2nd autumn, every second year.

Learning outcomes:

The student will assess and apply the concept of genetical modification. The student will apply the different techniques of genetic transformation and will judge their pros and cons.

Contents:

The lectures will cover gene constructs, marker-genes, different genetic transformation methods, legislation, and commercial cultivations. The exercises will familiarize the students with the most common genetic transformation methods including Agrobacterium-mediated transformation, electroporation, biolistic transformation and VIGS.

Mode of delivery:

Face-to-face teaching.

Learning activities and teaching methods:

Lab course + demonstrations (45 h) and lectures (20 h), reports, seminar or essay, lecture exam and final conclusions.

Target group:

BSb: compulsory MSc studies either course Advanced course in plant biology (752682S) 9 cr or Genetic transformation of plants (756625S) 8 cr.

Prerequisites and co-requisites:

Lectures of Advanced course in plant biology (752682S) helps in following the course.

Recommended optional programme components:

-

Recommended or required reading:

Handout and supplementary reading given in lectures and exercises.

Assessment methods and criteria:

Report, seminar and exam.

Read more about [assessment criteria](#) at the University of Oulu webpage.

Grading:

1-5 / Fail.

Person responsible:

Prof. Hely Häggman.

Working life cooperation:

No.

Other information:

-

753630S: Genetics research seminar, 2 op

Voimassaolo: - 31.07.2015

Opiskelumuoto: Advanced Studies

Laji: Course

Arvostelu: 1 - 5, pass, fail

Opettajat: Mikko Sillanpää

Opintokohteen kielet: English

Leikkaavuudet:

750653S Special seminar in biology 2.0 op

Voidaan suorittaa useasti: Kyllä

ECTS Credits:

2 ECTS credits / 53 hours of work.

Language of instruction:

Finnish / English.

Timing:

M.Sc. 1st or 2nd year, Ph.D. students.

Learning outcomes:

After the course the student has a view of current research topics in genetics.

Contents:

Consists of research presentations from researchers and students or discussion on fresh topics in genetics. On Thursdays at 12-13 according to a separate announcement.

Mode of delivery:

Face-to-face teaching.

Learning activities and teaching methods:

Attendance and reports. On Thursdays 12-13 announced separately.

Target group:

Suitable for BSg and for BSg Ph.D. students.

Prerequisites and co-requisites:

No.

Recommended optional programme components:

-

Recommended or required reading:

-

Assessment methods and criteria:

10 participations with reports.

Read more about [assessment criteria](#) at the University of Oulu webpage.

Grading:

Pass / Fail.

Person responsible:

Prof. Mikko Sillanpää.

Working life cooperation:

No.

Other information:

-

751373A: Identification of animals, 5 op

Voimassaolo: - 31.07.2016

Opiskelumuoto: Intermediate Studies

Laji: Course

Arvostelu: 1 - 5, pass, fail

Opettajat: Pudas, Tuula Kaarina, Kari Koivula

Opintokohteen kielet: Finnish

ECTS Credits:

5 ECTS credits / 133 hours of work.

Language of instruction:

Finnish / English.

Timing:B.Sc. 1st autumn and spring. NNE.**Learning outcomes:**

Main point of the course is to learn to identify Finnish animal species (vertebrate) and families (invertebrate) from museum samples. Basics of species' ecology and classification of organisms.

Contents:

During the autumn semester (2 h lectures, 16 h exercises, exam), the Finnish vertebrate fauna is studied using stuffed museum samples. In the spring semester (14 h lectures, 24 h exercises, exam) the invertebrate taxons (mostly family- or genus-level) common in Finland are studied using museum samples.

Mode of delivery:

Face-to-face teaching.

Learning activities and teaching methods:

16 h lectures, 40 h exercises, 2 exams.

Target group:

Compulsory to the biology students.

Prerequisites and co-requisites:

No.

