

Opasraportti

Open University - Natural sciences, mathematics and statistics (2019 - 2020)

Tutkintorakenteisiin kuulumattomat opintokokonaisuudet ja -jaksot

ay740152P: Basic biochemistry 1: Biomolecules (OPEN UNI), 5 op
 ay740153P: Basic biochemistry 2: Methods (OPEN UNI), 2 op
 ay740154P: Basic biochemistry 3: Metabolis (OPEN UNI), 3 op
 802354A: Basics in Algebra, 5 op
 750124P: Basics of ecology, 5 op
 740151P: Biochemical methodologies I, 10 op
 750173P: Biogeography, 5 op
 740148P: Biomolecules, 5 op
 752362A: Botanical collection and digital herbarium, 2 - 6 op
 750121P: Cell biology, 5 op
 ay766383A: Climate.Now (OPEN UNI), 2 - 5 op
 757109P: Concepts of genetics, 5 op
 756347A: Conservation of biodiversity, 5 op
 755320A: Developmental biology-histology, 5 op
 755313A: Field identification of birds, 1 - 5 op
 790101P: GIS-basics and Cartography, 5 op
 ay790340A: Geographies of global development (OPEN UNI), 5 op
 765308A: History of astronomy, 5 op
 ay765308A: History of astronomy (OPEN UNI), 5 op
 801623S: Introduction to Coding Theory, 5 op
 802336A: Introduction to Cryptography, 5 op
 802120P: Introduction to Matrices, 5 op
 790141P: Introduction to Regional Development and Regional Policy, 5 op
 806113P: Introduction to Statistics, 5 op
 ay806113P: Introduction to Statistics (OPEN UNI), 5 op
 ay806118P: Introduction to Statistics (OPEN UNI), 5 op
 790160P: Introduction to Tourism Geography, 5 op
 ay765103P: Introduction to astronomy (OPEN UNI), 3 op
 802151P: Introduction to mathematical deduction, 5 op
 ay802151P: Introduction to mathematical deduction (OPEN UNI), 5 op
 790104P: Introduction to systematic Human Geography, 5 op
 790152P: Introduction to the discipline of Geography, 5 op
 790102P: Introduction to the systematic Physical Geography, 5 op
 761115P: Laboratory Exercises in Physics 1, 5 op
 ay752316A: Macro fungi (OPEN UNI), 3 op
 802158P: Mathematics for Economic Sciences, 7 op
 763101P: Mathematics for physics, 6 op
 761118P: Mechanics 1, 5 op
 740149P: Metabolism I, 4 op
 752692S: Mire ecology, 5 op
 ay791635A: Physical Geography of Fennoscandia (OPEN UNI), 5 op
 761108P: Physical world view, 5 op

756346A: Plant biology lectures, 5 op
 766116P: Radiation physics, biology and safety, 5 op
 ay740155P: Targeting climate change on individual level (OPEN UNI), 2 op
 761310A: Wave motion and optics, 5 op
 ay790349A: World regional geography (OPEN UNI), 5 op

Opintojaksojen kuvaukset

Tutkintorakenteisiin kuulumattomien opintokokonaisuuksien ja -jaksojen kuvaukset

ay740152P: Basic biochemistry 1: Biomolecules (OPEN UNI), 5 op

Voimassaolo: 01.08.2019 -

Opiskelumuoto: Basic Studies

Laji: Course

Vastuuyksikkö: University of Oulu, Open University

Arvostelu: 1 - 5, pass, fail

Opetus suunnattu: University of Oulu, Open University

Opettajat: Henrika Honkanen

Opintokohteen kielet: Finnish

Leikkaavuudet:

ay740157P	Basic biochemistry 1: Biomolecules (OPEN UNI)	4.0 op
740148P	Biomolecules	5.0 op
740143P	Biomolecules for Biochemists	8.0 op
740147P	Biomolecules for Bioscientists	8.0 op

ay740153P: Basic biochemistry 2: Methods (OPEN UNI), 2 op

Voimassaolo: 01.08.2019 -

Opiskelumuoto: Basic Studies

Laji: Course

Vastuuyksikkö: University of Oulu, Open University

Arvostelu: 1 - 5, pass, fail

Opetus suunnattu: University of Oulu, Open University

Opettajat: Henrika Honkanen

Opintokohteen kielet: Finnish

Leikkaavuudet:

740151P	Biochemical methodologies I	10.0 op
740144P	Biochemical Methodologies I	8.0 op

ay740154P: Basic biochemistry 3: Metabolis (OPEN UNI), 3 op

Voimassaolo: 01.08.2019 -

Opiskelumuoto: Basic Studies

Laji: Course

Vastuuyksikkö: University of Oulu, Open University

Arvostelu: 1 - 5, pass, fail

Opetus suunnattu: University of Oulu, Open University

Opettajat: Henrika Honkanen

Opintokohteen kielet: Finnish

Leikkaavuudet:

ay740158P Basic biochemistry 3: Metabolis (OPEN UNI) 4.0 op

740146P Metabolism I 6.0 op

740149P Metabolism I 4.0 op

802354A: Basics in Algebra, 5 op

Voimassaolo: 01.08.2010 -

Opiskelumuoto: Intermediate Studies

Laji: Course

Vastuuyksikkö: Field of Mathematics

Arvostelu: 1 - 5, pass, fail

Opettajat: Kari Myllylä

Opintokohteen kielet: Finnish

Leikkaavuudet:

ay802354A Number Theory and Groups (OPEN UNI) 5.0 op

800333A Algebra I 8.0 op

ECTS Credits:

5 ECTS cr

Language of instruction:

Finnish

Timing:

1. year, 3. period

Learning outcomes:

After completing the course, student is able to

- derive and proof main results in the course
- use and apply different proof techniques
- recognize algebraic structures and the concepts
- see connections and differences between different algebraic structures

Contents:

The course includes basics in arithmetics and algebraic structures, such as, congruence, residue classes, prime numbers, Euclidean algorithm, the fundamental theorem of arithmetic, Euler-Fermat formula, groups and morphisms. The course gives an understanding of algebraic terms and concepts used in mathematics and physics.

Mode of delivery:

Face-to-face teaching

Learning activities and teaching methods:

28 h lectures, 14 h exercises

Target group:

Major and minor students

Prerequisites and co-requisites:

802151P Introduction to mathematical deduction

Recommended optional programme components:

-

Recommended or required reading:

Lecture notes

Assessment methods and criteria:

Final exam

Grading:

1-5

Person responsible:

Kari Myllylä

Working life cooperation:

-

750124P: Basics of ecology, 5 op

Opiskelumuoto: Basic Studies

Laji: Course

Vastuuyksikkö: Field of Biology

Arvostelu: 1 - 5, pass, fail

Opintokohteen kielet: Finnish

ECTS Credits:

5 ECTS credits / 133 hours of work.

Language of instruction:

Finnish.

Timing:

B.Sc. 1st 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. Moodle excersises.

Learning activities and teaching methods:

The course is based on the course book Manuel C. Molles Jr. & Anna A. Sher 2018. Ecology: concepts and applications (8. ed), lectures describing the major sections of the book, and the Moodle exercises based on the book. After each lecture, a new Moodle-exercise will open (in ca. 2 week-intervals). Assessment is based on the success in the Moodle-exercises. There is no final exam in the course.

Target group:

Compulsory biology students.

Prerequisites and co-requisites:

No.

Recommended optional programme components:

-

Recommended or required reading:

Manuel C. Molles Jr. & Anna A. Sher 2018. Ecology: concepts and applications (8. p).

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

Assessment methods and criteria:

Passing the course demands passing all the Moodle-exercises in the given time. Assessment is based on the success in the Moodle-exercises.

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

Grading:

1-5 / Fail.

Person responsible:

Doc. Seppo Rytkönen.

Working life cooperation:

No.

Other information:

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740151P: Biochemical methodologies I, 10 op

Voimassaolo: 01.08.2017 -

Opiskelumuoto: Basic Studies

Laji: Course

Vastuuyksikkö: Faculty of Biochemistry and Molecular Medicine

Arvostelu: 1 - 5, pass, fail

Opettajat: Kaija Autio

Opintokohteen kielet: Finnish

Leikkaavuudet:

ay740153P Basic biochemistry 2: Methods (OPEN UNI) 2.0 op

ay740144P Biochemical Methodologies I (OPEN UNI) 8.0 op

740144P Biochemical Methodologies I 8.0 op

Voidaan suorittaa useasti: Kyllä

ECTS Credits:

10 credits

Language of instruction:

Finnish

Timing:

B.Sc. yr1 autumn (lectures), yr1 spring (laboratory practicals)

Learning outcomes:

Upon successful completion students are able to:

- use basic methods used in biochemical research laboratory
- Use laboratory equipment and work safely
- Prepare solutions used in the lab
- document and present experiments and results in the laboratory and other works

Contents:

This module covers the basic methodologies used in practical biochemistry. The following topics will be addressed: safety in the laboratory, qualitative and quantitative observations, the calculations of concentrations and dilution factors (includes a workshop), pipette cleaning and calibration, identification and quantification of biological molecules, principals and practice of the use of centrifuges, spectrophotometry, SDS-PAGE, agarose gel electrophoresis, thin-layer and paper chromatography, basics of protein purification, extraction of chromosomal DNA from bacteria, mini-prep extraction of plasmid DNA, extraction of RNA from mammalian tissue, extraction of lipids from nutmeg, sterile technique, basic microbial growth, dialysis, filtration and pH measurement. In addition transferable skills like word processing (Microsoft Word) and spreadsheet (Microsoft Excel), drawing of curve charts, the basics of oral presentation, ethics in scientific research and good scientific practice are involved.

