Opasraportti

LuTK - Biology 2012-2013 (2012 - 2013)

Tutkintorakenteisiin kuulumattomat opintokokonaisuudet ja -jaksot

300002M: Advanced Information Skills, 1 op
751635S: Advanced course in animal physiology, 8 op
753629S: Advanced course in bioinformatics, 4 op
752682S: Advanced course in plant biology, 9 op
751651S: Advanced identification in animals, 4 - 8 op
752608S: Advanced identification of plant species I, 6 op
752625S: Advanced identification of plant species II, 5 - 8 op
756629S: Advanced plant tissue culture, 4 op
751666S: Animal behaviour, 5 op
751366A: Animal behaviour, 5 op
755318A: Animal physiology, exercises, 4 op
751388A: Animal physiology, lectures, 4 op
752677S: Aquatic and littoral vegetation, 3,5 op
755608S: Avian reproductive biology, 2 op
750366A: Bachelor of Science final examination, 5 op
750332A: Bachelor of Science maturity exam, 0 op
750396A: Bachelor of Science seminar, 3 op
750367A: Bachelor of Science thesis, 10 op
756340A: Basic course in plant morphology, exercises, 2 op
752337A: Basic course in plant morphology, lectures, 2 op
752688S: Basic of plant tissue culture, 5 op
756341A: Basics in functional plant biology, exercises, 5 op
753614S: Basics in population genetics, 8 op
753314A: Basics in population genetics, 8 op
750340A: Basics of bioinformatics, 3 op
750640S: Basics of bioinformatics, 3 op
750124P: Basics of ecology, 5 op
752345A: Basics of functional plant biology, lectures, 4 op
752388A: Basics of plant tissue culture, 5 op
750635S: Biodiversity in human changed environments, 3 - 6 op
750363A: Biogeography, 4 op
752662S: Botanical collection and digital herbarium, 2 - 6 op
752362A: Botanical collection and digital herbarium, 2 - 6 op
750121P: Cell biology, 5 op
755310A: Community ecology, 3 - 4 op
755610S: Community ecology, 3 - 4 op
751384A: Comparative animal physiology, 8 op
751684S: Comparative animal physiology, 8 op
753124P: Concepts of genetics, 4 - 7 op
752321A: Conservation of Biodiversity, 3 op
750621S: Conservation of biodiversity, 3 op
750619S: Course in microscopic techniques, 4 op
753631S: DNA analysis in population genetics, exercises, 6 op
753616S: DNA analysis in population genetics, lectures, 4 op

755317A: Developmental biology-histology, exercises, 5 op
751367A: Developmental biology-histology, lectures, 4 op
752672S: Distribution mapping of plants, 2 - 5 op
750347A: Ecological methods I, 6 op
750343A: Ecological responses to global change and air pollution in the subarctic, 4 - 7 op
750643S: Ecological responses to global change and air pollution in the subarctic, 4 - 7 op
750631S: Ecosystem ecology, 3 op
752175P: Environmental ecology, 5 op
750626S: Environmental impact assessment (EIA) and ecological inventory of natural resources, 5 op
750307A: Evolution and systematics of organisms, 4 op
755609S: Evolution of life histories, 4 op
755312A: Evolution, systematics and morphology of animals, practicals, 4 op
750336A: Evolutionary ecology, 5 op
752352A: Examination in optional topics, 2 - 6 op
751654S: Examination on optional topics, 2 - 6 op
752652S: Examinations on optional topics, 2 - 6 op
751354A: Examinations on optional topics, 2 - 6 op
753651S: Examinations on optional topics, 2 - 6 op
753351A: Examinations on optional topics, 2 - 6 op
752605S: Excursion to Southern Finland or Abroad, 4 - 7 op
752305A: Excursion to Southern Finland or Abroad, 4 - 7 op
753634S: Experimental course in bioinformatics and molecular evolution, 4 op
753104P: Experimental course in general genetics, 6 op
751307A: Field course in aquatic animals, 4 op
751607S: Field course in aquatic animals, 4 op
752342A: Field course in arctic-alpine ecology and vegetation, 5 op
752642S: Field course in arctic-alpine ecology and vegetation, 5 op
752604S: Field course in ecological botany, 5 - 6 op
752304A: Field course in ecological botany, 5 - 6 op
756639S: Field course in plant ecological research on the Bothnian Bay coast, 3 op
751306A: Field course in terrestrial animals, 4 op
751606S: Field course in terrestrial animals, 4 op
755313A: Field identification of birds, 1 - 5 op
754616S: Field methods in freshwater biomonitoring, 4 op
752699S: Final examination in botany, 10 op
753699S: Final examination in genetics, 10 op
754612S: Final examination in hydrobiology, 7 op
751699S: Final examination in zoology, 10 op
752186P: Foreign studies, 0 op
751193P: Foreign studies, 0 op
753193P: Foreign studies, 0 op
751393A: Foreign studies, 0 op
753393A: Foreign studies, 0 op
752386A: Foreign studies, 0 op
752686S: Foreign studies, 0 op
753693S: Foreign studies, 0 op
751693S: Foreign studies, 0 op
751678S: Functional animal ecology, 6 op
751378A: Functional animal ecology, 6 op
756625S: Genetic transformation of plants, 4 - 8 op
753630S: Genetics research seminar, 2 op
753617S: Genomics and gene expression practicals, 8 op
753317A: Genomics and gene expression practicals, 8 op
753607S: Human genetics, 4 op
753307A: Human genetics, 4 op
751373A: Identification of animals, 5 op
751673S: Identification of animals, 5 op
756311A: Identification of garden plant species, 5 op
752303A: Identification of plant species, 2 - 3 op
752603S: Identification of plant species, 3 op
751642S: Identification of vertebrates in the field, 2 op
030005P: Information Skills, 1 op
750600J: Integration of research and teaching, 1 - 4 op
754308A: Introduction to hydrobiology, 3 op

755614J: Introductory essay of Ph. D. research, 4 op
757606J: Introductory essay of Ph.D. research, 4 op
756632J: Introductory essay of Ph.D. research, 4 op
750329A: Kaamos symposium, 2 op
750629S: Kaamos symposium, 2 - 4 op
040910S: Laboratory Animal Course For Scientists, 6 op
750322A: Laboratory techniques and instrumentation, 5 op
750622S: Laboratory, instrumentation and measurement techniques, 5 op
751690S: Lectures on special topics in zoology, 2 - 4 op
750616S: Legislation in environmental protection, 5 op
750316A: Legislation in environmental protection, 5 op
752316A: Macro fungi, 3 op
752616S: Macro fungi, 3 op
750696S: Master of science seminar, 4 op
757602S: Master of science thesis in genetics, 40 op
755602S: Master of science thesis in zoology, 40 op
750632S: Maturity exam, 0 op
750604S: Metapopulation dynamics, 4 op
750644S: Methods in ecology I, 6 op
750647S: Methods in ecology II, 7 op
753612S: Methods in genomics and genomics evolution, 6 op
750160P: Minor subject examination in biology, 4 op
752692S: Mire ecology, 5 op
752392A: Mire ecology, 5 op
750645S: Molecular ecology, 2 - 5 op
753327A: Molecular evolution, 4 op
750664S: Molecular methods I, 4 op
750364A: Molecular methods I, 4 op
750365A: Molecular methods II, 4 op
750303A: Nature conservation and land use, 3 op
750603S: Nature conservation and land use, 3 op
750642S: Optimatisation and game theories, 3 op
750199P: Optional examinations in environmental protection, 2 - 6 op
750399A: Optional examinations in environmental protection, 2 - 6 op
750699S: Optional examinations in environmental protection, 2 - 6 op
750031Y: Orientation course for new students, 1 op
756615S: Physiology of forest trees, 5 op
756621S: Plant adaptations to herbivory, 2 op
756332A: Plant developmental biology, 4 op
752600S: Plant ecology, 7 op
752300A: Plant ecology, 7 op
752359A: Plant ecology and forestry, 3,5 op
756304A: Plant ecophysiology in changing environments, 5 op
756604S: Plant ecophysiology in changing environments, 5 op
752609S: Plant evolution and systematics, exercises, 2 op
756627S: Plant hormones, 5 op
756623S: Plant population biology, 5 op
756619S: Plant reproductive biology, 2 - 4 op
756638S: Plant symbiosis, 4 op
756338A: Plant symbiosis, 4 op
756323A: Population biology of plants, 5 op
755607S: Population ecology, 7 op
750615S: Practical training, 10 - 15 op
751660S: Preparation of an insect collection, 2 - 6 op
756602S: Pro gradu thesis, 40 op
753394A: Quantitative genetics and plant and animal breeding, 6 op
753694S: Quantitative genetics and plant and animal breeding, 6 op
750661S: Research group seminar, 2 - 4 op
750662J: Research plan seminar, 1 - 2 op
754618S: Research seminar in fish ecology, 2 - 4 op
750613S: Research training, 2 - 15 op
750313A: Research training, 2 - 15 op
756607S: Restoration ecology, 2 - 6 op
756618S: Secondary metabolism of plants, 4 op

753692S: Seminar in ecological and conservation genetics, 4 op
752695S: Seminar on special topics in botany, 2 op
755616S: Seminars on special topics in zoology, 2 - 4 op
756633S: Soil biology, 3 op
756612S: Soil ecology, 3 - 5 op
751648S: Special course in aquatic invertebrates, 2 - 4 op
754619S: Special course in fish ecology, 8 op
755614S: Special course in ornithology, 2 op
752691S: Special course/Signal transduction in plants, 2 - 4 op
753613S: Special seminar in genetics, 4 op
752667S: Special topics in plant ecology, 2 - 5 op
754621S: Specific topics on hydrobiology, 4 op
754620S: Stream biology, 4 op
754320A: Stream ecology, 4 op
756626S: Stress physiology of plants, 4 op
756622S: Structure and dynamics of plant communities, 5 op
756605S: Studies in Botany in other Finnish Universities, 0 op
757605S: Studies in Genetics in other Finnish Universities, 0 op
755605S: Studies in Zoology in other Finnish Universities, 0 op
756105P: Studies in botany in other Finnish universities, 0 op
756305A: Studies in botany in other Finnish universities, 0 op
757105P: Studies in genetics in other Finnish universities, 0 op
757305A: Studies in genetics in other Finnish universities, 0 op
755105P: Studies in zoology in other Finnish universities, 0 op
755305A: Studies in zoology in other Finnish universities, 0 op
752656S: Taxonomy and ecology of plants, 2 - 4 op
750618S: Thursday seminar in biology, 2 op
750318A: Thursday seminar in biology, 2 op
750033Y: Tutorial for new students, 1 op
751668S: Wildlife management and game animal ecology, 6 op
751368A: Wildlife management and game animal ecology, 6 op
750625S: Winter ecology and physiology, 3 - 8 op
750325A: Winter ecology and physiology, 3 - 8 op

Opintojaksojen kuvaukset

Tutkintorakenteisiin kuulumattomien opintokokonaisuuksien ja -jaksojen kuvaukset

300002M: Advanced Information Skills, 1 op

Voimassaolo: 01.08.2009 -
Opiskelumuoto: Other Studies
Laji: Course
Vastuuyksikkö: Faculty of Science
Arvostelu: 1 - 5, pass, fail
Opettajat: Sassali, Jani Henrik
Opintokohteen kielet: Finnish

ECTS Credits:
1 credit
Language of instruction:
Finnish
Timing:

Recommend to degree students who are working on their diploma/master's thesis. The course unit is held once in the autumn and once in the spring semester.

Learning outcomes:
Students know the different phases of scientific information retrieval process and basic techniques of systematic information search. They will find the most important reference databases of their discipline and know how to evaluate information sources and search results.

Contents:
Scientific information retrieval, evaluation of search results and information sources, information search on subject areas of diploma/master's thesis.

Mode of delivery:
Blended teaching: lectures, web-based learning material and exercises in Optima environment, personal guidance

Learning activities and teaching methods:
Lectures 6-12h, self-study 20h, personal guidance 1h

Target group:
The course is optional for students of the Faculty of Science and the Faculty of Technology.

Prerequisites and co-requisites:
-

Recommended optional programme components:
-

Recommended or required reading:
Parts from the following chapters of the Toolbox of Research: https://wiki.oulu.fi/display/jotut/1.1+Tieteellinen+tiedonhankinta, https://wiki.oulu.fi/display/jotut/1.3.1+Tieteellisiin+julkaisuihin+pohjautuva+arviointi

Assessment methods and criteria:
Passing the course requires participation in the lectures (6h) and personal guidance and successful completion of the course assignments.

Grading:
pass/fail

Person responsible:
Science and Technology Library Tellus, tellustieto (at) oulu.fi

Working life cooperation:
-

Other information:
-

751635S: Advanced course in animal physiology, 8 op

Voimassaolo: - 31.07.2019

Opiskelumuoto: Advanced Studies

Laji: Course

Vastuuyksikkö: Department of Biology

Arvostelu: 1 - 5, pass, fail

Opettajat: Hohtola, Esa Juhani

Opintokohteen kielet: Finnish

ECTS Credits:
8 cr.

Language of instruction:
Finnish / (English).

Timing:
M.Sc. 1 st 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:
-
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.
Grading:
Pass / Fail.
Person responsible:
Prof. Esa Hohtola.
Working life cooperation:
No.
Other information:
-

753629S: Advanced course in bioinformatics, 4 op

Voimassaolo: - 31.07.2015

Opiskelumuoto: Advanced Studies

Laji: Course

Vastuuyksikkö: Department of Biology

Arvostelu: 1 - 5, pass, fail

Opettajat: Mikko Sillanpää

Opintokohteen kielet: Finnish

Leikkaavuudet:

757619S Advanced course in bioinformatics 5.0 op

ECTS Credits:
4 cr.
Language of instruction:
Finnish / (English).
Timing:
M.Sc. 1 st spring.
Learning outcomes:
The aim of the course is that students learn to handle independently sequence and genome data methods in genetic perspective.
Contents:
Bioinformatics methods in genome analyses, research methods for sequence evolution, new sequence data analysing methods. Course is connected with the course Experimental course in bioinformatics and molecular evolution (753624S).
Mode of delivery:
Face-to-face teaching.
Learning activities and teaching methods:
24 h lectures, 12 h seminars, 60 h independent studying, final exam or learning diary.
Target group:
BTg, preferably in same semester as Experimental course in bioinformatics and molecular evolution (753634S).
Prerequisites and co-requisites:
Molecular evolution (753327A) and Basics of bioinformatics (750340A) or equivalent knowledge.
Recommended optional programme components:
Prerequisite to Experimental course in bioinformatics and molecular evolution (753624S).
Recommended or required reading:
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Assessment methods and criteria:

Final exam or learning diary.
Grading:
1-5 / Fail.
Person responsible:
Prof. Mikko Sillanpää.
Working life cooperation:
No.
Other information:
-

752682S: Advanced course in plant biology, 9 op

Voimassaolo: - 31.07.2018

Opiskelumuoto: Advanced Studies

Laji: Course

Vastuuyksikkö: Department of Biology

Arvostelu: 1 - 5, pass, fail

Opettajat: Häggman, Hely Margaretha

Opintokohteen kielet: Finnish

ECTS Credits:
9 cr.
Language of instruction:
Finnish / English.
Timing:
M.Sc. 1 st or 2 nd spring, every second year.
Learning outcomes:
The student will be able to evaluate how gene expression affects plant development and metabolism, learns both holistic and specific methods of studying gene expression. She/he is also able to evaluate and analyze the reliability of the data achieved. The student will also be familiar with the most recent literature of the field.
Contents:
Due to the new sequencing technologies the amount of sequence data will increase rapidly. The course will focus on gene expression and especially on regulation of gene expression (transcription factors, RNAi, microRNAs, genome level regulation, histone acetylation, and methylation). Research methods at transcriptome, proteome and metabolome level will be included as well as qualitative and quantitative methods both at single gene level but also at global level. The exercises include methodology used in gene expression analyses. The seminars will familiarize in the most recent literature.
Mode of delivery:
Face-to-face teaching.
Learning activities and teaching methods:
30 h lectures and seminar, 68 h exercises (demonstrations included), reports, final exam.
Target group:
BSb: compulsory.
Prerequisites and co-requisites:
Basics of functional plant biology lectures and exercises (752345A, 756341A) or equivalent knowledge.
Recommended optional programme components:
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Recommended or required reading:
Taiz, L. & Zeiger, E.: Plant Physiology (5th ed.) Sinauer Ass., Sunderland Mass.
The availability of the literature can be checked from this link.
Assessment methods and criteria:
Reports, exam.
Grading:
1-5 / Fail.
Person responsible:
Prof. Hely Häggman and Prof. Anja Hohtola.
Working life cooperation:
No.
Other information:
-

751651S: Advanced identification in animals, 4 - 8 op

Opiskelumuoto: Advanced Studies
Laji: Course
Vastuuyksikkö: Department of Biology
Arvostelu: 1 - 5, pass, fail
Opettajat: Orell, Markku Ilmari
Opintokohteen kielet: Finnish

ECTS Credits:
4-8 cr.
Language of instruction:
Finnish / English.
Timing:
M.Sc. 1 st autumn.
Learning outcomes:
Student is able to identify special animal groups or species from museum samples and know the ecology and distribution in Finland.
Contents:
Identification of special animal groups (fishes; amphibian and reptiles; birds; mammals; some group of invertebrates), their ecology and distribution.
Mode of delivery:
Face-to-face teaching.
Learning activities and teaching methods:
Independent study, oral final exam.
Target group:
ECOe.
Prerequisites and co-requisites:
No.
Recommended optional programme components:
-
Recommended or required reading:
Suomen eläimet 1-3; Suomen luonto: Linnut; Nisäkkäät; Kalat, Sammakkoeläimet ja matelijat, Koli, L.: Suomen kalat, Siivonen, L. & Sulkava, S.: Pohjolan nisäkkäät or relevant literature in English.
The availability of the literature can be checked from this link.
Assessment methods and criteria:
Oral exam.
Grading:
1-5 / Fail.
Person responsible:
Prof. Markku Orell.
Working life cooperation:
No.
Other information:
-

752608S: Advanced identification of plant species I, 6 op

Opiskelumuoto: Advanced Studies
Laji: Course
Vastuuyksikkö: Department of Biology
Arvostelu: 1 - 5, pass, fail
Opettajat: Anna Ruotsalainen
Opintokohteen kielet: Finnish

ECTS Credits:
6 cr.
Language of instruction:

Finnish / English
Timing:
B.Sc. 3 rd year, M.Sc. 1 st year.
Learning outcomes:
Advanced identification of the vascular plants of Finland.
Contents:
Independent studying of herbarium samples. Distribution types of plants in Fennoscandia excluding the Russian parts.
Mode of delivery:
Face-to-face teaching.
Learning activities and teaching methods:
Independent studying of herbarium samples. The course could be examined in two parts: 1) monocots, 2) ferns, dicots and distributions.
Target group:
-
Prerequisites and co-requisites:
Identification of plant species (752303A) or equivalent knowledge.
Recommended optional programme components:
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Recommended or required reading:
Hämet-Ahti et al. 1998: Retkeilykasvio (Field Flora of Finland), Ed. 4. Finnish Museum of Natural History, Helsinki. 656 p.
The availability of the literature can be checked from this link.
Assessment methods and criteria:
Species exam.
Grading:
1-5 / Fail.
Person responsible:
Dr. Anna Liisa Ruotsalainen.
Working life cooperation:
No.
Other information:
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752625S: Advanced identification of plant species II, 5 - 8 op

Opiskelumuoto: Advanced Studies

Laji: Course

Vastuuyksikkö: Department of Biology

Arvostelu: 1 - 5, pass, fail

Opettajat: Anna Ruotsalainen

Opintokohteen kielet: Finnish

Voidaan suorittaa useasti: Kyllä

ECTS Credits:
5-8 cr.
Language of instruction:
Finnish / English.
Timing:
M.Sc. 1 st or 2 nd year.
Learning outcomes:
Identification of systematically or ecologically limited groups. For example macrofungi, mosses, lichens, phytoplankton, aquatic, shore, forest, meadow, peatland or fell plants, species of primeval forest and macroscopic plant remains.
Contents:
Identification of systematically or ecologically limited groups from herbarium samples and preparates. Lichens 8 cr., others 5 cr.
Mode of delivery:
Face-to-face teaching.
Learning activities and teaching methods:
Independent studying of herbarium samples or preparations, species exam.

Target group:
Ecology students.
Prerequisites and co-requisites:
Identification of plant species (752303A).
Recommended optional programme components:
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Recommended or required reading:
Literature related to the topic.
Assessment methods and criteria:
Species exam.
Grading:
1-5 / Fail.
Person responsible:
Dr. Anna Liisa Ruotsalainen.
Working life cooperation:
No.
Other information:
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756629S: Advanced plant tissue culture, 4 op

Voimassaolo: - 31.07.2014

Opiskelumuoto: Advanced Studies

Laji: Course

Vastuuyksikkö: Department of Biology

Arvostelu: 1 - 5, pass, fail

Opettajat: Hohtola, Anja Terttu Marjatta

Opintokohteen kielet: Finnish

ECTS Credits:
4 cr.
Language of instruction:
Finnish / English.
Timing:
M.Sc. 1 st spring, (arranged if resources allow).
Learning outcomes:
Lectures deepens the knowledge and understanding of various tissue culture techniques.
Contents:
Lectures provide insight into tissue culture techniques and research work by expanding knowledge and understanding especially in applications which are potential in plant biotechnology. The course includes laboratory part, which familiarizes students with certain techniques like e.g. cryopreservation, protoplast fusion; the topic depends on the field of specialization of the visiting teacher.
Mode of delivery:
Face-to-face teaching.
Learning activities and teaching methods:
Lectures, exercises.
Target group:
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Prerequisites and co-requisites:
Plant tissue culture (752388A).
Recommended optional programme components:
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Recommended or required reading:
Handouts.
Assessment methods and criteria:
Exam.
Grading:
1-5 / Fail.
Person responsible:
Prof. Anja Hohtola.
Working life cooperation:

No.
Other information:
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751666S: Animal behaviour, 5 op

Opiskelumuoto: Advanced Studies
Laji: Course
Vastuuyksikkö: Department of Biology
Arvostelu: 1 - 5, pass, fail
Opettajat: Kaitala Arja
Opintokohteen kielet: Finnish

ECTS Credits:
5 cr.
Language of instruction:
Finnish.
Timing:
B.Sc. 3 rd spring, M.Sc. 1 st spring.
Learning outcomes:
To understand basic principles of animal behaviour in an evolutionary ecology contest.
Contents:
The basics of behavioural ecology of animals. Lecture topics: Animal foraging, predator-pray interactions, mating systems, and social behaviour. Seminars are based on the latest research results.
Mode of delivery:
Face-to-face teaching.
Learning activities and teaching methods:
30 h lectures, seminars, final exam.
Target group:
B.Sc. degree optional to ECO, M.Sc. degree compulsory to ECOz.
Prerequisites and co-requisites:
No.
Recommended optional programme components:
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Recommended or required reading:
Krebs, J. R. & Davies, N.B. (1993) An Introduction to Behavioural Ecology, 4 th edition, Oxford: Blackwell.
Viitala, J, (2005): Vapaasta tahdosta? Käyttäytymisen evolutiivinen perusta. 2005. Atena.
The availability of the literature can be checked from this link.
Assessment methods and criteria:
Seminar and exam.
Grading:
1-5 / Fail.
Person responsible:
Prof. Arja Kaitala.
Working life cooperation:
No.
Other information:
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751366A: Animal behaviour, 5 op

Opiskelumuoto: Intermediate Studies
Laji: Course
Vastuuyksikkö: Department of Biology
Arvostelu: 1 - 5, pass, fail
Opettajat: Kaitala Arja
Opintokohteen kielet: Finnish

ECTS Credits:
5 cr.
Language of instruction:
Finnish.
Timing:
B.Sc. 3 rd spring, M.Sc. 1 st spring.
Learning outcomes:
To understand basic principles of animal behaviour in an evolutionary ecology contest.
Contents:
The basics of behavioural ecology of animals. Lecture topics: Animal foraging, predator-pray interactions, mating systems, and social behaviour. Seminars are based on the latest research results.
Mode of delivery:
Face-to-face teaching.
Learning activities and teaching methods:
30 h lectures, seminars, exam.
Target group:
B.Sc. degree optional to ECO, M.Sc. degree compulsory to ECOz.
Prerequisites and co-requisites:
No.
Recommended optional programme components:
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Recommended or required reading:
Additional reading: *Krebs*, J. R. & *Davies*, N.B. (1993) An *Introduction to Behavioural* Ecology, 4s painos Oxford: Blackwell. Viitala, J, (2005): Vapaasta tahdosta? Käyttäytymisen evolutiivinen perusta. 2005. Atena.
The availability of the literature can be checked from this link.
Assessment methods and criteria:
Seminar and exam.
Grading:
1-5 / Fail.
Person responsible:
Prof. Arja Kaitala.
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

Vastuuyksikkö: Department of Biology

Arvostelu: 1 - 5, pass, fail

Opettajat: Saarela, Seppo Yrjö Olavi

Opintokohteen kielet: Finnish

Leikkaavuudet:

755327A Animal physiology exercises 5.0 op

ECTS Credits:
4 cr.
Language of instruction:
Finnish.
Timing:
B.Sc. 3 rd 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.
Grading:
1-5 / Fail.
Person responsible:
Prof. Seppo Saarela.
Working life cooperation:
No.
Other information:
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751388A: Animal physiology, lectures, 4 op

Voimassaolo: - 31.07.2015

Opiskelumuoto: Intermediate Studies

Laji: Course

Vastuuyksikkö: Department of Biology

Arvostelu: 1 - 5, pass, fail

Opettajat: Saarela, Seppo Yrjö Olavi

Opintokohteen kielet: Finnish

Leikkaavuudet:

755323A Animal physiology 5.0 op

ECTS Credits:
4 cr.
Language of instruction:
Finnish.
Timing:
B.Sc. 2nd spring.
Learning outcomes:
After completing the course the student is able to form a general view of animal body functions, the regulation of organ systems, and the background of human health and diseases.
Contents:
Course focus on the basic problematic of physiological themes including nervous system, muscles, circulation, nutrition, metabolism, immune system, hormones and reproduction physiology.
Mode of delivery:
Face-to-face teaching.
Learning activities and teaching methods:
50 h lectures and independent studying, mid-semester exams, home essays.
Target group:
Compulsory to the biology students.
Prerequisites and co-requisites:
Cell biology (750121P) or equivalent knowledge.
Recommended optional programme components:
This course is a prerequisite for the courses Animal physiology, exercises (755318A), Comparative animal physiology (751x84A/S) and Advanced course in animal physiology (751635S).
Recommended or required reading:

Reece, J.B. Urry, L.A. Cain, M.L., Wasserman, S.A. Minorsky, P.V. & Jackson R.B. 2011: Campbell Biology (9. painos). Pearson, Global Edition, 1309 s, handouts.
The availability of the literature can be checked from this link.
Assessment methods and criteria:
Home essays and exam.
Grading:
1-5 / Fail.
Person responsible:
Prof. Seppo Saarela.
Working life cooperation:
No.
Other information:
-

752677S: Aquatic and littoral vegetation, 3,5 op

Voimassaolo: - 31.07.2015

Opiskelumuoto: Advanced Studies

Laji: Course

Vastuuyksikkö: Department of Biology

Arvostelu: 1 - 5, pass, fail

Opettajat: Jari-Heikki Oksanen

Opintokohteen kielet: Finnish

ECTS Credits:
3,5 cr.
Language of instruction:
Finnish.
Timing:
M.Sc. 1 st or 2 nd autumn, (arranged if resources allow).
Learning outcomes:
The student will learn to identify a selection of aquatic and littoral plant species, and some features of their ecological requirements.
Contents:
Littoral and aquatic vascular plants, bryophytes and macro algae.
Mode of delivery:
Face-to-face teaching.
Learning activities and teaching methods:
10 h lectures, 26 h exercises, field excursions around Oulu.
Target group:
-
Prerequisites and co-requisites:
No.
Recommended optional programme components:
-
Recommended or required reading:
-
Assessment methods and criteria:
-
Grading:
-
Person responsible:
Prof. Jari Oksanen.
Working life cooperation:
No.
Other information:
-

755608S: Avian reproductive biology, 2 op

Opiskelumuoto: Advanced Studies
Laji: Course
Vastuuyksikkö: Department of Biology
Arvostelu: 1 - 5, pass, fail
Opettajat: Seppo Rytkönen, Orell, Markku Ilmari
Opintokohteen kielet: Finnish

ECTS Credits:
2 cr.
Language of instruction:
Finnish.
Timing:
M.Sc. degree. Every second year.
Learning outcomes:
Student gets current scientific research knowledge in animal reproductive ecology and behaviour.
Contents:
Introduction to sexual reproduction and parental care in animals. Birds are used as a taxonomic reference group, but the concepts and theories are discussed in the general evolutionary ecological framework. Topics: e.g. habitat selection, territoriality, mating systems and brood parasitism.
Mode of delivery:
Face-to-face teaching.
Learning activities and teaching methods:
24 h lectures, exam.
Target group:
-
Prerequisites and co-requisites:
No.
Recommended optional programme components:
-
Recommended or required reading:
-
Assessment methods and criteria:
Exam.
Grading:
1-5 / Fail.
Person responsible:
Prof. Markku Orell and Dr. Seppo Rytkönen.
Working life cooperation:
No.
Other information:
-

750366A: Bachelor of Science final examination, 5 op

Opiskelumuoto: Intermediate Studies
Laji: Course
Vastuuyksikkö: Department of Biology
Arvostelu: 1 - 5, pass, fail
Opintokohteen kielet: Finnish

ECTS Credits:
5 cr.
Language of instruction:
Finnish / English.
Timing:
B.Sc. 3 rd year.
Learning outcomes:
Student will understand basic methods, results and theories in ecology, physiology or genetics.
Contents:

Examinations on books related to B.Sc. thesis subject. List of books are presented on noticed boards and in the internet. All the books are done on the same exam.

Mode of delivery:
Face-to-face teaching.
Learning activities and teaching methods:
Students make workshops where they discuss content of the books. Book exam.

Target group:
Compulsory to the biology students.
Prerequisites and co-requisites:
No.
Recommended optional programme components:
-
Recommended or required reading:
BSz:

- Option 1: Randall etc.: Eckert's Animal Physiology, 5. ed., 2002 or newer, (chapter 4 onwards).
- Option 2: Richard W. Hill, Gordon A. Wyse, and Margaret Anderson: Animal Physiology, 2. ed., Sinauer Press, 2008.
- Other books can be agreed on special reasons.

BSg

- Klug, W. S., Cummings, M. R., Spencer, C.A ja Palladino M.A.: Concepts of Genetics (9. ed.). Pearson & Prentice Hall, 2009

BSb:

- Option 1: Ridge, I. 2002. Plants. Oxford University Press, 344p. ISBN 0-19-925548-2
- Option 2: Mauseth, J.D. 2003. An introduction to plant biology. Third Edition 848p. ISBN 0-7637-2134-4
- Other books can be agreed on special reasons.

ECOz:
Exam book ensemble (5 cr.) is chosen from the following list:

- Bennett, P.M. & Owens, I.P.F. 2002. Evolutionary ecology of birds. Life histories, mating systems and extinction. – Oxford University Press. 206 s.
- Hanski, I . 2007. The Scrinking world. (2 cr.)
- Jarvis, P. 2000. Ecological principles and environmental issues. – Prentice Hall, 279 s.
- Krebs, J.R. & Davies, N.B. 1993. An introduction to behavioural ecology. – Blackwell, 386 s. (3 cr.)
- Mayr, E. 1999. Biologia. Elämän tiede. – Art House, 327 s. (2 cr.)
- Pianka, E. R. 2000. Evolutionary ecology. – Harper & Row, 429 s.
- Townsend, C.R., Begon, M. & Harper, J.L. 2008. – Blackwell. 482 s.
- Smith, J.N.M., Keller, L.F., Marr, A.B. & Arcese, P. 2006. Conservation and biology of small populations. – Oxford University Press. 205 s.
- Other books can be agreed on special reasons.

ECOb:

- Larcher W. 2003. Physiological Plant Ecology 4th edition, 513 sivua
- Ridge I. (Ed.) 2002. Plants. Oxford University Press, 345 sivua.
- Salonen V. 2006. Kasviekologia. 306 sivua, WSOY.
- Willis K.J. and McElwain J.C. 2002. The evolution of plants. 378 sivua. Oxford University Press.
- Terävä E. ja Kanervo E. 2008. Kasvianatomia. EDITA, 205 sivua.
- Scott Peter 2008. Physiology and Behaviour of Plants. Wiley, 305 sivua.
- Other books can be agreed on special reasons.

The availability of the literature can be checked from this link.
Assessment methods and criteria:
Exam.
Grading:
1-5 / Fail.
Person responsible:
Prof. Esa Hohtola, Prof. Hely Häggman, Prof. Juha Tuomi, Dr. Helmi Kuittinen and Prof. Markku Orell.
Working life cooperation:
No.
Other information:
-

750332A: Bachelor of Science maturity exam, 0 op

Opiskelumuoto: Intermediate Studies

Laji: Course

Vastuuyksikkö: Department of Biology

Arvostelu: 1 - 5, pass, fail

Opintokohteen kielet: Finnish

ECTS Credits:
0 cr.
Language of instruction:
Finnish / Swedish / English.
Timing:
B.Sc. degree.
Learning outcomes:
The student is well acquainted with the subject of the thesis and shows good first language skills.
Contents:
After completing the Bachelor of Science Thesis, the student writes an essay in his/her native language on the thesis, to show a good command of the language and the topic of the thesis.

Mode of delivery:
Face-to-face teaching.
Learning activities and teaching methods:
Detailed instructions on the biology notice board. Four pages long essay exam. One teacher examine the maturity exam and Pro gradu working group accepts it. 4 h exam.