Recommended optional programme components:

This course is needed for attending courses Field course in terrestrial animals (751306A) and Field course in aquatic animals (751307A).

Recommended or required reading:

Course handouts, Itämies J. ja Viro P. 1995: Eläinten lajintuntemus, selkärangattomat, 73 p.; Putaala, A., Marjakangas, A. & Rytönen, S. 2001: Eläinten lajintuntemus, selkärangaiset, 42 p.

The availability of the literature can be checked from [this link](#).

Assessment methods and criteria:

Two species exams.

Read more about [assessment criteria](#) at the University of Oulu webpage.

Grading:

1-5 / Fail.

Person responsible:

Dr. Kari Koivula.

Working life cooperation:

No.

Other information:

-

752303A: Identification of plant species, 2 - 3 op

Voimassaolo: - 31.07.2015

Opiskelumuoto: Intermediate Studies

Laji: Course

Arvostelu: 1 - 5, pass, fail

Opettajat: Kari Taulavuori, Annamari Markkola

Opintokohteen kielet: Finnish

Leikkaavuudet:

ay752303A Identification of plant species (OPEN UNI) 2.0 op

ECTS Credits:

2-3 ECTS credits / 53-80 hours of work. NNE.

Language of instruction:

Finnish / English.

Timing:

B.Sc. 1st autumn.

Learning outcomes:

Student is able to identify most common boreal plant species in herbarium specimens.

Contents:

Demonstrations (16 h) and/or independent study of ca. 350 vascular plants, mosses and lichens in the boreal vegetation zone. 3 cr. without the literature in the exam and 2 cr. with the literature in the exam. In the identification exam student has to know specimens scientific name and family in latin.

Mode of delivery:

Face-to-face teaching.

Learning activities and teaching methods:

16 h demonstrations and learning from the herbarium samples. In the identification exam student has to know specimens scientific name and family in latin.

Target group:

3 cr compulsory to TEA and ECO, 2 cr compulsory to BS.

Prerequisites and co-requisites:

No.

Recommended optional programme components:

Course is prerequisite for the Field course in ecological botany (752304A) and for the advanced plant species identification courses.

Recommended or required reading:

Booklet Hanhela, P. & Halonen, P. 1995: Plant Identification.

The availability of the literature can be checked from [this link](#).

Assessment methods and criteria:

Species exam. 3 cr. without the literature and 2 cr. with the help of the literature.

Read more about [assessment criteria](#) at the University of Oulu webpage.

Grading:

1-5 / Fail.

Person responsible:

Dr. Annamari Markkola.

Working life cooperation:

No.

Other information:

-

750629S: Kaamos symposium, 2 - 4 op

Opiskelumuoto: Advanced Studies

Laji: Course

Arvostelu: 1 - 5, pass, fail

Opintokohteen kielet: English

Voidaan suorittaa useasti: Kyllä

ECTS Credits:

2-4 ECTS credits / 53-107 hours of work.

Language of instruction:

English.

Timing:

M.Sc., Ph.Lic. and Ph.D. autumn.

Learning outcomes:

Students get acquainted to preparing, presenting and evaluating a scientific oral presentation.

Contents:

The Kaamos Symposium consisting of presenting current research projects is held every year at the end of autumn period. Through presenting their research work and projects and obtaining feedback from the audience (students and the staff of the department) post graduate students gain experience in holding a scientific presentation.

Mode of delivery:

Face-to-face teaching.

Learning activities and teaching methods:

Own presentation and the whole symposium 4 cr (postgraduate students), Organizing the symposium 3 cr (postgraduate students), poster 2 cr (postgraduate students), summary of five presentations and symposium 2 cr (undergraduate students).

Target group:

Undergraduate and postgraduate biology students.

Prerequisites and co-requisites:

No.

Recommended optional programme components:

-

Recommended or required reading:

Abstract book.

Assessment methods and criteria:

Presentation or reports.

Read more about [assessment criteria](#) at the University of Oulu webpage.