Mode of delivery:

Face to face teaching

Learning activities and teaching methods:

34 h lectures and exercises, 120 h lab. Laboratory work is compulsory. It is possible to complete lecture part only (3.5 ECTS).

Target group:

Major students

Prerequisites and co-requisites:

Biomolecules, Biomolecules for Biochemists tai Biomolecules for Bioscientists

Recommended optional programme components:

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Recommended or required reading:

Recommended reading: Reed, Holmes, Weyers & Jones: Practical skills in biomolecular sciences, 4th edition, Pearson, 2013.

You can check the availability of the course books via [this link](#)

Assessment methods and criteria:

Continuous assessment (home works, lab reports), final exam

Grading:

1-5/fail

Person responsible:

Kaija Autio

Working life cooperation:

No

Other information:

Location of instruction: lectures (in Finnish) at Linnanmaa campus, laboratory practicals at Kontinkangas campus

750173P: Biogeography, 5 op

Voimassaolo: 01.08.2019 -

Opiskelumuoto: Basic Studies

Laji: Course

Vastuuyksikkö: Field of Biology

Arvostelu: 1 - 5, pass, fail

Opettajat: Kvist, Laura Irmeli

Opintokohteen kielet: Finnish

Leikkaavuudet:

750373A Biogeography 5.0 op

ECTS Credits:

5 ECTS credits / 133 hours of work.

Language of instruction:

Finnish.

Timing:

B.Sc. 1st autumn.

Learning outcomes:

The course introduces students to basic concepts of biogeography, patterns of distribution and historical and present factors affecting the distribution. The student will have an understanding also of how human impact changes distributions and how the Finnish biota has been formed.

Contents:

The course introduces basic models and theories of distribution of organisms in the environment, offering historical, evolutionary, geographical, climatic and ecological explanations. It also introduces research methods used in biogeography and offers understanding on human impact on distributions and a special part of distributions of biota in Finland.

Mode of delivery:

Face-to-face teaching.

Learning activities and teaching methods:

34 h lectures, independent work (3 cr, a learning diary), exam.

Target group:

BSc: Compulsory for biology students.

Prerequisites and co-requisites:

No.

Recommended optional programme components:

Other recommended courses related to the field: Basics of Ecology (750124P), Evolution and systematics of organisms (750372A) and Evolution, systematics and morphology of organisms, practicals (750374A)

Recommended or required reading:

Cox, C.B. & Moore, P.D. 2005: Biogeography. An ecological and evolutionary approach (7 ed.), Blackwell Publishing Ltd, tai Cox, C.B. & Moore, P.D. 2010: Biogeography. An ecological and evolutionary approach (8 ed.), John Wiley & Sons Inc. Euroola, S. 1999: Kasvipeitteemme alueellisuus. Oulanka Reports. Oulu. 116 s.

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

Assessment methods and criteria:

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

Grading:

1-5 / Fail. Final grade is average value of the two exams.

Person responsible:

Doc. Laura Kvist.

Working life cooperation:

No.

Other information:

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740148P: Biomolecules, 5 op

Opiskelumuoto: Basic Studies

Laji: Course

Vastuuyksikkö: Faculty of Biochemistry and Molecular Medicine

Arvostelu: 1 - 5, pass, fail

Opettajat: Tuomo Glumoff

Opintokohteen kielet: English

Leikkaavuudet:

ay740157P	Basic biochemistry 1: Biomolecules (OPEN UNI)	4.0 op
ay740152P	Basic biochemistry 1: Biomolecules (OPEN UNI)	5.0 op
740143P	Biomolecules for Biochemists	8.0 op
740147P	Biomolecules for Bioscientists	8.0 op

ECTS Credits:

5 credits

Language of instruction:

English and Finnish

Timing:

autumn

Learning outcomes:

Upon successful completion students are able to:

- tell the composition, structure and function of the major groups of biomolecules in cells; nucleic acids, proteins, carbohydrates and lipids and describe the forces that modulate their function.
- apply information in the right context and evaluate it critically

Contents:

This module provides an overview of biochemistry, outlining the forces involved in biomolecule structure and the chemical structures and properties of polynucleic acids, proteins, carbohydrates and lipids. There will also be an introduction to prebiotic evolution and a student debate on this subject. The module is arranged into lectures or workshops. All of the exercises course materials are in English, but both English and Finnish are used in teaching. Both a final examination and continuous assessment will count towards the final mark and attendance of some parts is compulsory.

Mode of delivery:

Face to face teaching

Learning activities and teaching methods:

30 h lectures, plus exercises

Target group:

Minor subject students, exchange students

Prerequisites and co-requisites:

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Recommended optional programme components:

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Recommended or required reading:

Appling et al. Biochemistry – Concepts and Connections (2nd edition, 2019)
Pearson Education Limited; ISBN 10: 1-292-26720-8, or equivalent

Assessment methods and criteria:

Continuous assessment, final examination

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

Grading:

1-5/fail

Person responsible:

Tuomo Glumoff

Working life cooperation:

No

Other information:

This module is the same as Biomolecules for Biochemists except that it contains no practical component. Location of instruction: Linnanmaa campus

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

Opiskelumuoto: Intermediate Studies

Laji: Course

Vastuuyksikkö: Field of Biology

Arvostelu: 1 - 5, pass, fail

Opettajat: Anna Ruotsalainen

Opintokohteen kielet: Finnish

ECTS Credits:

2-6 ECTS credits / 53-160 hours of work, 100 species = 2 cr.

Language of instruction:

Finnish / English.

Timing:

B.Sc. or M.Sc. degree.

Learning outcomes:

Preparation (including labels and coordinates) and identification of self-collected botanical specimen.

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. Digital herbarium (2 cr.) can be done alone or combined with the physical herbarium (=max 6 cr.). Before starting the collection work student has to consult the teacher.

Target group:

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Prerequisites and co-requisites:

Identification of plant species, extensive (756354A) 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 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.

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

Grading:

Pass / Fail.

Person responsible:

Doc. Anna Liisa Ruotsalainen.

Working life cooperation:

No.

Other information:

Info will be arranged at the end of spring semester same time as the Plant ecology field course. Contact the responsible teacher on details latest on the beginning of the summer.

750121P: Cell biology, 5 op

Voimassaolo: - 31.07.2020

Opiskelumuoto: Basic Studies

Laji: Course

Vastuuyksikkö: Field of Biology

Arvostelu: 1 - 5, pass, fail

Opettajat: Jaana Jurvansuu, Häggman, Hely Margaretha

Opintokohteen oppimateriaali:

Heino, Jyrki (2) , , 2004

Alberts, B. ym., , 2008

Lodish et al., , 2003

Opintokohteen kielet: Finnish

ECTS Credits:

5 ECTS credits / 133 hours of work.

Language of instruction:

Finnish.

Timing:

B.Sc. 1st autumn.

Learning outcomes:

The student is familiar with cellular structure and functions of 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, and understands the material basis and mechanisms of this continuity.

Contents:

The course is divided into three sections: genetics, animal cell biology, and plant cell biology. The course covers the structural and functional characteristics of plant and animal cells as well as the genetic basis of life (nucleic acids and inheritance, mitosis, meiosis, and gene expression).

Mode of delivery:

Face-to-face teaching.

Learning activities and teaching methods:

38 h lectures, 97 h independent work, and home assignments.

Target group:

Compulsory to the biology and biochemistry students.

Prerequisites and co-requisites:

Good knowledge of upper elementary school biology and chemistry.

Recommended optional programme components:

Cell biology is prerequisite for the following courses: Developmental biology-histology (755320A), Animal physiology (755323A), Plant biology lectures (756346A), Concepts of genetics (757109P). Course also gives readiness for studies in molecular biology and biochemistry.

Recommended or required reading:

Suitable parts of Reece ym. 2014: Campbell et al. 2018. Biology: A Global Approach (10e), Pearson, 1350 s. 978-1-292-00865-3, Alberts, B. ym. 2015: Molecular Biology of the Cell (6e), Garland Science Publishing, London, 1464 s. ISBN: 9780815345244, Heino J. & Vuento M. 2014: Biokemian ja solubiologian perusteet (3. painos) WSOY Pro Oy, Helsinki, Jones R. ym. 2013: The molecular life of plants. Wiley-Blackwell, 742 s. ISBN : 978-0-470-87012-9.

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

[\[HK1\]](#)linkkiä en osannut uudistaa

Assessment methods and criteria:

Three exams. Each lecture section has a separate exam, which all have to be passed to do the course (no credits to Oodi are given before all three exams are passed). No final exam. The exams have to be done within one academic year.

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

Grading:

1-5 / Fail. Final grade is average value of the three exams.

Person responsible:

Dr. Jaana Jurvansuu and Prof. Hely Häggman.

Working life cooperation:

No.

Other information:

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ay766383A: Climate.Now (OPEN UNI), 2 - 5 op

Voimassaolo: 01.01.2019 -

Opiskelumuoto: Intermediate Studies

Laji: Course

Vastuuyksikkö: University of Oulu, Open University

Arvostelu: 1 - 5, pass, fail

Opetus suunnattu: University of Oulu, Open University

Opintokohteen kielet: Finnish, English

Leikkaavuudet:

ay766386A Climate.Now (OPEN UNI) 2.0 op

766383A Climate.Now 2.0 op

ECTS Credits:

2-5 ECTS credits

Language of instruction:

Study material and tuition are available both in Finnish and English.