Target group:
Compulsory to the biology students. Exam is taken after completion of the thesis.
Prerequisites and co-requisites:
No.
Recommended optional programme components:
-
Recommended or required reading:
-
Assessment methods and criteria:
Four pages long essay.
Grading:
Pass / Fail.
Person responsible:
Professor of the student's major subject.
Working life cooperation:
No.
Other information:
-

750396A: Bachelor of Science seminar, 3 op

Voimassaolo: - 31.07.2015

Opiskelumuoto: Intermediate Studies

Laji: Course

Vastuuyksikkö: Department of Biology

Arvostelu: 1 - 5, pass, fail

Opintokohteen kielet: Finnish

Leikkaavuudet:

750376A	Bachelor of Science seminar and thesis	10.0 op

ECTS Credits:
3+1 cr.
Language of instruction:
Finnish.
Timing:

B.Sc. 3 rd year.
Learning outcomes:
The student is familiar with the technical and ethical principles of scientific writing and publishing. The student is capable of composing a scientific review (bachelor thesis), and is able to present its key points in the form of talk or poster.
Contents:
The seminar gives a broad overview of scientific communication. It supports the students in the process of writing BSc thesis. The course includes a short seminar presentation of the thesis subject. The lecture part includes principles of composing theses and scientific articles, modes and channels of scientific communication, writing techniques, scientific publishing forums and the correct use citations. Seminar includes course 030005P Introduction to information retrieval (1 cr), see Scientific library Tellus for more information.
Mode of delivery:
Face-to-face teaching.
Learning activities and teaching methods:
Lectures, computer exercises, workgroups, and seminar or poster presentation.
Target group:
Compulsory to the biology students.
Prerequisites and co-requisites:
No.
Recommended optional programme components:
-
Recommended or required reading:
-
Assessment methods and criteria:
Exam, workgroup participation and presentation.
Grading:
Pass / Fail.
Person responsible:
Prof. Esa Hohtola (autumn) and Prof. Jari Oksanen (spring).
Working life cooperation:
No.
Other information:
-

750367A: Bachelor of Science thesis, 10 op

Voimassaolo: - 31.07.2015

Opiskelumuoto: Intermediate Studies

Laji: Course

Vastuuyksikkö: Department of Biology

Arvostelu: 1 - 5, pass, fail

Opintokohteen kielet: Finnish

ECTS Credits:
10 cr.
Language of instruction:
Finnish / English.
Timing:
B.Sc. 3 rd year.
Learning outcomes:
Student will plan and write up thesis by getting acquainted to an interesting biology subject and reviewing it critically with the help of relevant scientific source material.
Contents:
Independent research work on a scientific subject in agreement with the responsible professor and under the supervision of the Department. The supervisors may be professors of the department, docents and other teachers and researchers who have the docent's status. The student may have several supervisors, the other supervisor may be from other department, university (also abroad) or from research institute. The subject must be agreed on with the professor in advance. The research work can contain fieldwork, laboratory work, theoretical work or work on collections in museum. The work always includes a literature survey. After having completed the thesis, the student writes the Maturity Exam. The dean will order the examiners by the proposal of the professor. Pro gradu working group accepts and grades the thesis on the basis of the examiners' opinions.

Mode of delivery:
Face-to-face teaching.
Learning activities and teaching methods:
About 20 pages long thesis.

Target group:
Compulsory to the biology students.
Prerequisites and co-requisites:
No.
Recommended optional programme components:
Done at the same time as B.Sc. seminar workshop in spring.
Recommended or required reading:
-
Assessment methods and criteria:
Thesis.
Grading:
Pass / Fail.
Person responsible:
Professors.
Working life cooperation:
No.
Other information:
-

756340A: Basic course in plant morphology, exercises, 2 op

Voimassaolo: 01.08.2011 - 31.07.2015

Opiskelumuoto: Intermediate Studies

Laji: Course

Vastuuyksikkö: Department of Biology

Arvostelu: 1 - 5, pass, fail

Opettajat: Hohtola, Anja Terttu Marjatta

Opintokohteen kielet: Finnish

ECTS Credits:
2 cr.
Language of instruction:
Finnish / English.
Timing:
B.Sc. 1st autumn.
Learning outcomes:
The student can differentiate the basic structures of root, leaf and reproductive organs in the microscope and on the whole plant level.
Contents:
Organology and morphology of higher plants including the transformation of organs and adaptation to different functions. Exercises give a general survey of the plant tissues and anatomical structures of organs at the microscopic and macroscopic level. Students learn to identify the diversity of plant structures and ways of the adaption to the various habitats.
Mode of delivery:
Face-to-face teaching.
Learning activities and teaching methods:
30 h laboratory exercises and plant microscopy, drawing the structures.
Target group:
Compulsory to BS, optional to TEAbs.
Prerequisites and co-requisites:
Basic course in plant morphology, lectures (752337A).
Recommended optional programme components:
Basics in functional plant biology, lectures (752345A) and exercises (756341A).
Recommended or required reading:

Lecture material and supplementary reading: Mauseth, J.D.: Botany. An Introduction to Plant Biology (parts) and /or Timmermans, M.C.P.: Plant Development. 2010. Elsevier.
The availability of the literature can be checked from this link.
Assessment methods and criteria:
Exam.
Grading:
1-5 / Fail.
Person responsible:
Prof. Anja Hohtola.
Working life cooperation:
No.
Other information:
-

752337A: Basic course in plant morphology, lectures, 2 op

Voimassaolo: - 31.07.2015

Opiskelumuoto: Intermediate Studies

Laji: Course

Vastuuyksikkö: Department of Biology

Arvostelu: 1 - 5, pass, fail

Opettajat: Hohtola, Anja Terttu Marjatta

Opintokohteen kielet: Finnish

ECTS Credits:
2 cr.
Language of instruction:
Finnish.
Timing:
B.Sc. 1 st autumn.
Learning outcomes:
The student can identify the basic structure of root, leaf and reproductive organs and to understand the development towards more complex structures.
Contents:
Organology and morphology of shoot plants including transformation of organs and adaptation to different functions. General survey of plant tissues and anatomical structure of organs. Basic terms used in plant morphology are introduced.
Mode of delivery:
Face-to-face teaching.
Learning activities and teaching methods:
16 h independent studying and exam.
Target group:
Lectures compulsory to the biology students.
Prerequisites and co-requisites:
No.
Recommended optional programme components:
Lectures are prerequisite for the Basic course in plant morphology, exercises (756340A) 2 cr.
Recommended or required reading:
Lecture material and supplementary reading: Mauseth, J.D.: Botany. An Introduction to Plant Biology (parts) and /or Timmermans, M.C.P.: Plant Development. 2010. Elsevier.
The availability of the literature can be checked from this link.
Assessment methods and criteria:
Exam.
Grading:
1-5 / Fail.
Person responsible:
Prof. Anja Hohtola.
Working life cooperation:
No.
Other information:
-

752688S: Basic of plant tissue culture, 5 op

Opiskelumuoto: Advanced Studies
Laji: Course
Vastuuyksikkö: Department of Biology
Arvostelu: 1 - 5, pass, fail
Opettajat: Hohtola, Anja Terttu Marjatta
Opintokohteen kielet: Finnish

ECTS Credits:
5 cr.
Language of instruction:
Finnish / English.
Timing:
B.Sc. 2 nd or M.Sc. 1 st autumn.
Learning outcomes:
The course aims to help students learn to basic plant tissue culture concepts, to establish tissue culture systems and to understand totipotency.
Contents:
Preparation of culture media and establishment of sterile cultures starting from different plant organs and tissues. Cytodifferentiation and viability tests are also included in the course. Students are able to follow how plant hormones determine the differentiation of tissues.
Mode of delivery:
Face-to-face teaching.
Learning activities and teaching methods:
8 h lectures, 35 h demonstrations and exercises, literature work, seminar.
Target group:
Optional to BS in the B.Sc. degree, compulsory to BSb in the M.Sc. degree.
Prerequisites and co-requisites:
No.
Recommended optional programme components:
Course gives ability to further studies in molecular biology.
Recommended or required reading:
Course handout the book: Collin, H. A. & Edwards, S. 1998: Plant Cell Culture. Bios Scientific Publ.
The availability of the literature can be checked from this link.
Assessment methods and criteria:
Exam.
Grading:
1-5 / Fail.
Person responsible:
Prof. Anja Hohtola.
Working life cooperation:
No.
Other information:
-

756341A: Basics in functional plant biology, exercises, 5 op

Voimassaolo: 01.08.2011 -
Opiskelumuoto: Intermediate Studies
Laji: Course
Vastuuyksikkö: Department of Biology
Arvostelu: 1 - 5, pass, fail
Opettajat: Anna-Maria Pirttilä, Hohtola, Anja Terttu Marjatta
Opintokohteen kielet: Finnish

ECTS Credits:

5 cr.
Language of instruction:
Finnish / English.
Timing:
B.Sc. 2nd spring.
Learning outcomes:
Student extends the basic laboratory skills and associate physiological phenomena from literature to practice. After completing the course, the student is able to plan small physiological research projects and can analyze, interpret and report the results in a scientific form.
Contents:
The course comprises of 10 laboratory exercises from various areas of plant physiology. The students will themselves plan the schedule for the experiments and write the results in the form of a scientific publication. The reports will be graded and the score will be part of the mark.
Mode of delivery:
Face-to-face teaching.
Learning activities and teaching methods:
45 h laboratory exercises which precedes pre exam in Optima (questions from handout). Exercises are done in pairs and reports are made as team work.
Target group:
BS: compulsory, TEAbs optional.
Prerequisites and co-requisites:
Cell biology (750121P) and Basics in functional plant biology, lectures (752345A). Also Basic course in plant morphology (752337A, 756340A) helps in following the course.
Recommended optional programme components:
Basics in functional plant biology lectures and exercises (752345A, 756341A) is prerequisite to Advanced course in plant biology (752682S).
Recommended or required reading:
Taiz, L. & Zeigler, E. 2010: Plant Physiology (parts), Sinauer Ass., Sunderland Mass.; Hohtola ym.: Harjoitustyömoniste.
The availability of the literature can be checked from this link.
Assessment methods and criteria:
Laboratory exercises, reports.
Grading:
1-5 / Fail.
Person responsible:
Dr. Anna Maria Pirttilä.
Working life cooperation:
No.
Other information:
-

753614S: Basics in population genetics, 8 op

Voimassaolo: - 31.07.2015

Opiskelumuoto: Advanced Studies

Laji: Course

Vastuuyksikkö: Department of Biology

Arvostelu: 1 - 5, pass, fail

Opettajat: Savolainen Outi

Opintokohteen kielet: Finnish

Leikkaavuudet:

757613S	Basics in population genetics	5.0 op

ECTS Credits:
8 cr.
Language of instruction:
Finnish / English.
Timing:
BS: B.Sc. 2nd or M.Sc. 1st autumn and spring, ECOGEN BSg 1st autumn and spring, ECOGEN ECOz,b 2nd 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 population genetics. Measuring variation, mutation, genetic drift, inbreeding, selection, genetics of speciation, 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 seminar + 40 h of independent work.
Target group:
Optional to BS in B.Sc. degree, compulsory to BSg in M.Sc. degree. Compulsory to ECOGEN students. Suitable 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 for 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. ed (or older) Hartl 2000: A Primer of Population Genetics, Sinauer, Massachusetts.
The availability of the literature can be checked from this link.
Assessment methods and criteria:
Seminar and final exams.
Grading:
1-5 / Fail.
Person responsible:
Dr. Minna Ruokonen.
Working life cooperation:
No.
Other information:
-

753314A: Basics in population genetics, 8 op

Voimassaolo: - 31.07.2015

Opiskelumuoto: Intermediate Studies

Laji: Course

Vastuuyksikkö: Department of Biology

Arvostelu: 1 - 5, pass, fail

Opettajat: Tanja Pyhäjärvi

Opintokohteen kielet: English

Leikkaavuudet:

757313A	Basics in population genetics	5.0 op

ECTS Credits:
8 cr.
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 population genetics. Measuring variation, mutation, genetic drift, inbreeding, selection, genetics of speciation, 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 + independent work; final exam.
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. ed (or older) Hartl 2000: A Primer of Population Genetics, Sinauer, Massachusetts.
The availability of the literature can be checked from this link.
Assessment methods and criteria:
Seminar and final exams.
Grading:
1-5 / Fail.
Person responsible:
Dr. Minna Ruokonen.
Working life cooperation:
No.
Other information:
-

750340A: Basics of bioinformatics, 3 op

Voimassaolo: - 31.07.2016

Opiskelumuoto: Intermediate Studies

Laji: Course

Vastuuyksikkö: Department of Biology

Arvostelu: 1 - 5, pass, fail

Opintokohteen kielet: English

Leikkaavuudet:

757314A	Basics of bioinformatics	5.0 op

ECTS Credits:
3 cr.
Language of instruction:
Finnish / English.
Timing:
B.Sc. studies, 2 nd 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:
-
Recommended or required reading:
Given in the course.
Assessment methods and criteria:
Reports, exercises, reports, seminar presentation, independent working.
Grading:
1-5 / Fail
Person responsible:
Dr. Minna Ruokonen.
Working life cooperation:
No.
Other information:
-

750640S: Basics of bioinformatics, 3 op

Voimassaolo: 01.08.2011 -

Opiskelumuoto: Advanced Studies

Laji: Course

Vastuuyksikkö: Department of Biology

Arvostelu: 1 - 5, pass, fail

Opintokohteen kielet: English

ECTS Credits:
3 cr.
Language of instruction:
English.
Timing:
ECOGEN 1st 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:
ECOGEN.
Prerequisites and co-requisites:
Course Concepts of genetics (753124P) compulsory, also Molecular evolution (753327A) is recommended or equivalent knowledge.
Recommended optional programme components:
-
Recommended or required reading:
Given in the course.
Assessment methods and criteria:
Reports, exercises, reports, seminar presentation, independent working.
Grading:
1-5 / Fail
Person responsible:
Dr. Minna Ruokonen.
Working life cooperation:

No.
Other information:
-

750124P: Basics of ecology, 5 op

Opiskelumuoto: Basic Studies
Laji: Course
Vastuuyksikkö: Department of Biology
Arvostelu: 1 - 5, pass, fail
Opettajat: Jari-Heikki Oksanen
Opintokohteen kielet: Finnish

ECTS Credits:
5 cr.
Language of instruction:
Finnish.
Timing:
B.Sc. 1 st spring.
Learning outcomes:
After completion of the course both biology and minor studies students understand better function of nature and the ecological phenomena in individual, population, community and ecosystem level.
Contents:
The course gives a student a basic idea about ecological interactions in individual-, population-, community- and ecosystem levels. In individual level the focus is on environmental demands of plants and animals. In population level the birth- and death rate of age groups and their effect on population growth is focused. In interactions between different species the emphasis is on how the competition between species leads to differentiation of niches. Predation is viewed as the regulatory effect on the population dynamics of prey populations. In community level the biodiversity and the patterns of succession are the main questions. In ecosystem level the emphasis is on energy flows and nutrient cycling. Evolution and adaptation are important in different fields of ecology.
Mode of delivery:
Face-to-face teaching.
Learning activities and teaching methods:
The course is divided into three parts which follow the course book Krebs, C. J. 2009: Ecology (6 th edition). 1 st part: 24 hours of lectures based mainly on parts 1-2 of the course book. 2 nd part: 24 hours of lectures are based on part 3 of the course book. 3 rd part: students read the part 4 from the course book. In the course exam, there will be three questions, one from each part and all the questions have to be passed.
Target group:
Compulsory biology students.
Prerequisites and co-requisites:
No.
Recommended optional programme components:
-
Recommended or required reading:
Krebs, C. J. 2009: Ecology (6 th edition).
The availability of the literature can be checked from this link.
Assessment methods and criteria:
Exam.
Grading:
1-5 / Fail.
Person responsible:
Prof. Markku Orell and Prof. Jari Oksanen.
Working life cooperation:
No.
Other information:
-

752345A: Basics of functional plant biology, lectures, 4 op

Voimassaolo: - 31.07.2015

Opiskelumuoto: Intermediate Studies
Laji: Course
Vastuuyksikkö: Department of Biology
Arvostelu: 1 - 5, pass, fail
Opettajat: Hohtola, Anja Terttu Marjatta
Opintokohteen kielet: Finnish
Leikkaavuudet:

756346A Plant biology lectures 5.0 op

ECTS Credits:
4 cr.
Language of instruction:
Finnish.
Timing:
B.Sc. 2 nd spring.
Learning outcomes:
The student can understand and explain the function and regulation of plant cells, tissues and entire plants.
Contents:
The most important phenomena of plant life, like photosynthesis, nitrogen metabolism, function of cell membranes and plant hormones are discussed.
Mode of delivery:
Face-to-face teaching.
Learning activities and teaching methods:
Lectures (26 h) and exam.
Target group:
Compulsory to the biology students.
Prerequisites and co-requisites:
Cell biology (750121P) or equivalent knowledge and course Plant morphology (752337A, 756340A) help to follow this course. This course is a prerequisite for course Advanced course in plant biology (752682S).
Recommended optional programme components:
-
Recommended or required reading:
Taiz, L. & Zeigler, E. 2010: Plant Physiology (parts), Sinauer Ass., Sunderland Mass.
The availability of the literature can be checked from this link.
Assessment methods and criteria:
Exam.
Grading:
1-5 / Fail.
Person responsible:
Prof. Anja Hohtola.

Working life cooperation:
No.
Other information:
-

752388A: Basics of plant tissue culture, 5 op

Opiskelumuoto: Intermediate Studies
Laji: Course
Vastuuyksikkö: Department of Biology
Arvostelu: 1 - 5, pass, fail
Opettajat: Hohtola, Anja Terttu Marjatta
Opintokohteen kielet: Finnish

ECTS Credits:
5 cr.
Language of instruction:

Finnish / English.
Timing:
B.Sc. 2 nd or M.Sc. 1 st autumn.
Learning outcomes:
The course aims to help students learn to basic plant tissue culture concepts, to establish tissue culture systems and to understand totipotency.
Contents:
Preparation of culture media and establishment of sterile cultures starting from different plant organs and tissues. Cytodifferentiation and viability tests are also included in the course. Students are able to follow how plant hormones determine the differentiation of tissues.
Mode of delivery:
Face-to-face teaching.
Learning activities and teaching methods:
8 h lectures, 35 h demonstrations and exercises, essay, seminar.
Target group:
B.Sc. degree BS: optional, M.Sc. degree BSb: compulsory.
Prerequisites and co-requisites:
No.
Recommended optional programme components:
Course gives ability to further studies in molecular biology.
Recommended or required reading:
Course handout the book: Collin, H. A. & Edwards, S. 1998: Plant Cell Culture. Bios Scientific Publ.
The availability of the literature can be checked from this link.
Assessment methods and criteria:
Exam.
Grading:
1-5 / Fail.
Person responsible:
Prof. Anja Hohtola.
Working life cooperation:
No.
Other information:
-

750635S: Biodiversity in human changed environments, 3 - 6 op

Voimassaolo: - 31.07.2015

Opiskelumuoto: Advanced Studies

Laji: Course

Vastuuyksikkö: Department of Biology

Arvostelu: 1 - 5, pass, fail

Opettajat: Orell, Markku Ilmari, Jouni Aspi, Muotka, Timo Tapani

Opintokohteen kielet: Finnish

Leikkaavuudet:

755631S Biodiversity in human changed environments 5.0 op

ECTS Credits:
6 cr.
Language of instruction:
Finnish / English.
Timing:
M.Sc. 1 st and 2 nd year, autumn, (arranged if resources allow).
Learning outcomes:
Student gets a wide view on basic concepts in conservation biology, why and how biodiversity can be maintained, present situation of biodiversity worldwide, threats and conservation needs of biodiversity.
Contents:
The course consists of three parts:
The course consists of three parts.
1. Introduction, which initiates students into main concepts and the present situation of biodiversity worldwide.
2. Populations, communities, and ecosystems in human changed environments. Themes e.g. extinctions,

conservation areas and their management, biodiversity and functioning of ecosystems, invasive species issues, extinction and fragmentation of natural habitats.
3. Genetics. Modern theory and practice of genetic conservation especially the usage of molecular genetic methods in determining the population structure.
Mode of delivery:
Face-to-face teaching.
Learning activities and teaching methods:
34 h lectures nad practicals, internet work and exam.
Target group:
Advanced course for ecology and genetics students.
Prerequisites and co-requisites:
No.
Recommended optional programme components:
-
Recommended or required reading:
Gaston, K. J. & Spicer, J. I. 2004: Biodiversity. An Introduction. 2 nd ed, Blackwell. 191 p. Other literature agreed on with the responsible persons.
The availability of the literature can be checked from this link.
Assessment methods and criteria:
Practical work and exam.
Grading:
Work report: Accepted / Fail, exam: 1-5 / Fail.
Person responsible:
Dos. Jouni Aspi, Prof. Timo Muotka and Prof. Markku Orell
Working life cooperation:
No.
Other information:
-

750363A: Biogeography, 4 op

Voimassaolo: - 31.07.2015

Opiskelumuoto: Intermediate Studies

Laji: Course

Vastuuyksikkö: Department of Biology

Arvostelu: 1 - 5, pass, fail

Opettajat: Jari-Heikki Oksanen

Opintokohteen kielet: Finnish

Leikkaavuudet:

750373A	Biogeography	5.0 op

ECTS Credits:
4 cr.

Language of instruction:
Finnish.
Timing:
B.Sc. 1 st autumn and spring.
Learning outcomes:
The course introduces students to basic concepts of biogeography, patterns of distribution and historical and present factors affecting the distribution. Plant biogeography introduces students to modern and historical factors controlling the plant cover, and to the special methods of vegetation science.
Contents:
The course consists of general part and optional part on plant biogeography and vegetation science. The general part introduces basic models and theories of distribution of organisms in the environment. Historical, evolutionary, geographical, climatic and ecological explanations. Research methods used in biogeography. The part on plant biogeography and vegetation science introduces methods on factors controlling the structure and composition of vegetation, and describes major vegetation types in Finland and principal biomes in the World. Methods of vegetation science are briefly surveyed.
Mode of delivery:

Face-to-face teaching.
Learning activities and teaching methods:
24 h (z) + 24 h (b) = 48 h lectures, two exams.
Target group:
Compulsory to biology students.
Prerequisites and co-requisites:
No.
Recommended optional programme components:
Other recommended courses related to the field: Biodiversity (750635S), Structure and dynamics of plant communities (756622S).
Recommended or required reading:
Cox, C. B. & Moore, P. D. 2005: Biogeography (7th ed.). Blackwell Science, Cambridge University Press. Eurola, S. 1999: Kasvipeitteemme alueellisuus. Oulanka Reports. Oulu 116 p., Cox, C. B. & Moore, P. D. 2000: Biogeography* (6 th ed.). Blackwell Science, Cambridge University Press. 298 p.
The availability of the literature can be checked from this link.
Assessment methods and criteria:
Two exams.
Grading:
1-5 / Fail. Final grade is average value of the two exams.
Person responsible:
Dr. Laura Kvist and Prof. Jari Oksanen.
Working life cooperation:
No.
Other information:
-

752662S: Botanical collection and digital herbarium, 2 - 6 op

Opiskelumuoto: Advanced Studies

Laji: Course

Vastuuyksikkö: Department of Biology

Arvostelu: 1 - 5, pass, fail

Opettajat: Anna Ruotsalainen

Opintokohteen kielet: Finnish

Voidaan suorittaa useasti: Kyllä

ECTS Credits:
2-6 cr, 100 species = 2 cr.
Language of instruction:
Finnish / English.
Timing:
B.Sc. or M.Sc. degree.
Learning outcomes:
Preparation (including labels) and identification of self-collected botanical specimens.
Contents:
The collection may contain solely vascular plants or together with moss and lichen specimens, for instance.
Mode of delivery:
Face-to-face teaching.
Learning activities and teaching methods:
Vascular plants have to be pressed and dried. The samples have to be in folded paper or small box including the name and place tag. Before starting the collection work student has to consult the teacher.
Target group:
-
Prerequisites and co-requisites:
Identification of plant species (752303A) or equivalent knowledge.
Recommended optional programme components:
-
Recommended or required reading:
Hämet-Ahti et al. 1998: Retkeilykasvio (Field Flora of Finland), Ed. 4. Finnish Museum of Natural History, Helsinki. 656 pp., and other field floras.
The availability of the literature can be checked from this link.

Assessment methods and criteria:
Collection is delivered to the person in responsible.
Grading:
Pass / Fail.
Person responsible:
Dr. Anna Liisa Ruotsalainen.
Working life cooperation:
No.
Other information:
-

752362A: Botanical collection and digital herbarium, 2 - 6 op

Opiskelumuoto: Intermediate Studies

Laji: Course

Vastuuyksikkö: Department of Biology

Arvostelu: 1 - 5, pass, fail

Opettajat: Anna Ruotsalainen

Opintokohteen kielet: Finnish

ECTS Credits:
2-6 cr., 100 species = 2 cr.
Language of instruction:
Finnish / English.
Timing:
B.Sc. or M.Sc. degree.
Learning outcomes:
Preparation (including labels) and identification of self-collected botanical specimens.
Contents:
The collection may contain solely vascular plants or together with moss and lichen specimens, for instance.
Mode of delivery:
Face-to-face teaching.
Learning activities and teaching methods:
Vascular plants have to be pressed and dried. The samples have to be in folded paper or small box including the name and place tag. Before starting the collection work student has to consult the teacher. 100 plant species correspond to 2 credits.
Target group:
-
Prerequisites and co-requisites:
Identification of plant species (752303A) or equivalent knowledge.
Recommended optional programme components:
-
Recommended or required reading:
Hämet-Ahti et al. 1998: Retkeilykasvio (Field Flora of Finland), Ed. 4. Finnish Museum of Natural History, Helsinki. 656 pp., and other field floras.
The availability of the literature can be checked from this link.
Assessment methods and criteria:
Collection is delivered to the person in responsible.
Grading:
Pass / Fail.
Person responsible:
Dr. Anna Liisa Ruotsalainen.
Working life cooperation:
No.
Other information:
-

750121P: Cell biology, 5 op

Voimassaolo: - 31.07.2020

Opiskelumuoto: Basic Studies
Laji: Course
Vastuuyksikkö: Department of Biology
Arvostelu: 1 - 5, pass, fail
Opettajat: Saarela, Seppo Yrjö Olavi
Opintokohteen kielet: Finnish

ECTS Credits:
5 cr.
Language of instruction:
Finnish.
Timing:
B.Sc. 1 st autumn.
Learning outcomes:
The student is familiar with cellular structure and functioning in plant and animal cells, understands the social structures in multicellular species and knows why and how the genetic organizations (in nucleus, chloroplast and mitochondria) are co-operating, maintaining and regulating the cellular metabolism.Student understands the common origin and evolution of life on planet Earth, and understands the material basis and mechanisms of this continuity.
Contents:
During the recent years especially the development of molecular and microscopic and imaging techniques has increased our knowledge on cells and their social interactions. The structural and functional characteristics of plant and animal cells will be covered as well as the genetic organization maintaining and regulating the system.
Mode of delivery:
Face-to-face teaching.
Learning activities and teaching methods:
72 h lectures, three exams (zoology, botany, genetics). Home essays and internet material.
Target group:
Compulsory to the biology and biochemistry students.
Prerequisites and co-requisites:
Good basics in biology from elementary school.
Recommended optional programme components:
Cell biology is prerequisite for the following courses: Developmental biology-histology lectures and excercises (751367A, 755317A), Anilal physiology lectures and exercises (751388A, 755318A), Functional plant biology lectures and exercises (752345A, 756341A), Concepts of genetics (753124P). Course also gives readiness for studies in molecular biology and biochemistry.
Recommended or required reading:
Oppikirja Alberts, B. ym. 2008: Molecular Biology of the Cell (5 th ed.). Garland Science Publishing, London, 1268 s. ISBN: 0815341067. (Lodish et al. 2004: Molecular Cell Biology (5 th ed.). Freeman, New York, 973 s.). Heino J. & Vuento M. 2004: Solubiologia (2. painos), WSOY, Porvoo 306 s. http://cc.oulu.fi/~ssaarela/; http://www.oulu.fi/genet/solubilsa/.
The availability of the literature can be checked from this link.
Assessment methods and criteria:
Three exams.
Grading:
1-5 / Fail. Final grade is average value of the three exams.
Person responsible:
Prof. Seppo Saarela, Prof. Hely Häggman and Dr. Helmi Kuittinen.
Working life cooperation:
No.
Other information:
-

755310A: Community ecology, 3 - 4 op

Voimassaolo: - 31.07.2015
Opiskelumuoto: Intermediate Studies
Laji: Course
Vastuuyksikkö: Department of Biology

Arvostelu: 1 - 5, pass, fail

Opettajat: Muotka, Timo Tapani

Opintokohteen kielet: Finnish

Leikkaavuudet:

755630S Community ecology 5.0 op

ECTS Credits:
3-4 cr.
Language of instruction:
Finnish.
Timing:
B. Sc. 3 rd or M.Sc. 1 st spring, odd years.
Learning outcomes:
Students are introduced to essential concepts of modern community ecology. Course gives ability to understand ecological community research.
Contents:
Effects of biotic (e.g. interspecific competition, predation) and abiotic (e.g. environmental disturbances) factors on the structure of communities, temporal and spatial variation of community structure and species richness at different scales, detection of human impacts on biotic communities, macroecological phenomena.
Mode of delivery:
Face-to-face teaching.
Learning activities and teaching methods:
26 h lectures, computer demonstrations, seminar.
Target group:
Compulsory to ECOz in the M.Sc. degree.
Prerequisites and co-requisites:
Basics of ecology (750124P).
Recommended optional programme components:
-
Recommended or required reading:
Handouts and book Morin, P. J. (1999): Community Ecology. Blackwell, 424 p.
The availability of the literature can be checked from this link.
Assessment methods and criteria:
Exam.
Grading:
1-5 / Fail.
Person responsible:
Prof. Timo Muotka.
Working life cooperation:
No.
Other information:
-

755610S: Community ecology, 3 - 4 op

Voimassaolo: - 31.07.2015

Opiskelumuoto: Advanced Studies

Laji: Course

Vastuuyksikkö: Department of Biology

Arvostelu: 1 - 5, pass, fail

Opettajat: Muotka, Timo Tapani

Opintokohteen kielet: Finnish

Leikkaavuudet:

755630S Community ecology 5.0 op

ECTS Credits:
3-4 cr.
Language of instruction:

Finnish.
Timing:
B. Sc. 3 rd or M.Sc. 1 st spring, odd years.
Learning outcomes:
Students are introduced to essential concepts of modern community ecology. Course gives ability to understand ecological community research.
Contents:
Effects of biotic (e.g. interspecific competition, predation) and abiotic (e.g. environmental disturbances) factors on the structure of communities, temporal and spatial variation of community structure and species richness at different scales, detection of human impacts on biotic communities, macroecological phenomena.
Mode of delivery:
Face-to-face teaching.
Learning activities and teaching methods:
26 h lectures, computer demonstrations, seminar.
Target group:
Compulsory to ECOz 3 cr. in the M.Sc. degree.
Prerequisites and co-requisites:
Basics of ecology (750124P).
Recommended optional programme components:
-
Recommended or required reading:
Handouts and book Morin, P. J. (1999): Community Ecology. Blackwell, 424 p.
The availability of the literature can be checked from this link.
Assessment methods and criteria:
Exam.
Grading:
1-5 / Fail.
Person responsible:
Prof. Timo Muotka.
Working life cooperation:
No.
Other information:
-

751384A: Comparative animal physiology, 8 op

Voimassaolo: - 31.07.2017

Opiskelumuoto: Intermediate Studies

Laji: Course

Vastuuyksikkö: Department of Biology

Arvostelu: 1 - 5, pass, fail

Opettajat: Satu Mänttäri

Opintokohteen kielet: Finnish

ECTS Credits:
8 cr.
Language of instruction:
Finnish.
Timing:
B.Sc. 3 rd or M.Sc. 1 st spring.
Learning outcomes:
After completing the course the student is able to form a general view of the similarities and differences in vital physiological functions between different animal species. The understanding of the regulation mechanisms of these physiological functions will be expanded by practical experiments conducted with several different animal species.
Contents:
Comparative animal physiology will be studied through the central physiological themes (nervous system, muscles, metabolism, thermoregulation, reproduction, circulation). The lectures consist of an introductory lecture on the given subject, and seminars. Physiological, cell physiological, neurophysiological, and histochemical methods are used in practical works related to the above mentioned themes. In the experiments invertebrate animals, frog, birds and mammals, including human being, will be used.

Mode of delivery:
Face-to-face teaching.
Learning activities and teaching methods:
32 h lectures, 128 h laboratory work, exam.
Target group:
B.Sc. degree optional to BS or M.Sc. degree compulsory to BSz.
Prerequisites and co-requisites:
Cell biology (750121P) and Animal physiology (751388A, 755318A) or equivalent knowledge.
Recommended optional programme components:
Prerequisite for the course Advanced course in animal physiology (751635S).
Recommended or required reading:
Course handout. Willemer, Pat (2000) Environmental physiology of animals.
The availability of the literature can be checked from this link.
Assessment methods and criteria:
Exam.
Grading:
1-5 / Fail.
Person responsible:
Dr. Satu Mänttäri.
Working life cooperation:
No.
Other information:
-

751684S: Comparative animal physiology, 8 op

Voimassaolo: - 31.07.2017

Opiskelumuoto: Advanced Studies

Laji: Course

Vastuuyksikkö: Department of Biology

Arvostelu: 1 - 5, pass, fail

Opettajat: Satu Mänttäri, Saarela, Seppo Yrjö Olavi, Hohtola, Esa Juhani

Opintokohteen kielet: Finnish

ECTS Credits:
8 cr.
Language of instruction:
Finnish.
Timing:
B.Sc. 3 rd or M.Sc. 1 st spring.
Learning outcomes:
After completing the course the student is able to form a general view of the similarities and differences in vital physiological functions between different animal species. The understanding of the regulation mechanisms of these physiological functions will be expanded by practical experiments conducted with several different animal species.
Contents:
Comparative animal physiology will be studied through the central physiological themes (nervous system, muscles, metabolism, thermoregulation, reproduction, circulation). The lectures consist of an introductory lecture on the given subject, and seminars. Physiological, cell physiological, neurophysiological, and histochemical methods are used in practical works related to the above mentioned themes. In the experiments invertebrate animals, frog, birds and mammals, including human being, will be used.
Mode of delivery:
Face-to-face teaching.
Learning activities and teaching methods:
32 h lectures, 128 h laboratory work, final exam.
Target group:
B.Sc. degree optional to BS or M.Sc. degree compulsory to BSz.
Prerequisites and co-requisites:
Cell biology (750121P) and Animal physiology (751388A, 755318A) or equivalent knowledge.
Recommended optional programme components:
Prerequisite for the course Advanced course in animal physiology (751635S).

Recommended or required reading:
Course handout. Willmer, Pat (2000) Environmental physiology of animals.
The availability of the literature can be checked from this link.
Assessment methods and criteria:
Exam.
Grading:
1-5 / Fail.
Person responsible:
Dr. Satu Mänttäri.
Working life cooperation:
No.
Other information:
-

753124P: Concepts of genetics, 4 - 7 op

Voimassaolo: - 31.07.2015

Opiskelumuoto: Basic Studies

Laji: Course

Vastuuyksikkö: Department of Biology

Arvostelu: 1 - 5, pass, fail

Opettajat: Päivi Leinonen, Lumi Viljakainen, Savolainen Outi, Kuittinen, Helmi Helena

Opintokohteen kielet: Finnish

Leikkaavuudet:

757109P	Concepts of genetics	5.0 op

ECTS Credits:
4-7 cr.
Language of instruction:
Finnish.
Timing:
B.Sc. 1 st spring.
Learning outcomes:
To understand and remember the genetic basis of life and evolution, on Mendelian and molecular level .
Contents:
Part 1. Mendelian genetics, including the ideas of quantitative and population genetics. Part 2. Molecular genetics: replication, transcription, translation, genetic code, mutations, repair of DNA. Part 3. Selected topics on developmental genetics, genetics of health and threats: viruses and diseases.
Mode of delivery:
Face-to-face teaching.
Learning activities and teaching methods:
Lectures, homework, the book.
Target group:
Compulsory to the biology students (7 cr.) Biochemistry students: parts 1 and 3 (4 cr.) compulsory, biophysics students.