Grading:

Pass / Fail.

Person responsible:

Prof. Timo Muotka.

Working life cooperation:

No.

Other information:

-

751690S: Lectures on special topics in zoology, 2 - 4 op

Voimassaolo: - 31.07.2015

Opiskelumuoto: Advanced Studies

Laji: Course

Arvostelu: 1 - 5, pass, fail

Opintokohteen kielet: Finnish

Leikkaavuudet:

750654S Special lecture in biology 2.0 op

Voidaan suorittaa useasti: Kyllä

ECTS Credits:

2-4 ECTS credits / 53-107 hours of work.

Language of instruction:

Finnish / English.

Timing:

M.Sc. degree BSz and ECOz, (arranged if resources allow).

Learning outcomes:

Student will be profoundly acquainted to current special issues in zoology.

Contents:

The topics are announced separately.

Mode of delivery:

Varying.

Learning activities and teaching methods:

Varying.

Target group:

Optional to BSz and ECOz.

Prerequisites and co-requisites:

No.

Recommended optional programme components:

-

Recommended or required reading:

Course specific.

Assessment methods and criteria:

Course specific.

Read more about [assessment criteria](#) at the University of Oulu webpage.

Grading:

1-5 / Fail or Pass / Fail.

Person responsible:

Professors and docents.

Working life cooperation:

No.

Other information:

-

752316A: Macro fungi, 3 op

Opiskelumuoto: Intermediate Studies

Laji: Course

Arvostelu: 1 - 5, pass, fail

Opettajat: Annamari Markkola

Opintokohteen kielet: Finnish

Leikkaavuudet:

ay752316A Macro fungi (OPEN UNI) 3.0 op

ECTS Credits:

3 ECTS credits / 80 hours of work.

Language of instruction:

Finnish / English.

Timing:

B.Sc. 3 rd autumn. NNE.

Learning outcomes:

Student is able to identify most common macrofungal species as fresh specimens and knows basics of fungal ecology.

Contents:

Demonstrations of macrofungi in the field, basics of identification, ecology and distribution.

Mode of delivery:

Face-to-face teaching.

Learning activities and teaching methods:

14 h lectures, 25 h exercises including excursions, identification exam.

Target group:

Optional.

Prerequisites and co-requisites:

No.

Recommended optional programme components:

-

Recommended or required reading:

Course handout, Salo, P. and Nummela-Salo, U. 2002: Sienikurssi (752316). Toinen uusittu painos. Lajiesittelyt. Biologian laitoksen monisteita 2/2002, 41 p. and mushroom guides.

The availability of the literature can be checked from [this link](#).

Assessment methods and criteria:

Species identification exam.

Read more about [assessment criteria](#) at the University of Oulu webpage.

Grading:

1-5 / Fail.

Person responsible:

Dr. Annamari Markkola.

Working life cooperation:

No.

Other information:

-

750645S: Molecular ecology, 2 - 5 op

Voimassaolo: 01.08.2012 - 31.07.2015

Opiskelumuoto: Advanced Studies

Laji: Course

Arvostelu: 1 - 5, pass, fail

Opettajat: Kvist, Laura Irmeli

Opintokohteen kielet: Finnish

Leikkaavuudet:

756650S Introduction to molecular ecology 5.0 op

ECTS Credits:

2-5 ECTS credits / 53-133 hours of work.

Language of instruction:

English.

Timing:

M.Sc. 1 st spring, ECOGEN ECOz and ECOb 1 st spring.

Learning outcomes:

This course introduces the usage of molecular biology methods and genetic theories in ecology. The aim is that students know the basic laboratory methodology, can apply them into variety of ecological questions and is familiar with basics of population genetics and phylogenetics in order to be able to analyze and interpret genetic data.