Timing:

2nd period

Learning outcomes:

Upon completion of the course, student can

- look at climate change from many different perspectives and create connections between them as well as look for solutions to the climate challenge in a variety of ways

- reflect her or his own role in climate change and apply what has been learned on the course to her or his field of study

- examine different perspectives, solutions, information sources, and the current debate on climate change critically

Contents:

Scientific basis of climate change, mitigation of climate change, effects of climate change and adaptation.

Mode of delivery:

Web-based and face-to-face teaching

Learning activities and teaching methods:

Two credits: Guided teaching events 10 h, online material and independent study 36 h, learning diary 8 h.

Five credits: Guided teaching events 10 h, online material and independent study 36 h, learning diary 12 h, two projects with reports in small groups 77 h.

Target group:

All students.

Prerequisites and co-requisites:

No prerequisiteEi muita samanaikaisia opintoja required

Recommended optional programme components:

No simultaneous studies

Recommended or required reading:

Online learning material at www.climatenow.fi, course moodle pages

Assessment methods and criteria:

Two cr course grading is based on the learning diary.

Five cr course grading is based on the learning diary (50%), project assignment 1 (25%) and project assignment 2 (25%).

Grading:

The course utilizes a numerical grading scal 0-5. In the numerical scale zero stands for a fail.

Person responsible:

Jussi Malila

Working life cooperation:

Problems for group works for the 5 cr course may come from private sector.

757109P: Concepts of genetics, 5 op

Voimassaolo: 01.08.2015 -

Opiskelumuoto: Basic Studies

Laji: Course

Vastuuyksikkö: Field of Biology

Arvostelu: 1 - 5, pass, fail

Opettajat: Heikki Helanterä

Opintokohteen kielet: Finnish

Leikkaavuudet:

757122P Concepts of genetics for biochemists 3.0 op

753124P General genetics 4.0 op

ECTS Credits:

5 ECTS credits / 133 hours of work.

Language of instruction:

Finnish.

Timing:

B.Sc. 1st spring.

Learning outcomes:

To understand and apply basic concepts of genetics, at 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, and genetics of health and diseases.

Mode of delivery:

Face-to-face teaching.

Learning activities and teaching methods:

50 h lectures and seminars, 83 h independent studies, exam.

Target group:

Compulsory to the biology students (5 cr) Biochemistry students: parts 1 and 3 (3 cr) compulsory.

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:

Materials are in Optima. Klug et al. 2012. Concepts of Genetics (11. ed). Pearson, 896 p. Alberts, B. et al. 2008: Molecular Biology of the Cell (5. ed). Garland Science Publishing, London, 1268 p.

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

Assessment methods and criteria:

Homeworks, home exams, lecture diary, exams.

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

Grading:

1-5 / Fail.

Person responsible:

Ass. Prof. Heikki Helanterä.

Working life cooperation:

No.

Other information:

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756347A: Conservation of biodiversity, 5 op

Voimassaolo: 01.08.2015 -

Opiskelumuoto: Intermediate Studies

Laji: Course

Vastuuyksikkö: Field of Biology

Arvostelu: 1 - 5, pass, fail

Opintokohteen kielet: Finnish

Leikkaavuudet:

ay756347A Conservation of biodiversity (OPEN UNI) 5.0 op

752321A Conservation of Biodiversity 3.0 op

ECTS Credits:

5 ECTS credits / 133 hours of work.

Language of instruction:

English.

Timing:

M.Sc. ECOGEN.

Learning outcomes:

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

Contents:

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

Mode of delivery:

Face-to-face teaching.

Learning activities and teaching methods:

28 h lectures, literature, exam.

Target group:

ECOGEN students (code S). Other studies (code A).

Prerequisites and co-requisites:

No

Recommended optional programme components:

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Recommended or required reading:

Hanski I. 2005: The Shrinking World. International Ecology Institute, Oldendorf/Luhe, Germany.
The availability of the literature can be checked from [this link](#).

Assessment methods and criteria:

Exam.

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

Grading:

1-5 / Fail.

Person responsible:

Dr. Phillip Watts.

Working life cooperation:

No.

Other information:

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755320A: Developmental biology-histology, 5 op

Voimassaolo: 01.08.2015 -

Opiskelumuoto: Intermediate Studies

Laji: Course

Vastuuyksikkö: Field of Biology

Arvostelu: 1 - 5, pass, fail

Opettajat: Sanni Kinnunen

Opintokohteen kielet: Finnish

Leikkaavuudet:

751367A Developmental biology-histology, lectures 4.0 op

ECTS Credits:

5 ECTS credits / 133 hours of work.

Language of instruction:

Finnish.

Timing:

B.Sc. 1st 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:

“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 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.

Mode of delivery:

Distance learning, in Moodle.

Learning activities and teaching methods:

Lecture videos, exercises, virtual microscopic preparates, independent working on virtual microscope, identification of different tissue types on histologic preparates.

Target group:

Compulsory to BS students. Optional to ECO and TEA.

Prerequisites and co-requisites:

Cell biology (750121P) or equivalent knowledge.

Recommended optional programme components:

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Recommended or required reading:

video lecture, material in Moodle, Recommended reading: Scott Gilbert, Developmental Biology 10th ed, Sinauer Associates.Inc.U.S. (or older), 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:

1 exam in developmental biology, 4-5 exams in histology.

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

Grading:

1-5 / Fail.

Person responsible:

Dr. Sanni Kinnunen

Working life cooperation:

No.

Other information:

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

Voimassaolo: 01.08.2010 -

Opiskelumuoto: Intermediate Studies

Laji: Course

Vastuuyksikkö: Field of Biology

Arvostelu: 1 - 5, pass, fail

Opettajat: Seppo Rytkönen

Opintokohteen kielet: Finnish

ECTS Credits:

1-5 ECTS credits / 27-133 hours of work.

Language of instruction:

Finnish / English.

Timing:

B.Sc. 1 st summer.

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.

Learning activities and teaching methods:

Blended teaching.

Target group:

ECO optional.

Prerequisites and co-requisites:

Identification of animals, vertebrates 4 cr (755333A) Identification of animals, invertebrates 4 cr (755335A) or equivalent knowledge.

Recommended optional programme components:

Optional addition to course Field course in terrestrial animals (755322A).

Recommended or required reading:

Additional information and material: wiki oulu.fi à Animal ecology à Teaching à Field identification of birds.

Assessment methods and criteria:

Notebook of field observations.

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

Grading:

Accepted / Failed.

Person responsible:

Doc. Seppo Rytönen.

Working life cooperation:

No.

Other information:

-

790101P: GIS-basics and Cartography, 5 op

Opiskelumuoto: Basic Studies

Laji: Course

Vastuuyksikkö: Field of Geography

Arvostelu: 1 - 5, pass, fail

Opettajat: Harri Antikainen

Opintokohteen kielet: Finnish

Leikkaavuudet:

ay790101P GIS-basics and Cartography (OPEN UNI) 5.0 op

Voidaan suorittaa useasti: Kyllä

ECTS Credits:

5 ECTS

Language of instruction:

Finnish, partly in English. English speaking students are asked to contact prof. Rusanen before the course.

Timing:

1 year, 2nd semester

Learning outcomes:

Course gives basic information about Geographical Information System and about the theory of cartography. After the course the student can use ArcGIS program and he/she is able to produce cartographic presentations.

Contents:

Basics of GIS, theories of cartography and statistical graphics and use of ArcGIS program.

Mode of delivery:

Face-to-face learning.

Learning activities and teaching methods:

16 h lectures, 56 h practicals.

Target group:

Common course to all 1st year students of Geography.

Prerequisites and co-requisites:

-

Recommended optional programme components:

Course is part of the minor studies of GIS.

Recommended or required reading:

Paul A Longley, Michael G Goodchild, David J. Maguire & David W. Rhind (2005). Geographic Information Systems and Science. 2nd edition. 516 p

Assessment methods and criteria:

Exam on exam day.

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

Grading:

1–5.

Person responsible:

Harri Antikainen

Working life cooperation:

No

Other information:

English speaking students are asked to contact Harri Antikainen before the course.

ay790340A: Geographies of global development (OPEN UNI), 5 op

Voimassaolo: 01.08.2019 -

Opiskelumuoto: Intermediate Studies

Laji: Course

Vastuuyksikkö: University of Oulu, Open University

Arvostelu: 1 - 5, pass, fail

Opetus suunnattu: University of Oulu, Open University

Opintokohteen kielet: Finnish

Leikkaavuudet:

790340A Geographies of global development 5.0 op

ECTS Credits:

5 ECTS

Language of instruction:

Finnish or English.

Timing:

2nd or 3rd year, 1st or 2nd semesters (autumn or spring semesters).

Learning outcomes:

This course gives knowledge of global development problems from geographical point of view. After the course the student can explain what development indicates and what kind of social and economic phenomena will explain both development and under development. He/she is also able to compare different actions that are aimed to diminish the uneven development based on different theories and strategies.

Contents:

The course familiarizes students to the theories that aim to explain differences in uneven development. Under development, and its social, cultural and economic aspects will be studied from national, regional and local level. This course also requires to political programs and strategies that are aimed to stabilize equalizes uneven development.

Mode of delivery:

Book exam.

Learning activities and teaching methods:

Book exam.

Target group:

Compulsory for teachers, others obligatory.

Prerequisites and co-requisites:

-

Recommended optional programme components:

-

Recommended or required reading:

- Potter, R.B.T, T. Binns, J.A.Elliot & D.Smith (2004). Geographies of development.

Assessment methods and criteria:

Exam on exam day.

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

Grading:

1–5.