Prerequisites and co-requisites:
Cell biology (750121P) or equivalent knowledge.
Recommended optional programme components:
This course is prerequisite to all other genetics courses.
Recommended or required reading:
Alberts et al. (2008, fifth edition) Molecular Biology of the Cell. Web page (in Finnish) http://www.oulu.fi/genet/perusteet
The availability of the literature can be checked from this link.
Assessment methods and criteria:
Homeworks, participation, exams.
Grading:
1-5 / Fail.
Person responsible:
N.N.

Working life cooperation:
No.
Other information:
-

752321A: Conservation of Biodiversity, 3 op

Voimassaolo: - 31.07.2015
Opiskelumuoto: Intermediate Studies
Laji: Course
Vastuuyksikkö: Department of Biology
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 cr.
Language of instruction:
English.
Timing:
B.Sc. 3 rd autumn. NNE.
Learning outcomes:
Students know the central concepts of biodiversity, threads 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:
-
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.
Grading:
1-5 / Fail.
Person responsible:
Prof. Jari Oksanen.
Working life cooperation:
No.
Other information:
-

750621S: Conservation of biodiversity, 3 op

Voimassaolo: 01.08.2011 - 31.07.2015
Opiskelumuoto: Advanced Studies
Laji: Course
Vastuuyksikkö: Department of Biology
Arvostelu: 1 - 5, pass, fail
Opettajat: Jari-Heikki Oksanen
Opintokohteen kielet: English
Leikkaavuudet:

756647S Conservation of biodiversity 5.0 op

ECTS Credits:
3 cr.
Language of instruction:
English.
Timing:
ECOGEN 1st autumn.
Learning outcomes:
Students know the central concepts of biodiversity, threads 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:
ECOGEN.
Prerequisites and co-requisites:
No.
Recommended optional programme components:
-
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.
Grading:
1-5 / Fail.
Person responsible:
Prof. Jari Oksanen.
Working life cooperation:
No.
Other information:
-

750619S: Course in microscopic techniques, 4 op

Voimassaolo: - 31.07.2014
Opiskelumuoto: Advanced Studies
Laji: Course
Vastuuyksikkö: Department of Biology
Arvostelu: 1 - 5, pass, fail
Opettajat: Hohtola, Anja Terttu Marjatta
Opintokohteen kielet: Finnish

ECTS Credits:

4 cr.
Language of instruction:
Finnish.
Timing:
M.Sc. every second autumn. Arranged if resources allow.
Learning outcomes:
Course gives skills to be applied to animal and plant structural studies and to localization of chemical and molecular phenomena in cells.
Contents:
Lectures include introduction to the different types of microscopes and microscopic techniques and main steps of biological sample preparation. Exercises include practice in preparation of conventional light microscopic (paraffin, plastic and cryo techniques) and electron microscopic (SEM and TEM) specimens.
Mode of delivery:
Face-to-face teaching.
Learning activities and teaching methods:
24 h lectures, demonstrations, laboratory work, exam.
Target group:
Suitable for BS and ecophysiology students.
Prerequisites and co-requisites:
No.
Recommended optional programme components:
Methods and skills learned in this course make good use in many fields.
Recommended or required reading:
Handouts, lecture material and literature are given at the start of the course.
Assessment methods and criteria:
Exam.
Grading:
1-5 / Fail.
Person responsible:
Prof. Anja Hohtola.
Working life cooperation:
No.
Other information:
The course will take place every second year if sufficient resources are available **.**

753631S: DNA analysis in population genetics, exercises, 6 op

Voimassaolo: - 31.07.2015

Opiskelumuoto: Advanced Studies

Laji: Course

Vastuuyksikkö: Department of Biology

Arvostelu: 1 - 5, pass, fail

Opettajat: Kuittinen, Helmi Helena

Opintokohteen kielet: Finnish

Leikkaavuudet:

757618S DNA analysis in population genetics 10.0 op

ECTS Credits:
6 cr.
Language of instruction:
Finnish / English.
Timing:
M.Sc. 1 st spring, ECOGEN BSg. 1 st spring.
Learning outcomes:
After the course the student can analyze nuclear and mitochondrial sequence and marker variation with population genetic methods. The student can describe the amount of variation and linkage disequilibrium and recognize features in the data that may be a result of reproductive system, selection, population size changes or population structure. The student can test the null hypotheses with relevant tests and coalescent simulations.

Contents:

Methods and computer programs used for analyzing sequence and genotype data. Work is done mainly in the computer classroom.
Mode of delivery:
Face-to-face teaching.
Learning activities and teaching methods:
Exercise reports.
Target group:
BSg and ECOGEN BSg: compulsory.
Prerequisites and co-requisites:
DNA analysis in population genetics, lectures (753616S).
Recommended optional programme components:
-
Recommended or required reading:
-
Assessment methods and criteria:
Reports.
Grading:
1-5 / Fail.
Person responsible:
Dr. Tanja Pyhäjärvi.
Working life cooperation:
No.
Other information:
-

753616S: DNA analysis in population genetics, lectures, 4 op

Voimassaolo: - 31.07.2015

Opiskelumuoto: Advanced Studies

Laji: Course

Vastuuyksikkö: Department of Biology

Arvostelu: 1 - 5, pass, fail

Opettajat: Savolainen Outi, Kuittinen, Helmi Helena

Opintokohteen kielet: Finnish

Leikkaavuudet:

757618S DNA analysis in population genetics 10.0 op

ECTS Credits:
4 cr.
Language of instruction:
Finnish / English.
Timing:
M.Sc. 1st spring, ECOGEN BSg 1st spring.
Learning outcomes:
Students will be familiar with advanced theory of population genetics of DNA sequence and markers, and with methods of analysis based on this theory.
Contents:
Basic coalescent theory, most important analysis methods, examining population structure.
Mode of delivery:
Face-to-face teaching.
Learning activities and teaching methods:
24 h lectures, 12 h seminars and exercises, independent work 60 h, exam.
Target group:
BSg and ECOGEN BSg: compulsory.
Prerequisites and co-requisites:
Basics in population genetics (753x14A/S) or equivalent knowledge.
Recommended optional programme components:
Gives a theoretical basis for DNA analysis in population genetics, exercises (753631S).
Recommended or required reading:
-

Assessment methods and criteria:
Exam.
Grading:
1-5 / Failed.
Person responsible:
Dr. Tanja Pyhäjärvi.
Working life cooperation:
No.
Other information:
-

755317A: Developmental biology-histology, exercises, 5 op

Voimassaolo: 01.08.2011 - 31.07.2019
Opiskelumuoto: Intermediate Studies
Laji: Course
Vastuuyksikkö: Department of Biology
Arvostelu: 1 - 5, pass, fail
Opettajat: Saarela, Seppo Yrjö Olavi
Opintokohteen kielet: Finnish

ECTS Credits:
5 cr.
Language of instruction:
Finnish.
Timing:
B. Sc. 1 st spring.
Learning outcomes:
After completing the developmental biology -part of the course the student is able to name the most important events of embryonic development and the structural changes related to them. The student is also able to describe the principles gene regulation related to embryonic development. After completing the histology-part of the course the student is able to describe the various tissue types and the microscopic structure of important organs and is also able to identify tissue types and organs from microscopic sections.
Contents:
Motto: “It is not birth, marriage, or death, but gastrulation, which is truly the most important time in your life.” Lewis Wolpert (1986). Developmental biology will cover gametogenesis, fertilization, forming of embryonic tissue layers (gastrulation), embryonic induction, signal molecules and the differentiation of the most important tissues and organs (organogenesis). Histology will first cover various tissue types, their cell types and matrix composition. Thereafter, the microscopic structure and tissue composition of various organs and organ systems will be covered. In both parts, drawing from microscopic slides will support lectures.
Mode of delivery:
Face-to-face teaching.
Learning activities and teaching methods:
44 h exercises, microscopic studying and drawing from the preparates.
Target group:
BS: compulsory, TEAbs optional.
Prerequisites and co-requisites:
Cell biology (750121P) or equivalent knowledge.
Recommended optional programme components:
Same time with Developmental biology-histology lectures (751367A).
Recommended or required reading:
Handout.
Assessment methods and criteria:
Exercise exam.
Grading:
1-5 / Fail.
Person responsible:
Prof. Seppo Saarela.
Working life cooperation:
No.
Other information:

-

751367A: Developmental biology-histology, lectures, 4 op

Voimassaolo: - 31.07.2015
Opiskelumuoto: Intermediate Studies
Laji: Course
Vastuuyksikkö: Department of Biology
Arvostelu: 1 - 5, pass, fail
Opettajat: Hohtola, Esa Juhani
Opintokohteen kielet: Finnish
Leikkaavuudet:

755320A Developmental biology-histology 5.0 op

ECTS Credits:
4 cr.

Language of instruction:
Finnish.
Timing:
B.Sc. 1 st spring.

Learning outcomes:
After completing the developmental biology -part of the course the student is able to name the most important events of embryonic development and the structural changes related to them. The student is also able to describe the principles gene regulation related to embryonic development. After completing the histology-part of the course the student is able to describe the various tissue types and the microscopic structure of important organs and is also able to identify tissue types and organs from microscopic sections.
Contents:
Motto: “It is not birth, marriage, or death, but gastrulation, which is truly the most important time in your life.” Lewis Wolpert (1986). Developmental biology will cover gametogenesis, fertilization, forming of embryonic tissue layers (gastrulation), embryonic induction, signal molecules and the differentiation of the most important tissues and organs (organogenesis). Histology will first cover various tissue types, their cell types and matrix composition. Thereafter, the microscopic structure and tissue composition of various organs and organ systems will be covered. In both parts, drawing from microscopic slides will support lectures.
Mode of delivery:
Face-to-face teaching.
Learning activities and teaching methods:
38 h lectures and two exams.
Target group:
Compulsory to biology students.

Prerequisites and co-requisites:
Cell biology (750121P) or equivalent knowledge.
Recommended optional programme components:
-
Recommended or required reading:
Lecture notes, lecture handouts. Recommended reading: Sariola, Frilander ym., Solusta yksilöksi: Kehitysbiologia, Duodecim, Helsinki 2003; Gilbert: Developmental Biology, Sinauer Press, 6.ed. 2000, or newer; Young & Heath: Wheater’s Functional Histology, Churchill Livingstone, 4. ed. 2000, or newer.
The availability of the literature can be checked from this link.
Assessment methods and criteria:
2 lecture exams.
Grading:
1-5 / Fail.
Person responsible:
Prof. Esa Hohtola.
Working life cooperation:
No.
Other information:

-

752672S: Distribution mapping of plants, 2 - 5 op

Voimassaolo: - 31.07.2019
Opiskelumuoto: Advanced Studies
Laji: Course
Vastuuyksikkö: Department of Biology
Arvostelu: 1 - 5, pass, fail
Opintokohteen kielet: Finnish
Voidaan suorittaa useasti: Kyllä

ECTS Credits:
2-5 cr.
Language of instruction:
Finnish / English.
Timing:
B.Sc. 3 rd summer or M.Sc. 1 st or 2 nd summer.
Learning outcomes:
Train oneself in floristic mapping skills.
Contents:
Floristic mapping of plants with special emphasis on endangered species. Participant should agree with the Botanical Museum in advance. Field work in the provinces of Oulu and Lapland, including sample collection, identification, preparation of herbarium specimens in consultation with the responsible teacher.
Mode of delivery:
Face-to-face teaching.
Learning activities and teaching methods:
Field excursions.
Target group:
-
Prerequisites and co-requisites:
Identification of plant species (752303A), Field course in ecological botany (752304A) and Advanced identification of plant species (752608S) or equivalent knowledge.
Recommended optional programme components:
-
Recommended or required reading:
-
Assessment methods and criteria:
-
Grading:
Pass / Fail.
Person responsible:
Botanical museum.
Working life cooperation:
No.
Other information:
-

750347A: Ecological methods I, 6 op

Voimassaolo: - 31.07.2015
Opiskelumuoto: Intermediate Studies
Laji: Course
Vastuuyksikkö: Department of Biology
Arvostelu: 1 - 5, pass, fail
Opettajat: Kari Koivula
Opintokohteen kielet: Finnish

Leikkaavuudet:

755325A Methods in ecology I 5.0 op

ECTS Credits:
6 cr.
Language of instruction:
Finnish / English.
Timing:
B.Sc. 3 rd 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:
-
Recommended or required reading:
-
Assessment methods and criteria:
Exam.
Grading:
1-5 / Fail.
Person responsible:
Dr. Kari Koivula, Dr. Seppo Rytkönen ja Prof. Juha Tuomi.
Working life cooperation:
No.
Other information:
-

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

Vastuuyksikkö: Department of Biology

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 cr.
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 (assay 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:
-
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 & Trehow 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.
Grading:
1-5 / Fail
Person responsible:
Dr. Kari Taulavuori.
Working life cooperation:
No.
Other information:
Field excursion is arranged if resources allow.

750643S: Ecological responses to global change and air pollution in the subarctic, 4 - 7 op

Voimassaolo: 01.08.2011 - 31.07.2015

Opiskelumuoto: Advanced Studies

Laji: Course

Vastuuyksikkö: Department of Biology

Arvostelu: 1 - 5, pass, fail

Opettajat: Kari Taulavuori

Opintokohteen kielet: English

Leikkaavuudet:

756648S	Ecological responses to global change and air pollution in the subarctic	5.0 op

ECTS Credits:
4-7 cr.
Language of instruction:
Finnish / English.
Timing:
B. Sc. / M. Sc. / Ph.D., (excursion arranged if resources alow).
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 (assay 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:
-
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 & Trehow 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, assay and seminar, excursion, closing report and seminar.
Grading:
1-5 / Fail
Person responsible:
Dr. Kari Taulavuori.
Working life cooperation:
No.
Other information:
Field excursion is arranged if resources allow.

750631S: Ecosystem ecology, 3 op

Voimassaolo: - 31.07.2015

Opiskelumuoto: Advanced Studies

Laji: Course

Vastuuyksikkö: Department of Biology

Arvostelu: 1 - 5, pass, fail

Opettajat: Jari-Heikki Oksanen

Opintokohteen kielet: Finnish

ECTS Credits:
3 cr.
Language of instruction:
Finnish / English.
Timing:
M.Sc. 1 st or 2 nd year.
Learning outcomes:
Know the central theoretical constructs and results of ecosystems ecology, and be able to apply ecosystem ecology in the analysis of ecological and environmental questions.
Contents:
Most important ecological processes, such as cycles of water, coal and nutrients, and the flux of the energy. Ecological control processes, and the effect of environmental heterogeneity. The impacts of Humans in the ecosystem processes in global and local scales.
Mode of delivery:

Face-to-face teaching.
Learning activities and teaching methods:
24 h lectures, exam.
Target group:
Ecology students.
Prerequisites and co-requisites:
Basics of ecology (750124P) or equivalent knowledge.
Recommended optional programme components:
-
Recommended or required reading:
Chapin, F.S., Matson, P.A. & Mooney H. A. 2002: Principles of terrestrial ecosystem ecology. Springer Verlag.
The availability of the literature can be checked from this link.
Assessment methods and criteria:
Exam.
Grading:
1-5 / Fail.
Person responsible:
Prof. Jari Oksanen.
Working life cooperation:
No.
Other information:
-

752175P: Environmental ecology, 5 op

Opiskelumuoto: Basic Studies

Laji: Course

Vastuuyksikkö: Department of Biology

Arvostelu: 1 - 5, pass, fail

Opettajat: Jari-Heikki Oksanen

Opintokohteen kielet: Finnish

Leikkaavuudet:

ay752175P	Environmental ecology (OPEN UNI)	5.0 op

ECTS Credits:
5 cr.
Language of instruction:
Finnish.
Timing:
Spring, (arranged if resources allow).

Learning outcomes:
After finishing the course student understands the ecological background of most important environmental questions and has knowledge to apply this to decision making in environmental problems.

Contents:
Ecological basics of nature conservation. Effects of physical and chemical environment on living organisms, basics of population ecology, communities and ecosystems. Environmental changes and how species can adapt to them. World wide environmental problems and actions to solve them are studied within the course. Special environmental questions in Finland and in Europe.
Mode of delivery:
Face-to-face teaching.
Learning activities and teaching methods:
Book exam and written report according to agreement with teacher.

Target group:
-
Prerequisites and co-requisites:
No.
Recommended optional programme components:

-
Recommended or required reading:
Jarvis, P. J. 2000: Ecological Principles and Environmental Issues. Prentice Hall. 303 p.; Chiras, D.D. 2001: Environmental Science 6 th edition or new editions. Jones and Bartlett Publishers 730 p.
The availability of the literature can be checked from this link.

Assessment methods and criteria:
Report and final exam.
Grading:
1-5 / Fail.
Person responsible:
Prof. Jari Oksanen.
Working life cooperation:
No.
Other information:
-

750626S: Environmental impact assessment (EIA) and ecological inventory of natural resources, 5 op

Opiskelumuoto: Advanced Studies

Laji: Course

Vastuuyksikkö: Department of Biology

Arvostelu: 1 - 5, pass, fail

Opettajat: Jari-Heikki Oksanen

Opintokohteen kielet: Finnish

ECTS Credits:
5 cr.

Language of instruction:
Finnish.

Timing:
M.Sc. degree.
Learning outcomes:
After finishing the course student get acquainted to inventory approaches of natural ecosystems and is able to apply knowledge to environmental impact assessments. Student has skills to fulfill environmental impact assessments based on different types of case studies. Additionally, student knows the legal procedure to act as responsible person for EIA.

Contents:
The course gives an overview of Environmental Impact Assessment (EIA) and its tasks according to the present legislation of the European Community. The course includes ecological impacts on e.g. hydrology, water quality, ecology, ecological inventories of nature. Course includes obligatory exercise work.

Mode of delivery:
Face-to-face teaching.
Learning activities and teaching methods:
24 h lectures, 18 h seminars.

Target group:
-
Prerequisites and co-requisites:
No.
Recommended optional programme components:
-
Recommended or required reading:
http://ec.europa.eu/environment/eia/eia-support.htm

Assessment methods and criteria:

Exam and report.
Grading:
1-5 / Failed.
Person responsible:
Prof. Jari Oksanen.

Working life cooperation:
No.
Other information:
-

750307A: Evolution and systematics of organisms, 4 op

Voimassaolo: 01.08.2010 - 31.07.2015
Opiskelumuoto: Intermediate Studies
Laji: Course
Vastuuyksikkö: Department of Biology
Arvostelu: 1 - 5, pass, fail
Opettajat: Kaitala Arja, Annamari Markkola, Jari-Heikki Oksanen
Opintokohteen kielet: Finnish
Leikkaavuudet:

750372A	Evolution and systematics of organisms	5.0 op

ECTS Credits:
4 cr.
Language of instruction:
Finnish.
Timing:
B.Sc. 2nd autumn.
Learning outcomes:
Students will learn a general picture of the diversity of life-forms as to understand the evolutionary history of organisms.
Contents:
The course provides an insight into the biological evolution and evolutionary processes reflected by the systematic classification of the organisms. Also basic principles and concepts of systematics and classification are presented.
Mode of delivery:
Face-to-face teaching.
Learning activities and teaching methods:
48 h lectures.
Target group:
Compulsory to the biology students.
Prerequisites and co-requisites:
No.
Recommended optional programme components:
Lectures give basic ability to different biology subjects.
Recommended or required reading:
Supplementary reading: Bell, P.R. & Helmsley, A.R. 2000: Green Plants. Their origin and diversity. 2 nd ed. Cambridge University Press., Willis, K.J. & McElwain, J.C. 2002: The evolution of plants. Oxford University Press. Animal Diversity, 5.edition, McGraw Hill New York.
The availability of the literature can be checked from this link.
Assessment methods and criteria:
Lecture exam.
Grading:
1-5 / Fail.
Person responsible:
Prof. Arja Kaitala, Prof. Jari Oksanen and Dr. Annamari Markkola.
Working life cooperation:
No.
Other information:

-

755609S: Evolution of life histories, 4 op

Voimassaolo: - 31.07.2015
Opiskelumuoto: Advanced Studies
Laji: Course
Vastuuyksikkö: Department of Biology
Arvostelu: 1 - 5, pass, fail
Opettajat: Kari Koivula, Orell, Markku Ilmari
Opintokohteen kielet: Finnish

ECTS Credits:
4 cr.
Language of instruction:
Finnish.
Timing:
M.Sc. 1 st or 2 nd autumn, (arranged if resources allow).
Learning outcomes:
After completing the course the student knows the basic concepts of the classical life history theory, is familiar with major analytical tools and their applications.
Contents:
The course initiates into the processes of evolution of life histories. Important subject is the allocation of resources: weather the organism allocates on its surviving or on production of offspring. Demographic factors of populations are also handled as well as factors affecting individuals' capacity. Evolutionary explanations for differing reproduction strategies in different environments are introduced.
Mode of delivery:
Face-to-face teaching.
Learning activities and teaching methods:
48 h lectures, exercises.
Target group:
ECO.
Prerequisites and co-requisites:
No.
Recommended optional programme components:
-
Recommended or required reading:
-
Assessment methods and criteria:
Exam.
Grading:
1-5 / Fail.
Person responsible:
Prof. Markku Orell and Dr. Kari Koivula.
Working life cooperation:
No.
Other information:
-

755312A: Evolution, systematics and morphology of animals, practicals, 4 op

Voimassaolo: 01.08.2010 - 31.07.2015
Opiskelumuoto: Intermediate Studies
Laji: Course
Vastuuyksikkö: Department of Biology
Arvostelu: 1 - 5, pass, fail
Opintokohteen kielet: Finnish
Leikkaavuudet:

750374A Systematics and morphology of organisms exercises 3.0 op

ECTS Credits:
4 cr
Language of instruction:
Finnish / English.
Timing:
B.Sc. 2 nd autumn.
Learning outcomes:
To understand basics of the evolution of animal kingdom, evolution of structural innovations and principles of systematics.
Contents:
Evolution history of animals, basics of systematics, relationships, the structure of animals and their organs in different invertebrate and vertebrate classes. Practical work deals with reviews to structural characters and animal dissecting.
Mode of delivery:
Face-to-face teaching.
Learning activities and teaching methods:
36 h compulsory exercises (preparations and demonstrations), exercise exam.
Target group:
Compulsory for ECO, optional for TEAeco.
Prerequisites and co-requisites:
Evolution and systematics of organisms (750307A) or equivalent knowledge.
Recommended optional programme components:
-
Recommended or required reading:
A course booklet (in Finnish) can be bought from biology office. Hickman, C, P. et al. (2009). Animal Diversity, 5. edition, McGraw Hill New York.
The availability of the literature can be checked from this link.
Assessment methods and criteria:
Exercises exams.
Grading:
1-5 / Fail.
Person responsible:
Prof. Arja Kaitala.
Working life cooperation:
No.
Other information:
-

750336A: Evolutionary ecology, 5 op

Opiskelumuoto: Intermediate Studies

Laji: Course

Vastuuyksikkö: Department of Biology

Arvostelu: 1 - 5, pass, fail

Opettajat: Kaitala Arja

Opintokohteen kielet: Finnish

ECTS Credits:
5 cr.
Language of instruction:
Finnish / (English).
Timing:
B.Sc. degree 2 nd autumn.

Learning outcomes:
To understand main principles of evolution and the concepts of natural selection, fitness and adaptation. Learn basics of life-history adaptation, speciation processes and social evolution.
Contents:

The aim of the course is to introduce a student with lectures and seminars to the main topics of evolutionary ecology, for example basic concepts of natural selection and evolution, selection level, speciation, evolution of life cycles, interactions between and within species are included. Review to the latest research results.
Mode of delivery:
Face-to-face teaching.
Learning activities and teaching methods:
36 h lectures and compulsory seminars, exam.
Target group:
BS and ECO compulsory, TEAeco optional.
Prerequisites and co-requisites:
No.
Recommended optional programme components:
-
Recommended or required reading:
Additional reading: Björklund, Mats 2009 Evoluutiobiologia. Gaudeamus, Sterans, S. and Hoekstra, R. F. 2005: Evolution, An Introduction. Oxford University Press, New York, 575 p.
The availability of the literature can be checked from this link.
Assessment methods and criteria:
Seminar and exam.
Grading:
1-5 / Fail.
Person responsible:
Prof. Arja Kaitala.
Working life cooperation:
No.
Other information:
-

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

Voimassaolo: - 31.07.2015

Opiskelumuoto: Intermediate Studies

Laji: Course

Vastuuyksikkö: Department of Biology

Arvostelu: 1 - 5, pass, fail

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 cr.
Language of instruction:
Depends on the book.
Timing:
B.Sc. 2 nd - 3 rd or M.Sc. 1 st -2 nd 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:
-
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.
Grading:
1-5 / Fail.
Person responsible:
Prof. Juha Tuomi or prof. Hely Häggman.
Working life cooperation:
No.
Other information:
-

751654S: Examination on optional topics, 2 - 6 op

Voimassaolo: - 31.07.2015

Opiskelumuoto: Advanced Studies

Laji: Course

Vastuuyksikkö: Department of Biology

Arvostelu: 1 - 5, pass, fail

Opintokohteen kielet: Finnish

Leikkaavuudet:

750649S Examinations on optional topics in biology 2.0 op

Voidaan suorittaa useasti: Kyllä

ECTS Credits:
2-6 cr.
Language of instruction:
Depends on the book.
Timing:
B.Sc. 2 nd - 3 rd or M.Sc. 1 st - 2 nd 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:
Subject, credit amount and literature chosen in agreement with the responsible professor.
Assessment methods and criteria:
Book exam in biology public exam day.
Grading:
1-5 / Fail.
Person responsible:
Prof. Esa Hohtola or Prof. Markku Orell.
Working life cooperation:

No.
Other information:
-

752652S: Examinations on optional topics, 2 - 6 op

Voimassaolo: - 31.07.2015
Opiskelumuoto: Advanced Studies
Laji: Course
Vastuuyksikkö: Department of Biology
Arvostelu: 1 - 5, pass, fail
Opettajat: Häggman, Hely Margaretha, Tuomi Juha
Opintokohteen kielet: Finnish
Leikkaavuudet:

750649S Examinations on optional topics in biology 2.0 op

Voidaan suorittaa useasti: Kyllä

ECTS Credits:
2-6 cr.
Language of instruction:
Depends on the book.
Timing:
M.Sc. 1 st - 2 nd 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:
-
Prerequisites and co-requisites:
-
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 ECTS) ja Pohjoinen luontomme http://www.oulu.fi/northnature/Northnature.html (2 ECTS)
The availability of the literature can be checked from this link.
Assessment methods and criteria:
Book exam in biology public exam day.
Grading:
1-5 / Fail.
Person responsible:
Prof. Juha Tuomi 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

Vastuuyksikkö: Department of Biology

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 cr.
Language of instruction:
Depends on the book.
Timing:
B.Sc. 2 nd - 3 rd or M.Sc. 1 st -2 nd 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:
Subject, credit amount and literature chosen in agreement with the responsible professor.
Assessment methods and criteria:
Book exam in biology public exam day.
Grading:
1-5 / Fail.
Person responsible:
Prof. Esa Hohtola or Prof. Markku Orell.
Working life cooperation:
No.
Other information:
-

753651S: Examinations on optional topics, 2 - 6 op

Voimassaolo: - 31.07.2015

Opiskelumuoto: Advanced Studies

Laji: Course

Vastuuyksikkö: Department of Biology

Arvostelu: 1 - 5, pass, fail

Opintokohteen kielet: Finnish

Leikkaavuudet:

750649S Examinations on optional topics in biology 2.0 op

Voidaan suorittaa useasti: Kyllä

ECTS Credits:
2-6 cr.
Language of instruction:
Depends on the book.

Timing:
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:
-
Prerequisites and co-requisites:
No.
Recommended optional programme components:
-
Recommended or required reading:
Literature chosen in agreement with the responsible person.
Assessment methods and criteria:
Book exam in biology public exam day.
Grading:
1-5 / Fail.
Person responsible:
Prof. Outi Savolainen.
Working life cooperation:
No.
Other information:
-

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

Voimassaolo: - 31.07.2015

Opiskelumuoto: Intermediate Studies

Laji: Course

Vastuuyksikkö: Department of Biology

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 cr.
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:
-
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.
Grading:
1-5 / Fail.
Person responsible:
Prof. Outi Savolainen.
Working life cooperation:
No.
Other information:
-

752605S: Excursion to Southern Finland or Abroad, 4 - 7 op

Voimassaolo: - 31.07.2015

Opiskelumuoto: Advanced Studies

Laji: Course

Vastuuyksikkö: Department of Biology

Arvostelu: 1 - 5, pass, fail

Opettajat: Jari-Heikki Oksanen

Opintokohteen kielet: Finnish

Voidaan suorittaa useasti: Kyllä

ECTS Credits:
4-7 cr.
Language of instruction:
Finnish.
Timing:
B.Sc. or M.Sc., (arranged if resources allow).
Learning outcomes:
Learn to know some features of flora, vegetation and natural conditions outside the Oulu region.
Contents:
Field excursion.
Mode of delivery:
Face-to-face teaching.
Learning activities and teaching methods:
Demonstrations, field exercises, exam.
Target group:
-
Prerequisites and co-requisites:
Identification of plant species (752303A) or equivalent knowledge.
Recommended optional programme components:
-
Recommended or required reading:
-
Assessment methods and criteria:
-
Grading:
Pass / Fail.
Person responsible:
Prof. Jari Oksanen.
Working life cooperation:
No.
Other information:
-

752305A: Excursion to Southern Finland or Abroad, 4 - 7 op

Voimassaolo: - 31.07.2015
Opiskelumuoto: Intermediate Studies
Laji: Course
Vastuuyksikkö: Department of Biology
Arvostelu: 1 - 5, pass, fail
Opettajat: Jari-Heikki Oksanen
Opintokohteen kielet: Finnish

ECTS Credits:
4-7 cr.
Language of instruction:
Finnish.
Timing:
B.Sc. or M.Sc. (arranged if resources allow).
Learning outcomes:
Learn to know some features of flora, vegetation and natural conditions outside the Oulu region.
Contents:
Field excursion.
Mode of delivery:
Face-to-face teaching.
Learning activities and teaching methods:
Demonstrations, field exercises, final exam.
Target group:
-
Prerequisites and co-requisites:
Identification of plant species (752303A) or equivalent knowledge.
Recommended optional programme components:
-
Recommended or required reading:
-
Assessment methods and criteria:
-
Grading:
Pass / Fail.
Person responsible:
Prof. Jari Oksanen.
Working life cooperation:
-
Other information:
-

753634S: Experimental course in bioinformatics and molecular evolution, 4 op

Voimassaolo: 01.08.2012 - 31.07.2013
Opiskelumuoto: Advanced Studies
Laji: Course
Vastuuyksikkö: Department of Biology
Arvostelu: 1 - 5, pass, fail
Opettajat: Kuittinen, Helmi Helena
Opintokohteen kielet: Finnish

ECTS Credits:
4 cr.
Language of instruction:
Finnish / English.
Timing:
M.Sc. 2nd autumn.
Learning outcomes:

After the course the student is able to analyze DNA sequence differences between species in practice, applying knowledge obtained in earlier studies in bioinformatics and molecular evolution. The student knows how to get information from public sequence data bases, characterize sequences, estimate nucleotide substitutions, align sequences, build phylogenetic trees and estimate their confidence. The student is able to make a hypothesis relating to molecular evolution and test it using sequence data.

Contents:
Sequence data bases, methods and computer programs for handling and analysing sequences obtained from data bases. Scientific literature. Work is done mainly in the computer classroom.

Mode of delivery:
Face-to-face teaching.

Learning activities and teaching methods:
48 h exercises including demonstrations and seminar, independent work including reports.

Target group:
BSg students.

Prerequisites and co-requisites:
Bioinformatics (753629S) and Molecular evolution (753327A) or equivalent knowledge.

Recommended optional programme components:
-

Recommended or required reading:
-

Assessment methods and criteria:
Reports, independent work.

Grading:
1-5 / Fail.

Person responsible:
Dr. Helmi Kuittinen.

Working life cooperation:
No.

Other information:
-

753104P: Experimental course in general genetics, 6 op

Voimassaolo: - 31.07.2015

Opiskelumuoto: Basic Studies

Laji: Course

Vastuuyksikkö: Department of Biology

Arvostelu: 1 - 5, pass, fail

Opintokohteen kielet: Finnish

Leikkaavuudet:

757110P Experimental course in general genetics 5.0 op

ECTS Credits:
6 cr.

Language of instruction:
Finnish.

Timing:
B. Sc degree, 1 st spring.

Learning outcomes:
After passing the course students have elementary knowledge of basic phenomena of genetics, important working methods and laboratory organisms. Student has the basic ability to understand, apply and analyse simple genetical works and phenomena.

Contents:
To investigate Mendelian inheritance, gene mapping and additive? effects of genes using cross-breeding, basics of population genetics, to investigate regulation of promoter and recombination using microbial genetic methods, to investigate mitosis and meiosis using cytogenetical methods and studying basic methods of DNA techniques: isolating DNA, digesting DNA using restriction enzymes, PCR, electrophoresis and cloning.

Mode of delivery:
Face-to-face teaching.

Learning activities and teaching methods:
18 h demonstrations, 45 h exercises, independent work, exam.