Contents:

Initiation to structure and evolution of proteins and DNA, identification of species, sex and individuals, behavioural ecology (mating systems, cooperation, mating success). Basics of population genetics (variation, effective population size, bottlenecks, population structure, gene flow), relationships between molecular and adaptive variation, phylogenetic methods, phylogeography and conservation genetics.

Mode of delivery:

Face-to-face teaching.

Learning activities and teaching methods:

20 h lectures, 4 h seminars, 21 h laboratory exercises, 16 h computer exercises. Final exam from lectures, seminar, participation to exercises.

Target group:

ECOz, ECOb. Compulsory ECOGEN ECOz and ECOb.

Prerequisites and co-requisites:

Concepts of genetics (753124P) or equivalent knowledge.

Recommended optional programme components:

Other related courses : Population ecology (755607S), Plant population biology (756323A), Basics of population genetics (753314A), Molecular evolution (753327A).

Recommended or required reading:

Beebee, T. and Rowe G. 2004 or 2008. An introduction to molecular ecology. Oxford University Press.

The availability of the literature can be checked from [this link](#).

Assessment methods and criteria:

Lecture exam and seminar, participation to exercises.

Read more about [assessment criteria](#) at the University of Oulu webpage.

Grading:

1-5 / Fail.

Person responsible:

Dr. Laura Kvist.

Working life cooperation:

No.

Other information:

-

750699S: Optional examinations in environmental protection, 2 - 6 op**Opiskelumuoto:** Advanced Studies**Laji:** Course**Arvostelu:** 1 - 5, pass, fail**Opettajat:** Kari Taulavuori**Opintokohteen kielet:** Finnish**Voidaan suorittaa useasti:** Kyllä**ECTS Credits:**

2-6 ECTS credits / 53-160 hours of work. About 100 pages / 1 ECTS credit.

Language of instruction:

Most books are in English.

Timing:

B.Sc. or M.Sc. degree.

Learning outcomes:

To understand environmental protection in global context.

Contents:

Depends on the book.

Mode of delivery:

Face-to-face teaching.

Learning activities and teaching methods:

Three times per both semesters in biology public exam days. Exam days are announced in WebOodi.

Target group:

Biology, geography, geology, environmental engineering, exchange students.

Prerequisites and co-requisites:

No.

Recommended optional programme components:

-

Recommended or required reading:

Gaston & Spicer (2004) Biodiversity – an introduction. Blackwell Publishing, 191p; Lockwood et al. (2007) Invasion Ecology, Blackwell Publishing, 304 p; ACIA (2005) Arctic Climate Impact Assessment, Cambridge University Press, 1042 p.; Dincer et al. (2013) Causes, Impacts and Solutions to Global Warming, Springer, 1183 p.

Assessment methods and criteria:

Exam.

Read more about [assessment criteria](#) at the University of Oulu webpage.**Grading:**

1-5 / Fail.

Person responsible:

Dr. Kari Taulavuori.

Working life cooperation:

No.

Other information:

Student has to consult about the selected literature before exam.

756621S: Plant adaptations to herbivory, 2 op**Voimassaolo:** - 31.07.2019**Opiskelumuoto:** Advanced Studies**Laji:** Course**Arvostelu:** 1 - 5, pass, fail**Opintokohteen kielet:** Finnish

ECTS Credits:

2 ECTS credits / 53 hours of work.

Language of instruction:

Finnish / English.

Timing:

M.Sc. degree, (arranged if resources allow).

Learning outcomes:

Student will get knowledge of plant adaptations to herbivory.

Contents:

Plants have different means to avoid or tolerate herbivory. The emphasis is on the importance and evolution of chemical defence mechanisms and on the theory of optimal defence. The course will also introduce how herbivory can affect the interactions between plant species and biodiversity of a plant community.

Mode of delivery:

Face-to-face teaching.

Learning activities and teaching methods:

20 h lectures, 10 h seminar.

Target group:

-

Prerequisites and co-requisites:

Plant ecology (752300A) and Population biology of plants (756323A) or equivalent knowledge.