Person responsible:

Juha Ridanpää
Working life cooperation:
 No.

765308A: History of astronomy, 5 op

Voimassaolo: 01.08.2017 -

Opiskelumuoto: Intermediate Studies

Laji: Course

Vastuuyksikkö: Field of Physics

Arvostelu: 1 - 5, pass, fail

Opintokohteen kielet: Finnish

Leikkaavuudet:

ay765308A History of astronomy (OPEN UNI) 5.0 op
 765107P Astronomical world view 5.0 op
 765107P-02 Astronomical world view (part 2): History of astronomy 0.0 op
 765106P History of astronomy 3.0 op

ECTS Credits:

5 ECTS credits / 133 hours of work

Language of instruction:

Finnish

Timing:

1st - 3rd year

Learning outcomes:

Student has a general concept of the history of astronomy and the development of physical world view.

Contents:

Astronomy is the oldest exact science. On the other hand, it uses space telescopes and computer simulations. The stellar sky has been observed already in prehistory. Explaining planetary motions and other celestial phenomena has been in central role in the development of physical theories, and the revelation of the cosmic scale has deeply shaped our world view. The history of astronomy has an important role in the discussions on the history and philosophy of science. Art and popular culture have also been inspired by astronomical phenomena.

Target group:

All students

Prerequisites and co-requisites:

None

Grading:

Numerical grading scale 0-5, where 0=fail

Person responsible:

Heikki Salo

Working life cooperation:

No work placement period

ay765308A: History of astronomy (OPEN UNI), 5 op

Voimassaolo: 01.08.2017 -

Opiskelumuoto: Intermediate Studies

Laji: Course

Vastuuyksikkö: University of Oulu, Open University

Arvostelu: 1 - 5, pass, fail

Opetus suunnattu: University of Oulu, Open University

Opintokohteen kielet: Finnish

Leikkaavuudet:

765308A History of astronomy 5.0 op

Ei opintojaksokuvauksia.

801623S: Introduction to Coding Theory, 5 op

Voimassaolo: 01.01.2018 -

Opiskelumuoto: Advanced Studies

Laji: Course

Vastuuyksikkö: Field of Mathematics

Arvostelu: 1 - 5, pass, fail

Opintokohteen kielet: Finnish

ECTS Credits:

5 ECTS

Language of instruction:

Finnish

Learning outcomes:

After completing the course, the student

- understands the basic principles and concepts of error correcting codes
- can code and decode using the codes introduced on the course
- knows how to derive and prove the main results introduced on the course

Contents:

The course is about the theory of error correcting codes needed in the transfer of information. The goal of the course is to give students the basic knowledge of the structure and use of these codes. The focus is on binary block codes and the most important subjects are linear codes, RM-codes and cyclic codes. Finally we consider convolutional codes.

Mode of delivery:

Face-to-face teaching

Learning activities and teaching methods:

Lectures + exercises 30 h, independent studying 105 h

Target group:

Major and minor students

Prerequisites and co-requisites:

802354A Basics in Algebra, 802355A Algebraic structures, 802120P Introduction to Matrices

Recommended or required reading:

Material will be available in Noppa

Assessment methods and criteria:

Final exam

Grading:

1-5, fail

Person responsible:

Topi Törmä

802336A: Introduction to Cryptography, 5 op

Voimassaolo: 01.06.2016 -

Opiskelumuoto: Intermediate Studies

Laji: Course

Vastuuyksikkö: Field of Mathematics

Arvostelu: 1 - 5, pass, fail

Opintokohteen kielet: Finnish

Leikkaavuudet:

ay802336A Introduction to Cryptography (OPEN UNI) 5.0 op

801346A Introduction to Cryptography 4.0 op

ECTS Credits:

5 ECTS credits

Language of instruction:

Finnish

Timing:

2nd year or later, every period

Learning outcomes:

After completing the course, student

- knows the principles of some traditional symmetric key methods
- knows how public key methods (RSA, discrete logarithm, knapsack) work
- is familiar with the possibility to use and apply number theory in cryptography

Contents:

The course considers some traditional symmetric key methods (affine system, matrix cryptography) and three public key methods, namely RSA, discrete logarithm and knapsack.

Mode of delivery:

Independent work

Learning activities and teaching methods:

Net course; Lecture slides, exercises, solutions of exercises (in Noppa) + stack-exercises

Target group:

Major and minor students

Prerequisites and co-requisites:

802354A Basics of Algebra, 802120P Introduction to Matrices

Recommended optional programme components:

-

Recommended or required reading:

Lecture slides, exercises, solutions of exercises, stack-exercises

Assessment methods and criteria:

Final exam or Final exam + stack-exercises

Grading:

1-5, fail

Person responsible:

Marko Leinonen

Working life cooperation:

No

802120P: Introduction to Matrices, 5 op

Voimassaolo: 01.06.2015 -

Opiskelumuoto: Basic Studies

Laji: Course

Vastuuyksikkö: Field of Mathematics

Arvostelu: 1 - 5, pass, fail

Opintokohteen kielet: Finnish

Leikkaavuudet:

802118P Linear Algebra I 4.0 op

ECTS Credits:

5 ECTS credits

Language of instruction:

Finnish

Timing:

1. year, 4. period

Learning outcomes:

After completing the course the student is able to

- apply arithmetic operations of matrices
- solve system of linear equations by matrix methods
- study linear dependence and linear independence of vectors
- recognize the subspace of \mathbb{R}^n and understands the concepts of basis and dimension of a vector space
- analyse matrices by the parameters and the vectors

Contents:

Vectors and matrices, Systems of linear equations, determinant of a matrix, subspaces of \mathbb{R}^n , linear dependence and linear independence of vectors, base, dimension, eigenvalues and eigenvectors of a matrix, diagonalization.

Mode of delivery:

Face-to-face teaching

Learning activities and teaching methods:

Lectures 28 h, Exercises 14 h

Target group:

Major and minor studies

Prerequisites and co-requisites:

802151P Introduction to Mathematical Deduction

Recommended or required reading:

Lecture notes

Grossman, S.I. : Elementary Linear Algebra, David C. Lay: Linear Algebra and Its Applications.

Assessment methods and criteria:

Final exam

Grading:

Fail, 1-5

Person responsible:

Marko Leinonen

Working life cooperation:

-

790141P: Introduction to Regional Development and Regional Policy, 5 op

Opiskelumuoto: Basic Studies

Laji: Course

Vastuuyksikkö: Field of Geography

Arvostelu: 1 - 5, pass, fail

Opettajat: Eeva-Kaisa Prokkola

Opintokohteen kielet: Finnish

Leikkaavuudet:

ay790141P Introduction to planning geography (OPEN UNI) 5.0 op

ECTS Credits:

5 ECTS

Language of instruction:

Lectures in Finnish. Exchange students can take this course by taking the exam (extra literature for exchange students).

Timing:

1st year, autumn semester (1st period).

Learning outcomes:

The student is able to apply the most essential concepts of regional development and regional policy. He/she can tell the historical progress of regional development, regional policy and regional planning of Finland and its relationship to contemporary development of European Union.

Contents:

Regional development and regional policy from conceptual and empirical aspects; Theories and mechanisms of RD and RP; Local, national and international development based on regional planning.

Mode of delivery:

Face-to-face learning.

Learning activities and teaching methods:

20 hrs lectures, literature and written exam.

Target group:

Common course to all 1st year students of Geography.

Prerequisites and co-requisites:

-

Recommended optional programme components:

Course is part of minor studies in Geography and minor studies of Regional Development and regional planning.

Recommended or required reading:

Andy Pike, Andrés Rodríguez-Pose ja John Tomaney (2016). Local and Regional Development. (toinen painos) Routledge. Saatavilla e-kirjana.

Assessment methods and criteria:

Exam on exam day.

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

Grading:

1-5.

Person responsible:

Eeva-Kaisa Prokkola

Working life cooperation:

No.

Other information:

Exchange students can take this course by taking the exam (extra literature for exchange students).

Literature for exchange students:

- Andy Pike, Andrés Rodríguez-Pose ja John Tomaney (2016). Local and Regional Development. Routledge.
- Anssi Paasi, Kaj Zimmerbauer (2016). Penumbra borders and planning paradoxes: Relational thinking and the question of borders in spatial planning. Environment and Planning A 2016, Vol. 48(1) 75–93
- Martin, Lauren. & Eeva-Kaisa, Prokkola (2017). Making labor mobile: Borders, precarity, and the competitive state in Finnish migration politics. Political Geography 60C, 143-153.

Further information ask teacher.

806113P: Introduction to Statistics, 5 op

Voimassaolo: 01.01.2011 -

Opiskelumuoto: Basic Studies

Laji: Course

Vastuuyksikkö: Field of Mathematics

Arvostelu: 1 - 5, pass, fail

Opettajat: Hanna Heikkinen

Opintokohteen oppimateriaali:

Wild, Christopher J. , , 2000

Grönroos, Matti (2) , , 2003

Opintokohteen kielet: Finnish

Leikkaavuudet:

- | | | |
|---------|----------------------------------|--------|
| 806118P | Introduction to Statistics | 5.0 op |
| 806119P | A Second Course in Statistics | 5.0 op |
| 806116P | Statistics for Economic Sciences | 5.0 op |

ECTS Credits:

5 ECTS cr

Language of instruction:

Finnish

Timing:

4th period. 1st or 2nd year of studies.

Learning outcomes:

Upon completion of the course, student will be

- able to identify and define the main principles of statistical research, collection of the data and analysis
- able to apply basic methods of descriptive statistics and statistical inference in simple quantitative research using a statistical software
- able to critically evaluate results of the statistical research presented in media
- prepared for teaching statistics in secondary school and high school
- prepared for participating in a group.