Target group:
Compulsory to the biology students.
Prerequisites and co-requisites:
Concepts of genetics (753124P) or equivalent knowledge
Recommended optional programme components:
Course is prerequisite to all the following genetics courses.
Recommended or required reading:
Course handout and web pages http://www.oulu.fi/genet/peruskurssi/

Assessment methods and criteria:
Report, final exam.
Grading:
1-5 / Fail.
Person responsible:
N.N.
Working life cooperation:
No.
Other information:
-

751307A: Field course in aquatic animals, 4 op

Voimassaolo: - 31.07.2015

Opiskelumuoto: Intermediate Studies

Laji: Course

Vastuuyksikkö: Department of Biology

Arvostelu: 1 - 5, pass, fail

Opintokohteen kielet: Finnish

Leikkaavuudet:

755321A	Aquatic ecology field course	5.0 op

ECTS Credits:
4 cr.
Language of instruction:
Finnish / English.
Timing:
B.Sc. 1 st 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 to course Winter ecology and physiology (750325A).
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.
Grading:
1-5 / Fail.
Person responsible:
Dr. Pauliina Louhi.
Working life cooperation:
No.
Other information:
-

751607S: Field course in aquatic animals, 4 op

Voimassaolo: 01.08.2011 - 31.07.2015

Opiskelumuoto: Advanced Studies

Laji: Course

Vastuuyksikkö: Department of Biology

Arvostelu: 1 - 5, pass, fail

Opintokohteen kielet: English

Leikkaavuudet:

755621S	Aquatic ecology field course	5.0 op

ECTS Credits:
4 cr.
Language of instruction:
English.
Timing:
ECOGEN ECOz 1 st 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:
ECOGEN.
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 to course Winter ecology and physiology (750325A).
Recommended or required reading:
Handouts and lectures given during the course.
Assessment methods and criteria:
Species identification, practical and theoretical exam on the final course day.
Grading:
1-5 / Fail.
Person responsible:
Dr. Pauliina Louhi.
Working life cooperation:
No.
Other information:
-

752342A: Field course in arctic-alpine ecology and vegetation, 5 op

Opiskelumuoto: Intermediate Studies

Laji: Course

Vastuuyksikkö: Department of Biology

Arvostelu: 1 - 5, pass, fail

Opettajat: Virtanen, Risto Juhani

Opintokohteen kielet: Finnish

ECTS Credits:
4 cr.
Language of instruction:
Finnish.
Timing:
B.Sc. 2 nd or 3 rd autumn. M.Sc. 1 st or 2 nd autumn. Every second year at the Kilpisjärvi biological station. Arranged if resources allow.
Learning outcomes:
By passing this course a student is able to identify plant and animal species, nature types, vegetation of NW Fennoscandian mountain areas, understand ecology of northern ecosystems, ecological interactions and adaptation. Advanced training in experimental and observational field research.
Contents:
Arctic-alpine ecosystems as one the main biomes of the world. Plant and animal species of arctic-alpine areas. Vegetation and ecology of NW Fennoscandian mountain areas. Plant-herbivore interactions in tundra ecosystems.
Mode of delivery:
Face-to-face teaching.
Learning activities and teaching methods:
Field course.
Target group:
Ecology students.
Prerequisites and co-requisites:
Field course in ecological botany (752304A) or equivalent knowledge.
Recommended optional programme components:
-
Recommended or required reading:
Disseminated during course, internet resources. Literature on arctic-alpine ecosystems.
The availability of the literature can be checked from this link.
Assessment methods and criteria:
Field course, field exercise. Planning of the study, field work and analyzing data. Making a report with reference to scientific literature. Oral presentation of the study (Power Point).
Grading:
Field exam including questions about the species and northern arctic-alpine nature. Pass / Fail.
Person responsible:
Dr. Risto Virtanen.
Working life cooperation:
No.
Other information:
Arranged with cooperation of the University of Eastern Finland.

752642S: Field course in arctic-alpine ecology and vegetation, 5 op

Opiskelumuoto: Advanced Studies

Laji: Course

Vastuuyksikkö: Department of Biology

Arvostelu: 1 - 5, pass, fail

Opettajat: Virtanen, Risto Juhani

Opintokohteen kielet: Finnish

ECTS Credits:
4 cr.

Language of instruction:
Finnish.
Timing:
B.Sc. 2 nd or 3 rd autumn. M.Sc. 1 st or 2 nd autumn. Every second year at the Kilpisjärvi biological station. Arranged if resources allow.
Learning outcomes:
By passing this course a student is able to identify plant and animal species, nature types, vegetation of NW Fennoscandian mountain areas, understand ecology of northern ecosystems, ecological interactions and adaptation. Advanced training in experimental and observational field research.
Contents:
Arctic-alpine ecosystems as one the main biomes of the world. Plant and animal species of arctic-alpine areas. Vegetation and ecology of NW Fennoscandian mountain areas. Plant-herbivore interactions in tundra ecosystems.
Mode of delivery:
Face-to-face teaching.
Learning activities and teaching methods:
Field course.
Target group:
Ecology students.
Prerequisites and co-requisites:
Field course in ecological botany (752304A) or equivalent knowledge.
Recommended optional programme components:
-
Recommended or required reading:
Disseminated during course, internet resources. Literature on arctic-alpine ecosystems.
The availability of the literature can be checked from this link.
Assessment methods and criteria:
Field course, field exercise. Planning of the study, field work and analyzing data. Making a report with reference to scientific literature. Oral presentation of the study (Power Point).
Grading:
Field exam including questions about the species and arctic-alpine nature. Pass / Fail.
Person responsible:
Dr. Risto Virtanen.
Working life cooperation:
No.
Other information:
Arranged with cooperation of the University of Eastern Finland.

752604S: Field course in ecological botany, 5 - 6 op

Voimassaolo: 01.08.2011 - 31.07.2015

Opiskelumuoto: Advanced Studies

Laji: Course

Vastuuyksikkö: Department of Biology

Arvostelu: 1 - 5, pass, fail

Opettajat: Annamari Markkola

Opintokohteen kielet: English

Leikkaavuudet:

756643S	Plant ecology field course	5.0 op

ECTS Credits:
6 cr.
Language of instruction:
English.
Timing:
ECOGEN ECOz and ECOb 1 st summer.
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 (3 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 70 h. Field exams for plant identification and mire ecology. Seminar, report.
Target group:
ECOGEN.
Prerequisites and co-requisites:
Identification of plant species (752603S) 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 (752603S) grade. This course is a prerequisite for courses Plant ecology (752600S), 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.
Assessment methods and criteria:
Reports, field exams.
Grading:
1-5 / Fail.
Person responsible:
Dr. Annamari Markkola.
Working life cooperation:
No.
Other information:
-

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

Voimassaolo: - 31.07.2015

Opiskelumuoto: Intermediate Studies

Laji: Course

Vastuuyksikkö: Department of Biology

Arvostelu: 1 - 5, pass, fail

Opettajat: Annamari Markkola

Opintokohteen kielet: Finnish

Leikkaavuudet:

756343A	Plant ecology field course	5.0 op

ECTS Credits:
5-6 cr.

Language of instruction:
Finnish / English.
Timing:
B.Sc. 1 st 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 (3 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 70 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.

Grading:
1-5 / Fail.
Person responsible:
Dr. Annamari Markkola.
Working life cooperation:
No.
Other information:
-

756639S: Field course in plant ecological research on the Bothnian Bay coast, 3 op

Voimassaolo: 01.08.2010 - 31.07.2015
Opiskelumuoto: Advanced Studies
Laji: Course
Vastuuyksikkö: Department of Biology
Arvostelu: 1 - 5, pass, fail
Opettajat: Annamari Markkola
Opintokohteen kielet: English

ECTS Credits:
3 cr.
Language of instruction:
English.
Timing:
M.Sc.. 1-2 summer. ECOGEN.

Learning outcomes:
Student understands basic ecological dynamics and interactions between plants and other organisms on primary successional seashores.

Contents:
Vegetational succession on the coast of Bothnian Bay, soil formation, plant-fungal interactions, ecology of halophytes, endangered plant species, plant population dynamics in the field.

Mode of delivery:
Face-to-face teaching.
Learning activities and teaching methods:

Lectures 6 h, field demonstrations, exercises and excursions 40 h. Seminar, report.

Target group:
ECO.
Prerequisites and co-requisites:
Identification of plant species (752303A) 3 cr. or equivalent knowledge, Field course in ecological botany (752304A).
Recommended optional programme components:
-

Recommended or required reading:
Current literature.

Assessment methods and criteria:
Report, field exam.
Grading:
Pass / Fail.
Person responsible:
Dr. Annamari Markkola.
Working life cooperation:
No.
Other information:
-

751306A: Field course in terrestrial animals, 4 op

Voimassaolo: - 31.07.2015

Opiskelumuoto: Intermediate Studies

Laji: Course

Vastuuyksikkö: Department of Biology

Arvostelu: 1 - 5, pass, fail

Opettajat: Seppo Rytkönen

Opintokohteen kielet: Finnish

Leikkaavuudet:

755322A Terrestrial animals field course 5.0 op

ECTS Credits:
4 cr.

Language of instruction:
Finnish / English.
Timing:
B.Sc. - 1 st 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 hold 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 määritysopas, Tammi, Helsinki, 2. painos.
The availability of the literature can be checked from this link.
Assessment methods and criteria:
Exam, seminar presentation.
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.

751606S: Field course in terrestrial animals, 4 op

Voimassaolo: 01.08.2011 - 31.07.2015
Opiskelumuoto: Advanced Studies
Laji: Course
Vastuuyksikkö: Department of Biology
Arvostelu: 1 - 5, pass, fail
Opettajat: Seppo Rytkönen
Opintokohteen kielet: English
Leikkaavuudet:

755622S	Terrestrial animals field course	5.0 op

ECTS Credits:
4 cr.
Language of instruction:
English.
Timing:
ECOGEN ECOz 1st summer.
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 hold 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:
ECOGEN.

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 määritysopas, Tammi, Helsinki, 2. painos. The availability of the literature can be checked from this link.
Assessment methods and criteria:
Exam, seminar presentation.
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.

755313A: Field identification of birds, 1 - 5 op

Voimassaolo: 01.08.2010 -

Opiskelumuoto: Intermediate Studies

Laji: Course

Vastuuyksikkö: Department of Biology

Arvostelu: 1 - 5, pass, fail

Opettajat: Seppo Rytkönen

Opintokohteen kielet: Finnish

ECTS Credits:
2 cr.
Language of instruction:
Finnish / English.
Timing:
B.Sc. - 1 st summer. NNE.
Learning outcomes:
The aim of the course is to get a basic level of field identification of Finnish birds.
Contents:
The student will learn the basics of avian field identification by familiarizing him/herself with the local bird fauna in different biotopes. The method is self-learning with keeping a notebook of the field observations.
Mode of delivery:
Blended teaching.
Learning activities and teaching methods:
Info in spring, self-learning with notebook. See www.tiira.fi
Target group:
ECO optional.
Prerequisites and co-requisites:
Basic identification of animals (751373A) or equivalent knowledge.
Recommended optional programme components:
Optional addition to course Field course in terrestrial animals (751306A). Recommended prerequisite to M.Sc. course Special course in ornithology (755614S).
Recommended or required reading:
Additional information and material: wiki.oulu.fi à Animal ecology à Teaching à Field identification of birds.
The availability of the literature can be checked from this link.
Assessment methods and criteria:
Notebook of field observations.
Grading:

Accepted / Failed
Person responsible:
Dr. Seppo Rytkönen.
Working life cooperation:
No.
Other information:
Binoculars, bird identification book, suitable outfit.

754616S: Field methods in freshwater biomonitoring, 4 op

Voimassaolo: - 31.07.2015

Opiskelumuoto: Advanced Studies

Laji: Course

Vastuuyksikkö: Department of Biology

Arvostelu: 1 - 5, pass, fail

Opintokohteen kielet: Finnish

Leikkaavuudet:

754626S Field methods in freshwater biomonitoring 5.0 op

ECTS Credits:
4 cr.
Language of instruction:
Finnish.
Timing:
M.Sc. 1.-2. year. Arranged if resources allow.
Learning outcomes:
The course familiarises students with methods used in biomonitoring of lakes and rivers.
Contents:
Sampling methods as well as biological and ecotoxicological laboratory analysis are practiced. Survey methods used to describe the state of habitats are applied to lake and river environments.
Mode of delivery:
Blended teaching.
Learning activities and teaching methods:
10 h lectures, 30 h field and laboratory exercises, group works.
Target group:
ECOz, ECOb.
Prerequisites and co-requisites:
Field course in aquatic animals (751307A) and Basic course in hydrobiology (754308A) or equivalent knowledge.
Recommended optional programme components:
-
Recommended or required reading:
Internet material, sample taking standards and instructions.
Assessment methods and criteria:
Group work.
Grading:
Pass / Fail.
Person responsible:
Prof. Timo Muotka.
Working life cooperation:
No.
Other information:
-

752699S: Final examination in botany, 10 op

Voimassaolo: - 31.07.2015

Opiskelumuoto: Advanced Studies

Laji: Course

Vastuuyksikkö: Department of Biology

Arvostelu: 1 - 5, pass, fail

Opintokohteen kielet: Finnish

Leikkaavuudet:

750656S Final examination in biology 10.0 op

ECTS Credits:
10 cr.
Language of instruction:
Depending on the book, exam answers Finnish / English.
Timing:
M.Sc. 1 st or 2 nd year.
Learning outcomes:
TEAb, BSb and ECOb student will understand profoundly plant ecology's or plant physiology's essential methods, results and theories.
Contents:
Book list at the notice board. Examination on selected literature of a specific subject.
Mode of delivery:
Face-to-face teaching.
Learning activities and teaching methods:
Book exam in biology public exam day.
Target group:
TEAb, BSb and ECOb: compulsory.
Prerequisites and co-requisites:
No.
Recommended optional programme components:
-
Recommended or required reading:
ECOb:
Schultze, E.-D., Beck, E., K. Muller-Hohenstein. 2002. Plant ecology. Springer.
Crawford, R.M.M. 2008. Plants at the margin. Cambridge. (copy has to be given for the professor before the exam date)
Keddy, P.A. Plants and Vegetation. Origin, processes, consequences. Cambridge.
Chapin, Matson & Mooney 2002. Principles of terrestrial ecosystem ecology. Springer.
Salonen, V. kasviekologia. Wsoy
BSb:
Beeckman 2009. Root Development. Annual Plant Reviews 37. - Wiley-Blackwell. ISBN 978-1-4051-6150-3
Coruzzi Gutierrez 2009. Plant Systems Biology. Annual Plant Reviews 35. - Wiley-Blackwell. ISBN 978-1-4051-6283-8.
Dickison, W.C. (2000) Integrative plant anatomy. 533 s. ISBN 0-12-215170-4
Fahn, A. (1990) Plant anatomy. 4. rev. ed. 588 p. ISBN 0-08-037490
Gan 2007. Senescence processes in plants. - Wiley-Blackwell. ISBN 978-0-8138-1963-1
Hayat, Mori, Pichtel & Ahmad 2010. Nitric oxide in plant physiology. - Wiley-Blackwell. ISBN 978-3-527-32519-1
Hvoslef-Eide, A.K. & Preil, W. 2005. Liquid culture systems for in vitro plant propagation. Springer ISBN 1-4020-3199-8
Jenks & Wood 2009. Genes for Plant Abiotic Stress. - Wiley-Blackwell. ISBN 978-1-4051-3984-7
Kinight, Perroud, Cove 2009. The Moss Physcomitrella- Annual Plant Reviews, volume 36 - Wiley-Blackwell. ISBN 978-1-4051-8189-1.
Lambers, H., Chapin III, F.S., Pons, T.L. (2008) Plant physiological ecology. Springer. 610 p. ISBN 978-0-387-78340-6
Osbourn, A.E. & Lanzotti, V. (2009): Plant-derived natural products: synthesis, function, and application. 587 s. Springer. (Paper and electronical copy at the library)
Parker 2008. Molecular aspects of plant disease resistance. Annual Plant Reviews , volume 34. - Wiley-Blackwell. ISBN 978-1-4051-7532-6
Reed, B.M. 2008. Plant Cryopreservation: A Practical Guide. Springer ISBN 978-0-387-72275-7
Smith & Read (2008) Mycorrhizal symbiosis. 3. ed. Academic Press. 800 p.
Taiz, L. & Zeiger, E. (2010) Plant Physiology. Fifth Edition.782 p. Sinauer Associates, Inc. ISBN-10: 0878938664
Wink 2010. Biochemistry of plant secondary metabolism. Annual Plant Reviews, volume 40. - Wiley-Blackwell. ISBN 978-1-4051-83970. Electronical book. Link in OULA-database. Dawsonera password paju.
http://www.dawsonera.com/depp/reader/protected/external/AbstractView/S9781444320510
Yeo & Flowers 2007. Plant Solute Transport. - Wiley-Blackwell. ISBN 978-1-4051-3995-3

Yoshioka & Shinozaki 2009. Signal Crosstalk in Plant Stress Responses - Wiley-Blackwell. ISBN 978-0-8138-1963-1
The availability of the literature can be checked from this link.
The literature has to be agreed upon with the professor in advance.
Assessment methods and criteria:
Final exam.
Grading:
1-5 / Fail.
Person responsible:
Prof. Juha Tuomi or Prof. Hely Häggman.
Working life cooperation:
No.
Other information:
-

753699S: Final examination in genetics, 10 op

Voimassaolo: - 31.07.2015

Opiskelumuoto: Advanced Studies

Laji: Course

Vastuuyksikkö: Department of Biology

Arvostelu: 1 - 5, pass, fail

Opintokohteen kielet: Finnish

Leikkaavuudet:

750656S	Final examination in biology	10.0 op

ECTS Credits:
10 cr.
Language of instruction:
Book in English. Exam answers Finnish / English.
Timing:
M.Sc. 1 st or 2 nd year.
Learning outcomes:
TEAg and BSg student will understand profoundly general and molecular genetics and essential methods, results and theories in other area of genetics.
Contents:
Examination on selected literature of a specific subject. A list of literature can be found on the notice board. The literature has to be agreed upon with the professor in advance.
Mode of delivery:
Face-to-face teaching.
Learning activities and teaching methods:
Final exam.
Target group:
TEAg and BSg: compulsory.
Prerequisites and co-requisites:
No.
Recommended optional programme components:
-
Recommended or required reading:
Lewin Genes (VIII tai IX) (or equivalent knowledge).
The availability of the literature can be checked from this link.
Assessment methods and criteria:
Final exam in biology public exam day.
Grading:
1-5 / Fail.
Person responsible:
Prof. Outi Savolainen.
Working life cooperation:
No.
Other information:

-

754612S: Final examination in hydrobiology, 7 op

Voimassaolo: - 31.07.2015
Opiskelumuoto: Advanced Studies
Laji: Course
Vastuuyksikkö: Department of Biology
Arvostelu: 1 - 5, pass, fail
Opettajat: Muotka, Timo Tapani
Opintokohteen kielet: Finnish
Leikkaavuudet:

754623S Final examination in hydrobiology 5.0 op

ECTS Credits:
7 cr.
Language of instruction:
English.
Timing:
M.Sc. 1 st or 2 nd year.
Learning outcomes:
The student will understand profoundly certain hydrobiology's methods, results and theories.
Contents:
The examination is compulsory to the students taking the hydrobiology study package. Reading material selected in agreement with the teacher in charge.
Mode of delivery:
Face-to-face teaching.
Learning activities and teaching methods:
Book exam.
Target group:
-
Prerequisites and co-requisites:
No.
Recommended optional programme components:
-
Recommended or required reading:
Exam books agreed with the teacher.
Assessment methods and criteria:
Final exam in biology public exam day.
Grading:
1-5 / Fail.
Person responsible:
Prof. Timo Muotka.
Working life cooperation:
No.
Other information:
-

751699S: Final examination in zoology, 10 op

Voimassaolo: - 31.07.2015
Opiskelumuoto: Advanced Studies
Laji: Course
Vastuuyksikkö: Department of Biology
Arvostelu: 1 - 5, pass, fail
Opintokohteen kielet: Finnish
Leikkaavuudet:

750656S Final examination in biology 10.0 op

ECTS Credits:
10 cr.
Language of instruction:
Depending on the book, exam answers Finnish / English.
Timing:
M.Sc. 1 st or 2 nd year.
Learning outcomes:
TEAz and BSz student will understand profoundly certain (usually related to the pro gradu thesis) animal physiology's methods, results and theories.
TEAz and ECOz student will understand profoundly animal ecology's essential methods, results and theories.
Contents:
Examination on selected literature of a specific subject.
Mode of delivery:
Face-to-face teaching.
Learning activities and teaching methods:
Book exam.
Target group:
TEAz, ECOz and BSz: compulsory.
Prerequisites and co-requisites:
No.
Recommended optional programme components:
-
Recommended or required reading:
ECOz:
Begon, M., Townsend, C.R. & Harper, J.L. 2006: Ecology. From Individuals to Ecosystems. - Blackwell, 658 s., (8 ECTS).
In case if student is not able to get the newer edition: Begon, M., Townsend, C.R. & Harper, J.L. 1996: Ecology. - Blackwell, ss. 135-952., (8 ECTS).
Ridley, M. 2004: Evolution - Blackwell, 198 p. (pages 347-520 and 590-613), (2 ECTS)
or
Futuyma, D.J. 2005: Evolution - Sinauer, 200 p. (chapters 2-6, 13, 15-16, 21), (2 ECTS).
Optional books in different animal ecology topics:
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).
BSz:
Compulsory Willmer, Stone, Johnston 2004: Environmental Physiology of Animals, 2. ed, Blackwell, 754 p.
Literature related to the pro gradu thesis 200-250 pages.
The literature has to be agreed upon with the professor in advance!
Assessment methods and criteria:
Book exam in biology public exam day.
Grading:
1-5 / Fail.

Person responsible:
Prof. Esa Hohtola or Prof. Markku Orell.
Working life cooperation:
No.
Other information:
-

752186P: Foreign studies, 0 op

Voimassaolo: - 31.07.2015

Opiskelumuoto: Basic Studies

Laji: Course

Vastuuyksikkö: Department of Biology

Arvostelu: 1 - 5, pass, fail

Opintokohteen kielet: English

Leikkaavuudet:

750133P Studies abroad 1.0 op

Voidaan suorittaa useasti: Kyllä

ECTS Credits:
-
Language of instruction:
Varying.
Timing:
B.Sc. or M.Sc. degree.
Learning outcomes:
Student will be acquainted to varying issues in botany.
Contents:
Studies done under international exchange programs (ERASMUS, NORDPLUS, ISEP) in foreign universities. Courses are either credit transferred or substituted.
Mode of delivery:
Varying.
Learning activities and teaching methods:
Varying.
Target group:
Varying.
Prerequisites and co-requisites:
Exchange programme university’s prerequisites for the courses.
Recommended optional programme components:
-
Recommended or required reading:
-
Assessment methods and criteria:
Credit transfer.
Grading:
1-5 / Fail or Pass / Fail.
Person responsible:
Prof. Juha Tuomi or Prof. Hely Häggman.
Working life cooperation:
No.
Other information:
-

751193P: Foreign studies, 0 op

Voimassaolo: - 31.07.2015

Opiskelumuoto: Basic Studies

Laji: Course

Vastuuyksikkö: Department of Biology

Arvostelu: 1 - 5, pass, fail

Opintokohteen kielet: English

Leikkaavuudet:

750133P Studies abroad 1.0 op

Voidaan suorittaa useasti: Kyllä

ECTS Credits:
-
Language of instruction:
Varying.
Timing:
B.Sc. or M.Sc. degree.
Learning outcomes:
Student will be acquainted to varying issues in zoology.
Contents:
Studies done under international exchange programs (ERASMUS, NORDPLUS, ISEP) in foreign universities. Courses are either credit transferred or substituted.
Mode of delivery:
Varying.
Learning activities and teaching methods:
Varying.
Target group:
Varying.
Prerequisites and co-requisites:
Exchange programme university’s prerequisites for the courses.
Recommended optional programme components:
-
Recommended or required reading:
-
Assessment methods and criteria:
Credit transfer.
Grading:
1-5 / Fail or Pass / Fail.
Person responsible:
Prof. Esa Hohtola or Prof. Markku Orell.
Working life cooperation:
No.
Other information:
-

753193P: Foreign studies, 0 op

Voimassaolo: - 31.07.2015

Opiskelumuoto: Basic Studies

Laji: Course

Vastuuyksikkö: Department of Biology

Arvostelu: 1 - 5, pass, fail

Opintokohteen kielet: English

Leikkaavuudet:

750133P Studies abroad 1.0 op

Voidaan suorittaa useasti: Kyllä

ECTS Credits:
-
Language of instruction:
Varying.

Timing:
B.Sc. or M.Sc. degree.
Learning outcomes:
Student will be acquainted to varying issues in genetics.
Contents:
Studies done under international exchange programs (ERASMUS, NORDPLUS, ISEP) in foreign universities. Courses are either credit transferred or substituted.
Mode of delivery:
Varying.
Learning activities and teaching methods:
Varying.
Target group:
Varying.
Prerequisites and co-requisites:
Exchange programme university's prerequisites for the courses.
Recommended optional programme components:
-
Recommended or required reading:
-
Assessment methods and criteria:
Credit transfer.
Grading:
1-5 / Fail or Pass / Fail.
Person responsible:
Prof. Outi Savolainen.
Working life cooperation:
No.
Other information:
-

751393A: Foreign studies, 0 op

Voimassaolo: - 31.07.2015

Opiskelumuoto: Intermediate Studies

Laji: Course

Vastuuyksikkö: Department of Biology

Arvostelu: 1 - 5, pass, fail

Opintokohteen kielet: English

Leikkaavuudet:

750333A Studies abroad 1.0 op

Voidaan suorittaa useasti: Kyllä

ECTS Credits:
-
Language of instruction:
Varying.
Timing:
B.Sc. or M.Sc. degree.
Learning outcomes:
Student will be acquainted to varying issues in zoology.
Contents:
Studies done under international exchange programs (ERASMUS, NORDPLUS, ISEP) in foreign universities. Courses are either credit transferred or substituted.
Mode of delivery:
Varying.
Learning activities and teaching methods:
Varying.
Target group:
Varying.
Prerequisites and co-requisites:

Exchange programme university’s prerequisites for the courses.
Recommended optional programme components:
-
Recommended or required reading:
-
Assessment methods and criteria:
Credit transfer.
Grading:
1-5 / Fail or Pass / Fail.
Person responsible:
Prof. Esa Hohtola or Prof. Markku Orell.
Working life cooperation:
No.
Other information:
-

753393A: Foreign studies, 0 op

Voimassaolo: - 31.07.2015

Opiskelumuoto: Intermediate Studies

Laji: Course

Vastuuyksikkö: Department of Biology

Arvostelu: 1 - 5, pass, fail

Opintokohteen kielet: English

Leikkaavuudet:

750333A Studies abroad 1.0 op

Voidaan suorittaa useasti: Kyllä

ECTS Credits:
-
Language of instruction:
Varying.
Timing:
B.Sc. or M.Sc. degree.
Learning outcomes:
Student will be acquainted to varying issues in genetics.
Contents:
Studies done under international exchange programs (ERASMUS, NORDPLUS, ISEP) in foreign universities. Courses are either credit transferred or substituted.
Mode of delivery:
Varying.
Learning activities and teaching methods:
Varying.
Target group:
Varying.
Prerequisites and co-requisites:
Exchange programme university’s prerequisites for the courses.
Recommended optional programme components:
-
Recommended or required reading:
-
Assessment methods and criteria:
Credit transfer.
Grading:
1-5 / Fail or Pass / Fail.
Person responsible:
Prof. Outi Savolainen.
Working life cooperation:
No.
Other information:

-

752386A: Foreign studies, 0 op

Voimassaolo: - 31.07.2015
Opiskelumuoto: Intermediate Studies
Laji: Course
Vastuuyksikkö: Department of Biology
Arvostelu: 1 - 5, pass, fail
Opintokohteen kielet: English
Leikkaavuudet:

750333A Studies abroad 1.0 op

Voidaan suorittaa useasti: Kyllä

ECTS Credits:
-
Language of instruction:
Varying.
Timing:
B.Sc. or M.Sc. degree.
Learning outcomes:
Student will be acquainted to varying issues in botany.
Contents:
Studies done under international exchange programs (ERASMUS, NORDPLUS, ISEP) in foreign universities. Courses are either credit transferred or substituted.
Mode of delivery:
Varying.
Learning activities and teaching methods:
Varying.
Target group:
Varying.
Prerequisites and co-requisites:
Exchange programme university’s prerequisites for the courses.
Recommended optional programme components:
-
Recommended or required reading:
-
Assessment methods and criteria:
Credit transfer.
Grading:
1-5 / Fail or Pass / Fail.
Person responsible:
Prof. Juha Tuomi or Prof. Hely Häggman.
Working life cooperation:
No.
Other information:
-

752686S: Foreign studies, 0 op

Voimassaolo: - 31.07.2015
Opiskelumuoto: Advanced Studies
Laji: Course
Vastuuyksikkö: Department of Biology
Arvostelu: 1 - 5, pass, fail
Opettajat: Häggman, Hely Margaretha, Tuomi Juha
Opintokohteen kielet: English

Leikkaavuudet:

750633S Studies abroad 1.0 op

Voidaan suorittaa useasti: Kyllä

ECTS Credits:
-
Language of instruction:
Varying.
Timing:
M.Sc. degree.
Learning outcomes:
Student will be acquainted to varying issues in botany.
Contents:
Studies done under international exchange programs (ERASMUS, NORDPLUS, ISEP) in foreign universities. Courses are either credit transferred or substituted.
Mode of delivery:
Varying.
Learning activities and teaching methods:
Varying.
Target group:
Varying.
Prerequisites and co-requisites:
Exchange programme university’s prerequisites for the courses.
Recommended optional programme components:
-
Recommended or required reading:
-
Assessment methods and criteria:
Credit transfer.
Grading:
1-5 / Fail or Pass / Fail.
Person responsible:
Prof. Juha Tuomi or Prof. Hely Häggman.
Working life cooperation:
No.
Other information:
-

753693S: Foreign studies, 0 op

Voimassaolo: - 31.07.2015

Opiskelumuoto: Advanced Studies

Laji: Course

Vastuuyksikkö: Department of Biology

Arvostelu: 1 - 5, pass, fail

Opintokohteen kielet: English

Leikkaavuudet:

750633S Studies abroad 1.0 op

Voidaan suorittaa useasti: Kyllä

ECTS Credits:
-
Language of instruction:
Varying.
Timing:
M.Sc. degree.
Learning outcomes:
Student will be acquainted to varying issues in genetics.

Contents:
Studies done under international exchange programs (ERASMUS, NORDPLUS, ISEP) in foreign universities. Courses are either credit transferred or substituted.
Mode of delivery:
Varying.
Learning activities and teaching methods:
Varying.
Target group:
Varying.
Prerequisites and co-requisites:
Exchange programme university's prerequisites for the courses.
Recommended optional programme components:
-
Recommended or required reading:
-
Assessment methods and criteria:
Credit transfer.
Grading:
1-5 / Fail or Pass / Fail.
Person responsible:
Prof. Outi Savolainen.
Working life cooperation:
No.
Other information:
-

751693S: Foreign studies, 0 op

Voimassaolo: - 31.07.2015

Opiskelumuoto: Advanced Studies

Laji: Course

Vastuuyksikkö: Department of Biology

Arvostelu: 1 - 5, pass, fail

Opintokohteen kielet: English

Leikkaavuudet:

750633S Studies abroad 1.0 op

Voidaan suorittaa useasti: Kyllä

ECTS Credits:
-
Language of instruction:
Varying.
Timing:
M.Sc. degree.
Learning outcomes:
Student will be acquainted to varying issues in zoology.
Contents:
Studies done under international exchange programs (ERASMUS, NORDPLUS, ISEP) in foreign universities. Courses are either credit transferred or substituted.
Mode of delivery:
Varying.
Learning activities and teaching methods:
Varying.
Target group:
Varying.
Prerequisites and co-requisites:
Exchange programme university's prerequisites for the courses.
Recommended optional programme components:
-
Recommended or required reading:

-
Assessment methods and criteria:
Credit transfer.
Grading:
1-5 / Fail or Pass / Fail.
Person responsible:
Prof. Esa Hohtola or Prof. Markku Orell.
Working life cooperation:
No.
Other information:
-

751678S: Functional animal ecology, 6 op

Voimassaolo: - 31.07.2015

Opiskelumuoto: Advanced Studies

Laji: Course

Vastuuyksikkö: Department of Biology

Arvostelu: 1 - 5, pass, fail

Opettajat: Seppo Rytkönen

Opintokohteen kielet: Finnish

Leikkaavuudet:

755624S Functional animal ecology 5.0 op

ECTS Credits:
6 cr.
Language of instruction:
Lectures in Finnish , exercises in Finnish / English.
Timing:
B.Sc. 2 nd spring or M.Sc. 1 st 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.
Grading:
1-5 / Fail.
Person responsible:

Dr. Seppo Rytkönen.
Working life cooperation:
No.
Other information:
-

751378A: Functional animal ecology, 6 op

Voimassaolo: - 31.07.2015
Opiskelumuoto: Intermediate Studies
Laji: Course
Vastuuyksikkö: Department of Biology
Arvostelu: 1 - 5, pass, fail
Opettajat: Seppo Rytkönen
Opintokohteen kielet: Finnish
Leikkaavuudet:

755324A Functional animal ecology 5.0 op

ECTS Credits:
6 cr.
Language of instruction:
Lectures in Finnish, exercises in Finnish / English.
Timing:
B.Sc. 2 nd spring or M.Sc. 1 st 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.
Grading:
1-5 / Fail.
Person responsible:
Dr. Seppo Rytkönen.
Working life cooperation:
No.
Other information:
-

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

Voimassaolo: - 31.07.2015
Opiskelumuoto: Advanced Studies
Laji: Course
Vastuuyksikkö: Department of Biology
Arvostelu: 1 - 5, pass, fail
Opettajat: Häggman, Hely Margaretha
Opintokohteen kielet: Finnish
Leikkaavuudet:

756652S Genetic transformation of plants 5.0 op

ECTS Credits:
4 cr.
Language of instruction:
Finnish / English.
Timing:
M.Sc. 1 st or 2 nd 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, lecture exam and final conclusions.
Target group:
BS students.
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.
Assessment methods and criteria:
Report, seminar and exam.
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
Vastuuyksikkö: Department of Biology
Arvostelu: 1 - 5, pass, fail
Opettajat: Kuittinen, Helmi Helena
Opintokohteen kielet: English

Leikkaavuudet:

750653S Special seminar in biology 2.0 op

Voidaan suorittaa useasti: Kyllä

ECTS Credits:
2 cr.
Language of instruction:
Finnish/English.
Timing:
M.Sc. 1 st or 2 nd 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.
Grading:
Pass / Fail.
Person responsible:
Dr. Helmi Kuittinen.
Working life cooperation:
No.
Other information:
-

753617S: Genomics and gene expression practicals, 8 op

Voimassaolo: - 31.07.2013

Opiskelumuoto: Advanced Studies

Laji: Course

Vastuuyksikkö: Department of Biology

Arvostelu: 1 - 5, pass, fail

Opettajat: Kuittinen, Helmi Helena

Opintokohteen kielet: Finnish

ECTS Credits:
8 cr.
Language of instruction:
Finnish / English.
Timing:
B.Sc. 3rd spring or M.Sc. 1st spring.
Learning outcomes:
After the course the student can study the structure of the chromosomes using traditional staining methods, localize genes in chromosomes with in-situ hybridization and study their expression with RT-PCR.
Contents:
Traditional chromosome staining methods, in-situ hybridization, RT-PCR.