Recommended optional programme components:

-

Recommended or required reading:

-

Assessment methods and criteria:

-

Read more about [assessment criteria](#) at the University of Oulu webpage.

Grading:

-

Person responsible:

Prof. Juha Tuomi.

Working life cooperation:

No.

Other information:

-

752300A: Plant ecology, 7 op

Voimassaolo: - 31.07.2015

Opiskelumuoto: Intermediate Studies

Laji: Course

Arvostelu: 1 - 5, pass, fail

Opettajat: Annamari Markkola, Kari Taulavuori

Opintokohteen kielet: Finnish

Leikkaavuudet:

756344A Plant ecology 5.0 op

ECTS Credits:

7 ECTS credits / 187 hours of work.

Language of instruction:

Lectures Finnish, Exercises Finnish / English.

Timing:

B.Sc. 2nd autumn. NNE.

Learning outcomes:

Student will get basic knowledge how plants adapt to different environmental factors.

Contents:

The main subject of this course is the heterogeneity of environment and the capacity of plants to adapt flexibly to different light and nutrient conditions. For carbon economy the main questions are variation in photosynthetic potential, extrinsic factors which restrict the photosynthesis and the structural and physiological adaptations to different light conditions. Nutrient economy is not only dependent on the soil of the habitat but also on the capacity

of plant to change the ions from the surface of soil particles. Symbiosis has a great importance on nutrient economy of boreal plants. The balance between benefits and costs defines whether the symbiosis with the nitrogen fixation bacteria or with mycorrhizal fungi is beneficial for the plant or not. There is competition between plants for soil nutrients and for light. How is it possible that plants competing for the same basic nutrients can live in the same habitat? Isn't the niche theory valid for plants?

Mode of delivery:

Face-to-face teaching.

Learning activities and teaching methods:

24 h lectures and exam, 30 h demonstrations and exercises in field and laboratory (basic methods in plant ecology and laboratory work), 10 h seminars on the literature of plant ecology; 4 h final seminars. International students will compensate lectures by reading book Ridge, I. 2002: Plants, Oxford Univ. Press.

Target group:

Compulsory to ECO.

Prerequisites and co-requisites:

Basics of ecology (750124P) and Field course in ecological botany (752304A) or equivalent knowledge.

Recommended optional programme components:

-

Recommended or required reading:

Ridge, I. 2002: Plants.

The availability of the literature can be checked from [this link](#).

Assessment methods and criteria:

Lecture exam, laboratory diary and seminar presentation.

Read more about [assessment criteria](#) at the University of Oulu webpage.

Grading:

1-5 / Fail.

Person responsible:

Kari Taulavuori ja Annamari Markkola (lectures), Kari Taulavuori (exercises).

Working life cooperation:

No.

Other information:

-

756627S: Plant hormones, 5 op

Opiskelumuoto: Advanced Studies

Laji: Course

Arvostelu: 1 - 5, pass, fail

Opettajat: Häggman, Hely Margaretha

Opintokohteen kielet: Finnish

ECTS Credits:

4 ECTS credits / 107 hours of work.

Language of instruction:

Finnish / English.

Timing:

M.Sc. 1 st or 2 nd spring, (arranged if resources allow).

Learning outcomes:

The students will assess the plant hormone action, understand hormone interactions and the significance of the hormone balance as well as the molecular mechanisms.

Contents:

Plant hormones are signalling molecules with profound effects on growth and development at trace quantities. Until quite recently plant development was considered to be regulated by auxins, gibberellins, cytokinins, ethylene and abscisic acid. New analytical and molecular methods have evidenced new plant hormone receptors and signalling pathways. During the lectures the mode of action of the hormones and the latest literature is used to gain the most recent view of the topic.

Mode of delivery:

Face-to-face teaching.

Learning activities and teaching methods:

20 h and exam.