Contents:

- the nature and the meaning of statistics
- data and the acquisition of them: observations, variables, measuring and designs of a study
- the descriptive statistics of empirical distributions: tables, graphical presentations and descriptive measures of center, variation and dependence
- the most important probability distributions
- the principles and the basic methods of statistical inference: random sample, sample statistics, point estimation, confidence intervals and statistical testing of hypotheses.

Mode of delivery:

Face-to-face teaching

Learning activities and teaching methods:

Lectures 16 h (partly compulsory) / instructed group work (28 h) / independent work 80 h. Group works will be returned. Additional independently implemented learning diary tasks. Independent work contains also preparation for group work and peer assessment.

Target group:

Students of mathematical and physical sciences.

Prerequisites and co-requisites:

The recommended prerequisite prior to enrolling for the course is the completion of the courses: 802151P Introduction to mathematical deduction and 800119P Functions and limit.

Recommended optional programme components:

After the course, student is able to continue other statistics courses.

Recommended or required reading:

Lecture notes.

Assessment methods and criteria:

This course utilizes continuous assessment. Practical works and learning diaries are assessed weekly. In addition web tests and learning tasks. The assessment of the course is based on the learning outcomes of the course. The more detailed assessment criteria is available in the beginning of the course. In addition one compulsory lecture and peer assessment.

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

Grading:

The course utilizes a numerical grading scale 1-5. In the numerical scale zero stands for a fail.

Person responsible:

Hanna Heikkinen

Working life cooperation:

No

ay806113P: Introduction to Statistics (OPEN UNI), 5 op

Voimassaolo: 01.08.2019 -

Opiskelumuoto: Basic Studies

Laji: Course

Vastuuyksikkö: Field of Mathematics

Arvostelu: 1 - 5, pass, fail

Opintokohteen kielet: Finnish

ECTS Credits:

5 ECTS cr

Language of instruction:

Finnish

Timing:

4th period. 1st or 2nd year of studies.

Learning outcomes:

Upon completion of the course, student will be

- able to identify and define the main principles of statistical research, collection of the data and analysis
- able to apply basic methods of descriptive statistics and statistical inference in simple quantitative research using a statistical software
- able to critically evaluate results of the statistical research presented in media
- prepared for teaching statistics in secondary school and high school
- prepared for participating in a group.

Contents:

- the nature and the meaning of statistics
- data and the acquisition of them: observations, variables, measuring and designs of a study
- the descriptive statistics of empirical distributions: tables, graphical presentations and descriptive measures of center, variation and dependence
- the most important probability distributions
- the principles and the basic methods of statistical inference: random sample, sample statistics, point estimation, confidence intervals and statistical testing of hypotheses.

Mode of delivery:

Face-to-face teaching

Learning activities and teaching methods:

Lectures 16 h (partly compulsory) / instructed group work (28 h) / independent work 80 h. Group works will be returned. Additional independently implemented learning diary tasks. Independent work contains also preparation for group work and peer assessment.

Target group:

Students of mathematical and physical sciences.

Prerequisites and co-requisites:

The recommended prerequisite prior to enrolling for the course is the completion of the courses: 802151P Introduction to mathematical deduction and 800119P Functions and limit.

Recommended optional programme components:

After the course, student is able to continue other statistics courses.

Recommended or required reading:

Lecture notes.

Assessment methods and criteria:

This course utilizes continuous assessment. Practical works and learning diaries are assessed weekly. In addition web tests and learning tasks. The assessment of the course is based on the learning outcomes of the course. The more detailed assessment criteria is available in the beginning of the course. In addition one compulsory lecture and peer assessment.

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

Grading:

The course utilizes a numerical grading scale 1-5. In the numerical scale zero stands for a fail.

Person responsible:

Hanna Heikkinen

Working life cooperation:

No

ay806118P: Introduction to Statistics (OPEN UNI), 5 op

Voimassaolo: 01.08.2019 -

Opiskelumuoto: Basic Studies

Laji: Course

Vastuuyksikkö: University of Oulu, Open University

Arvostelu: 1 - 5, pass, fail

Opetus suunnattu: University of Oulu, Open University

Opintokohteen kielet: Finnish

Leikkaavuudet:

806118P Introduction to Statistics 5.0 op

ECTS Credits:

5 ECTS credits

Language of instruction:

Finnish

Timing:

3rd period

Learning outcomes:

After completing the course, student will be able to

- consider issues influencing to data collection
- describe data by appropriate methods (tables, statistics and graphical presentations)
- evaluate the effect size of the sample to the margin of error for instance in Gallup polls and in different market researches
- interpret output of a statistical software.

Contents:

- collecting data, e.g. sampling
- variables and measuring
- descriptive statistical methods and their selection
- margin of error of estimator for population mean and proportion
- statistical literacy
- basic analysis of data using statistical software

Mode of delivery:

Face-to-face teaching

Learning activities and teaching methods:

Total 50 h face-to-face teaching including lectures and exercise (partly computer exercises). Independent work 83 h.

Target group:

Minor students

Recommended optional programme components:

After the course, student is able to continue to A Second Course in Statistics.

Recommended or required reading:

Lecture notes

Assessment methods and criteria:

Mid-term exams and/or final exam and possible homework.

Grading:

Fail, 1-5

Person responsible:

Hanna Heikkinen and Jari Pääkkilä

Working life cooperation:

No

Other information:

-

790160P: Introduction to Tourism Geography, 5 op

Opiskelumuoto: Basic Studies

Laji: Course

Vastuuyksikkö: Field of Geography

Arvostelu: 1 - 5, pass, fail

Opettajat: Saarinen, Jarkko Juhani

Opintokohteen kielet: Finnish

Leikkaavuudet:

790160A Introduction to tourism geography 5.0 op

ECTS Credits:

5 ECTS

Language of instruction:

Finnish

Timing:

1st year, 1st semester.

Learning outcomes:

Student will learn about the tourism phenomenon and its regional and development characteristics and impacts. After the course the student can define and interpret different aspects of the tourism geography and its subject matters.

Contents:

Basic concepts of the tourism phenomena, spatial characteristics of tourism and its development aspects.

Mode of delivery:

Face-to-face learning.

Learning activities and teaching methods:

16 h lectures, exam.

Target group:

Common course to all 1st year students of Geography.

Prerequisites and co-requisites:

-

Recommended optional programme components:

Course is part of the minor studies of Tourism studies.

Recommended or required reading:

- Hall, C.M., Muller, D.K. and J. Saarinen (2009). Nordic Tourism: Issues and Cases.
- Hall, C.M. and S. Page (1999 or later edition). The Geography of Tourism and Recreation - Environment, Place and Space (partly)

Assessment methods and criteria:

Exam on exam day.

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

Grading:

1–5.

Person responsible:

Jarkko Saarinen

Working life cooperation:

No

ay765103P: Introduction to astronomy (OPEN UNI), 3 op**Voimassaolo:** 01.08.2012 -**Opiskelumuoto:** Basic Studies**Laji:** Course**Vastuuyksikkö:** University of Oulu, Open University**Arvostelu:** 1 - 5, pass, fail**Opetus suunnattu:** University of Oulu, Open University**Opintokohteen kielet:** Finnish**Leikkaavuudet:**

765103P Introduction to astronomy 2.0 op

ECTS Credits:

3 credits

Language of instruction:

Finnish

Learning outcomes:

Student can describe by full sentences the role of astronomy in the formation of physical world view, can name the most central astronomical research subjects and can describe the proportions of the Universe.

Contents:

Basic level introduction to astronomical topics: history of astronomy, astronomical methods, the Solar System, the Sun, stars and their evolution, interstellar matter, star clusters, the Milky Way and galaxies.

Mode of delivery:

Face-to-face teaching

Learning activities and teaching methods:

Lectures 21 h, self-study 59 h

Prerequisites and co-requisites:

No specific prerequisites

Recommended or required reading:

Course lectured in Finnish, possible English study material will be decided later.

Assessment methods and criteria:

One written examination.

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

Numerical grading scale 0 – 5, where 0 = fail

Person responsible:

Petri Kostama

Other information:<https://wiki oulu.fi/display/765103P/>**802151P: Introduction to mathematical deduction, 5 op****Voimassaolo:** 01.08.2009 -**Opiskelumuoto:** Basic Studies**Laji:** Course**Vastuuyksikkö:** Field of Mathematics**Arvostelu:** 1 - 5, pass, fail**Opintokohteen kielet:** Finnish**Leikkaavuudet:**

ay802151P Introduction to mathematical deduction (OPEN UNI) 5.0 op

ECTS Credits:

5 ECTS cr

Language of instruction:

Finnish

Timing:

First period at the first semester.

Learning outcomes:

After completing the course, student is:

- able to use different methods proving techniques
- able to use basic set theoretic concepts and definitions
- able to define and apply basic definitions related to functions

Contents:

The course is an introduction to mathematical deduction and introduces different types of proof techniques. The course covers the concepts familiar from upper secondary school studies more profoundly. Main concepts in this course are basic set theory and functions.