Mode of delivery:
Face-to-face teaching.
Learning activities and teaching methods:
110 h demonstrations, exercises, seminars, 30 h independent small-scale research work including research plan and work report.
Target group:
BSg.
Prerequisites and co-requisites:
Experimental course in general genetics (753104P) or equivalent knowledge.
Recommended optional programme components:
-
Recommended or required reading:
-
Assessment methods and criteria:
Work report.
Grading:
1-5 / Fail.
Person responsible:
N.N.
Working life cooperation:
No.
Other information:
-

753317A: Genomics and gene expression practicals, 8 op

Voimassaolo: - 31.07.2013

Opiskelumuoto: Intermediate Studies

Laji: Course

Vastuuyksikkö: Department of Biology

Arvostelu: 1 - 5, pass, fail

Opintokohteen kielet: Finnish

ECTS Credits:
8 cr.
Language of instruction:
Finnish / English.
Timing:
B.Sc. 3rd or M.Sc. 1st spring.
Learning outcomes:
After the course the student can study the structure of the chromosomes using traditional staining methods, localize genes in chromosomes with in-situ hybridization and study their expression with RT-PCR.
Contents:
Traditional chromosome staining methods, in-situ hybridization, RT-PCR.
Mode of delivery:
Face-to-face teaching.
Learning activities and teaching methods:
110 h demonstrations, exercises, seminars, 30 h independent small-scale research work including research plan and work report, final exam.
Target group:
For BSg students.
Prerequisites and co-requisites:
Experimental course in general genetics (753104P) or equivalent knowledge.
Recommended optional programme components:
-
Recommended or required reading:
-
Assessment methods and criteria:
Work report.
Grading:
1-5 / Fail.

Person responsible:
N.N.
Working life cooperation:
No.
Other information:
-

753607S: Human genetics, 4 op

Voimassaolo: - 31.07.2015

Opiskelumuoto: Advanced Studies

Laji: Course

Vastuuyksikkö: Department of Biology

Arvostelu: 1 - 5, pass, fail

Opintokohteen kielet: Finnish

Leikkaavuudet:

757615S Human genetics 5.0 op

ECTS Credits:
4 cr.
Language of instruction:
Finnish / English.
Timing:
B.Sc. or M.Sc. degree. Odd years, autumn.
Learning outcomes:
To understand human evolution and man as a biological species.
Contents:
Human evolution in Africa, spread of different human species to other continents, research methods including population genetics and genomics, molecular human genetics: inherited diseases and susceptibilities, methods.
Mode of delivery:
Face-to-face teaching.
Learning activities and teaching methods:
Lectures, home works.
Target group:
Students of genetics. Suitable also for biochemistry students and education students.
Prerequisites and co-requisites:
Concepts of genetics (753124P) or equivalent knowledge.
Recommended optional programme components:
Educational, voluntary.
Recommended or required reading:
http://www.oulu.fi/genet/HumGen/.
Recommended reading: Jobling et al. (2004) Human evolutionary genetics. Origins, peoples & disease. Garland Publishing, ISBN 08153 41857.
The availability of the literature can be checked from this link.

Assessment methods and criteria:
Home exam, controlled exam.
Grading:
1-5 / Fail.
Person responsible:
Dr. Tanja Pyhäjärvi
Working life cooperation:
No.
Other information:
-

753307A: Human genetics, 4 op

Voimassaolo: - 31.07.2015

Opiskelumuoto: Intermediate Studies
Laji: Course
Vastuuyksikkö: Department of Biology
Arvostelu: 1 - 5, pass, fail
Opettajat: Tanja Pyhäjärvi
Opintokohteen kielet: Finnish
Leikkaavuudet:

757315A Human genetics 5.0 op

ECTS Credits:
4 cr.
Language of instruction:
Finnish / English.
Timing:
B.Sc. or M.Sc. degree. Odd years, autumn.
Learning outcomes:
To understand human evolution and man as a biological species.
Contents:
Human evolution in Africa, spread of different human species to other continents, research methods including population genetics and genomics, molecular human genetics: inherited diseases and susceptibilities, methods.
Mode of delivery:
Face-to-face teaching.
Learning activities and teaching methods:
Lectures, home works.
Target group:
Students of genetics. Suitable also for biochemistry students and education students.
Prerequisites and co-requisites:
Concepts of genetics (753124P) or equivalent knowledge.
Recommended optional programme components:
Educational, voluntary.
Recommended or required reading:
http://www.oulu.fi/genet/HumGen/.
Recommended reading: Jobling et al. (2004) Human evolutionary genetics. Origins, peoples & disease. Garland Publishing, ISBN 08153 41857.
The availability of the literature can be checked from this link.
Assessment methods and criteria:
Home exam, controlled exam.
Grading:
1-5 / Fail.
Person responsible:
Dr. Tanja Pyhäjärvi
Working life cooperation:
No.
Other information:
-

751373A: Identification of animals, 5 op

Voimassaolo: - 31.07.2016
Opiskelumuoto: Intermediate Studies
Laji: Course
Vastuuyksikkö: Department of Biology
Arvostelu: 1 - 5, pass, fail
Opettajat: Kari Koivula
Opintokohteen kielet: Finnish

ECTS Credits:
5 cr.

Language of instruction:
Finnish / English.
Timing:
B.Sc. 1 st autumn and spring. NNE.
Learning outcomes:
Main point of the course is to learn to indentify 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. & Rytkönen, S. 2001: Eläinten lajintuntemus, selkärankaiset, 42 p.
The availability of the literature can be checked from this link.
Assessment methods and criteria:
Two species exams.
Grading:
1-5 / Fail.
Person responsible:
Dr. Kari Koivula.
Working life cooperation:
No.
Other information:
-

751673S: Identification of animals, 5 op

Voimassaolo: 01.08.2011 - 31.07.2016

Opiskelumuoto: Advanced Studies

Laji: Course

Vastuuyksikkö: Department of Biology

Arvostelu: 1 - 5, pass, fail

Opettajat: Kari Koivula

Opintokohteen kielet: English

ECTS Credits:
5 cr.
Language of instruction:
English.
Timing:
ECOGEN ECOz 1 st autumn and spring.
Learning outcomes:
Main point of the course is to learn to indentify 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:
ECOGEN.
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. & Rytkönen, S. 2001: Eläinten lajintuntemus, selkärankaiset, 42 p.
The availability of the literature can be checked from this link.
Assessment methods and criteria:
Two species exams.
Grading:
1-5 / Fail.
Person responsible:
Dr. Kari Koivula.
Working life cooperation:
No.
Other information:
-

756311A: Identification of garden plant species, 5 op

Opiskelumuoto: Intermediate Studies

Laji: Course

Vastuuyksikkö: Department of Biology

Arvostelu: 1 - 5, pass, fail

Opettajat: Hiltunen, Ritva Anneli

Opintokohteen kielet: Finnish

Leikkaavuudet:

ay756311A	Identification of garden plant species (OPEN UNI)	5.0 op

ECTS Credits:
5 cr.
Language of instruction:
Finnish / English.
Timing:
B.Sc. 2 nd summer.
Learning outcomes:
Capability to indentify garden and crop species. Emphasising species thriving in northern conditions.
Contents:
Independent study of approximately 400 species in the Botanical Gardens with the help of a handout.
Mode of delivery:
Face-to-face teaching.
Learning activities and teaching methods:
Independent studying in the garden. Botanical Gardens personnel will help finding the species on demand.
Target group:
ECOb, BSb and TEA.
Prerequisites and co-requisites:
No.
Recommended optional programme components:

Course generally promotes studies in species identification and biodiversity. It is separate course but linked with the Plant evolution and systematics, exercises (752609S).
Recommended or required reading:
Hiltunen, R. & Hyvärinen, M. 2009: Puutarhakasvien lajintuntemus. Biologian laitoksen monisteita, Yliopistopaino, Oulu.
The availability of the literature can be checked from this link.
Assessment methods and criteria:
Final exam in August or beginning of September in the Botanical Gardens.
Grading:
1-5 / Fail.
Person responsible:
Ritva Hiltunen.
Working life cooperation:
No.
Other information:
-

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

Voimassaolo: - 31.07.2015

Opiskelumuoto: Intermediate Studies

Laji: Course

Vastuuyksikkö: Department of Biology

Arvostelu: 1 - 5, pass, fail

Opettajat: Annamari Markkola

Opintokohteen kielet: Finnish

Leikkaavuudet:

ay752303A Identification of plant species (OPEN UNI) 2.0 op

ECTS Credits:
2-3 cr. NNE.

Language of instruction:
Finnish / English.
Timing:
B.Sc. 1 st autumn.
Learning outcomes:
Student is able to identify most common boreal plant species in herbarium specimens.
Contents:
Demonstrations (18 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.

Mode of delivery:
Face-to-face teaching.
Learning activities and teaching methods:
18 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.

Grading:
1-5 / Fail.
Person responsible:
Dr. Annamari Markkola.
Working life cooperation:
No.
Other information:
-

752603S: Identification of plant species, 3 op

Voimassaolo: 01.08.2011 - 31.07.2015
Opiskelumuoto: Advanced Studies
Laji: Course
Vastuuyksikkö: Department of Biology
Arvostelu: 1 - 5, pass, fail
Opettajat: Annamari Markkola
Opintokohteen kielet: English
Leikkaavuudet:

756642S	Identification of plant species	3.0 op

ECTS Credits:
3 cr.
Language of instruction:
English.
Timing:
M.Sc. 1st autumn ECOGEN ECOb.
Learning outcomes:
Student is able to identify most common boreal plant species in herbarium specimens.
Contents:
Demonstrations (18 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.
Mode of delivery:
Face-to-face teaching.
Learning activities and teaching methods:
18 h demonstrations, identification exam.
Target group:
ECOGEN.
Prerequisites and co-requisites:
No.
Recommended optional programme components:
Course is prerequisite for the Field course in ecological botany (752304A).
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.
Grading:
1-5 / Fail.
Person responsible:
Dr. Annamari Markkola.
Working life cooperation:
No.
Other information:
-

751642S: Identification of vertebrates in the field, 2 op

Opiskelumuoto: Advanced Studies

Laji: Course
Vastuuyksikkö: Department of Biology
Arvostelu: 1 - 5, pass, fail
Opettajat: Kari Koivula
Opintokohteen kielet: Finnish

ECTS Credits:
2 cr.
Language of instruction:
Finnish / English.
Timing:
M.Sc. 1 st spring.
Learning outcomes:
After having the course the students have a basic knowledge (a level expected from a professional biologist) about identification of vertebrate animals in the field.
Contents:
Identification exam on birds and mammals in the field. Their natural history: tracks, droppings, nests etc.
Mode of delivery:
Face-to-face teaching.
Learning activities and teaching methods:
Independent learning, exam.
Target group:
Compulsory to ECOz.
Prerequisites and co-requisites:
No.
Recommended optional programme components:
-
Recommended or required reading:
-
Assessment methods and criteria:
Field exam.
Grading:
1-5 / Fail.
Person responsible:
Dr. Kari Koivula.
Working life cooperation:
No.
Other information:
-

030005P: Information Skills, 1 op

Opiskelumuoto: Basic Studies
Laji: Course
Vastuuyksikkö: Faculty of Technology
Arvostelu: 1 - 5, pass, fail
Opettajat: Koivuniemi, Mirja-Liisa, Sassali, Jani Henrik
Opintokohteen kielet: Finnish
Leikkaavuudet:

030004P	Introduction to Information Retrieval	0.0 op

ECTS Credits:
1 ECTS credit
Language of instruction:
Finnish
Timing:
2nd or 3rd year
Learning outcomes:

Students know the different phases of information retrieval process and basic techniques of scientific information retrieval. They will find the most important reference databases of their discipline and know how to evaluate information sources and retrieval results.
Contents:
Retrieval of scientific information, the retrieval process, key databases of the discipline, and evaluation of information retrieval and information sources.
Mode of delivery:
Blended teaching: classroom training, web-based learning material and exercises in Optima environment, a final assignment on a topic of the student's own choice
Learning activities and teaching methods:
Training sessions 8h, group working 7h, self-study 12h
Target group:
Compulsory for all students of the Faculty of Technology. In the Faculty of Science the course is compulsory for students of biology, physics, geosciences, chemistry, geography and information processing science. The course is optional for students of biochemistry and mathematics.
Prerequisites and co-requisites:
-
Recommended optional programme components:
-
Recommended or required reading:
Web learning material https://wiki.oulu.fi/display/030005P.
Assessment methods and criteria:
Passing the course requires participation in the training sessions and successful completion of the course assignments.
Grading:
pass/fail
Person responsible:
Science and Technology Library Tellus, tellustieto (at) oulu.fi
Working life cooperation:
-
Other information:
-

750600J: Integration of research and teaching, 1 - 4 op

Opiskelumuoto: Post-graduate Studies

Laji: Course

Vastuuyksikkö: Department of Biology

Arvostelu: 1 - 5, pass, fail

Opintokohteen kielet: Finnish

Voidaan suorittaa useasti: Kyllä

ECTS Credits:
1-4 cr.
Language of instruction:
Finnish / English.
Timing:
Ph.Lic. or Ph.D. degree.
Learning outcomes:
Students get teaching experience and learn to integrate latest scientific results in subject teaching.
Contents:
Teaching in a course belonging to the B.Sc. or M.Sc. degree in the Department of Biology. Credits depend on the amount of teaching. Arranged with the professor of the student's major subject.
Mode of delivery:
Face-to-face teaching.
Learning activities and teaching methods:
Teaching in biology degree programme courses.
Target group:
Ph.Lic. or Ph.D. students in biology.
Prerequisites and co-requisites:
No.

Recommended optional programme components:
-
Recommended or required reading:
-
Assessment methods and criteria:
Teaching.
Grading:
Pass / Fail.
Person responsible:
Professors.
Working life cooperation:
Yes. Teaching experience.
Other information:
-

754308A: Introduction to hydrobiology, 3 op

Voimassaolo: - 31.07.2015

Opiskelumuoto: Intermediate Studies

Laji: Course

Vastuuyksikkö: Department of Biology

Arvostelu: 1 - 5, pass, fail

Opettajat: Muotka, Timo Tapani

Opintokohteen kielet: Finnish

Leikkaavuudet:

754322A	Introduction to hydrobiology	5.0 op

ECTS Credits:
3 cr.
Language of instruction:
Finnish.
Timing:
B.Sc. 3rd spring, M.Sc. 1st spring. Even numbered years.
Learning outcomes:
Basic knowledge of inland water ecosystems structure, function and organisms. Basic concepts of hydrobiology which are necessary for further hydrobiology studies.
Contents:
Hydrography and physical and chemical properties of lakes and streams. Structure and ecological interactions of aquatic ecosystems (bacters plant and animal plankton, water insects other invertebrates, fishes). Most important biological interactions (competition, predation, parasitism, mutualism), inland water food web structure and regulation. Biodiversity of inland waters. Human influence on inland water biodiversity and ecosystem functions.
Mode of delivery:
Face-to-face teaching.
Learning activities and teaching methods:
26 h lectures, final exam.
Target group:
ECO, TEA.
Prerequisites and co-requisites:
No.
Recommended optional programme components:
Lectures are compulsory to the students taking the hydrobiology study package.
Recommended or required reading:
Course material and book Brönmark, C. & Hansson, L. 2005: The Biology of Lakes and Ponds. Oxford University Press, 285 p.
The availability of the literature can be checked from this link.
Assessment methods and criteria:
Exam.
Grading:
1-5 / Fail.
Person responsible:

Prof. Timo Muotka.
Working life cooperation:
No.
Other information:
-

755614J: Introductory essay of Ph. D. research, 4 op

Voimassaolo: - 31.07.2015
Opiskelumuoto: Post-graduate Studies
Laji: Course
Vastuuyksikkö: Department of Biology
Arvostelu: 1 - 5, pass, fail
Opintokohteen kielet: English
Leikkaavuudet:

750659J Introductory essay of Ph. D. research 4.0 op

ECTS Credits:
4 cr.
Language of instruction:
English.
Timing:
Ph.D. 1 st semester.
Learning outcomes:
Student learns about theories and recent progress of his/hers own research area.
Contents:
Theories, methodology and progress of a specific research area.
Mode of delivery:
Face-to-face teaching.
Learning activities and teaching methods:
Independent work.
Target group:
Ph.D. degree: compulsory.
Prerequisites and co-requisites:
No.
Recommended optional programme components:
-
Recommended or required reading:
Literature related to the research topic.
Assessment methods and criteria:
Ten pages long essay in English.
Grading:
Pass / Fail.
Person responsible:
Professors, supervisors.
Working life cooperation:
No.
Other information:
-

757606J: Introductory essay of Ph.D. research, 4 op

Voimassaolo: - 31.07.2015
Opiskelumuoto: Post-graduate Studies
Laji: Course
Vastuuyksikkö: Department of Biology
Arvostelu: 1 - 5, pass, fail
Opintokohteen kielet: English

Leikkaavuudet:

750659J Introductory essay of Ph. D. research 4.0 op

ECTS Credits:
4 cr.
Language of instruction:
English.
Timing:
Ph.D. 1 st semester.
Learning outcomes:
Student learns about theories and recent progress of his/hers own research area.
Contents:
Theories, methodology and progress of a specific research area.
Mode of delivery:
Face-to-face teaching.
Learning activities and teaching methods:
Independent work.
Target group:
Ph.D. degree: compulsory.
Prerequisites and co-requisites:
No.
Recommended optional programme components:
-
Recommended or required reading:
Literature related to the research topic.
Assessment methods and criteria:
Ten pages long essay in English.
Grading:
Pass / Fail.
Person responsible:
Professors, supervisors.
Working life cooperation:
No.
Other information:
-

756632J: Introductory essay of Ph.D. research, 4 op

Voimassaolo: - 31.07.2015

Opiskelumuoto: Post-graduate Studies

Laji: Course

Vastuuyksikkö: Department of Biology

Arvostelu: 1 - 5, pass, fail

Opintokohteen kielet: English

Leikkaavuudet:

750659J Introductory essay of Ph. D. research 4.0 op

ECTS Credits:
4 cr.
Language of instruction:
English.
Timing:
Ph.D. 1 st semester.
Learning outcomes:
Student learns about theories and recent progress of his/hers own research area.
Contents:
Theories, methodology and progress of a specific research area.
Mode of delivery:
Face-to-face teaching.

Learning activities and teaching methods:
Independent work.
Target group:
Ph.D. degree: compulsory.
Prerequisites and co-requisites:
No.
Recommended optional programme components:
-
Recommended or required reading:
Literature related to the research topic.
Assessment methods and criteria:
Ten pages long essay in English.
Grading:
Pass / Fail.
Person responsible:
Professors, supervisors.
Working life cooperation:
No.
Other information:
-

750329A: Kaamos symposium, 2 op

Voimassaolo: 01.08.2011 -

Opiskelumuoto: Intermediate Studies

Laji: Course

Vastuuyksikkö: Department of Biology

Arvostelu: 1 - 5, pass, fail

Opintokohteen kielet: English

Voidaan suorittaa useasti: Kyllä

ECTS Credits:
2 cr.
Language of instruction:
English.
Timing:
B. Sc., M. Sc., autumn.
Learning outcomes:
Undergraduate students get acquainted to listening and evaluating scientific oral presentations.
Contents:
Keynote spekers and Ph.D. students seminar presentations in The Kaamos Symposium.
Mode of delivery:
Face-to-face teaching.
Learning activities and teaching methods:
Summary of five presentations and symposium 2 cr.
Target group:
Undergraduate biology students.
Prerequisites and co-requisites:
No.
Recommended optional programme components:
-
Recommended or required reading:
Abstract book.
Assessment methods and criteria:
Reports.
Grading:
Pass / Fail.
Person responsible:
Prof. Timo Muotka.
Working life cooperation:
No.

Other information:
-

750629S: Kaamos symposium, 2 - 4 op

Opiskelumuoto: Advanced Studies
Laji: Course
Vastuuyksikkö: Department of Biology
Arvostelu: 1 - 5, pass, fail
Opintokohteen kielet: English
Voidaan suorittaa useasti: Kyllä

ECTS Credits:
2-4 cr.
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 credits (postgraduate students), summary of five presentations and symposium 2 cr (undergraduate students).
Target group:
Biology students: undergraduate (2 cr.) and postgraduate (4 cr.).
Prerequisites and co-requisites:
No.
Recommended optional programme components:
-
Recommended or required reading:
Abstract book.
Assessment methods and criteria:
Presentation or reports.
Grading:
Pass / Fail.
Person responsible:
Professors.
Working life cooperation:
No.
Other information:
-

040910S: Laboratory Animal Course For Scientists, 6 op

Voimassaolo: - 31.07.2012
Opiskelumuoto: Advanced Studies
Laji: Course
Vastuuyksikkö: Laboratory Animal Centre
Arvostelu: 1 - 5, pass, fail
Opettajat: Voipio Hanna-marja
Opintokohteen kielet: Finnish

Ei opintojaksokuvauksia.

750322A: Laboratory techniques and instrumentation, 5 op

Voimassaolo: - 31.07.2015
Opiskelumuoto: Intermediate Studies
Laji: Course
Vastuuyksikkö: Department of Biology
Arvostelu: 1 - 5, pass, fail
Opettajat: Hohtola, Esa Juhani, Satu Mänttäri
Opintokohteen kielet: Finnish

ECTS Credits:
5 cr.
Language of instruction:
Finnish.
Timing:
B.Sc. 3 rd or M.Sc. 1 st autumn, every other year.
Learning outcomes:
After completing the course the student 1) knows the biologically important variable types and their scales as well as sources of measurement errors, 2) can explain the operation principles of biologically important transducers, 3) is able to apply this knowledge in planning and constructing experimental set-ups, 4) knows the principles of laboratory safety.
Contents:
Lectures: Variables, distributions, scales; random and systematic errors. Important transducers in biology: electrodes, temperature, pressure, flow force, movement, radiation and gas transducers. Interferences in measurements, recording and storing measurement signals, elementary signal analysis. Principal concepts of electronics. Practicals: Hands-on exercises on biologically important transducers, instruments, data collection systems, microscopy and chemical analysis. Laboratory safety.
Mode of delivery:
Face-to-face teaching.
Learning activities and teaching methods:
24 h lectures, 64 h laboratory exercises: demonstrations and hands-on exercises on various laboratory instruments.
Target group:
Optional for BS in B.Sc. degree, compulsory to BSz in M.Sc. degree.
Prerequisites and co-requisites:
No.
Recommended optional programme components:
This course is a prerequisite to course 751635S, Advanced course in animal physiology.
Recommended or required reading:
Required: Handouts and other delivered material.
Assessment methods and criteria:
Exam.
Grading:
Pass / Fail.
Person responsible:
Prof. Esa Hohtola and Dr. Satu Mänttäri.
Working life cooperation:
No.
Other information:
Course may include visits to research and analyze laboratories.

750622S: Laboratory, instrumentation and measurement techniques, 5 op

Voimassaolo: - 31.07.2015
Opiskelumuoto: Advanced Studies
Laji: Course

Vastuuyksikkö: Department of Biology

Arvostelu: 1 - 5, pass, fail

Opettajat: Hohtola, Esa Juhani, Satu Mänttäri

Opintokohteen kielet: Finnish

ECTS Credits:
5 cr.
Language of instruction:
Finnish.
Timing:
B.Sc. 3 rd or M.Sc. 1 st autumn, every other year.
Learning outcomes:
After completing the course the student 1) knows the biologically important variable types and their scales as well as sources of measurement errors, 2) can explain the operation principles of biologically important transducers, 3) is able to apply this knowledge in planning and constructing experimental set-ups, 4) knows the principles of laboratory safety.
Contents:
Lectures: Variables, distributions, scales; random and systematic errors. Important transducers in biology: electrodes, temperature, pressure, flow force, movement, radiation and gas transducers. Interferences in measurements, recording and storing measurement signals, elementary signal analysis. Principal concepts of electronics. Practicals: Hands-on exercises on biologically important transducers, instruments, data collection systems, microscopy and chemical analysis. Laboratory safety.
Mode of delivery:
Face-to-face teaching.
Learning activities and teaching methods:
24 h lectures, 64 h laboratory exercises: demonstrations and hands-on exercises on various laboratory instruments.
Target group:
Optional for BS in B.Sc. degree, compulsory to BSz in M.Sc. degree.
Prerequisites and co-requisites:
No.
Recommended optional programme components:
This course is a prerequisite to course Advanced course in animal physiology (751635S).
Recommended or required reading:
Required: Handouts and other delivered material.
Assessment methods and criteria:
Exam.
Grading:
Pass / Fail.
Person responsible:
Prof. Esa Hohtola and Dr. Satu Mänttäri.
Working life cooperation:
No.
Other information:
Course may include visits to research and analyze laboratories.

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

Voimassaolo: - 31.07.2015

Opiskelumuoto: Advanced Studies

Laji: Course

Vastuuyksikkö: Department of Biology

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 cr.
Language of instruction:
Finnish / English.
Timing:
M.Sc. degree, (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:
Varying.
Assessment methods and criteria:
Varying.
Grading:
1-5 / Fail or Pass / Fail.
Person responsible:
Professors and docents.
Working life cooperation:
No.
Other information:
-

750616S: Legislation in environmental protection, 5 op

Opiskelumuoto: Advanced Studies

Laji: Course

Vastuuyksikkö: Department of Biology

Arvostelu: 1 - 5, pass, fail

Opettajat: Jari-Heikki Oksanen

Opintokohteen kielet: Finnish

ECTS Credits:
5 cr.
Language of instruction:
Finnish.
Timing:
B.Sc. 2 nd or 3 rd or M.Sc. 1 st autumn - spring. Every second year.
Learning outcomes:
To familiarise students with environmental legislation in European Union with regard to environmental protection and natural resources. Student is able to apply his knowledge to different environmental questions and analyze the needed means. Student knows the environmental administration and organisations in environmental protection and natural resources.
Contents:
Environmental protection and natural resources legislation in Finland and in Europe. Environmental administration and organisations, use and protection of natural resources, prevention of environmental destruction, assessment of environmental effect as well as principles of environmental legislation and main international conventions, environmental issues in UNEP and OECD are covered.
Mode of delivery:
Face-to-face teaching.
Learning activities and teaching methods:

24 h lectures, 18 h demonstrations and exercises.
Target group:
Compulsory to students who are doing the environmental protection 25 cr study module.
Prerequisites and co-requisites:
No.
Recommended optional programme components:
-
Recommended or required reading:
Erkki J. Hollo 2001: Ympäristönsuojeluoikeus, WSOY, 592 s, Kokkonen, Tuomas (toim.): Ympäristölainsäädäntö 2011. 1269 s Talentum.
The availability of the literature can be checked from this link.
Assessment methods and criteria:
Final exam or learning diary.
Grading:
1-5 / Fail.
Person responsible:
Prof. Jari Oksanen.
Working life cooperation:
No.
Other information:
Also the environmental legislation course that Faculty of technology arranges is accepted.

750316A: Legislation in environmental protection, 5 op

Opiskelumuoto: Intermediate Studies

Laji: Course

Vastuuyksikkö: Department of Biology

Arvostelu: 1 - 5, pass, fail

Opettajat: Anne Jokela, Jari-Heikki Oksanen

Opintokohteen kielet: Finnish

Leikkaavuudet:

ay750316A	Legislation in environmental protection (OPEN UNI)	5.0 op

ECTS Credits:
5 cr.
Language of instruction:
Finnish.
Timing:
B.Sc. 2 nd or 3 rd or M.Sc. 1 st autumn - spring. Every second year.
Learning outcomes:
To familiarise students with environmental legislation in European Union with regard to environmental protection and natural resources. Student is able to apply his knowledge to different environmental questions and analyze the needed means. Student knows the environmental administration and organisations in environmental protection and natural resources.
Contents:
Environmental protection and natural resources legislation in Finland and in Europe. Environmental administration and organisations, use and protection of natural resources, prevention of environmental destruction, assessment of environmental effect as well as principles of environmental legislation and main international conventions, environmental issues in UNEP and OECD are covered.
Mode of delivery:
Face-to-face teaching.
Learning activities and teaching methods:
24 h lectures, 18 h exercises including demonstrations and literature.
Target group:
Compulsory to students who are doing the environmental protection 25 cr. study module.
Prerequisites and co-requisites:
No.
Recommended optional programme components:
Compulsory to students who are doing the environmental protection 25 cr. study module.
Recommended or required reading:

Erkki J. Hollo 2001: Ympäristönsuojeluoikeus, WSOY, 592 s, Kokkonen, Tuomas (toim.): Ympäristölainsäädäntö 2011. 1269 s Talentum.
The availability of the literature can be checked from this link.
Assessment methods and criteria:
Exam or learning diary.

Grading:
1-5 / Fail.
Person responsible:
Prof. Jari Oksanen.
Working life cooperation:
No.
Other information:
Also the environmental legislation course that Faculty of technology arranges is accepted.

752316A: Macro fungi, 3 op

Opiskelumuoto: Intermediate Studies

Laji: Course

Vastuuyksikkö: Department of Biology

Arvostelu: 1 - 5, pass, fail

Opettajat: Annamari Markkola

Opintokohteen kielet: Finnish

Leikkaavuudet:

ay752316A	Macro fungi (OPEN UNI)	3.0 op

ECTS Credits:
3 cr.
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.
Grading:
1-5 / Fail.
Person responsible:
Dr. Annamari Markkola.
Working life cooperation:
No.

Other information:
-

752616S: Macro fungi, 3 op

Opiskelumuoto: Advanced Studies
Laji: Course
Vastuuyksikkö: Department of Biology
Arvostelu: 1 - 5, pass, fail
Opintokohteen kielet: Finnish

ECTS Credits:
3 cr.
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), independent study in fresh identification exam on fresh specimens, exam.
Target group:
Optional course.

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 exam.
Grading:
1-5 / Fail.
Person responsible:
Dr. Annamari Markkola.
Working life cooperation:
No.
Other information:
-

750696S: Master of science seminar, 4 op

Voimassaolo: - 31.07.2015
Opiskelumuoto: Advanced Studies
Laji: Course
Vastuuyksikkö: Department of Biology
Arvostelu: 1 - 5, pass, fail
Opettajat: Muotka, Timo Tapani

Opintokohteen kielet: Finnish

Leikkaavuudet:

750678S Master of science seminar 5.0 op

ECTS Credits:
4 cr.
Language of instruction:
Finnish / English.
Timing:
M.Sc. 1 st - 2 nd year.
Learning outcomes:
The seminar gives advanced scientific communication and information retrieval skills.
Contents:
Instructions for the M.Sc. thesis and interactive reporting of the work in progress.
Mode of delivery:
Face-to-face teaching.
Learning activities and teaching methods:
Student will give two seminar presentations and one research seminar and one result seminar presentation opponenting, eight research seminar and eight result seminar attendances. Research plan seminar and results seminar presentations cannot be given at same day. Topics and dates have to be agreed with the professor in beforehand. See notice board for the schedule and instructions.
Target group:
Compulsory to the biology students.
Prerequisites and co-requisites:
No.
Recommended optional programme components:
-
Recommended or required reading:
-
Assessment methods and criteria:
Seminar presentations, attendance and opponenting. Detailed instructions on the department's notice board.
Grading:
Pass / Fail.
Person responsible:
Prof. Markku Orell.
Working life cooperation:
No.
Other information:
-

757602S: Master of science thesis in genetics, 40 op

Voimassaolo: - 31.07.2015

Opiskelumuoto: Advanced Studies

Laji: Diploma thesis

Vastuuyksikkö: Department of Biology

Arvostelu: 1 - 5, pass, fail

Opintokohteen kielet: Finnish

Leikkaavuudet:

750657S Biology subject teacher pro gradu thesis 20.0 op

750658S Pro gradu thesis in biology 40.0 op

ECTS Credits:
20-40 cr.
Language of instruction:
Finnish / English.
Timing:
M.Sc. 1 st or 2 nd year.
Learning outcomes:

Student knows the research methods in specific field of biology. She is conversant with her field of thesis and is able to scientific thinking, estimating the results, analysing, drawing conclusions and scientific communicating.
Contents:
Literary work which in general includes experimental research work. Student gets profoundly acquainted on certain special field in biology.
Mode of delivery:
Face-to-face teaching.
Learning activities and teaching methods:
Independent research work on a scientific subject in agreement with the responsible professor and under the supervision of the Department. The supervisors may be professors of the department, docents and other teachers and researchers who have the docent's status. The student may have several supervisors, the other supervisor may be from other department, university (also abroad) or from research institute. The subject must be agreed on with the professor in advance. The research work can contain fieldwork, laboratory work, theoretical work or work on collections in museum. The work always includes a literature survey. After having completed the thesis, the student writes the Maturity Exam. The dean will order the examiners by the proposal of the professor. Pro gradu working group accepts and grades the thesis on the basis of the final examiners' opinions.
Target group:
TEAg: compulsory 20 cr, BSg: compulsory 40 cr.
Prerequisites and co-requisites:
-
Recommended optional programme components:
-
Recommended or required reading:
-
Assessment methods and criteria:
Literary work.
Grading:
1-5 / Fail.

Person responsible:
Professors.
Working life cooperation:
-
Other information:
-

755602S: Master of science thesis in zoology, 40 op

Voimassaolo: - 31.07.2015

Opiskelumuoto: Advanced Studies

Laji: Diploma thesis

Vastuuyksikkö: Department of Biology

Arvostelu: 1 - 5, pass, fail

Opintokohteen kielet: Finnish

Leikkaavuudet:

750657S	Biology subject teacher pro gradu thesis	20.0 op
750658S	Pro gradu thesis in biology	40.0 op

ECTS Credits:
20-40 cr.
Language of instruction:
Finnish / English.
Timing:
M.Sc. 1 st or 2 nd year.
Learning outcomes:
Student knows the research methods in specific field of biology. She is conversant with her field of thesis and is able to scientific thinking, estimating the results, analysing, drawing conclusions and scientific communicating.
Contents:
Literary work which in general includes experimental research work. Student gets profoundly acquainted on certain special field in biology.

Mode of delivery:
Face-to-face teaching.
Learning activities and teaching methods:
Independent research work on a scientific subject in agreement with the responsible professor and under the supervision of the Department. The supervisors may be professors of the department, docents and other teachers and researchers who have the docent's status. The student may have several supervisors, the other supervisor may be from other department, university (also abroad) or from research institute. The subject must be agreed on with the professor in advance. The research work can contain fieldwork, laboratory work, theoretical work or work on collections in museum. The work always includes a literature survey. After having completed the thesis, the student writes the Maturity Exam. The dean will order the final examiners by the proposal of the professor. Pro gradu working group accepts and grades the thesis on the basis of the final examiners' opinions.

Target group:
TEAz: compulsory 20 cr, ECOz and BSz: compulsory 40 cr.
Prerequisites and co-requisites:
No.
Recommended optional programme components:
-
Recommended or required reading:
-
Assessment methods and criteria:
Literary work.
Grading:
1-5 / Fail.