Target group:

Suitable for BSb and ecophysicologists.

Prerequisites and co-requisites:

Basics of functional plant biology lectures and exercises (752345A, 756341A).

Recommended optional programme components:

-

Recommended or required reading:

Chapters concerning plant hormones from Taiz, L. & Zeiger, E. 2010: Plant Physiology. Sinauer Associates Inc. 5. ed. and literature given in the lectures.

The availability of the literature can be checked from [this link](#).

Assessment methods and criteria:

Exam.

Read more about [assessment criteria](#) at the University of Oulu webpage.

Grading:

1-5 / Fail.

Person responsible:

Prof. Hely Häggman.

Working life cooperation:

No.

Other information:

-

750613S: Research training, 2 - 15 op

Opiskelumuoto: Advanced Studies

Laji: Practical training

Arvostelu: 1 - 5, pass, fail

Opintokohteen kielet: Finnish

Voidaan suorittaa useasti: Kyllä

ECTS Credits:

1-14 ECTS credits / 27-378 hours of work.

Language of instruction:

Finnish / English.

Timing:

M.Sc. degree.

Learning outcomes:

Student applies the education given knowledge and skills in working life to gain hands-on experience.

Contents:

Work on special projects in the different biology research groups at the department or elsewhere or independent project work including field and/or laboratory work or work at the biological stations. The work is not included to other study modules in biology.

Mode of delivery:

Face-to-face teaching.

Learning activities and teaching methods:

The topic and the study plan have to be agreed on in advance (registration form). The student has to keep diary and prepare a report on the work.

Target group:

-

Prerequisites and co-requisites:

No.

Recommended optional programme components:

-

Recommended or required reading:

-

Assessment methods and criteria:

Report.

Read more about [assessment criteria](#) at the University of Oulu webpage.

Grading:

Pass / Fail.

Person responsible:

Professor of the student's major subject.

Working life cooperation:

Yes. Participating to biology project gives working life skills.

Other information:

-

750313A: Research training, 2 - 15 op

Opiskelumuoto: Intermediate Studies

Laji: Practical training

Arvostelu: 1 - 5, pass, fail

Opintokohteen kielet: Finnish

Voidaan suorittaa useasti: Kyllä

ECTS Credits:

1-14 ECTS credits / 27-378 hours of work.

Language of instruction:

Finnish / English.

Timing:

B.Sc. degree.

Learning outcomes:

Student applies the education given knowledge and skills in working life to gain hands-on experience.

Contents:

Work on special projects in the different biology research groups at the department or elsewhere or independent project work including field and/or laboratory work or work at the biological stations. The work is not included to other study modules in biology.

Mode of delivery:

Face-to-face teaching.

Learning activities and teaching methods:

The topic and the study plan have to be agreed on in advance (registration form). The student has to keep diary and prepare a report on the work.

Target group:

-

Prerequisites and co-requisites:

No.

Recommended optional programme components:

-

Recommended or required reading:

-

Assessment methods and criteria:

Report.

Read more about [assessment criteria](#) at the University of Oulu webpage.

Grading:

Pass / Fail.

Person responsible:

Professor of the student's major subject.

Working life cooperation:

Yes. Participating to biology project gives working life skills.

Other information:

-

752695S: Seminar on special topics in botany, 2 op

Voimassaolo: - 31.07.2015

Opiskelumuoto: Advanced Studies

Laji: Course

Arvostelu: 1 - 5, pass, fail

Opintokohteen kielet: Finnish

Leikkaavuudet:

750653S Special seminar in biology 2.0 op

Voidaan suorittaa useasti: Kyllä

ECTS Credits:

2 ECTS credits / 53 hours of work.

Language of instruction:

Finnish / English.

Timing:

M.Sc., Ph.D. degree. ECOB M.Sc. 1 st autumn and spring.

Learning outcomes:

Students concern themselves to current issues in plant physiology or plant ecology.