Mode of delivery:

Face-to-face teaching

Learning activities and teaching methods:

Lectures 28 h, exercises 14 h

Target group:

Major and minor students

Prerequisites and co-requisites:

-

Recommended optional programme components:

-

Recommended or required reading:

Lecture notes

Assessment methods and criteria:

Final exam

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

Pass/Fail

Person responsible:

Topi Törmä

Working life cooperation:

-

ay802151P: Introduction to mathematical deduction (OPEN UNI), 5 op

Voimassaolo: 01.08.2012 -

Opiskelumuoto: Basic Studies

Laji: Course

Vastuuyksikkö: University of Oulu, Open University

Arvostelu: 1 - 5, pass, fail

Opetus suunnattu: University of Oulu, Open University

Opintokohteen kielet: Finnish

Leikkaavuudet:

802151P Introduction to mathematical deduction 5.0 op

ECTS Credits:

5 ECTS

Language of instruction:

Finnish

Timing:

First period at the first semester.

Learning outcomes:

After completing the course, student

- is able to use different methods proving techniques
- is able to use basic set theoretic concepts and definitions

- is able to define and apply basic definitions related to functions

Mode of delivery:

Face-to-face teaching

Learning activities and teaching methods:

Lectures 30h, exercises 18h

Target group:

Major and minor students

Recommended or required reading:

Lecture notes

Assessment methods and criteria:

Final exam

Grading:

1-5

Person responsible:

Maarit Järvenpää

Working life cooperation:

No

790104P: Introduction to systematic Human Geography, 5 op

Opiskelumuoto: Basic Studies

Laji: Course

Vastuuyksikkö: Field of Geography

Arvostelu: 1 - 5, pass, fail

Opettajat: Juha Ridanpää

Opintokohteen kielet: Finnish

Leikkaavuudet:

ay790104P Introduction to systematic humangeography (OPEN UNI) 5.0 op

Voidaan suorittaa useasti: Kyllä

ECTS Credits:

5 ECTS

Language of instruction:

Finnish

Timing:

1st year, 2nd semester.

Learning outcomes:

The purpose of the course is to initiate the development of human geography and topical research themes. Upon completion of the course, the student will be able to comprehend different fields of study and systematic approaches in human geography.

Contents:

Cultural phenomena and their geographical examination: including economics, industrialization, politics, religion, urban geography, demography, ethnicity, postcolonialism, languages, globalization, popular culture.

Mode of delivery:

Face-to-face teaching.

Learning activities and teaching methods:

Lectures 20 h. and exercises 56 h. (including small group teaching, self-study and a practical work). The work at exercises focus on concrete human geographical problems with the use of empirical material. The course includes an exam, based on the content of lectures. The grading bases on both lecture exam and the work in exercises (50/50).

Target group:

The course is aimed at all first year students in geography.

Prerequisites and co-requisites:

-

Recommended optional programme components:

Course is part of the minor studies of Geography.

Recommended or required reading:

Will be announced later.

Assessment methods and criteria:

Exam on exam day.

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

Grading:

1-5.

Person responsible:

Juha Ridanpää (lectures) and Tuomo Alhojärvi (practicals).

Working life cooperation:

No.

790152P: Introduction to the discipline of Geography, 5 op

Opiskelumuoto: Basic Studies

Laji: Course

Vastuuyksikkö: Field of Geography

Arvostelu: 1 - 5, pass, fail

Opettajat: Jan Hjort

Opintokohteen kielet: Finnish

Leikkaavuudet:

ay790152P Introduction to the discipline of geography (OPEN UNI) 5.0 op

ECTS Credits:

5 ECTS

Language of instruction:

Only in Finnish.

Timing:

BSc, 1st year, 1st semester

Learning outcomes:

With this course the students can analyse the history of Geography and contents of its different fields, concepts and research aspects.

Contents:

Lectures will give a general overview of Geography as an independent discipline. It will be completed by considering history, concepts and research aspects of Geography.

Mode of delivery:

Face-to-face learning.

Learning activities and teaching methods:

20 hours lectures, literature and written exam.

Target group:

Obligatory for all the 1st year students of Geography.

Prerequisites and co-requisites:

-

Recommended optional programme components:

Course is part of the minor studies of Geography.

Recommended or required reading:

- International Encyclopedia of Human Geography (toim. Rob Kitchin & Nigel Thrift), chapters: Metaconcepts: Landscape, Place, Scale, Space I, Space-Time, Space II, Territory and Territoriality Philosophy and Geography: Regional Geography I Political Geography: Regionalism Social & cultural geography: Citizenship, Cultural Geography, Sense of Place.
- Lecture slides and three articles can be found from the Moodle.

Assessment methods and criteria:

Exam.

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

Grading:

1-5.

Person responsible:

Jan Hjort, Juha Ridanpää

Working life cooperation:

No.

790102P: Introduction to the systematic Physical Geography, 5 op

Opiskelumuoto: Basic Studies

Laji: Course

Vastuuyksikkö: Field of Geography

Arvostelu: 1 - 5, pass, fail

Opettajat: Jan Hjort

Opintokohteen kielet: Finnish

Leikkaavuudet:

ay790102P Introduction to the systematic physical geography (OPEN UNI) 5.0 op

Voidaan suorittaa useasti: Kyllä

ECTS Credits:

5 ECTS cr

Language of instruction:

Finnish and English (Lectures are only in Finnish, but this course can be completed also in English with some extra readings. Practicals are also organized in English.)

Timing:

1 year, 2nd semester

Learning outcomes:

This introductory course will give information about systematic fields of Physical Geography and its contemporary research. After the course, the student recognizes the most essential phenomena of geosphere (geomorphology), hydrosphere (hydrogeography), biosphere (biogeography), atmosphere (climatology), and he/she is able to do conclusions about the factors that influence those phenomena. The aim of the practical's is that the student can use basic methods of the research of Physical Geography.

Contents:

Geomorphology, climatology, hydrogeography, biogeography; and geosphere, atmosphere, hydrosphere and biosphere. The students will learn how nature works and how to resolve multiple environmental questions. Practical's are focused to the importance of the material compilation and its technical use.

Mode of delivery:

Face-to-face learning.

Learning activities and teaching methods:

20 h lectures, 56 h practicals.

Target group:

Common course to all 1st year students of Geography.

Prerequisites and co-requisites:

-

Recommended optional programme components:

Course is part of the minor studies of Geography.

Recommended or required reading:

- Strahler, Alan (2013). Introducing Physical Geography.
- More material from the practicals.

Assessment methods and criteria:

Exam on an exam day.

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

Grading:

1–5.

Person responsible:

Jan Hjort and Olli-Matti Kärnä

Working life cooperation:

No.

Other information:

Exchange students are asked to contact prof. Hjort before the course.

761115P: Laboratory Exercises in Physics 1, 5 op

Voimassaolo: 01.08.2017 -

Opiskelumuoto: Basic Studies

Laji: Course

Vastuuyksikkö: Field of Physics

Arvostelu: 1 - 5, pass, fail

Opettajat: Lauri Hautala

Opintokohteen kielet: Finnish

Leikkaavuudet:

761121P Physical Measurements I 3.0 op
 761121P-01 Physical measurements I, exam 0.0 op
 761121P-02 Physical measurements I, lab. exercises 0.0 op
 800149P Introduction to LateX 2.0 op

ECTS Credits:

5 ECTS credits / 133 hours of work

Language of instruction:

Finnish

Timing:

Spring

Learning outcomes:

The student can safely make physical measurements, use different measurement tools, read different scales, handle the data, calculate the error estimations and make a sensible report of his laboratory measurements.

Contents:

The skill to make laboratory measurements is important for physicists. This is an introductory course how to make physical measurements and how to treat the measured data. Laboratory works are made in groups. The laboratory security is an essential part also in physics. Measurements are made with different instruments. As a result the most probable value is determined as well as its error. The skills obtained during this course can be applied in the other laboratory courses Laboratory exercises in physics 2 and 3.

Mode of delivery:

Face-to-face teaching

Learning activities and teaching methods:

Lectures 10 h, exercises 20 h (5 x 4 h). Five different works will be made during the course in groups. Self-study 103 h.

Target group:

For the students of the University of Oulu.

Prerequisites and co-requisites:

No specific prerequisites.

Recommended optional programme components:

800149P Introduction to LaTeX

Recommended or required reading:

Lecture material is in Finnish. Work instructions are available also in English.

Assessment methods and criteria:

Written reports of the experiments and one written examination.

Grading:

Numerical grading scale 0 – 5, where 0 = fail

Person responsible:

Seppo Alanko

Working life cooperation:

No work placement period

Other information:

Includes parts:

761115P-01 Laboratory Exercises in Physics 1, lecture and exam

761115P-02 Laboratory Exercises in Physics 1, laboratory exercises

761115P-03 Laboratory Exercises in Physics 1, Introduction to LaTeX

ay752316A: Macro fungi (OPEN UNI), 3 op

Voimassaolo: 01.08.2012 -

Opiskelumuoto: Intermediate Studies

Laji: Course

Vastuuyksikkö: University of Oulu, Open University

Arvostelu: 1 - 5, pass, fail

Opetus suunnattu: University of Oulu, Open University

Opintokohteen kielet: Finnish

Leikkaavuudet:

752316A Macro fungi 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:

-

802158P: Mathematics for Economic Sciences, 7 op

Voimassaolo: 01.06.2014 -

Opiskelumuoto: Basic Studies

Laji: Course

Vastuuyksikkö: Field of Mathematics

Arvostelu: 1 - 5, pass, fail

Opettajat: Kari Myllylä

Opintokohteen kielet: Finnish

Leikkaavuudet:

ay802158P Mathematics for Economic Sciences (OPEN UNI) 7.0 op

ECTS Credits:

7 ECTS cr

Language of instruction:

Finnish

Timing:

1. period. It is recommended to complete the course at the 1st autumn semester.