Person responsible:
Professors.
Working life cooperation:
No.
Other information:
-

750632S: Maturity exam, 0 op

Opiskelumuoto: Advanced Studies

Laji: Course

Vastuuyksikkö: Department of Biology

Arvostelu: 1 - 5, pass, fail

Opintokohteen kielet: Finnish

ECTS Credits:
0 cr.
Language of instruction:
Finnish / Swedish / English.
Timing:
M.Sc. degree.
Learning outcomes:
Student will present and analyze research material, methods and results.
Contents:
After completing the Master of Science Thesis, the student will give summary in his/her native language to show his/her familiarity with the topic of the thesis.
Mode of delivery:
Face-to-face teaching.
Learning activities and teaching methods:
Instructions at the Faculty of Science internet homepage. One teacher examine the maturity exam and Pro gradu working group accepts it.
Target group:
Compulsory to the biology students. After completing the thesis.
Prerequisites and co-requisites:
No.
Recommended optional programme components:

-
Recommended or required reading:
-
Assessment methods and criteria:
Summary form at the Faculty of Science internet homepage.
Grading:
Pass / Fail.
Person responsible:
Professor of the student's major subject.
Working life cooperation:
No.
Other information:
-

750604S: Metapopulation dynamics, 4 op

Voimassaolo: 01.08.2009 - 31.07.2015

Opiskelumuoto: Advanced Studies

Laji: Course

Vastuuyksikkö: Department of Biology

Arvostelu: 1 - 5, pass, fail

Opettajat: Orell, Markku Ilmari, Jari-Heikki Oksanen

Opintokohteen kielet: Finnish

ECTS Credits:
4 cr.
Language of instruction:
Finnish / English.
Timing:
M.Sc. degree, arranged if resources allow.
Learning outcomes:
The students know the principles of the theory of metapopulations, and can apply the theory for developing testable ecological hypotheses, concerning, for instance, the conservation of threatened species.
Contents:
The general theory of metapopulations, spatially explicit (or nature-like) metapopulation models, the genetic structure of metapopulations, application of metapopulation models in conservation of endangered species.
Mode of delivery:
Face-to-face teaching.
Learning activities and teaching methods:
24 h lectures, 16 h exercises, seminar. Teachers from different study subjects.
Target group:
-
Prerequisites and co-requisites:
Population biology of plants (756323A).
Recommended optional programme components:
-
Recommended or required reading:
Hanski, I. 1999: Metapopulation Ecology. Oxford University Press, Oxford, 313 p and current scientific articles. The availability of the literature can be checked from this link.
Assessment methods and criteria:
Exam.
Grading:
1-5 / Fail.
Person responsible:
Prof. Jari Oksanen and Prof. Markku Orell.
Working life cooperation:
No.
Other information:
-

750644S: Methods in ecology I, 6 op

Voimassaolo: 01.08.2012 - 31.07.2015
Opiskelumuoto: Advanced Studies
Laji: Course
Vastuuyksikkö: Department of Biology
Arvostelu: 1 - 5, pass, fail
Opettajat: Kari Koivula, Seppo Rytkönen, Tuomi Juha
Opintokohteen kielet: English
Leikkaavuudet:

755625S Methods in ecology I 5.0 op

ECTS Credits:
6 cr.
Language of instruction:
English.
Timing:
ECOGEN ECOz and ECOb 1 st 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 ECOGEN ECOz and ECOb.
Prerequisites and co-requisites:
Basics in ecology (750124P) or equivalent knowledge.
Recommended optional programme components:
-
Recommended or required reading:
-
Assessment methods and criteria:
Exam.
Grading:
1-5 / Fail.
Person responsible:
Dr. Kari Koivula, Dr. Seppo Rytkönen and Prof. Juha Tuomi.
Working life cooperation:
No.
Other information:
-

750647S: Methods in ecology II, 7 op

Voimassaolo: - 31.07.2015
Opiskelumuoto: Advanced Studies
Laji: Course
Vastuuyksikkö: Department of Biology
Arvostelu: 1 - 5, pass, fail

Opettajat: Seppo Rytkönen

Opintokohteen kielet: Finnish

Leikkaavuudet:

755329A	Methods in ecology II	5.0 op
755629S	Methods in ecology II	5.0 op

ECTS Credits:
7 cr.
Language of instruction:
Finnish, exercises also in English.
Timing:
M. Sc. 1 st spring, ECOGEN ECOz and ECOb 1st spring.
Learning outcomes:
The aim of the course is to learn in practice how to apply scientific method in ecological research. The student learns how to select appropriate methods for different ecological problems, and a toolkit for study design and data analysis.
Contents:
Continuation to course Ecological methods I 6cr (750347A). This course focuses on applying the scientific method in ecological research. The course consists mainly of computer exercises in the following subjects: sampling, sample size determination, experimental design and statistical analysis esp. analysis of variance, comparative methods (independent contrasts - analysis), multivariate methods (cluster analysis, ordination) and meta-analysis. Also other current issues can be included. The course ends in a Master Thesis seminar where students can discuss and develop their thesis plans with students and instructors.
Mode of delivery:
Face-to-face teaching.
Learning activities and teaching methods:
Lectures, seminar, exercises and exam.
Target group:
Compulsory to ECOz and ECOb and ECOGEN ECOz and ECOb.
Prerequisites and co-requisites:
Course 750347A. Recommended: Basics of statistics I 806109P.
Recommended optional programme components:
-
Recommended or required reading:
Handout.

Assessment methods and criteria:
Exam.
Grading:
1-5 / Pass.
Person responsible:
Prof. Jari Oksanen and Dr. Seppo Rytkönen.
Working life cooperation:
No.
Other information:
-

753612S: Methods in genomics and genomics evolution, 6 op

Voimassaolo: 01.08.2009 - 31.07.2015

Opiskelumuoto: Advanced Studies

Laji: Course

Vastuuyksikkö: Department of Biology

Arvostelu: 1 - 5, pass, fail

Opettajat: Savolainen Outi

Opintokohteen kielet: Finnish

Leikkaavuudet:

757620S	Methods in genomics and genomics evolution	5.0 op

ECTS Credits:
6 cr.
Language of instruction:
Finnish / English.
Timing:
M.Sc. 1st spring.
Learning outcomes:
Student knows focal features of genome structure, evolution and research methods. Purpose of the course is to give a conseption of common bases, approach and question phrasing in gene expression, gene function, genome structure and gene mapping.
Contents:
Genome structure, composition, comparative genomics, recombination and evolutionary factors affecting genome composition.
Mode of delivery:
Face-to-face teaching.
Learning activities and teaching methods:
24 h lectures, 24 h seminars, independent work 70 h, exam, reports.
Target group:
BSg.
Prerequisites and co-requisites:
No.
Recommended optional programme components:
-
Recommended or required reading:
-
Assessment methods and criteria:
Reports and exam.
Grading:
1-5 / Fail.
Person responsible:
Prof. Outi Savolainen.
Working life cooperation:
No.
Other information:
-

750160P: Minor subject examination in biology, 4 op

Voimassaolo: - 31.07.2015

Opiskelumuoto: Basic Studies

Laji: Course

Vastuuyksikkö: Department of Biology

Arvostelu: 1 - 5, pass, fail

Opettajat: Muotka, Timo Tapani

Opintokohteen kielet: Finnish

Leikkaavuudet:

750179P Minor subject examination in biology 5.0 op

ECTS Credits:
4 cr.
Language of instruction:
Book in English.
Timing:
B.Sc. / M.Sc.
Learning outcomes:
The book exam gives to the non-biology student basics in biology so that he/she can follow the hydrobiology courses arranged by the biology degree programme.
Contents:
Basics in biology.
Mode of delivery:

Face-to-face teaching.
Learning activities and teaching methods:
Book exam.
Target group:
A book exam compulsory to non-biology students who do the hydrobiology study package.
Prerequisites and co-requisites:
No.
Recommended optional programme components:
A compulsory book exam to non-biology students taking the hydrobiology study package.
Recommended or required reading:
Campbell, N. A. & Reece J. B. & Mitchell, L.G. 1999: Biology, 5 th ed., Pearson Education Inc., 1175 p. Campbell, N. A. & Reece J. B. 2002: Biology, 6 th ed., Pearson Education Inc., 1247 p.
The availability of the literature can be checked from this link.
Assessment methods and criteria:
Book exam.
Grading:
1-5 / Fail.
Person responsible:
Prof. Timo Muotka.
Working life cooperation:
No.
Other information:
-

752692S: Mire ecology, 5 op

Voimassaolo: 01.08.2003 -

Opiskelumuoto: Advanced Studies

Laji: Course

Vastuuyksikkö: Department of Biology

Arvostelu: 1 - 5, pass, fail

Opettajat: Virtanen, Risto Juhani

Opintokohteen kielet: Finnish

Leikkaavuudet:

ay752692S Mire ecology 5.0 op

ECTS Credits:
4 cr.
Language of instruction:
Finnish.
Timing:
B.Sc. 2 nd or 3 rd autumn. M.Sc. 1 st or 2 nd autumn. Every second year at the Oulanka research station. Arranged if resources allow.
Learning outcomes:
By passing this course a student is able to identify plant species (bryophytes and vascular plants), mire types, vegetation of boreal areas, species indicator values, determine mire types, interpret ecology of mire systems and make inventories on mire landscapes.
Contents:
Plant species (bryophytes and vascular plants), mire types, vegetation of boreal areas. Regional patterns in mire vegetation, mire types and underlying ecological gradients. Mire hydrotopography and peat stratigraphy. Red list status of mire vegetation.
Mode of delivery:
Face-to-face teaching.
Learning activities and teaching methods:
Lectures 9 h, field course, demonstations and field exercises 47 h.
Target group:
Plant ecology students.
Prerequisites and co-requisites:
Field course in ecological botany (752304A) or equivalent knowledge.
Recommended optional programme components:

-
Recommended or required reading:
To be announced.
Assessment methods and criteria:
Mire type and species exam.
Grading:
Mire types and species exam. 1-5 / Fail.
Person responsible:
Dr. Risto Virtanen.
Working life cooperation:
No.
Other information:
Organised together with the University of Eastern Finland.

752392A: Mire ecology, 5 op

Opiskelumuoto: Intermediate Studies

Laji: Course

Vastuuyksikkö: Department of Biology

Arvostelu: 1 - 5, pass, fail

Opettajat: Virtanen, Risto Juhani

Opintokohteen kielet: Finnish

ECTS Credits:
4 cr.
Language of instruction:
Finnish.
Timing:
B.Sc. 2 nd or 3 rd autumn. M.Sc. 1 st or 2 nd autumn. Every second year at the Oulanka research station. Arranged if resources allow.
Learning outcomes:
By passing this course a student is able to identify plant species (bryophytes and vascular plants), mire types, vegetation of boreal areas, species indicator values, determine mire types, interpret ecology of mire systems and make inventories on mire landscapes.
Contents:
Plant species (bryophytes and vascular plants), mire types, vegetation of boreal areas. Regional patterns in mire vegetation, mire types and underlying ecological gradients. Mire hydrotopography and peat stratigraphy. Red list status of mire vegetation.
Mode of delivery:
Face-to-face teaching.
Learning activities and teaching methods:
Lectures 9 h, field course and field exercises 47 h.
Target group:
Plant ecology students.
Prerequisites and co-requisites:
Field course in ecological botany (752304A).
Recommended optional programme components:
-
Recommended or required reading:
Eurola, S., Huttunen, A. & Kukko-oja. K. 1995: Suokasvillisuusopas. Oulanka Reports 14: 1-85 ja Eurola, S., Bendiksen, K. & Rönkä, A. 1990: Suokasviopas. Oulanka Reports 9: 1-205.
The availability of the literature can be checked from this link.
Assessment methods and criteria:
Lectures, field exercises, team work in small groups.
Grading:
Mire types and species exam. 1-5 / Fail.
Person responsible:
Dr. Risto Virtanen.
Working life cooperation:
No.
Other information:

Organised together with the University of Eastern Finland.

750645S: Molecular ecology, 2 - 5 op

Voimassaolo: 01.08.2012 - 31.07.2015
Opiskelumuoto: Advanced Studies
Laji: Course
Vastuuyksikkö: Department of Biology
Arvostelu: 1 - 5, pass, fail
Opintokohteen kielet: Finnish
Leikkaavuudet:

756650S	Introduction to molecular ecology	5.0 op

ECTS Credits:
2-5 cr.
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), Seminar of ecological and conservation genetics (753692S).
Recommended or required reading:
Beebee, T and Rowe G.2004. 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.
Grading:
1-5 / Fail.
Person responsible:
Dr. Laura Kvist.
Working life cooperation:
No.
Other information:
-

753327A: Molecular evolution, 4 op

Voimassaolo: - 31.07.2015
Opiskelumuoto: Intermediate Studies

Laji: Course

Vastuuyksikkö: Department of Biology

Arvostelu: 1 - 5, pass, fail

Opettajat: Päivi Leinonen, Kuittinen, Helmi Helena

Opintokohteen kielet: Finnish

Leikkaavuudet:

757312A Molecular evolution 5.0 op

ECTS Credits:
4 cr.
Language of instruction:
Finnish / English.
Timing:
B.Sc. 2nd autumn or M.Sc. 1st autumn.
Learning outcomes:
After the course the student knows some basic methods that are used to study the history of living organisms and the evolutionary mechanisms. The student knows the main concepts in the field and can read scientific articles in molecular evolution.
Contents:
Basic methods of estimation of nucleotide substitution rates, building of phylogenetic trees with distance based methods and parsimony. Evolution of the genome structure and size. Scientific articles.

Mode of delivery:
Face-to-face teaching.
Learning activities and teaching methods:
24 h lectures, 12 h exercises, 40 h independent studies including home work.
Target group:
Compulsory to the biology students.
Prerequisites and co-requisites:
Concepts of genetics (753124P) or equivalent knowledge.
Recommended optional programme components:
-
Recommended or required reading:
Additional reading Graur, D. and Li, W.-H. 1999: Fundamentals of Molecular Evolution. Sinauer, Massachusetts.
The availability of the literature can be checked from this link.
Assessment methods and criteria:
Exam/home exam, homework.
Grading:
1-5 / Fail.
Person responsible:
Dr. Helmi Kuittinen.
Working life cooperation:
No.
Other information:
-

750664S: Molecular methods I, 4 op

Voimassaolo: 01.08.2011 - 31.07.2015

Opiskelumuoto: Advanced Studies

Laji: Course

Vastuuyksikkö: Department of Biology

Arvostelu: 1 - 5, pass, fail

Opettajat: Kuittinen, Helmi Helena

Opintokohteen kielet: English

Leikkaavuudet:

757611S Molecular methods I 5.0 op

ECTS Credits:
4 cr.
Language of instruction:
English.
Timing:
ECOGEN 1st autumn.
Learning outcomes:
After the course the student is able to use the basic methods of DNA work. The student can isolate DNA from different organisms, estimate the quality and quantity of the DNA, amplify DNA fragments with the polymerase chain reaction, design PCR primers, sequence DNA, and do fragment analysis. The student is able to evaluate his results and optimize methods to some degree.
Contents:
Isolation of genomic DNA, amplification of DNA by PCR, primer design, DNA sequencing, and fragment analysis (for example, microsatellites). Computer programs needed for DNA-sequence and fragment analysis.
Mode of delivery:
Face-to-face teaching.
Learning activities and teaching methods:
48 h exercises including demonstrations, 50 h independent work including homework and reports.
Target group:
Compulsory to ECOGEN students.
Prerequisites and co-requisites:
Consepts of genetics (753104A) or equivalent knowledge.
Recommended optional programme components:
-
Recommended or required reading:
-
Assessment methods and criteria:
Reports.
Grading:
1-5 / Fail
Person responsible:
Dr. Helmi Kuittinen.
Working life cooperation:
No.
Other information:
-

750364A: Molecular methods I, 4 op

Voimassaolo: - 31.07.2015

Opiskelumuoto: Intermediate Studies

Laji: Course

Vastuuyksikkö: Department of Biology

Arvostelu: 1 - 5, pass, fail

Opettajat: Kuittinen, Helmi Helena

Opintokohteen kielet: Finnish

Leikkaavuudet:

757311A Molecular methods I 5.0 op

ECTS Credits:
4 cr.
Language of instruction:
Finnish / English.
Timing:
BS: B.Sc. 2nd autumn, ECO: M.Sc. 1st autumn.
Learning outcomes:
After the course the student is able to use the basic methods of DNA work. The student can isolate DNA from different organisms, estimate the quality and quantity of the DNA, amplify DNA fragments with the polymerase chain reaction, design PCR primers, sequence DNA, and do fragment analysis. The student is able to evaluate his results and optimize methods to some degree.

Contents:
Contents: Isolation of genomic DNA, amplification of DNA by PCR, primer design, DNA sequencing, and fragment analysis (for example, microsatellites). Computer programs needed for DNA-sequence and fragment analysis.
Mode of delivery:
Face-to-face teaching.
Learning activities and teaching methods:
48 h exercises including demonstrations, 50 h independent work including homework and reports.
Target group:
Compulsory to BS, suitable for ECO students who are interested in population and evolutionary ecology.

Prerequisites and co-requisites:
Consepts of genetics (753104A).
Recommended optional programme components:
-
Recommended or required reading:
-
Assessment methods and criteria:
Reports.
Grading:
1-5 / Fail
Person responsible:
Dr. Helmi Kuittinen.
Working life cooperation:
No.
Other information:
-

750365A: Molecular methods II, 4 op

Voimassaolo: - 31.07.2017

Opiskelumuoto: Intermediate Studies

Laji: Course

Vastuuyksikkö: Department of Biology

Arvostelu: 1 - 5, pass, fail

Opettajat: Anna-Maria Pirttilä

Opintokohteen kielet: Finnish

Leikkaavuudet:

757617S Molecular methods II 5.0 op

ECTS Credits:
4 cr.
Language of instruction:
Finnish / English.
Timing:
BS: B.Sc. 3 rd autumn.

Learning outcomes:
The student knows how to study gene expression at different levels (transcription, translation) and understands the benefits and limitations of each method used.
Contents:
The course consists of laboratory work elaborating principles of gene expression by molecular biology.
Mode of delivery:
Face-to-face teaching.
Learning activities and teaching methods:
50 h exercises including demonstrations, 50 h independent work, work reports.
Target group:
Compulsory to BS.
Prerequisites and co-requisites:
Molecular methods I (750364A).
Recommended optional programme components:

-
Recommended or required reading:
Course handout.
Assessment methods and criteria:
Demonstrations, exercises, reports.
Grading:
1-5 / Fail.
Person responsible:
Dr. Anna Maria Pirttilä.

Working life cooperation:
No.
Other information:
-

750303A: Nature conservation and land use, 3 op

Voimassaolo: 01.08.2009 - 31.07.2015

Opiskelumuoto: Intermediate Studies

Laji: Course

Vastuuyksikkö: Department of Biology

Arvostelu: 1 - 5, pass, fail

Opettajat: Jäkäläniemi, Anne Marjatta

Opintokohteen kielet: Finnish

Leikkaavuudet:

756342A	Identification of plant species	3.0 op

ECTS Credits:
3 cr.
Language of instruction:
Finnish.
Timing:
B.Sc. 3 rd or M.Sc.
Learning outcomes:
The student understands the main goals of conservation at international, national and regional levels and can implement these goals in practice.
Contents:
The course will give general knowledge of conservation ecology and its use in the society policy making. The central themes are (1) conservation, monitoring and management of species and vegetation types, (2) the social impacts of conservation and (3) land use planning. The topics will be explored both at international and local levels.
Mode of delivery:
Face-to-face teaching.
Learning activities and teaching methods:
Before the course each pair of students will prepare an electronic poster presentation on a chosen theme. The students will present the posters during the course. Course materials and info will be gathered and updated in the OPTIMA-database (https:\\optima.oulu.fi). Course will be held at the Oulanka research station.
Target group:
Students of biology and geography.
Prerequisites and co-requisites:
For biology students Nature conservation (752321A), basic field courses (751306A, 751307A, 752304A). For geography students Nature conservation (752321A), Field course in physical geography (790310A).
Recommended optional programme components:
-
Recommended or required reading:
Course materials and info can be found in the OPTIMA database.
Assessment methods and criteria:
-
Grading:
Pass / Fail.

Person responsible:
Dr. Anne Jäkäläniemi.
Working life cooperation:
No.
Other information:
Arranged if resources allow.

750603S: Nature conservation and land use, 3 op

Voimassaolo: 01.08.2009 - 31.07.2015
Opiskelumuoto: Advanced Studies
Laji: Course
Vastuuyksikkö: Department of Biology
Arvostelu: 1 - 5, pass, fail
Opettajat: Jäkäläniemi, Anne Marjatta
Opintokohteen kielet: Finnish

ECTS Credits:
3 cr.
Language of instruction:
Finnish.
Timing:
B.Sc. 3 rd or M.Sc. 1 st or 2 nd spring and summer.
Learning outcomes:
The student understands the main goals of conservation at international, national and regional levels and can implement these goals in practice.
Contents:
The course will give general knowledge of conservation ecology and its use in the society policy making. The central themes are (1) conservation, monitoring and management of species and vegetation types, (2) the social impacts of conservation and (3) land use planning. The topics will be explored both at international and local levels.
Mode of delivery:
Face-to-face teaching.
Learning activities and teaching methods:
Before the course each pair of students will prepare an electronic poster presentation on a chosen theme. The students will present the posters during the course. Course materials and info will be gathered and updated in the OPTIMA-database (https:\\optima.oulu.fi). Course will be held at the Oulanka research station.
Target group:
Students of biology and geography.
Prerequisites and co-requisites:
For biology students Nature conservation (752321A), basic field courses (751306A, 751307A, 752304A). For geography students Nature conservation (752321A), Field course in physical geography (790310A).
Recommended optional programme components:
-
Recommended or required reading:
Course materials and info can be found in the OPTIMA database (see above).
Assessment methods and criteria:
-
Grading:
Pass / Fail.
Person responsible:
Dr. Anne Jäkäläniemi.
Working life cooperation:
No.
Other information:
Arranged if resources allow.

750642S: Optimatisation and game theories, 3 op

Voimassaolo: - 31.07.2015
Opiskelumuoto: Advanced Studies
Laji: Course
Vastuuyksikkö: Department of Biology
Arvostelu: 1 - 5, pass, fail
Opettajat: Tuomi Juha
Opintokohteen kielet: Finnish

ECTS Credits:
3 cr.
Language of instruction:
Finnish / English.
Timing:
M. Sc. degree, (arranged if resources allow).
Learning outcomes:
Get to know optimatisation and game theories.
Contents:
How to apply optimising principle into ecological problems. The emphasis is on the evolutionary ecological questions and how to analyse them with different optimising methods. Practicals include simple optimization exercises and game theory problems. Course includes modelling project where biological problems are solved with the help of taught methods.
Mode of delivery:
Face-to-face teaching.
Learning activities and teaching methods:
14 h lectures, 14 h exercises, exam.
Target group:
Ecology students.
Prerequisites and co-requisites:
Basic knowledge of ecology and evolution ecology, no necessary mathematical skills. Concept of derivative is basic in all optimising methods.
Recommended optional programme components:
-
Recommended or required reading:
-
Assessment methods and criteria:
Modelling project and exam.
Grading:
1-5 / Fail.
Person responsible:
Prof. Juha Tuomi.
Working life cooperation:
No.
Other information:
-

750199P: Optional examinations in environmental protection, 2 - 6 op

Voimassaolo: - 31.12.2018
Opiskelumuoto: Basic Studies
Laji: Course
Vastuuyksikkö: Department of Biology
Arvostelu: 1 - 5, pass, fail
Opettajat: Jari-Heikki Oksanen
Opintokohteen kielet: Finnish
Leikkaavuudet:

ay750199P	Optional examinations in environmental protection (OPEN UNI)	2.0 op

Voidaan suorittaa useasti: Kyllä

ECTS Credits:
2-6 cr.
Language of instruction:
Most books are in English.
Timing:
B.Sc. or M.Sc. degree.
Learning outcomes:
To understand biodiversity and its protection in global context.
Contents:
Depends on the book.
Mode of delivery:
Face-to-face teaching.
Learning activities and teaching methods:
Written exam, essay style. Biology public exam day also during the summer.
Target group:
Biology, geography, geology, environmental engineering , exchange students.
Prerequisites and co-requisites:
No.
Recommended optional programme components:
-
Recommended or required reading:
http://cc.oulu.fi/~jarioksa/opetus/
Assessment methods and criteria:
Exam.
Grading:
1-5 / Fail.
Person responsible:
Prof. Jari Oksanen.
Working life cooperation:
No.
Other information:
-

750399A: Optional examinations in environmental protection, 2 - 6 op

Opiskelumuoto: Intermediate Studies

Laji: Course

Vastuuyksikkö: Department of Biology

Arvostelu: 1 - 5, pass, fail

Opettajat: Jari-Heikki Oksanen

Opintokohteen kielet: Finnish

Voidaan suorittaa useasti: Kyllä

ECTS Credits:
2-6 cr.
Language of instruction:
Most books are in English.
Timing:
B.Sc. or M.Sc. degree.
Learning outcomes:
To understand biodiversity and its protection in global context.
Contents:
Depends on the book.
Mode of delivery:
Face-to-face teaching.
Learning activities and teaching methods:
Written exam, essay style. Biology public exam day also during the summer.
Target group:
Biology, geography, geology, environmental engineering , exchange students.
Prerequisites and co-requisites:

No.
Recommended optional programme components:
-
Recommended or required reading:
Books: http://cc.oulu.fi/~jarioksa/opetus/
Assessment methods and criteria:
Exam.
Grading:
1-5 / Fail.
Person responsible:
Prof. Jari Oksanen.
Working life cooperation:
No.
Other information:
-

750699S: Optional examinations in environmental protection, 2 - 6 op

Opiskelumuoto: Advanced Studies

Laji: Course

Vastuuyksikkö: Department of Biology

Arvostelu: 1 - 5, pass, fail

Opettajat: Jari-Heikki Oksanen

Opintokohteen kielet: Finnish

Voidaan suorittaa useasti: Kyllä

ECTS Credits:
2-6 cr.
Language of instruction:
Most books are in English.
Timing:
B.Sc. or M.Sc. degree.
Learning outcomes:
To understand biodiversity and its protection in global context.
Contents:
Depends on the book.
Mode of delivery:
Face-to-face teaching.
Learning activities and teaching methods:
Written exam, essay style. Biology public exam day also during the summer.
Target group:
Biology, geography, geology, environmental engineering, exchange students.
Prerequisites and co-requisites:
No.
Recommended optional programme components:
-
Recommended or required reading:
Books are listed on web page: http://cc.oulu.fi/~jarioksa/opetus/
Assessment methods and criteria:
Exam.
Grading:
1-5 / Fail.
Person responsible:
Prof. Jari Oksanen.
Working life cooperation:
No.
Other information:
-

750031Y: Orientation course for new students, 1 op

Voimassaolo: - 31.07.2017
Opiskelumuoto: General Studies
Laji: Course
Vastuuyksikkö: Department of Biology
Arvostelu: 1 - 5, pass, fail
Opettajat: Vanhatalo, Minna-Liisa
Opintokohteen kielet: Finnish
Leikkaavuudet:

750032Y Orientation course for new students 2.0 op

ECTS Credits:
2 cr.
Language of instruction:
Finnish.
Timing:
B.Sc. 1 st autumn - spring.
Learning outcomes:
The aim of the course is to introduce new biology students to the university, academic studies, the department and the studies of biology, give knowledge of the social relevance of the degree programme and student is able to set own goals for the studies.
Contents:
Students orientate themselves with the help of group meetings, presentations and seminar to the academic studies. During the course students make their first personal study plan (HOPS) for the first study year.
Mode of delivery:
Face-to-face teaching.
Learning activities and teaching methods:
Tutorials, presentations and seminar of major subjects, independent studying, total 30 h.
Target group:
Compulsory to the biology students.
Prerequisites and co-requisites:
No.
Recommended optional programme components:
-
Recommended or required reading:
Study guide.
Assessment methods and criteria:
Participation to the tutorials, presentations, seminar and doing the personal study plan for the first year.
Grading:
Pass / Fail.
Person responsible:
Ph.Lic. Minna Vanhatalo.
Working life cooperation:
No.
Other information:
-

756615S: Physiology of forest trees, 5 op

Opiskelumuoto: Advanced Studies
Laji: Course
Vastuuyksikkö: Department of Biology
Arvostelu: 1 - 5, pass, fail
Opettajat: Hohtola, Anja Terttu Marjatta, Häggman, Hely Margaretha
Opintokohteen kielet: Finnish

ECTS Credits:

4 cr.
Language of instruction:
Finnish / English.
Timing:
M.Sc. 1 st or 2 nd spring, (arranged if resources allow).
Learning outcomes:
The student is able to assess the specific features of forest tree physiology and from this basis can judge the effect of climate change to forestry.
Contents:
Trees are long-living, often wind-pollinated, tall organisms. The juvenile phase may be long and the adult phase is characterized by both reproductive and vegetative growth which causes competition on both carbohydrates and nutrients. Cold- and drought resistance, water relations, carbon allocation and mineral nutrition will be discussed. Partly due to forest tree's economic importance biotechnological applications have been developed e.g. for the production of health promoting substances or vegetative propagation. Forest trees are interesting from the point of molecular biology- what makes a tree tree? The course will cover these topics but the emphasis may vary during the years.
Mode of delivery:
Face-to-face teaching.
Learning activities and teaching methods:
Lectures, literature, final exam.
Target group:
-
Prerequisites and co-requisites:
Lectures of Basics of functional plant biology (752345A) helps the following of the course.
Recommended optional programme components:
-
Recommended or required reading:
Literature agreed on lectures.
Assessment methods and criteria:
Exam.
Grading:
1-5 / Fail.
Person responsible:
Prof. Hely Häggman and Prof. Anja Hohtola.
Working life cooperation:
No.
Other information:
-

756621S: Plant adaptations to herbivory, 2 op

Voimassaolo: - 31.07.2019

Opiskelumuoto: Advanced Studies

Laji: Course

Vastuuyksikkö: Department of Biology

Arvostelu: 1 - 5, pass, fail

Opettajat: Tuomi Juha

Opintokohteen kielet: Finnish

ECTS Credits:
2 cr.
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:
Topic is closely related also with the course Secondary metabolism of plants (756618S).
Recommended or required reading:
-
Assessment methods and criteria:
-
Grading:
-
Person responsible:
Prof. Juha Tuomi.
Working life cooperation:
No.
Other information:
-

756332A: Plant developmental biology, 4 op

Voimassaolo: - 31.07.2015

Opiskelumuoto: Intermediate Studies

Laji: Course

Vastuuyksikkö: Department of Biology

Arvostelu: 1 - 5, pass, fail

Opettajat: Häggman, Hely Margaretha

Opintokohteen kielet: Finnish

Leikkaavuudet:

756353A	Plant developmental biology	5.0 op

ECTS Credits:
4 cr.
Language of instruction:
Finnish / English.
Timing:
B.Sc. 3rd spring.

Learning outcomes:
The student has a comprehensive view on plant development and show knowledge of the recent methods used in the research of plant developmental biology.
Contents:
Modern methods in plant biology and especially the mutant or genetically modified plants have been in a key role to understand factors, mechanisms and regulation affecting plant development. The lectures include cell level information (cell division, growth and differentiation), embryo development, meristem formation and maintenance, organ development and cell death as a role of normal plant development. Moreover, the role of environmental factors in plant development will be covered.
Mode of delivery:
Face-to-face teaching.
Learning activities and teaching methods:
20 h lectures, home essay and final exam.
Target group:
Compulsory to the biology students.

Prerequisites and co-requisites:
Basic course in plant morphology, lectures (755337A).

Recommended optional programme components:
-
Recommended or required reading:
Lectures and supplementary material. Timmermans, M.C.P.: Plant Development. 2010. Elsevier.
The availability of the literature can be checked from this link.
Assessment methods and criteria:
Exam.
Grading:
1-5 / Fail.
Person responsible:
Prof. Hely Häggman.
Working life cooperation:
No.
Other information:
-

752600S: Plant ecology, 7 op

Voimassaolo: 01.08.2011 - 31.07.2015
Opiskelumuoto: Advanced Studies
Laji: Course
Vastuuyksikkö: Department of Biology
Arvostelu: 1 - 5, pass, fail
Opintokohteen kielet: English
Leikkaavuudet:

756644S	Plant ecology	5.0 op

ECTS Credits:
7 cr.
Language of instruction:
Lectures Finnish, Exercises English.
Timing:
M.Sc. 1 st autumn ECOGEN ECOb.
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:
34 h lectures and exam, 40 h demonstrations and exercises in field and laboratory (basic methods in plant ecology and laboratory work), 12 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:
ECOGEN ECOb.
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.
Grading:
1-5 / Fail.
Person responsible:
Prof. Juha Tuomi (lectures) and Dr. Kari Taulavuori (exercises).
Working life cooperation:
No.
Other information:
-

752300A: Plant ecology, 7 op

Voimassaolo: - 31.07.2015

Opiskelumuoto: Intermediate Studies

Laji: Course

Vastuuyksikkö: Department of Biology

Arvostelu: 1 - 5, pass, fail

Opettajat: Aikio, Sami Aslak

Opintokohteen kielet: Finnish

Leikkaavuudet:

756344A	Plant ecology	5.0 op

ECTS Credits:
7 cr.
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:
34 h lectures and exam, 40 h demonstrations and exercises in field and laboratory (basic methods in plant ecology and laboratory work), 12 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.
Grading:

1-5 / Fail.
Person responsible:
Prof. Juha Tuomi (lectures) and Dr. Kari Taulavuori (exercises).

Working life cooperation:
No.
Other information:
-

752359A: Plant ecology and forestry, 3,5 op

Voimassaolo: - 31.07.2014
Opiskelumuoto: Intermediate Studies
Laji: Course
Vastuuyksikkö: Department of Biology
Arvostelu: 1 - 5, pass, fail
Opettajat: Kubin, Eero
Opintokohteen kielet: Finnish

ECTS Credits:
3,5 cr.
Language of instruction:
Finnish.
Timing:
B.Sc. 2 nd or 3 rd spring, (arranged if resources allow).
Learning outcomes:
Student learns main characters of forestry and forest sites, environmental impacts of forestry and is able to use the knowledge in different habitat inventory and mapping.
Contents:
Structure of forests, growth of forest trees and succession in different forest types. Introduction to methods in forest management. Ecological specialities of northern areas and sustainable use of natural resources.
Mode of delivery:
Face-to-face teaching.
Learning activities and teaching methods:
18 h lectures, field excursion in May, and exam.
Target group:
-
Prerequisites and co-requisites:
No.
Recommended optional programme components:
-
Recommended or required reading:
Metsätalouden ympäristöopas. Metsähallitus 1997, 130 p.; Snellman, V. (ed.) 1994: Tutkimus metsien kestävän käytön perustana. Metsäntutkimuslaitoksen tiedonantoja 253, 192 p.; Meriluoto, M. ja Soininen, T. 1998: Metsäluonnon arvokkaat elinympäristöt. Metsälehti Kustannus, 192 p. or Environmental Guidelines to Practical Forest Management. Metsähallitus 1998, 124 p. and other relevant literature in English.
The availability of the literature can be checked from this link.
Assessment methods and criteria:
Exam.
Grading:
1-5 / Fail.
Person responsible:
Dr. Eero Kubin.
Working life cooperation:
No.
Other information:
-

756304A: Plant ecophysiology in changing environments, 5 op

Opiskelumuoto: Intermediate Studies
Laji: Course
Vastuuyksikkö: Department of Biology
Arvostelu: 1 - 5, pass, fail
Opettajat: Kari Taulavuori
Opintokohteen kielet: Finnish

ECTS Credits:
5-10 cr.
Language of instruction:
Finnish / English.
Timing:
B.Sc. 3 rd or M.Sc. 1 st spring.
Learning outcomes:
After finishing the course student understands interactions between plant and environment, and has become acquainted to most important experimental methods in physiological plant ecology and student can apply research parameters. Student can apply the knowledge to plant production and environmental protection issues.