Contents:

Current special problems in botany. Lectures by specialists and latest literature. Topics vary every year.

Mode of delivery:

Face-to-face teaching.

Learning activities and teaching methods:

Course specific.

Target group:

ECOB compulsory 2 cr., BSb optional.

Prerequisites and co-requisites:

No.

Recommended optional programme components:

-

Recommended or required reading:

Course specific.

Assessment methods and criteria:

Course specific.

Read more about [assessment criteria](#) at the University of Oulu webpage.**Grading:**

Course specific.

Person responsible:

Professors and docents.

Working life cooperation:

No.

Other information:

-

750646S: Symbiosis, 4 op

Voimassaolo: 01.08.2013 - 31.07.2015

Opiskelumuoto: Advanced Studies

Laji: Course

Arvostelu: 1 - 5, pass, fail

Opettajat: Anna-Maria Pirttilä

Opintokohteen kielet: Finnish

Leikkaavuudet:

756649S Symbiosis 5.0 op

ECTS Credits:

4 ECTS credits / 107 hours of work.

Language of instruction:

Finnish / English.

Timing:

B.Sc. degree 3rd spring, M.Sc. 1. or 2nd spring, arranged if resources allow.

Learning outcomes:

The student knows the concept of symbiosis, understands the extent of diversity of symbiotic interactions both at the community and molecular level.

Contents:

Practically every plant is living in symbiosis with other organisms. Lately new forms of symbiosis have been discovered, extending the diversity of plant interactions, and the significance of plant symbiosis in biotechnology and biocontrol has increased. Various forms of symbiosis, their importance for the plant and interaction at the molecular level are covered.

Mode of delivery:

Face-to-face teaching.

Learning activities and teaching methods:

30 h Lectures / laboratory work / demonstrations, seminar, lecture diary.

Target group:

BS and ecophysiology students.

Prerequisites and co-requisites:

Studies in bioscience.

Recommended optional programme components:

-

Recommended or required reading:

Lecture notes.

Assessment methods and criteria:

Seminar, lecture diary.

Read more about [assessment criteria](#) at the University of Oulu webpage.

Grading:

1-5 / Fail.

Person responsible:

Doc. Anna Maria Pirttilä.

Working life cooperation:

No.

Other information:

-

750318A: Thursday seminar in biology, 2 op

Voimassaolo: 01.08.2011 -

Opiskelumuoto: Intermediate Studies

Laji: Course

Arvostelu: 1 - 5, pass, fail

Opettajat: Hohtola, Esa Juhani

Opintokohteen kielet: English

Voidaan suorittaa useasti: Kyllä

ECTS Credits:

2 ECTS credits / 53 hours of work.

Language of instruction:

English.

Timing:

B.Sc., M.Sc., Ph.Lic. or Ph.D. degree.

Learning outcomes:

Students get knowledge about the current results and theories in biology.

Contents:

Lectures in English on current topics in biology given by guest lecturers from Finland or abroad.

Mode of delivery:

Face-to-face teaching.

Learning activities and teaching methods:

Guest lectures on Thursdays 12 am-1 pm. See notice boards for the lecture schedule. See seminar programme:

<http://cc.oulu.fi/~ehohtola/tose.htm>

Target group:

Undergraduate and postgraduate students interested in biology.

Prerequisites and co-requisites:

No.

Recommended optional programme components:

-

Recommended or required reading:

-

Assessment methods and criteria:

10 participations and 10 one page long reports.

Read more about [assessment criteria](#) at the University of Oulu webpage.

Grading:

Pass / Fail.

Person responsible:

Prof. Esa Hohtola

Working life cooperation:

No.

Other information:

-

751368A: Wildlife management and game animal ecology, 6 op

Voimassaolo: - 31.07.2015

Opiskelumuoto: Intermediate Studies

Laji: Course

Arvostelu: 1 - 5, pass, fail

Opettajat: Jouni Aspi

Opintokohteen kielet: Finnish

Leikkaavuudet:

755328A Wildlife management and game animal ecology 5.0 op

ECTS Credits:

6 ECTS credits / 160 hours of work.

Language of instruction:

Finnish / English.