Learning outcomes:

After completing the course, student is able to

- define and apply basic mathematical concept such as rationals, absolute value, power and root function
- handle different types of functions and knows their special properties
- solve different equations and inequalities
- define the concepts of limit and continuity of a function
- calculate limits in case of different functions
- calculate and apply derivative, and knows the relevance of the concept
- use all mathematical concepts covered by the course in different problems related to economics (interest, investments, optimization and indeces)

Contents:

Course aims to build a solid background to mathematics in later economics courses. Course begins with a revision of concepts familiar from high school such as sequences, rationals, absolute value and powers. After that we focus on different types of functions such as polynomials, rational functions, exponential functions and logarithm. Different types of equations and inequalities, containing the functions mentioned above, are solved. Main concepts in the course are also limit of a function, continuity and derivative and their applications. Nämä käsitteet tullaan esittelemään kaikille kurssilla käsiteltäville funktiotyypeille.

After the more mathematical part, the focus is turned on economical applications (such as interests, optimization, investments, indeces).

Mode of delivery:

Face-to-face teaching

Learning activities and teaching methods:

Lectures 40 h, exercises 20 h.

Target group:

Students in Oulu Business School

Prerequisites and co-requisites:

None

Recommended optional programme components:

After the course, student is able to continue other mathematics courses directed to the students in Oulu Business School.

Recommended or required reading:

Lecture notes

Assessment methods and criteria:

Mid-term exams and/or final exam

Grading:

The course utilizes a numerical grading scale 1-5. In the numerical scale zero stands for a fail.

Person responsible:

Kari Myllylä / Erkki Laitinen

Working life cooperation:

-

763101P: Mathematics for physics, 6 op

Opiskelumuoto: Basic Studies

Laji: Course

Vastuuyksikkö: Field of Physics

Arvostelu: 1 - 5, pass, fail

Opettajat: Seppo Alanko

Opintokohteen kielet: Finnish

Leikkaavuudet:

766101P Mathematics for physics 5.0 op

ECTS Credits:

6 credits

Language of instruction:

Finnish

Timing:

First autumn

Learning outcomes:

The course quickly provides the student the basic mathematical knowledge and skills required in physical sciences. The objective is to learn the basics of differential and integral calculus, methods for solving the most typical first and second order differential equations and the basics of vector differential calculus. After the course the student understands the basic mathematical methods needed in physics and is able to apply them to problems arising in the different physics courses. Another objective is also to understand the geometrical meaning of different mathematical concepts and their connection to physical phenomena.

Contents:

Integral and differential calculus, complex variables and functions, introduction to differential equation

Mode of delivery:

Face-to-face teaching

Learning activities and teaching methods:

Lectures 30 h, exercises 24 h, self-study 106 h

Target group:

Primarily for the students of the degree programme in physics. Also for the other students of the University of Oulu.

Prerequisites and co-requisites:

No specific prerequisites

Recommended optional programme components:

No alternative course units or course units that should be completed simultaneously

Recommended or required reading:

Lecture notes.

Assessment methods and criteria:

Four written intermediate examinations or final examination

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

Grading:

Numerical grading scale 0 – 5, where 0 = fail

Person responsible:

Seppo Alanko

Working life cooperation:

No work placement period

Other information:

<https://wiki oulu.fi/display/763101P/>

761118P: Mechanics 1, 5 op

Voimassaolo: 01.08.2017 -

Opiskelumuoto: Basic Studies

Laji: Course

Vastuuyksikkö: Field of Physics

Arvostelu: 1 - 5, pass, fail

Opettajat: Vaara, Juha Tapani

Opintokohteen kielet: Finnish

Leikkaavuudet:

766343A	Mechanics	7.0 op
761111P	Basic mechanics	5.0 op
761101P	Basic Mechanics	4.0 op
766323A	Mechanics	6.0 op
761323A	Mechanics	6.0 op

ECTS Credits:

5 ECTS credits / 133 hours of work

- 761118P-01, Lectures and exam (4 cr)

- 761118P-02, Lab. exercises (1 cr)

Language of instruction:

The lectures will be in Finnish. The textbook is in English and exercises are selected from the textbook. For further information, contact the responsible person of the course.

Timing:

Autumn

Learning outcomes:

The student is able to describe the basic concepts of mechanics and to apply those when solving the problems related to mechanics.

Contents:

We encounter many phenomena related to mechanics in our everyday life. Most engineering sciences are based on mechanics and mechanics forms the basis of many other fields of physics, including modern physics. Contents in brief: Short summary of vector calculus. Kinematics, projectile motion and circular motion. Newton's laws of motion. Work and different forms of energy. Momentum, impulse and collisions. Rotational motion and moment of inertia. Torque and angular momentum. Rigid body equilibrium problems. Gravitation. Periodic motion. Fluid mechanics.

Mode of delivery:

Face-to-face teaching

Learning activities and teaching methods:

Lectures 30 h, 7 exercises (14 h), 2 laboratory exercises (3 hours/exercise), self-study 83 h

Target group:

For the students of the University of Oulu.

Prerequisites and co-requisites:

Knowledge of vector calculus and basics of differential and integral calculus.

Recommended optional programme components:

No alternative course units or course units that should be completed simultaneously.

Recommended or required reading:

Text book: H.D. Young and R.A. Freedman: University physics, Addison-Wesley, 13th edition, 2012, chapters 2-14. Also older editions can be used. Lecture material: Finnish lecture material will be available on the web page of the course.

Assessment methods and criteria:

Both parts (761118P-01 and 761118P-02) will be graded separately. The final grade of the course is the weighted average of the grades of part 1 (4 cr) and part 2 (1 cr).

761118P-01: Three midterm exams or final examination

761118P-02: Two laboratory exercises

Read more about assessment criteria at the University of Oulu webpage.

Grading:

Numerical grading scale 0 – 5, where 0 = fail

Person responsible:

Juha Vaara

Working life cooperation:

No work placement period

Other information:

<https://wiki oulu.fi/display/761118P>

740149P: Metabolism I, 4 op

Opiskelumuoto: Basic Studies

Laji: Course

Vastuuyksikkö: Faculty of Biochemistry and Molecular Medicine

Arvostelu: 1 - 5, pass, fail

Opettajat: Tuomo Glumoff

Opintokohteen kielet: Finnish

Leikkaavuudet:

ay740158P Basic biochemistry 3: Metabolis (OPEN UNI) 4.0 op

ay740154P Basic biochemistry 3: Metabolis (OPEN UNI) 3.0 op

740146P Metabolism I 6.0 op

ECTS Credits:

4 credits

Language of instruction:

Finnish

Timing:

spring

Learning outcomes:

Students will be able to explain the main principles of how the metabolism is made up, will get a detailed picture of the energy metabolism, and will be able to organize part of the wholeness of metabolism, particularly how energy metabolism is networked to the synthesis and degradation of biomolecules.

Contents:

On this course the central concepts and mechanisms of metabolism, its regulation and the integration of metabolic pathways will be introduced, like anabolism and catabolism, linking of different pathways, and metabolic regulation. Especially the energy metabolism will be studied, concerning carbohydrates, lipids and the respiratory chain. Combined with the course Metabolism II the students will get a good overview on the principles of metabolism, metabolic integration and the methods to study metabolism.

Mode of delivery:

Face to face teaching

Learning activities and teaching methods:

Lectures (28 h), problem-based exercises (workshops) 6 h and final exam.

Target group:

Minor subject students

Prerequisites and co-requisites:

Biomolecules for Biochemists or Biomolecules for Bioscientists or Biomolecules

Recommended optional programme components:

-

Recommended or required reading:

-

Assessment methods and criteria:

Problem-based exercises and a final exam will count towards the final grade.

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

Grading:

1-5/fail.

Person responsible:

Tuomo Glumoff

Working life cooperation:

No

Other information:

This module is the same as Metabolism I (740146P), except that it contains no laboratory component.

Location of instruction: Linnanmaa

752692S: Mire ecology, 5 op

Voimassaolo: 01.08.2003 -

Opiskelumuoto: Advanced Studies

Laji: Course

Vastuuyksikkö: Field of Biology

Arvostelu: 1 - 5, pass, fail

Opettajat: Virtanen, Risto Juhani

Opintokohteen oppimateriaali:

Eurola, Seppo , , 1995

Eurola, Seppo , , 1992

Opintokohteen kielet: Finnish

Leikkaavuudet:

ay752692S Mire ecology 5.0 op

ECTS Credits:

5 ECTS credits / 133 hours of work.

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, demonstrations and field exercises 47 h.

Target group:

Plant ecology students.

Prerequisites and co-requisites:

Plant ecology field course (756343A) or equivalent knowledge.

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:

Mire type and species exam.

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

Grading:

Mire types and species exam. 1-5 / Fail.

Person responsible:

Doc. Risto Virtanen.

Working life cooperation:

No.

Other information:

-

ay791635A: Physical Geography of Fennoscandia (OPEN UNI), 5 op

Voimassaolo: 01.08.2019 -

Opiskelumuoto: Intermediate Studies

Laji: Course

Vastuuyksikkö: University of Oulu, Open University

Arvostelu: 1 - 5, pass, fail

Opetus suunnattu: University of Oulu, Open University

Opintokohteen kielet: Finnish

Leikkaavuudet:

791635A Physical Geography of Fennoscandia 5.0 op

ECTS Credits:

5 ECTS

Language of instruction:

Finnish and English

Timing:

2nd or 3rd year, 1st or 2nd semester.

Learning outcomes:

Course familiarizes students to the geography of the Fennoscandia. When the student has passed the written exam, he/she can define the special characters of the physical geography of Fennoscandia

Contents:

Physical geography of the Fennoscandia.