Contents:
The aim of the course is to initiate the students into the basics of plant ecophysiology in changing environments. The physical, chemical (abiotic) and biotic factors in the environment affects plant's growth and survival. Plant ecophysiology is an experimental science, which studies the physiological functions and adjustments underlining the ecological observations from the viewpoint of growth and survival. Different environmental stresses restrict the plant growth. Plant ecophysiology is experimental science which studies the physiological functions and regulation mechanisms on growth, survival, abundance and distribution. Effects of abiotic and biotic factors are studied. How elevated temperature, CO2, drought stress, nutrient imbalance, air pollutants, metals, UV radiation and plant pathogens affect on plants' gas exchange, primary metabolism, carbon allocation and growth. The exercises can also focus on the effects of environmental factors on photosynthesis, respiration, transport of photosynthetic products, water economy, energy economy and nutrient economy. Special features of ecophysiology of boreal plants are also dealt with.
Mode of delivery:
Face-to-face teaching.
Learning activities and teaching methods:
24 h lectures and demonstrations, 35 h exercises, final exam and report.
Target group:
ECOb, BSb, Ph.D. students (if not in the undergraduate degree).
Prerequisites and co-requisites:
-
Recommended optional programme components:
Course is related both to plant ecology and plant physiology basic studies.
Recommended or required reading:
Hans Lambers, F.Stuart Chapin III, Thijs L. Pons 2008: Plant Physiological Ecology. Springer Verlag. 540 s. Second edition.
The availability of the literature can be checked from this link.
Assessment methods and criteria:
Seminar and report.
Grading:
1-5 / Fail.
Person responsible:
Dr. Kari Taulavuori.
Working life cooperation:
No.
Other information:
-

756604S: Plant ecophysiology in changing environments, 5 op

Opiskelumuoto: Advanced Studies
Laji: Course
Vastuuyksikkö: Department of Biology

Arvostelu: 1 - 5, pass, fail
Opettajat: Kari Taulavuori
Opintokohteen kielet: Finnish

ECTS Credits:
5-10 cr.
Language of instruction:
Finnish / English.
Timing:
B.Sc. 3 rd or M.Sc. 1 st spring.
Learning outcomes:
After finishing the course student understands interactions between plant and environment, and has become acquainted to most important experimental methods in physiological plant ecology and student can apply research parameters. Student can apply the knowledge to plant production and environmental protection issues.

Contents:
The aim of the course is to initiate the students into the basics of plant ecophysiology in changing environments. The physical, chemical (abiotic) and biotic factors in the environment affects plant's growth and survival. Plant ecophysiology is an experimental science, which studies the physiological functions and adjustments underlining the ecological observations from the viewpoint of growth and survival. Different environmental stresses restrict the plant growth. Plant ecophysiology is experimental science which studies the physiological functions and regulation mechanisms on growth, survival, abundance and distribution. Effects of abiotic and biotic factors are studied. How elevated temperature, CO2, drought stress, nutrient imbalance, air pollutants, metals, UV radiation and plant pathogens affect on plants' gas exchange, primary metabolism, carbon allocation and growth. The exercises can also focus on the effects of environmental factors on photosynthesis, respiration, transport of photosynthetic products, water economy, energy economy and nutrient economy. Special features of ecophysiology of boreal plants are also dealt with.
Mode of delivery:
Face-to-face teaching.
Learning activities and teaching methods:
24 h lectures and demonstrations, 35 h exercises, exam and report.

Target group:
ECOb, BSb, Ph.D. students.
Prerequisites and co-requisites:
No.
Recommended optional programme components:
Course is related both to plant ecology and plant physiology basic studies.
Recommended or required reading:
Hans Lambers, F.Stuart Chapin III, Thijs L. Pons 2008: Plant Physiological Ecology. Springer Verlag. 540 s. Second edition.
The availability of the literature can be checked from this link.
Assessment methods and criteria:
Seminar and report.
Grading:
1-5 / Fail.
Person responsible:
Dr. Kari Taulavuori.
Working life cooperation:
No.
Other information:
-

752609S: Plant evolution and systematics, exercises, 2 op

Voimassaolo: - 31.08.2015
Opiskelumuoto: Advanced Studies
Laji: Course
Vastuuyksikkö: Department of Biology
Arvostelu: 1 - 5, pass, fail

Opettajat: Annamari Markkola
Opintokohteen kielet: Finnish

ECTS Credits:
2 cr.

Language of instruction:
Finnish / English.

Timing:
M.Sc. degree, spring term.
Learning outcomes:
Students will get a general picture of the diversity of plants and several other kingdoms an overview on evolutionary history of plants.

Contents:
The course provides an insight into the evolution plants and evolutionary processes reflected by the systematic classification of the plant kingdom. Moreover, many other kingdoms (e.g. Fungi, Bacteria and Stramenopila) and their diversity are highlighted. The practicals focus on the structure of plants, fungi and algae as well as on their life cycles.

Mode of delivery:
Face-to-face teaching.
Learning activities and teaching methods:
30 h demonstrations and exercises.
Target group:
M.Sc., compulsory to ECOb.
Prerequisites and co-requisites:
Course Evolution and systematics of organisms (750307A) 4 cr. or equivalent knowledge.
Recommended optional programme components:
Course gives students basic ability to different subjects in biology.
Recommended or required reading:
Literature: Handouts: Eskelinen, A., Taulavuori, K., Kauppi, M., Kauppi, A. & Markkola, A. 2008. 752309 Kasvien evoluutio ja systematiikka: itiöllisten eliöiden rakenne ja elinkierrot, Oulun yliopisto, and Kauppi, M. & Kauppi, A. 1999: Siemenkasvien järjestelmä ja luokittelun perusteet, 75209. - Oulun yliopiston kasvitieteen monisteita, Biologian laitos, Oulu. Supplementary reading: Bell, P.R. & Helmsley, A.R. 2000: Green Plants. Their origin and diversity. 2 nd ed. Cambridge University Press., Willis, K.J. & McElwain, J.C. 2002: The evolution of plants. Oxford University Press., Rikkinen, J. 1999: Leviä, sieniä ja leväsieniä, johdatus levien ja sienten monimuotoisuuteen. Yliopistopaino, Helsinki. 194 p.
The availability of the literature can be checked from this link.

Assessment methods and criteria:
Exam.

Grading:
1-5 / Fail.

Person responsible:
Dr. Annamari Markkola.
Working life cooperation:
No.
Other information:
-

756627S: Plant hormones, 5 op

Opiskelumuoto: Advanced Studies
Laji: Course
Vastuuyksikkö: Department of Biology
Arvostelu: 1 - 5, pass, fail
Opettajat: Häggman, Hely Margaretha

Opintokohteen kielet: Finnish

ECTS Credits:
4 cr.
Language of instruction:
Finnish / English.
Timing:
M.Sc. 1 st or 2 nd spring, every second year.
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 ecophysiologists.
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.
Grading:
1-5 / Fail.
Person responsible:
Prof. Anja Hohtola and prof. Hely Häggman.
Working life cooperation:
No.
Other information:
-

756623S: Plant population biology, 5 op

Voimassaolo: - 31.07.2019

Opiskelumuoto: Advanced Studies

Laji: Course

Vastuuyksikkö: Department of Biology

Arvostelu: 1 - 5, pass, fail

Opettajat: Tuomi Juha

Opintokohteen kielet: Finnish

ECTS Credits:
5 cr.
Language of instruction:
English.
Timing:
ECOGEN ECOb 1st autumn.
Learning outcomes:
Basic skills in methods of population biology.

Contents:
Demography and life history strategies of plants with emphasis on dynamics of structured plant populations in space and time. Moreover, ecological and evolutionary genetics of plants and interactions between plants and their environment are addressed. In exercises dynamics of populations is analysed with matrix models and simulation programs.
Mode of delivery:
Face-to-face teaching.
Learning activities and teaching methods:
32 h lectures, 18 h computer exercises, seminar, final exam.
Target group:
ECOGEN.
Prerequisites and co-requisites:
No.
Recommended optional programme components:
-
Recommended or required reading:
Silvertown & Charlesworth 2001: Introduction to Plant Population Biology (4 th edition), Blackwell Science. The availability of the literature can be checked from this link.
Assessment methods and criteria:
Exam.
Grading:
1-5 / Fail.
Person responsible:
Prof. Juha Tuomi.
Working life cooperation:
No.
Other information:
-

756619S: Plant reproductive biology, 2 - 4 op

Voimassaolo: - 31.07.2015

Opiskelumuoto: Advanced Studies

Laji: Course

Vastuuyksikkö: Department of Biology

Arvostelu: 1 - 5, pass, fail

Opettajat: Tuomi Juha

Opintokohteen kielet: Finnish

ECTS Credits:
2-4 cr.
Language of instruction:
Finnish / English.
Timing:
M.Sc. or Ph.D. degree, (arranged if resources allow).
Learning outcomes:
Student will get knowledge of plant reproductive traits.
Contents:
The main theme is to apply to special questions in plant evolution ecology, especially the evolution if different plant reproductive traits and ecological and genetic mechanisms that modify these traits. The course will cover topics such as plant sex allocation, pollination biology, inbreeding and avoidance of inbreeding depression, and the importance of frequency-dependent selection in the evolution of plant reproductive systems.
Mode of delivery:
Face-to-face teaching.
Learning activities and teaching methods:
Lectures, seminars and scientific articles.
Target group:
Suitable for M.Sc. and Ph.D. degree.
Prerequisites and co-requisites:
No.
Recommended optional programme components:

-
Recommended or required reading:
-
Assessment methods and criteria:
-
Grading:
-
Person responsible:
Prof. Juha Tuomi.
Working life cooperation:
No.
Other information:
-

756638S: Plant symbiosis, 4 op

Voimassaolo: 01.08.2009 - 31.07.2013
Opiskelumuoto: Advanced Studies
Laji: Course
Vastuuyksikkö: Department of Biology
Arvostelu: 1 - 5, pass, fail
Opettajat: Anna-Maria Pirttilä
Opintokohteen kielet: English

ECTS Credits:
4 cr.
Language of instruction:
Finnish / English.
Timing:
B.Sc. 3 rd spring or M.Sc. 1 st or 2 nd spring.
Learning outcomes:
The student knows the concept of symbiosis, understands the extent of diversity of plant 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 plant physiology.
Recommended optional programme components:
-
Recommended or required reading:
Lecture notes.
Assessment methods and criteria:
Seminar, lecture diary.

Grading:
1-5 / Fail.
Person responsible:
Dr. Anna Maria Pirttilä.

Working life cooperation:
No.

Other information:
-

756338A: Plant symbiosis, 4 op

Voimassaolo: 01.08.2009 - 31.07.2012
Opiskelumuoto: Intermediate Studies
Laji: Course
Vastuuyksikkö: Department of Biology
Arvostelu: 1 - 5, pass, fail
Opettajat: Anna-Maria Pirttilä
Opintokohteen kielet: English

ECTS Credits:
4 cr.
Language of instruction:
Finnish / English.
Timing:
B.Sc. 3 rd spring or M.Sc. 1 st or 2 nd spring.
Learning outcomes:
The student knows the concept of symbiosis, understands the extent of diversity of plant 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.

Grading:
1-5 / Fail.
Person responsible:
Dr. Anna Maria Pirttilä.

Working life cooperation:
No.
Other information:
-

756323A: Population biology of plants, 5 op

Voimassaolo: - 31.07.2015
Opiskelumuoto: Intermediate Studies
Laji: Course
Vastuuyksikkö: Department of Biology

Arvostelu: 1 - 5, pass, fail

Opettajat: Aikio, Sami Aslak

Opintokohteen kielet: Finnish

Leikkaavuudet:

756351A	Basics in population ecology	5.0 op
756651S	Basics in population ecology	5.0 op

ECTS Credits:
5 cr.
Language of instruction:
Finnish.
Timing:
BSc. 3 rd autumn.
Learning outcomes:
Basic skills in methods of population biology.
Contents:
Demography and life history strategies of plants with emphasis on dynamics of structured plant populations in space and time. Moreover, ecological and evolutionary genetics of plants and interactions between plants and their environment are addressed. In exercises dynamics of populations is analysed with matrix models and simulation programs.
Mode of delivery:
Face-to-face teaching.
Learning activities and teaching methods:
32 h lectures, 18 h computer exercises, seminar.
Target group:
ECO: compulsory.
Prerequisites and co-requisites:
No.
Recommended optional programme components:
-
Recommended or required reading:
Silvertown & Charlesworth 2001: Introduction to Plant Population Biology (4 th edition), Blackwell Science .
The availability of the literature can be checked from this link.
Assessment methods and criteria:
Exam.
Grading:
1-5 / Fail.
Person responsible:
Prof. Juha Tuomi.
Working life cooperation:
No.
Other information:
-

755607S: Population ecology, 7 op

Voimassaolo: - 31.07.2015

Opiskelumuoto: Advanced Studies

Laji: Course

Vastuuyksikkö: Department of Biology

Arvostelu: 1 - 5, pass, fail

Opettajat: Veli-Matti Pakanen

Opintokohteen kielet: Finnish

Leikkaavuudet:

755626S	Advanced population ecology	6.0 op

ECTS Credits:
7 cr.

Language of instruction:
Finnish.
Timing:
M.Sc. 1 st autumn.
Learning outcomes:
Student learns central methodologies how to derive population vital parameters from various kind of long-term data to apply the information to population viability analysis. The focus is to link modeling methods to real data.
Contents:
Introduction to the mechanisms and factors, which affect the structure, size and dynamics of a population. Topics include e.g. intraspecific relationships of species, predator-prey and parasite-host interactions, competition and the structure of environment and changes in it. Information of the relations between age distribution, birth rate, mortality rate and migration of the population are needed in viability analyses of a population. The aim of the course is to initiate into the methods by which the data of individuals is leaden to the parameters describing the condition and dynamics of the population.
Mode of delivery:
Face-to-face teaching.
Learning activities and teaching methods:
36 h lectures, 33 h computer exercises, independent work, exam.
Target group:
ECOz: compulsory.
Prerequisites and co-requisites:
No.
Recommended optional programme components:
-
Recommended or required reading:
Supplementary reading Morris, W.F & Doak, D.F. Quantitative conservation biology. Theory and practice of population viability analysis. Akçakaya, H.R., Burgman, M.A. & Ginzburg, L.R. Applied population ecology. Principles and computer exercises using RAMAS ® EcoLab. Lande, R., Engen,S. & Sæther, B-E. Stochastic population dynamics in ecology and conservation.
The availability of the literature can be checked from this link.
Assessment methods and criteria:
Exam.
Grading:
1-5 / Fail.
Person responsible:
Prof. Markku Orell.
Working life cooperation:
No.
Other information:
-

750615S: Practical training, 10 - 15 op

Opiskelumuoto: Advanced Studies

Laji: Practical training

Vastuuyksikkö: Department of Biology

Arvostelu: 1 - 5, pass, fail

Opintokohteen kielet: Finnish

ECTS Credits:
5-9 cr.
Language of instruction:
Finnish / English.
Timing:
Registration B.Sc. 3 rd autumn, training B.Sc. 3 rd summer - M.Sc. 1 st autumn.
Learning outcomes:
The aim of the course is for students to gain work experience in their own field of biology. Student applies the theoretical knowledge gained during the studies in practice.
Contents:
Minimum training period is two months full day work (5 cr.). Students obtain 5 - 9 credits depending on the length and intensity of the training. For three months trainig students can get 7 cr if the work is versatile.

Student can also do the training period during her exchange period or train otherwise abroad. For two months work abroad student gets 7 credits and 9 credits for three months work abroad.
Mode of delivery:
Face-to-face teaching.
Learning activities and teaching methods:
The trainee has to keep a journal of the work and its background factors. This journal and a summary of 6-8 pages have to be handed in to the responsible contact person after the training period. The summary should contain information on the training place, the ongoing research, the trainee's own work and its results. The journal is returned to the student after the summary has been approved. The student has also to be given a reference of the work. Offered training placements are announced in the internet page of Career Services. Entering for the practical training is made in 3rd autumn. Normally, the student has to find him/herself a placement in public or private sectors or abroad.

Target group:
Compulsory to BS and ECO in the M.Sc. degree.
Prerequisites and co-requisites:
About 80 credit amount of biology courses.
Recommended optional programme components:
-
Recommended or required reading:
-
Assessment methods and criteria:
Journal and final report.
Grading:
Pass / Fail.
Person responsible:
Contact person Minna Vanhatalo. The supervisors of the practical training are Prof. Markku Orell (ECOz), Prof. Juha Tuomi (ECOb), Prof. Hely Häggman (BSb), Prof. Esa Hohtola (BSz) and Prof. Outi Savolainen (BSg).
Working life cooperation:
Yes. Participating to biology project gives working life skills.
Other information:
The student has to contact the professor and discuss about the suitability of the internship place in beforehand.

751660S: Preparation of an insect collection, 2 - 6 op

Opiskelumuoto: Advanced Studies

Laji: Course

Vastuuyksikkö: Department of Biology

Arvostelu: 1 - 5, pass, fail

Opettajat: Jouni Aspi

Opintokohteen kielet: Finnish

ECTS Credits:
2-6 cr / 100 species = 2 cr.
Language of instruction:
Finnish / English.
Timing:
M.Sc. degree.
Learning outcomes:
Preparation (including labels) and identification of self-collected insects.
Contents:
Preparation of a collection on one insect order. The specimens have to be preserved adequately, identified and provided with labels. In consultation with the responsible teacher.
Mode of delivery:
Face-to-face teaching.
Learning activities and teaching methods:
Independent studying.
Target group:
-
Prerequisites and co-requisites:
No.

Recommended optional programme components:
-
Recommended or required reading:
Literature related to the topic.
Assessment methods and criteria:
Collection is delivered to the person in responsible.
Grading:
Pass / Fail.
Person responsible:
Dr. Jouni Aspi.
Working life cooperation:
No.
Other information:
-

756602S: Pro gradu thesis, 40 op

Voimassaolo: - 31.07.2015

Opiskelumuoto: Advanced Studies

Laji: Diploma thesis

Vastuuyksikkö: Department of Biology

Arvostelu: 1 - 5, pass, fail

Opintokohteen kielet: Finnish

Leikkaavuudet:

750657S	Biology subject teacher pro gradu thesis	20.0 op
750658S	Pro gradu thesis in biology	40.0 op

ECTS Credits:
20-40 cr.
Language of instruction:
Finnish / English.
Timing:
M.Sc. 1 st or 2 nd year.
Learning outcomes:
Student knows the research methods in specific field of biology. She is conversant with her field of thesis and is able to scientific thinking, estimating the results, analysing, drawing conclusions and scientific communicating.
Contents:
Literary work which in general includes experimental research work. Student gets profoundly acquainted on certain special field in biology.
Mode of delivery:
Face-to-face teaching.
Learning activities and teaching methods:
Independent research work on a scientific subject in agreement with the responsible professor and under the supervision of the Department. The supervisors may be professors of the department, docents and other teachers and researchers who have the docent's status. The student may have several supervisors, the other supervisor may be from other department, university (also abroad) or from research institute. The subject must be agreed on with the professor in advance. The research work can contain fieldwork, laboratory work, theoretical work or work on collections in museum. The work always includes a literature survey. After having completed the thesis, the student writes the Maturity Exam. The dean will order the examiners by the proposal of the professor. Pro gradu working group accepts and grades the thesis on the basis of the final examiners' opinions.
Target group:
TEAb: compulsory 20 cr, ECOb and BSb: compulsory 40 cr.
Prerequisites and co-requisites:
No.
Recommended optional programme components:
-
Recommended or required reading:
-
Assessment methods and criteria:
Literary work.

Grading:
1-5 / Fail.
Person responsible:
Professors.
Working life cooperation:
Ei.
Other information:
-

753394A: Quantitative genetics and plant and animal breeding, 6 op

Voimassaolo: 01.08.2009 - 31.07.2015
Opiskelumuoto: Intermediate Studies
Laji: Course
Vastuuyksikkö: Department of Biology
Arvostelu: 1 - 5, pass, fail
Opettajat: Mikko Sillanpää
Opintokohteen kielet: Finnish
Leikkaavuudet:

757616S Quantitative genetics and plant and animal breeding 5.0 op

ECTS Credits:
6 cr.
Language of instruction:
Finnish or English.
Timing:
B.Sc. 3rd or M.Sc. 1 st autumn.
Learning outcomes:
To know the basic theory of quantitative genetics, statistical methods and experimental settings, both from the point of view of breeding and evolution. Also, to understand the mutual dependence of human kind and the domesticated plants and animals, global consequences, threats and opportunities.
Contents:
Basic theory, heritability and its estimates, selection, maintenance of variability in evolution, QTL mapping, association mapping, GMO. Also: domestication of plants, and animals, conscious and unconscious levels of breeding, associated diseases, present breeding methods, including genetic modification, global consequences.
Mode of delivery:
Face-to-face teaching.
Learning activities and teaching methods:
Lectures, homeworks, mathematical and computer classes, seminar.
Target group:
Genetics students.
Prerequisites and co-requisites:
No.
Recommended optional programme components:
After courses Molecular evolution (753327A) and Population genetics (753x14A/S).
Recommended or required reading:
Web page (in Finnish) http://www.oulu.fi/genet/Jalostus/

Assessment methods and criteria:
Home exam, controlled exam, homeworks, seminar.
Grading:
1-5 / Fail.
Person responsible:
Prof. Mikko Sillanpää.
Working life cooperation:
No.
Other information:
-

753694S: Quantitative genetics and plant and animal breeding, 6 op

Voimassaolo: 01.08.2009 - 31.07.2015
Opiskelumuoto: Advanced Studies
Laji: Course
Vastuuyksikkö: Department of Biology
Arvostelu: 1 - 5, pass, fail
Opettajat: Mikko Sillanpää
Opintokohteen kielet: Finnish
Leikkaavuudet:

757616S Quantitative genetics and plant and animal breeding 5.0 op

ECTS Credits:
6 cr.
Language of instruction:
Finnish / English.
Timing:
B.Sc. 3rd or M.Sc. Even years, autumn.
Learning outcomes:
To know the basic theory of quantitative genetics, statistical methods and experimental settings, both from the point of view of breeding and evolution. Also, to understand the mutual dependence of human kind and the domesticated plants and animals, global consequences, threats and opportunities.
Contents:
Basic theory, heritability and its estimates, selection, maintenance of variability in evolution, QTL mapping, association mapping, GMO. Also: domestication of plants, and animals, conscious and unconscious levels of breeding, associated diseases, present breeding methods, including genetic modification, global consequences.
Mode of delivery:
Face-to-face teaching.
Learning activities and teaching methods:
Lectures, homeworks, mathematical and computer classes, seminar.
Target group:
BTg.
Prerequisites and co-requisites:
Molecular evolution (753327A) and Basics in population genetics (753x14A/S).
Recommended optional programme components:
-
Recommended or required reading:
Web page (in Finnish) http://www.oulu.fi/genet/Jalostus/
Assessment methods and criteria:
Home exam, controlled exam, homeworks, seminar.
Grading:
1-5 / Fail.
Person responsible:
Prof. Mikko Sillanpää.
Working life cooperation:
No.
Other information:
-

750661S: Research group seminar, 2 - 4 op

Opiskelumuoto: Advanced Studies
Laji: Course
Vastuuyksikkö: Department of Biology
Arvostelu: 1 - 5, pass, fail
Opintokohteen kielet: Finnish

ECTS Credits:

2-4 cr.
Language of instruction:
Finnish / English.
Timing:
Autumn-spring.
Learning outcomes:
Students concern themselves to special features of biological research.
Contents:
Workshop type seminars in different fields of biology help by research groups. Advanced or postgraduate studies. 2 cr. per different seminar series.
Mode of delivery:
Face-to-face teaching.
Learning activities and teaching methods:
26 h seminars / workshops.
Target group:
M.Sc. or Ph.D. degree.
Prerequisites and co-requisites:
No.
Recommended optional programme components:
-
Recommended or required reading:
-
Assessment methods and criteria:
Active participation to seminars.
Grading:
Pass / Fail.
Person responsible:
Professors.
Working life cooperation:
No.
Other information:
-

750662J: Research plan seminar, 1 - 2 op

Opiskelumuoto: Post-graduate Studies

Laji: Course

Vastuuyksikkö: Department of Biology

Arvostelu: 1 - 5, pass, fail

Opintokohteen kielet: English

Leikkaavuudet:

920004J-02 Research Plan and Seminar, seminar 1.0 op

Voidaan suorittaa useasti: Kyllä

ECTS Credits:
4 cr.
Language of instruction:
English.
Timing:
Ph. Lic. and Ph.D. students. Special announcement.
Learning outcomes:
The student will be able to write a clear, well-grounded research plan and present it orally. He/she will also be able to evaluate other students' research plans.
Contents:
Presentation of the student's own research plan.
Mode of delivery:
Face-to-face teaching.
Learning activities and teaching methods:

Presentation of the student’s own research plan in English, opponent for two other presentations and participation in 8 seminars. The student is expected to give his/her own presentation within one year after starting the Ph.D. studies.
Target group:
Compulsory to Ph.D. students.
Prerequisites and co-requisites:
M.Sc. degree.
Recommended optional programme components:
-
Recommended or required reading:
Research plans made for the seminar.
Assessment methods and criteria:
Seminars.
Grading:
Pass / fail.
Person responsible:
Prof. Timo Muotka and Dr. Laura Kvist.
Working life cooperation:
No.
Other information:
-

754618S: Research seminar in fish ecology, 2 - 4 op

Voimassaolo: - 31.07.2015

Opiskelumuoto: Advanced Studies

Laji: Course

Vastuuyksikkö: Department of Biology

Arvostelu: 1 - 5, pass, fail

Opettajat: Muotka, Timo Tapani

Opintokohteen kielet: Finnish

Leikkaavuudet:

750653S Special seminar in biology 2.0 op

ECTS Credits:
2-4 cr.
Language of instruction:
Finnish.
Timing:
M.Sc. 1 st or 2 nd year.
Learning outcomes:
The course aims to give students knowledge of fish ecology research done in University of Oulu and interest organizations. Lectures are given by university researchers, postgraduate students and guest lectures.
Contents:
Different topics.
Mode of delivery:
Face-to-face teaching.
Learning activities and teaching methods:
20 h lectures, 2-4 home essays from the lecture topics.
Target group:
-
Prerequisites and co-requisites:
Field course in aquatic animals (751307A) or equivalent knowledge.
Recommended optional programme components:
-
Recommended or required reading:
Course material.
Assessment methods and criteria:
Home essays.
Grading:

Pass / Fail.
Person responsible:
Prof. Timo Muotka.
Working life cooperation:
No.
Other information:
-

750613S: Research training, 2 - 15 op

Opiskelumuoto: Advanced Studies

Laji: Practical training

Vastuuyksikkö: Department of Biology

Arvostelu: 1 - 5, pass, fail

Opintokohteen kielet: Finnish

Voidaan suorittaa useasti: Kyllä

ECTS Credits:
2-14 cr.
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.
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

Vastuuyksikkö: Department of Biology

Arvostelu: 1 - 5, pass, fail

Opintokohteen kielet: Finnish

Voidaan suorittaa useasti: Kyllä

ECTS Credits:
2-14 cr.
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.
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:
-

756607S: Restoration ecology, 2 - 6 op

Voimassaolo: - 31.07.2015

Opiskelumuoto: Advanced Studies

Laji: Course

Vastuuyksikkö: Department of Biology

Arvostelu: 1 - 5, pass, fail

Opintokohteen kielet: Finnish

ECTS Credits:
2-6 cr.
Language of instruction:
Finnish.
Timing:
M.Sc. degree.
Learning outcomes:
Lectures: the student understands the ecological principles of restoration and remembers the basics of restoration options in different ecosystems. Exercises and excursion: the student is able to evaluate the need for restoration and possibilities of an ecosystem to regenerate, and apply the restoration techniques in practical restoration planning.
Contents:

Land-use impacts and ecosystem malfunctions caused by humans, ecological principles of restoration, prevention and restoration of manmade damage in the ecosystems. Examples from restoration options and practical techniques in terrestrial and aquatic ecosystems, and cultural landscapes.
Mode of delivery:
Face-to-face teaching.
Learning activities and teaching methods:
24 h lectures, exercises and an excursion. Total 45 h.
Target group:
ECO.
Prerequisites and co-requisites:
No.
Recommended optional programme components:
-
Recommended or required reading:
Andre Clewell, James Aronson 2008: Ecological Restoration, Principles, Values, and Structure of an Emerging Profession, Island Press, 230 p. and articles in the Restoration Ecology journal.
The availability of the literature can be checked from this link.
Assessment methods and criteria:
-
Grading:
1-5 / Fail.
Person responsible:
Prof. Anne Tolvanen.
Working life cooperation:
No.
Other information:
-

756618S: Secondary metabolism of plants, 4 op

Voimassaolo: - 31.07.2014

Opiskelumuoto: Advanced Studies

Laji: Course

Vastuuyksikkö: Department of Biology

Arvostelu: 1 - 5, pass, fail

Opettajat: Hohtola, Anja Terttu Marjatta

Opintokohteen kielet: Finnish

ECTS Credits:
4 cr.
Language of instruction:
Finnish / English.
Timing:
M.Sc. 1 st or 2 nd spring, odd years.
Learning outcomes:
The students will be able to define the role of plant secondary metabolism/metabolites, and the biosynthetic pathways involved. The possible role of secondary metabolites will be touched upon.
Contents:
General introduction to phenolic compounds, terpenoids, sterols, alcaloids; their synthesis and meaning for the plant. The economic importance and potential of plant secondary metabolites as fine chemicals and important traits of plants concerning quality and resistance will be discussed. The technological and economic feasibility of the large-scale culture of plant cells for the production of secondary metabolites are touched. Isolation and processing of useful metabolites will be discussed.
Mode of delivery:
Face-to-face teaching.
Learning activities and teaching methods:
Lectures (18 h) and seminars (4 h), literature, final exam.
Target group:
-
Prerequisites and co-requisites:
No.

Recommended optional programme components:
-
Recommended or required reading:
Literature agreed on lectures.
Assessment methods and criteria:
Exam.
Grading:
1-5 / Fail.
Person responsible:
Prof. Anja Hohtola .
Working life cooperation:
No.
Other information:
-

753692S: Seminar in ecological and conservation genetics, 4 op

Voimassaolo: 01.08.2009 - 31.07.2013

Opiskelumuoto: Advanced Studies

Laji: Course

Vastuuyksikkö: Department of Biology

Arvostelu: 1 - 5, pass, fail

Opettajat: Ruokonen, Minna Johanna

Opintokohteen kielet: Finnish

ECTS Credits:
4 cr.
Language of instruction:
Finnish / English.
Timing:
M.Sc. studies, 1 st or 2 nd year spring. Arranged if resources allow.
Learning outcomes:
The student will lean to apply genetics and to understand the role of genetic factors in ecological and conservation issues.
Contents:
Genetics of ecologically important traits, interaction between the species and between the environment and the species. Factors related to fitness, importance of genetic factors, especially in a changing environment. Genetic diversity as a part of biodiversity and how to preserve it. Genetics of threatened species.
Mode of delivery:
Face-to-face teaching.
Learning activities and teaching methods:
Reading literature on the topic, group discussions, independent working, and seminar presentation.
Target group:
BSg, other biologists (BSz,b, ECOz,b, TEA) as well as others interested, Ph.D. students.
Prerequisites and co-requisites:
Courses Concepts of genetics (753124P, 753104P), Molecular evolution (753327A) and Basics in population genetics (753351A).
Recommended optional programme components:
-
Recommended or required reading:
Recent scientific articles. Additional reading: Conner, J.K., Hartl, D.L.: A Primer of Ecological Genetics, and Frankham, R., Ballou, J.D., Briscoe, D.A.: Introduction to Conservation Genetics. Cambridge University Press.
The availability of the literature can be checked from this link.
Assessment methods and criteria:
Participation into the seminars, seminar presentation.
Grading:
Pass / Fail.
Person responsible:
Dr. Minna Ruokonen.
Working life cooperation:
No.

Other information:
-

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

Voimassaolo: - 31.07.2015
Opiskelumuoto: Advanced Studies
Laji: Course
Vastuuyksikkö: Department of Biology
Arvostelu: 1 - 5, pass, fail
Opintokohteen kielet: Finnish
Leikkaavuudet:

750653S Special seminar in biology 2.0 op

Voidaan suorittaa useasti: Kyllä

ECTS Credits:
2 cr.
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:
-
Target group:
ECOb compulsory 2 cr., BSb optional.
Prerequisites and co-requisites:
No.
Recommended optional programme components:
-
Recommended or required reading:
-
Assessment methods and criteria:
-
Grading:
-
Person responsible:
Professors and docents.
Working life cooperation:
No.
Other information:
-

755616S: Seminars on special topics in zoology, 2 - 4 op

Voimassaolo: 01.08.2010 - 31.07.2015
Opiskelumuoto: Advanced Studies
Laji: Course
Vastuuyksikkö: Department of Biology
Arvostelu: 1 - 5, pass, fail
Opintokohteen kielet: Finnish
Leikkaavuudet:

750653S Special seminar in biology 2.0 op

Voidaan suorittaa useasti: Kyllä

ECTS Credits:
2-4 cr.
Language of instruction:
Finnish / English.
Timing:
M.Sc., Ph.D. degree, (arranged if resources allow).
Learning outcomes:
Student will be acquainted to current issues in animal physiology or animal ecology.
Contents:
Current special problems in zoology. Lectures by specialists and latest literature. Topics vary every year.
Mode of delivery:
Face-to-face teaching.
Learning activities and teaching methods:
Varying.
Target group:
BSz and ECOz.
Prerequisites and co-requisites:
-
Recommended optional programme components:
-
Recommended or required reading:
-
Assessment methods and criteria:
-
Grading:
-
Person responsible:
Professors and docents.
Working life cooperation:
No.
Other information:
-

756633S: Soil biology, 3 op

Voimassaolo: - 31.07.2015

Opiskelumuoto: Advanced Studies

Laji: Course

Vastuuyksikkö: Department of Biology

Arvostelu: 1 - 5, pass, fail

Opettajat: Sutinen, Marja-Liisa Kaarina

Opintokohteen kielet: Finnish

ECTS Credits:
3 cr.
Language of instruction:
Finnish / English.
Timing:
M.Sc. degree.
Learning outcomes:
Student is able to recommend where there is opportunity for intensive forestry and what habitats should be conserved from forestry concern the need to protect forest biodiversity.
Contents:
Soil formation, physical properties and chemical properties. Course main themes are glacier carried soil and formations, soil microclimate and water relations, nutrients, soil characters as plant distribution affecting factor, forest regeneration and tree line.
Mode of delivery:

Face-to-face teaching.
Learning activities and teaching methods:
16-18 h lectures, 2-4 h seminar, exam.
Target group:
-
Prerequisites and co-requisites:
No.
Recommended optional programme components:
Recommended for the course Soil ecology (756612S).
Recommended or required reading:
Mälkönen, E., (2003) Metsämaa ja sen hoito. Kustannusosakeyhtiö Metsälehti.
The availability of the literature can be checked from this link.
Assessment methods and criteria:
Final exam.
Grading:
1-5 / Fail.