Timing:

B.Sc. 3rd or M.Sc. 1st autumn, (arranged if resources allow). NNE.

Learning outcomes:

After carrying out the study module the student will be able to recognize special ecological traits of the game animals and relate them to the general ecological framework. The student will be also to appraise the basics of durable hunting of game animals. The student will be also able to appraise the basics of durable hunting of game animals and critically judge different wildlife management methods from the scientific starting point.

Contents:

The ecology of game species, their life histories, population dynamics and predator-prey relationships. Hunting ecology: man as predator, management and hunting of the game species. The impact of forestry on the game species' populations. Students are also introduced to wildlife management in practice and to the social aspect of wildlife-human relationship.

Mode of delivery:

Face-to-face teaching.

Learning activities and teaching methods:

24 h lectures, one-day excursion to a game breeding area, seminar with written reports and exam.

Target group:

-

Prerequisites and co-requisites:

No.

Recommended optional programme components:

-

Recommended or required reading:

-

Assessment methods and criteria:

Seminar with report and exam.

Read more about [assessment criteria](#) at the University of Oulu webpage.

Grading:

1-5 / Fail.

Person responsible:

Dr. Jouni Aspi, Dr. Kari Koivula.

Working life cooperation:

No.

Other information:

-

750625S: Winter ecology and physiology, 3 - 8 op

Voimassaolo: - 31.07.2015

Opiskelumuoto: Advanced Studies

Laji: Course

Arvostelu: 1 - 5, pass, fail

Opettajat: Kari Taulavuori, Hohtola, Esa Juhani

Opintokohteen kielet: English

Leikkaavuudet:

750677S Winter ecology 5.0 op

ECTS Credits:

3-8 ECTS credits / 80-213 hours of work.

Language of instruction:

English.

Timing:B.Sc. 3rd or M.Sc. 1st spring. NNE.**Learning outcomes:**

Student obtains basic knowledge of animal and plant acclimations and adaptations to winter, and can evaluate the effects of cold temperatures and snow on overwintering, and learns central methodology in winter ecology and physiology.

Contents:

Three independent units: 1) Winter ecology and physiology course (7 h lectures and 13 h laboratory practicals and 4 h seminar in Oulu, and 4 day long field excursion to the Oulanka Research Station (total about 50 h, 3 cr); 2) Book exam on a common exam day 2 cr: Marchand, P. J. 1996: Life in the cold. An introduction to winter ecology. 1) Book exam on a common exam day Thermal biology and energetics 3 cr (prof. Esa Hohtola). Examinations on the parts are held independently from each other. Selected literature will be provided.

Mode of delivery:

Face-to-face teaching.

Learning activities and teaching methods:

Lectures, exercises, report and seminar presentation.

Target group:

Biology students.

Prerequisites and co-requisites:

Courses Basics of ecology (750124P), Field course in ecological botany (752304A), Cell biology (750121P), Field course in terrestrial animals (751306A), Field course in aquatic animals (751307A) and Basics of functional plant biology, lectures (752345A) or equivalent knowledge.

Recommended optional programme components:

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Recommended or required reading:

Marchand, P. J. 1996: Life in the cold. An introduction to winter ecology. (3rd edition). University Press of New England. 304 p.

The availability of the literature can be checked from [this link](#).

Assessment methods and criteria:

Seminar presentation and book exam.

Read more about [assessment criteria](#) at the University of Oulu webpage.

Grading:

Course + Seminar: Pass / Fail, book exam: 1-5 / Fail.

Person responsible:

Dr. Kari Taulavuori, Prof. Esa Hohtola and Prof. Markku Orell.

Working life cooperation:

No.

Other information:

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