Mode of delivery:

Book exam.

Learning activities and teaching methods:

Book exam.

Target group:

Obligatory for teachers, others voluntary.

Prerequisites and co-requisites:

Recommended optional programme components:

Course is part of minor studies of Geography.

Recommended or required reading:

- Seppälä, Matti (ed.) (2005). Physical Geography of Fennoscandia, 1st ed. 432 p. Oxford University Press.

Assessment methods and criteria:

Exam on examinarium.

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

Grading:

1–5.

Person responsible:

Janne Alahuhta

Working life cooperation:

No.

761108P: Physical world view, 5 op

Voimassaolo: 01.08.2017 -

Opiskelumuoto: Basic Studies

Laji: Course

Vastuuyksikkö: Field of Physics

Arvostelu: 1 - 5, pass, fail

Opettajat: Lauri Holappa

Opintokohteen kielet: Finnish

Leikkaavuudet:

761112P Physical world view 3.0 op

ECTS Credits:

5 ECTS credits / 133 hours of work

Language of instruction:

Finnish

Timing:

Autumn

Learning outcomes:

After the course student can see the position of physics in the advancement of scientific world view and technology. The student has a comprehensive view of different learning and studying methods (s)he can use later on.

Contents:

The forming of key concepts in physics, using models and observations in advancing both classical and modern physics. The meaning of applying physics in modern society. Getting to know different areas of physics research and employment opportunities for physicists.

Mode of delivery:

Multiform teaching

Learning activities and teaching methods:

48 h face-to-face teaching, 85 h independent work including course work and group work

Target group:

Primarily for the students of the degree programme in physics. Also for the other students of the University of Oulu.

Prerequisites and co-requisites:

No specific prerequisites

Recommended optional programme components:

No alternative course units or course units that should be completed simultaneously.

Recommended or required reading:

Feynman, R. The Character of Physical Law, Penguin Books 1992 (or equivalent, there are several prints). The original Messenger Lectures by Richard Feynman in 1965 (7x55min) can be found online with search "Richard Feynman messenger lectures".

Assessment methods and criteria:

Passed course work or final exam

Grading:

Numerical grading scale 0-5, where 0 = fail

Person responsible:

Lauri Holappa

Working life cooperation:

No work placement period

Other information:<https://wiki oulu.fi/display/761112P/>**756346A: Plant biology lectures, 5 op****Voimassaolo:** 01.08.2015 -**Opiskelumuoto:** Intermediate Studies**Laji:** Course**Vastuuyksikkö:** Field of Biology**Arvostelu:** 1 - 5, pass, fail**Opettajat:** Häggman, Hely Margaretha, Anna-Maria Pirttilä**Opintokohteen kielet:** Finnish**Leikkaavuudet:**

752345A Basics of functional plant biology, lectures 4.0 op

ECTS Credits:

5 ECTS credits / 133 hours of work.

Language of instruction:

Finnish.

Timing:

B.Sc. 2nd 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 and plant hormones are discussed.

Mode of delivery:

Face-to-face teaching, book exam.

Learning activities and teaching methods:

Lectures (20 h) and exams.

Target group:

Compulsory to the biology students.

Prerequisites and co-requisites:

Cell biology (750121P) or equivalent knowledge helps in following this course.

Recommended optional programme components:

This course is a prerequisite for course Plant biology practicals (756341A) and Biotechnology and Molecular Biology of Plants (751688S).

Recommended or required reading:

Taiz, L. et al. 2015. Plant Physiology and Development. Sixth Edition. 761 p. Sinauer Associates, Inc. ISBN-9781605352558.

Terävä, E. & Kanervo, E. 2008: Kasvianatomia or equivalent.

The availability of the literature can be checked from [this link](#).**Assessment methods and criteria:**

Lectures, book, exams.

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

1-5 / Fail.

Person responsible:

Prof. Hely Häggman and Doc. Anna Maria Pirttilä.

Working life cooperation:

No.

Other information:

-

761116P: Radiation physics, biology and safety, 5 op

Voimassaolo: 01.01.2015 -

Opiskelumuoto: Basic Studies

Laji: Course

Vastuuyksikkö: Field of Physics

Arvostelu: 1 - 5, pass, fail

Opettajat: Lauri Hautala

Opintokohteen kielet: Finnish

Leikkaavuudet:

761116P Radiation physics, biology and safety 3.0 op

ECTS Credits:

5 ECTS credits

Language of instruction:

Finnish

Timing:

Spring

Learning outcomes:

The student knows the origin of ionising radiation and the principles of its interaction with matter. He/she can explain the essential effects of ionising radiation on human tissue and remembers the principles of radiation safety and laws and regulations (in Finland) concerning this.

Contents:

The topics of the course include the origin of ionizing radiation e.g. as a result of radioactive decay and in nuclear reactions, the interaction between radiation and matter, the detection and measurements of radiation, physical quantities and measuring units related to radiation, radiation in the environment, and examples of utilizing radiation. The biologic effects of radiation and the legislation on radiation safety are also discussed.

Mode of delivery:

Face-to-face teaching

Learning activities and teaching methods:

Lectures 28 h, 7 problem solving exercises (14 h) and 2 laboratory exercises (8 h). Self-study 90 h.

Target group:

For the students of the University of Oulu.

Prerequisites and co-requisites:

No specific prerequisites

Recommended optional programme components:

740368A Radiation and safety

Recommended or required reading:

Lecture material (in Finnish), Laws and regulations concerning radiation safety

Assessment methods and criteria:

Final examination

Grading:

Numerical grading scale 0 – 5, where 0 = fail

Person responsible:

Seppo Alanko

Working life cooperation:

No work placement period

ay740155P: Targeting climate change on individual level (OPEN UNI), 2 op

Voimassaolo: 01.08.2019 -

Opiskelumuoto: Basic Studies

Laji: Course

Vastuuyksikkö: University of Oulu, Open University

Arvostelu: 1 - 5, pass, fail

Opetus suunnattu: University of Oulu, Open University

Opettajat: Raisa Serpi, Henrika Honkanen

Opintokohteen kielet: Finnish

761310A: Wave motion and optics, 5 op

Voimassaolo: 01.08.2017 -

Opiskelumuoto: Intermediate Studies

Laji: Course

Vastuuyksikkö: Field of Physics

Arvostelu: 1 - 5, pass, fail

Opettajat: Seppo Alanko

Opintokohteen kielet: Finnish

Leikkaavuudet:

766349A	Wave motion and optics	7.0 op
761114P	Wave motion and optics	5.0 op
761114P-02	Wave motion and optics, lab. exercises	0.0 op
761114P-01	Wave motion and optics, lectures and exam	0.0 op
766329A	Wave motion and optics	6.0 op
761104P	Wave Motion	3.0 op

ECTS Credits:

5 ECTS credits / 133 hours of work

Language of instruction:

Finnish. The course material and exercises are available in English.

Timing:

First spring

Learning outcomes:

The student is able to treat different types of waves by methods of general theory of wave motion. The student is also able to solve problems related to basic optics and apply her/his knowledge to teaching and research in physics.

Contents:

General principles of wave motion, sound, electromagnetic waves, propagation of light, image formation in mirrors and lenses, optical instruments, interference, Fraunhofer diffraction, diffraction grating.

Mode of delivery:

Face-to-face teaching

Learning activities and teaching methods:

Lectures 28 h, exercises 14 h, 2 laboratory exercises (3 hours/exercise), self-study 90 h

Target group:

No specific target group

Prerequisites and co-requisites:

Basic skills in mathematics.

Recommended optional programme components:

No alternative course units or course units that should be completed simultaneously

Recommended or required reading:

H. D. Young and R. A. Freedman, University Physics, Addison-Wesley, 2000 ja 2004, F. L. Pedrotti ja L. S. Pedrotti, Introduction to optics, Prentice-Hall, 2. ed., 1993 ja E. Hecht, Optics, (3rd ed.), Addison Wesley Longman, 1998.

Assessment methods and criteria:

Two written intermediate examinations or one final examination

Grading:

Numerical grading scale 0 – 5, where 0 is fail

Person responsible:

Seppo Alanko

Working life cooperation:

No work placement period

Other information:

Includes parts:

761310A-01 Wave motion and optics, lectures and exam

761310A-02 Wave motion and optics, lab. exercises

ay790349A: World regional geography (OPEN UNI), 5 op

Voimassaolo: 01.08.2019 -

Opiskelumuoto: Intermediate Studies

Laji: Course

Vastuuyksikkö: University of Oulu, Open University

Arvostelu: 1 - 5, pass, fail

Opetus suunnattu: University of Oulu, Open University

Opintokohteen kielet: Finnish

Leikkaavuudet:

790349A World regional geography 5.0 op

ECTS Credits:

5 ECTS

Language of instruction:

Finnish and English.

Timing:

2nd or 3rd year, 1st or 2nd semester.

Learning outcomes:

After the course, the student can define and interpret different regional phenomena and processes in the global level.

Contents:

Regional phenomena of the world and their role in Physical Geography.

Mode of delivery:

Book exam.

Learning activities and teaching methods:

Book exam.

Target group:

Obligatory to the teachers, other voluntary.

Prerequisites and co-requisites:

-

Recommended optional programme components:

Course is part of the minor studies of geography.

Recommended or required reading:

- Hobbs, Joseph J. (2013): Fundamentals of World Regional Geography, 3. painos. Brooks/Cole Cengage Learning, 443 s.

Assessment methods and criteria:

Exam on examinarium.

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

Grading:

1–5.

Person responsible:

Janne Alahuhta

Working life cooperation:

No.