Person responsible:
Dr. Marja-Liisa Sutinen.
Working life cooperation:
No.
Other information:
-

756612S: Soil ecology, 3 - 5 op

Voimassaolo: - 31.07.2019
Opiskelumuoto: Advanced Studies
Laji: Course
Vastuuyksikkö: Department of Biology
Arvostelu: 1 - 5, pass, fail
Opettajat: Annamari Markkola
Opintokohteen kielet: Finnish

ECTS Credits:
3-5 cr.
Language of instruction:
Finnish / English.
Timing:
M.Sc. 1 st or 2 nd year spring, (arranged if resources allow).
Learning outcomes:
Student will learn common basics of soil organisms and their interactions.
Contents:
Current soil ecological research and methods, planning and conducting experiments.
Mode of delivery:
Face-to-face teaching.
Learning activities and teaching methods:
Lectures, exercises, seminars, exam.
Target group:
-
Prerequisites and co-requisites:
No.
Recommended optional programme components:
-
Recommended or required reading:
Additional reading Smith, S.E. & Read, D.J. 1997. Mycorrhizal symbiosis. Academic Press, San Diego and London. 605 p.; Van der Hejden, M.G.A. & Sanders, I.R. (eds) 2002. Mycorrhizal ecology. Springer, Berlin. 469 p.; Bardgett, R. D. 2005. The biology of soil: a community and ecosystem approach. Biology of Habitats series. Oxford University Press, Oxford, UK. 256 p.
The availability of the literature can be checked from this link.

Assessment methods and criteria:
Exam.
Grading:
1-5 / Fail.
Person responsible:
Dr. Annamari Markkola.
Working life cooperation:
No.
Other information:
-

751648S: Special course in aquatic invertebrates, 2 - 4 op

Voimassaolo: - 31.07.2015

Opiskelumuoto: Advanced Studies

Laji: Course

Vastuuyksikkö: Department of Biology

Arvostelu: 1 - 5, pass, fail

Opintokohteen kielet: Finnish

Leikkaavuudet:

754627S Special course in aquatic invertebrates 5.0 op

ECTS Credits:
4 cr.
Language of instruction:
Finnish / English.
Timing:
M.Sc. 1 st or 2 nd year. Every third year.
Learning outcomes:
After the course, the student will have basic knowledge on quantitative sampling of benthic invertebrates in various inland waters (mainly streams) and species level identification of benthic invertebrates.
Contents:
Field sampling and identification practices in the laboratory.
Mode of delivery:
Blended teaching.
Learning activities and teaching methods:
40 h demonstrations, lectures and exercises.
Target group:
ECOz, elective.
Prerequisites and co-requisites:
Courses Field course in aquatic animals (751307A) and Introduction to hydrobiology (754308A).
Recommended optional programme components:
-
Recommended or required reading:
Course material.
Assessment methods and criteria:
-
Grading:
Pass / Fail.
Person responsible:
Prof. Timo Muotka.
Working life cooperation:
No.
Other information:
-

754619S: Special course in fish ecology, 8 op

Voimassaolo: - 31.07.2015

Opiskelumuoto: Advanced Studies
Laji: Course
Vastuuyksikkö: Department of Biology
Arvostelu: 1 - 5, pass, fail
Opettajat: Muotka, Timo Tapani
Opintokohteen kielet: Finnish
Voidaan suorittaa useasti: Kyllä

ECTS Credits:
8 cr.
Language of instruction:
Finnish / English.
Timing:
M.Sc. 1 st or 2 nd year. Arranged if resources allow.
Learning outcomes:
Guide students in independent research work.
Contents:
The course consists of four sections: 1. Field course where student gather in groups experimental and correlative field materials, 2. Statistical analysis of the data, 3. Making a research report, and 4. Final seminar where the results and conclusions are presented.
Mode of delivery:
Face-to-face teaching.
Learning activities and teaching methods:
40-60 h field work, 4-6 h supervised computer exercises, 80 h independent work (analysis, report making), 10-15 h final seminar.
Target group:
ECOz.
Prerequisites and co-requisites:
Field course in aquatic animals (751307A) and Research seminar in fish ecology (754618S) or equivalent knowledge.
Recommended optional programme components:
-
Recommended or required reading:
Course material.
Assessment methods and criteria:
Report.
Grading:
Pass / Fail.
Person responsible:
Prof. Timo Muotka.
Working life cooperation:
No.
Other information:
-

755614S: Special course in ornithology, 2 op

Voimassaolo: 01.08.2010 - 31.07.2015
Opiskelumuoto: Advanced Studies
Laji: Course
Vastuuyksikkö: Department of Biology
Arvostelu: 1 - 5, pass, fail
Opettajat: Seppo Rytkönen
Opintokohteen kielet: Finnish

ECTS Credits:
2 cr.
Language of instruction:

Finnish / English.
Timing:
M.Sc. 1 st summer.
Learning outcomes:
Course gives basic knowledge and skills in identification of birds in the field, bird counting methods and basics of bird ecology. Course shows how good identification skills and ecological knowledge of species are key facts in ecological research. Course emphasises how it is possible to specify environmental value of birdlife (e.g. environmental impact assessment).
Contents:
Course familiarizes students to birdlife in different habitates (city, field, aquatic environments, forests and bogs). Students learn birds by visual and auditory observations. Bird counting is practised by using methods specially suitable in each habitate. (line transect method, mapping method or point counting method). Data from the field is analysed during the course and results are presented in written form (Power Point presentation) in seminar. If participants has to be dropped down main grounds will be major of the student, starting year and success in course Basic identification of animals (751373A).
Mode of delivery:
Face-to-face teaching.
Learning activities and teaching methods:
12 h course. 18 h exercises and seminar.
Target group:
ECOz optional.
Prerequisites and co-requisites:
Basic identification of animals (751373A).
Recommended optional programme components:
Recommended additional courses Field course in terrestrial animals (751306A), Field identification of birds (755313A) and Identification of vertebrates in the field (751642S).
Recommended or required reading:
Compulsory handouts: 1) Rytkönen, S. ym. 2003: 751306 Maaeläimistön tuntemus ja ekologia. - Biologian laitoksen monisteita 3/2003. Oulun yliopisto, Oulu.
The availability of the literature can be checked from this link.
Assessment methods and criteria:
Seminar presentation.
Grading:
Pass / Fail.
Person responsible:
Dr. Seppo Rytkönen.
Working life cooperation:
No.
Other information:
Binoculars, bird identification book, suitable outfit.

752691S: Special course/Signal transduction in plants, 2 - 4 op

Voimassaolo: - 31.07.2014

Opiskelumuoto: Advanced Studies

Laji: Course

Vastuuyksikkö: Department of Biology

Arvostelu: 1 - 5, pass, fail

Opettajat: Häggman, Hely Margaretha

Opintokohteen kielet: Finnish

ECTS Credits:
2-4 cr.
Language of instruction:
Finnish / English.
Timing:
M.Sc. 1 st or 2 nd spring, (arranged if resources allow).
Learning outcomes:
The student assesses the basic mechanisms and components involved in signal transduction. She / he is also able to read and evaluate the plant signal transduction pathways not covered during the course.
Contents:

The course will cover the basics of plant signal transduction and some specific examples such as light induced signal transduction, plant hormones as signalling molecules, signalling to regulate the functioning of stomata and plant developmental biology or biological interactions related signalling.
Mode of delivery:
Face-to-face teaching.
Learning activities and teaching methods:
20 h lectures, independent work, presentations, workshops.
Target group:
Suitable for BS subject majors and ecophysiologists.
Prerequisites and co-requisites:
Functional plant biology lectures and exercises (752345A, 756341A), Plant developmental biology (756332A) and lectures of Advanced course in plant biology (752682S) or equivalent knowledge helps in following the course.
Recommended optional programme components:
-
Recommended or required reading:
Taiz, L. & Zeiger, E. 2010: Plant Physiology (5th ed.) Sinauer Ass., Sunderland Mass.
The availability of the literature can be checked from this link.
Assessment methods and criteria:
Exam.
Grading:
1-5 / Fail.
Person responsible:
Prof. Hely Häggman.
Working life cooperation:
No.
Other information:
-

753613S: Special seminar in genetics, 4 op

Voimassaolo: - 31.07.2015

Opiskelumuoto: Advanced Studies

Laji: Course

Vastuuyksikkö: Department of Biology

Arvostelu: 1 - 5, pass, fail

Opintokohteen kielet: Finnish

Leikkaavuudet:

750653S	Special seminar in biology	2.0 op

Voidaan suorittaa useasti: Kyllä

ECTS Credits:
4 cr.
Language of instruction:
Finnish / English.
Timing:
M.Sc. 1 st or 2 nd year.
Learning outcomes:
Students concern themselves to current issues in genetics.
Contents:
Subject varies and will be announced each year separately.
Mode of delivery:
Face-to-face teaching.
Learning activities and teaching methods:
24 h lectures, literature, 40 h independent studies, final exam.
Target group:
-
Prerequisites and co-requisites:
Concepts of genetics (753124P) or equivalent knowledge.
Recommended optional programme components:
-

Recommended or required reading:
-
Assessment methods and criteria:
-
Grading:
-
Person responsible:
Professors and docents of genetics.
Working life cooperation:
No.
Other information:
-

752667S: Special topics in plant ecology, 2 - 5 op

Voimassaolo: - 31.07.2015

Opiskelumuoto: Advanced Studies

Laji: Course

Vastuuyksikkö: Department of Biology

Arvostelu: 1 - 5, pass, fail

Opintokohteen kielet: Finnish

Leikkaavuudet:

750654S Special lecture in biology 2.0 op

Voidaan suorittaa useasti: Kyllä

ECTS Credits:
2-5 cr.
Language of instruction:
Finnish / English.
Timing:
M.Sc. 1 st or 2 nd year.
Learning outcomes:
Student will be profoundly acquainted to special issues in plant ecology.
Contents:
Subject varies every year and will be announced separately.
Mode of delivery:
Face-to-face teaching.
Learning activities and teaching methods:
Varying.
Target group:
ECO.
Prerequisites and co-requisites:
No.
Recommended optional programme components:
-
Recommended or required reading:
-
Assessment methods and criteria:
Varying.
Grading:
1-5 / fail or Pass / Fail.
Person responsible:
Professors and docents.
Working life cooperation:
No.
Other information:
-

754621S: Specific topics on hydrobiology, 4 op

Voimassaolo: - 31.07.2015
Opiskelumuoto: Advanced Studies
Laji: Course
Vastuuyksikkö: Department of Biology
Arvostelu: 1 - 5, pass, fail
Opettajat: Muotka, Timo Tapani
Opintokohteen kielet: Finnish
Leikkaavuudet:

754624S Specific topics on hydrobiology 5.0 op

Voidaan suorittaa useasti: Kyllä

ECTS Credits:
4 cr.
Language of instruction:
Finnish.
Timing:
M.Sc. 1 st or 2 nd year. Arranged if resources allow.
Learning outcomes:
Give student advanced skills in variable subjects in hydrobiology.
Contents:
Variable topics. Mainly species identification.
Mode of delivery:
Blended teaching.
Learning activities and teaching methods:
Laboratory exercise, sample taking, in the field about 20 h.
Target group:
ECOz, ECOb.
Prerequisites and co-requisites:
Basic course in hydrobiology (754308A).
Recommended optional programme components:
-
Recommended or required reading:
Specific for every course topic.
Assessment methods and criteria:
Course specific.
Grading:
Pass / Fail.
Person responsible:
Prof. Timo Muotka.
Working life cooperation:
No.
Other information:
-

754620S: Stream biology, 4 op

Voimassaolo: - 31.07.2015
Opiskelumuoto: Advanced Studies
Laji: Course
Vastuuyksikkö: Department of Biology
Arvostelu: 1 - 5, pass, fail
Opettajat: Muotka, Timo Tapani
Opintokohteen kielet: Finnish
Leikkaavuudet:

754628S Stream ecology 5.0 op

ECTS Credits:
4 cr.
Language of instruction:
Finnish.
Timing:
B.Sc. 3 rd year / M.Sc. 1 st or 2 nd year. Every 2 nd year.
Learning outcomes:
Basic principles of the structure and function of aquatic ecosystems.
Contents:
Interspecific competition, predation and environmental disturbance as factors regulating aquatic communities. Prey choice mechanisms of aquatic predators and avoidance behaviour of prey species. Trophic interactions in aquatic ecosystems. Biomanipulation as a management tool in water protection.
Mode of delivery:
Face-to-face teaching.
Learning activities and teaching methods:
20 h lectures, home essays.
Target group:
ECOz, optional.
Prerequisites and co-requisites:
Basic course in hydrobiology (754308A) or equivalent knowledge.
Recommended optional programme components:
-
Recommended or required reading:
Handouts and Allan, J. D. & Castillo, M. M. (2007). Stream Ecology: Structure and Function of Running Waters. Springer Verlagen.
The availability of the literature can be checked from this link.
Assessment methods and criteria:
Home essays.
Grading:
Pass / Fail.
Person responsible:
Prof. Timo Muotka.
Working life cooperation:
No.
Other information:
-

754320A: Stream ecology, 4 op

Voimassaolo: - 31.12.2019

Opiskelumuoto: Intermediate Studies

Laji: Course

Vastuuyksikkö: Department of Biology

Arvostelu: 1 - 5, pass, fail

Opettajat: Muotka, Timo Tapani

Opintokohteen kielet: Finnish

Leikkaavuudet:

754628S Stream ecology 5.0 op

ECTS Credits:
3 cr.
Language of instruction:
Finnish.
Timing:
B.Sc. 3 rd year, M.Sc. 1 st or 2 nd year. Every 2 nd year. Special announcement.
Learning outcomes:
Basic principles of the structure and function of aquatic ecosystems.
Contents:

Interspecific competition, predation and environmental disturbance as factors regulating stream communities. Prey choice mechanisms of aquatic predators and antipredatory behaviour of the prey species. Trophic interactions in stream ecosystems.
Mode of delivery:
Face-to-face teaching.
Learning activities and teaching methods:
20 h lectures, essays.
Target group:
-
Prerequisites and co-requisites:
Basic course of hydrobiology (754308A) or equivalent knowledge.
Recommended optional programme components:
-
Recommended or required reading:
Handouts and Allan, J. D. & Castillo, M. M. (2007). Stream Ecology: Structure and Function of Running Waters. Springer Verlagen.
The availability of the literature can be checked from this link.
Assessment methods and criteria:
Essays.
Grading:
Pass / Fail.
Person responsible:
Prof. Timo Muotka.
Working life cooperation:
No.
Other information:
-

756626S: Stress physiology of plants, 4 op

Voimassaolo: - 31.07.2020

Opiskelumuoto: Advanced Studies

Laji: Course

Vastuuyksikkö: Department of Biology

Arvostelu: 1 - 5, pass, fail

Opettajat: Häggman, Hely Margaretha

Opintokohteen kielet: Finnish

ECTS Credits:
4 cr.
Language of instruction:
Finnish / English.
Timing:
M.Sc. 1 st or 2 nd spring, arranged every second year if resources allow.
Learning outcomes:
The student will assess the effect of abiotic and biotic stresses on plant metabolism and the means of plants to cope with them.
Contents:
The course will cover all the stresses affecting plant metabolism at biochemical or molecular level. The signal transduction caused by the stresses will be followed as well as plant defense reactions. Plant pathogen biocontrol methods are introduced.
Mode of delivery:
Face-to-face teaching.
Learning activities and teaching methods:
20 h lectures, independent exercises or seminar and exam.
Target group:
Mainly for BS but also suitable for ECO.
Prerequisites and co-requisites:
No.
Recommended optional programme components:
-

Recommended or required reading:
Lecture handouts and literature given during the course.
Assessment methods and criteria:
Exam, essay/seminar.
Grading:
1-5 / Fail.
Person responsible:
Prof. Hely Häggman.
Working life cooperation:
No.
Other information:
-

756622S: Structure and dynamics of plant communities, 5 op

Voimassaolo: - 31.07.2017

Opiskelumuoto: Advanced Studies

Laji: Course

Vastuuyksikkö: Department of Biology

Arvostelu: 1 - 5, pass, fail

Opettajat: Jari-Heikki Oksanen

Opintokohteen kielet: Finnish

ECTS Credits:
5 cr.
Language of instruction:
Finnish / English.
Timing:
M.Sc. degree, (arranged if resources allow).
Learning outcomes:
The student knows the most important processes controlling the structure and dynamics of plant communities, and the major theories concerning those processes. The students can apply theories in the research of plant communities.
Contents:
Models on structure of communities, in particular the neutral models, and assembly rules. The estimation of biological diversity. The relationship between species and their environment, and its consequences: the analysis of ecological communities and bioindication. The course follows the scientific development, and its contents will be adjusted for the current scientific literature, and the exact contents will vary among years.
Mode of delivery:
Face-to-face teaching.
Learning activities and teaching methods:
24 h lectures, essay.
Target group:
-
Prerequisites and co-requisites:
No.
Recommended optional programme components:
-
Recommended or required reading:
Current article collection and course handout.
Assessment methods and criteria:
Essay.
Grading:
-
Person responsible:
Prof. Jari Oksanen.
Working life cooperation:
No.
Other information:
-

756605S: Studies in Botany in other Finnish Universities, 0 op

Voimassaolo: - 31.07.2015
Opiskelumuoto: Advanced Studies
Laji: Course
Vastuuyksikkö: Department of Biology
Arvostelu: 1 - 5, pass, fail
Opettajat: Tuomi Juha, Häggman, Hely Margaretha
Opintokohteen kielet: Finnish
Leikkaavuudet:

750655S Studies in other Finnish universities 1.0 op

Voidaan suorittaa useasti: Kyllä

ECTS Credits:
-
Language of instruction:
Varying.
Timing:
B. Sc. or M.Sc.
Learning outcomes:
Student will be acquainted to varying issues in botany.
Contents:
Studies done in other Finnish universities credit transferred on agreement.
Mode of delivery:
Varying.
Learning activities and teaching methods:
Varying.
Target group:
Varying.
Prerequisites and co-requisites:
-
Recommended optional programme components:
-
Recommended or required reading:
-
Assessment methods and criteria:
Credit transfer.
Grading:
1-5 / Fail or Pass / Fail.
Person responsible:
Prof. Juha Tuomi or Prof. Hely Häggman.
Working life cooperation:
No.
Other information:
-

757605S: Studies in Genetics in other Finnish Universities, 0 op

Voimassaolo: - 31.07.2015
Opiskelumuoto: Advanced Studies
Laji: Course
Vastuuyksikkö: Department of Biology
Arvostelu: 1 - 5, pass, fail
Opintokohteen kielet: Finnish
Leikkaavuudet:

750655S Studies in other Finnish universities 1.0 op

Voidaan suorittaa useasti: Kyllä

ECTS Credits:
-
Language of instruction:
Varying.
Timing:
B. Sc. or M.Sc.
Learning outcomes:
Student will be acquainted to varying issues in genetics.
Contents:
Studies done in other Finnish universities credit transferred on agreement.
Mode of delivery:
Varying.
Learning activities and teaching methods:
Varying.
Target group:
Varying.
Prerequisites and co-requisites:
-
Recommended optional programme components:
-
Recommended or required reading:
-
Assessment methods and criteria:
Credit transfer.
Grading:
1-5 / Fail or Pass / Fail.
Person responsible:
Prof. Outi Savolainen.
Working life cooperation:
No.
Other information:
-

755605S: Studies in Zoology in other Finnish Universities, 0 op

Voimassaolo: - 31.07.2015

Opiskelumuoto: Advanced Studies

Laji: Course

Vastuuyksikkö: Department of Biology

Arvostelu: 1 - 5, pass, fail

Opintokohteen kielet: Finnish

Leikkaavuudet:

750655S Studies in other Finnish universities 1.0 op

Voidaan suorittaa useasti: Kyllä

ECTS Credits:
-
Language of instruction:
Varying.
Timing:
B. Sc. or M.Sc. degree.
Learning outcomes:
Student will be acquainted to varying issues in zoology.
Contents:
Studies done in other Finnish universities credit transferred on agreement.
Mode of delivery:
Varying.

Learning activities and teaching methods:
Varying.
Target group:
Varying.
Prerequisites and co-requisites:
-
Recommended optional programme components:
-
Recommended or required reading:
-
Assessment methods and criteria:
Credit transfer.
Grading:
1-5 / Fail or Pass / Fail.
Person responsible:
Prof. Esa Hohtola or Prof. Markku Orell.
Working life cooperation:
No.
Other information:
-

756105P: Studies in botany in other Finnish universities, 0 op

Voimassaolo: - 31.07.2015

Opiskelumuoto: Basic Studies

Laji: Course

Vastuuyksikkö: Department of Biology

Arvostelu: 1 - 5, pass, fail

Opettajat: Tuomi Juha, Häggman, Hely Margaretha

Opintokohteen kielet: Finnish

Leikkaavuudet:

750155P Studies in other Finnish universities 1.0 op

Voidaan suorittaa useasti: Kyllä

ECTS Credits:
-
Language of instruction:
Varying.
Timing:
B. Sc. or M.Sc.
Learning outcomes:
Student will be acquainted to varying issues in botany.
Contents:
Studies done in other Finnish universities credit transferred on agreement.
Mode of delivery:
Varying.
Learning activities and teaching methods:
Varying.
Target group:
Varying.
Prerequisites and co-requisites:
-
Recommended optional programme components:
-
Recommended or required reading:
-
Assessment methods and criteria:
Credit transfer.
Grading:

1-5 / Fail or Pass / Fail.
Person responsible:
Prof. Juha Tuomi or Prof. Hely Häggman.
Working life cooperation:
No.
Other information:
-

756305A: Studies in botany in other Finnish universities, 0 op

Voimassaolo: - 31.07.2015
Opiskelumuoto: Intermediate Studies
Laji: Course
Vastuuyksikkö: Department of Biology
Arvostelu: 1 - 5, pass, fail
Opettajat: Tuomi Juha, Häggman, Hely Margaretha
Opintokohteen kielet: Finnish
Leikkaavuudet:

750355A Studies in other Finnish universities 1.0 op

Voidaan suorittaa useasti: Kyllä

ECTS Credits:
-
Language of instruction:
Varying.
Timing:
B. Sc. or M.Sc.
Learning outcomes:
Student will be acquainted to varying issues in botany.
Contents:
Studies done in other Finnish universities credit transferred on agreement.
Mode of delivery:
Varying.
Learning activities and teaching methods:
Varying.
Target group:
Varying.
Prerequisites and co-requisites:
-
Recommended optional programme components:
-
Recommended or required reading:
-
Assessment methods and criteria:
Credit transfer.
Grading:
1-5 / Fail or Pass / Fail.
Person responsible:
Prof. Juha Tuomi or Prof. Hely Häggman.
Working life cooperation:
No.
Other information:
-

757105P: Studies in genetics in other Finnish universities, 0 op

Voimassaolo: - 31.07.2015
Opiskelumuoto: Basic Studies

Laji: Course

Vastuuyksikkö: Department of Biology

Arvostelu: 1 - 5, pass, fail

Opintokohteen kielet: Finnish

Leikkaavuudet:

750155P Studies in other Finnish universities 1.0 op

Voidaan suorittaa useasti: Kyllä

ECTS Credits:
-
Language of instruction:
Varying.
Timing:
B. Sc. or M.Sc.
Learning outcomes:
Student will be acquainted to varying issues in genetics.
Contents:
Studies done in other Finnish universities credit transferred on agreement.
Mode of delivery:
Varying.
Learning activities and teaching methods:
Varying.
Target group:
Varying.
Prerequisites and co-requisites:
-
Recommended optional programme components:
-
Recommended or required reading:
-
Assessment methods and criteria:
Credit transfer.
Grading:
1-5 / Fail or Pass / Fail.
Person responsible:
Prof. Outi Savolainen.
Working life cooperation:
No.
Other information:
-

757305A: Studies in genetics in other Finnish universities, 0 op

Voimassaolo: - 31.07.2015

Opiskelumuoto: Intermediate Studies

Laji: Course

Vastuuyksikkö: Department of Biology

Arvostelu: 1 - 5, pass, fail

Opintokohteen kielet: Finnish

Leikkaavuudet:

750355A Studies in other Finnish universities 1.0 op

Voidaan suorittaa useasti: Kyllä

ECTS Credits:
-
Language of instruction:
Varying.

Timing:
B. Sc. or M.Sc.
Learning outcomes:
Student will be acquainted to varying issues in genetics.
Contents:
Studies done in other Finnish universities credit transferred on agreement.
Mode of delivery:
Varying.
Learning activities and teaching methods:
Varying.
Target group:
Varying.
Prerequisites and co-requisites:
-
Recommended optional programme components:
-
Recommended or required reading:
-
Assessment methods and criteria:
Credit transfer.
Grading:
1-5 / Fail or Pass / Fail.
Person responsible:
Prof. Outi Savolainen.
Working life cooperation:
No.
Other information:
-

755105P: Studies in zoology in other Finnish universities, 0 op

Voimassaolo: - 31.07.2015

Opiskelumuoto: Basic Studies

Laji: Course

Vastuuyksikkö: Department of Biology

Arvostelu: 1 - 5, pass, fail

Opintokohteen kielet: Finnish

Leikkaavuudet:

750155P Studies in other Finnish universities 1.0 op

Voidaan suorittaa useasti: Kyllä

ECTS Credits:
-
Language of instruction:
Varying.
Timing:
B. Sc. or M.Sc. degree.
Learning outcomes:
Student will be acquainted to varying issues in zoology.
Contents:
Studies done in other Finnish universities credit transferred on agreement.
Mode of delivery:
Varying.
Learning activities and teaching methods:
Varying.
Target group:
Varying.
Prerequisites and co-requisites:
-
Recommended optional programme components:

-
Recommended or required reading:
-
Assessment methods and criteria:
Credit transfer.
Grading:
1-5 / Fail or Pass / Fail.
Person responsible:
Prof. Esa Hohtola or Prof. Markku Orell.
Working life cooperation:
No.
Other information:
-

755305A: Studies in zoology in other Finnish universities, 0 op

Voimassaolo: - 31.07.2015

Opiskelumuoto: Intermediate Studies

Laji: Course

Vastuuyksikkö: Department of Biology

Arvostelu: 1 - 5, pass, fail

Opintokohteen kielet: Finnish

Leikkaavuudet:

750355A	Studies in other Finnish universities	1.0 op

Voidaan suorittaa useasti: Kyllä

ECTS Credits:
-
Language of instruction:
Varying.
Timing:
B. Sc. or M.Sc. degree.
Learning outcomes:
Student will be acquainted to varying issues in zoology.
Contents:
Studies done in other Finnish universities credit transferred on agreement.
Mode of delivery:
Varying.
Learning activities and teaching methods:
Varying.
Target group:
Varying.
Prerequisites and co-requisites:
-
Recommended optional programme components:
-
Recommended or required reading:
-
Assessment methods and criteria:
Credit transfer.
Grading:
1-5 / Fail or Pass / Fail.
Person responsible:
Prof. Esa Hohtola or Prof. Markku Orell.
Working life cooperation:
No.
Other information:
-

752656S: Taxonomy and ecology of plants, 2 - 4 op

Opiskelumuoto: Advanced Studies
Laji: Course
Vastuuyksikkö: Department of Biology
Arvostelu: 1 - 5, pass, fail
Opintokohteen kielet: Finnish
Voidaan suorittaa useasti: Kyllä

ECTS Credits:
2-4 cr.
Language of instruction:
Finnish / English.
Timing:
M.Sc. 1 st or 2 nd year. Arranged if resources allow every second year. See announcements at the notice board of the department.
Learning outcomes:
By passing this course a student is able to identify species of the given taxonomic group, understand the ecology of the species, and know their distribution and systematic position.
Contents:
A laboratory course, field course or blended course. Species identification by means of macroscopic or microscopic characters. Making a collection of specimens, sampling and handling of the material. Preparation of herbarium specimens. Field instruction on species mapping and quantitative approach. Species' characters (morphological and chemical). Inventory methods on red listed species. Alternative themes (lichens, polypores and other fungi, and bryophytes).
Mode of delivery:
Face-to-face teaching.
Learning activities and teaching methods:
Demonstrations, identification exercises and field exercises.
Target group:
Students of plant ecology.
Prerequisites and co-requisites:
No.
Recommended optional programme components:
-
Recommended or required reading:
Material given in the course.
Assessment methods and criteria:
Species exam.
Grading:
1-5 / Fail.
Person responsible:
Botanical museum.
Working life cooperation:
No.
Other information:
Course subject vary (lichens, polypore and other fungi, bryophytes).

750618S: Thursday seminar in biology, 2 op

Opiskelumuoto: Advanced Studies
Laji: Course
Vastuuyksikkö: Department of Biology
Arvostelu: 1 - 5, pass, fail
Opettajat: Hohtola, Esa Juhani
Opintokohteen kielet: English
Voidaan suorittaa useasti: Kyllä

ECTS Credits:

2 cr.
Language of instruction:
English.
Timing:
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 and abroad.
Mode of delivery:
Face-to-face teaching.
Learning activities and teaching methods:
Guest lectures on Thursdays 12 am-1 pm in the auditorium YB 210 (Kuusamonsali). See notice boards for the lecture schedule. See seminar programme: http://cc.oulu.fi/~ehohtola/tose.htm
Target group:
Undergraduate and postgraduate students.
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.
Grading:
Pass / Fail.
Person responsible:
Prof. Esa Hohtola.
Working life cooperation:
No.
Other information:
-

750318A: Thursday seminar in biology, 2 op

Voimassaolo: 01.08.2011 -

Opiskelumuoto: Intermediate Studies

Laji: Course

Vastuuyksikkö: Department of Biology

Arvostelu: 1 - 5, pass, fail

Opettajat: Hohtola, Esa Juhani

Opintokohteen kielet: English

Voidaan suorittaa useasti: Kyllä

ECTS Credits:
2 cr.
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 in the auditorium YB 210 (Kuusamonsali). 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.
Grading:
Pass / Fail.
Person responsible:
Prof. Esa Hohtola
Working life cooperation:
No.
Other information:
-

750033Y: Tutorial for new students, 1 op

Opiskelumuoto: General Studies

Laji: Course

Vastuuyksikkö: Department of Biology

Arvostelu: 1 - 5, pass, fail

Opettajat: Vanhatalo, Minna-Liisa

Opintokohteen kielet: Finnish

Voidaan suorittaa useasti: Kyllä

ECTS Credits:
2 cr.
Language of instruction:
Finnish.
Timing:
B.Sc. 3 rd autumn / M.Sc. 1 st autumn.
Learning outcomes:
Course develops students' skills to guide, make presentations, work in group and organize. It also advances planning, arrangement and guidance abilities as well as responsibility.
Contents:
The student guides a group of new students during the orientation course introducing them to the university, academic learning environment, the department, curriculum and other students with the help of small group meetings and presentations.
Mode of delivery:
Face-to-face teaching.
Learning activities and teaching methods:
Tutorials and presentations. Minimum 15 hours. In addition indenpendent work includes the preparation of the tutorials.
Target group:
Second and third year biology students.
Prerequisites and co-requisites:
Course 750031Y.
Recommended optional programme components:
-
Recommended or required reading:
Study guide and training material.
Assessment methods and criteria:
-
Grading:
Pass / Fail.
Person responsible:
Ph.Lic. Minna Vanhatalo.
Working life cooperation:

No.
Other information:
-

751668S: Wildlife management and game animal ecology, 6 op

Voimassaolo: - 31.07.2015
Opiskelumuoto: Advanced Studies
Laji: Course
Vastuuyksikkö: Department of Biology
Arvostelu: 1 - 5, pass, fail
Opettajat: Jouni Aspi
Opintokohteen kielet: Finnish
Leikkaavuudet:

755628S Wildlife management and game animal ecology 5.0 op

ECTS Credits:
6 cr.
Language of instruction:
Finnish / English.
Timing:
B.Sc. 3 rd or M.Sc. 1 st 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 final exam.
Target group:
-
Prerequisites and co-requisites:
No.
Recommended optional programme components:
-
Recommended or required reading:
-
Assessment methods and criteria:
Seminar with report and final exam.
Grading:
1-5 / Fail.
Person responsible:
Dr. Jouni Aspi, and Dr. Kari Koivula.
Working life cooperation:
No.
Other information:
-

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

Voimassaolo: - 31.07.2015

Opiskelumuoto: Intermediate Studies

Laji: Course

Vastuuyksikkö: Department of Biology

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 cr.
Language of instruction:
Finnish / English.
Timing:
B.Sc. 3 rd or M.Sc. 1 st 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.
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

Vastuuyksikkö: Department of Biology

Arvostelu: 1 - 5, pass, fail

Opettajat: Kari Taulavuori

Opintokohteen kielet: English

Leikkaavuudet:

750677S Winter ecology 5.0 op

ECTS Credits:
3-8 cr.
Language of instruction:
English.
Timing:
B.Sc. 3 rd or M.Sc. 1 st 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.
Grading:
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:
-

750325A: Winter ecology and physiology, 3 - 8 op

Voimassaolo: - 31.07.2015

Opiskelumuoto: Intermediate Studies

Laji: Course

Vastuuyksikkö: Department of Biology

Arvostelu: 1 - 5, pass, fail

Opettajat: Kari Taulavuori

Opintokohteen kielet: English

Leikkaavuudet:

750377A Winter ecology 5.0 op

ECTS Credits:
3-8 cr.
Language of instruction:

English.
Timing:
B.Sc. 3 rd or M.Sc. 1 st 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.
Grading:
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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