

Opasraportti

FTech - Courses in English for exchange students, Field of Chemistry (2019 - 2020)

Chemistry courses in English for exchange students at the Faculty of Technology

This Course Catalogue lists courses taught in English that are available for exchange students in the study field of Chemistry at the Faculty of Technology (FTech) during academic year 2019-20. Note please! Course availability: Chemistry courses are available for exchange students hosted by the study field of Chemistry at the FTech and only if they have the required previous knowledge. Exchange student hosted by other study fields or other University of Oulu faculties usually cannot take these courses.

When preparing your study plan please use the information provided under the **Courses tab** in this catalogue. Read carefully the information of each course you wish to take (language of instruction, target group, course content, timing, preceding studies, additional information etc.).

For information on the exchange application process please see www.oulu.fi/university/studentexchange. All exchange applicants must submit their exchange application through SoleMOVE by the deadline given, proposed study plan is attached to the on-line application.

Accepted exchange students are required to register to all courses and later separately to the possible course exams too. Course or exam registration takes place once you have received your University of Oulu login information, this takes place close to the start of your exchange period. When registering you will be able to find detailed information on teaching and schedule under **Instruction tab**.

Teaching periods for 2019-20

Autumn term 2019

Period 1: Sept 2 - Oct 25, 2019

Period 2: Oct 28 – Dec 20, 2019

Spring term 2020

Period 3: Jan 7 – March 6, 2020

Period 4: March 9 – May 8, 2020

For arrival and orientation dates see www.oulu.fi/university/studentexchange/academic-calender

Any questions on courses at the Faculty of Technology / Chemistry should be addressed to:

Dr Johanna Kärkkäinen
Exchange Coordinator for Chemistry
Research Unit of Sustainable Chemistry
Research Group of Organic Chemistry

M.Sc. Marita Puikkonen
Faculty International Coordinator
for Student Exchange
Incoming & Outgoing Mobility

Faculty of Technology, University of Oulu,
Finland
Email: Johanna.Karkkainen(at)oulu.fi

Faculty of Technology, University of Oulu,
Finland
Email: Study.Technology(at)oulu.fi

Further information on application process and services for incoming exchange students:
www.oulu.fi/university/studentexchange or international.office(at)oulu.fi

Tutkintorakenteisiin kuulumattomat opintokokonaisuudet ja -jaksot

900013Y: Beginners' Finnish Course 1, 3 op
900053Y: Beginners' Finnish Course 2, 5 op
782641S: Catalysis, 5 op
782638S: Chemistry in Industrial Applications, 5 op
782640S: Chemistry of Hydrometallurgical Processes, 5 op
900054Y: Conversational Skills in Finnish, 3 op
781657S: Experimental Design, 5 op
900015Y: Intermediate Finnish Course 1, 5 op
900016Y: Intermediate Finnish Course 2, 5 op
781627S: Main Group Chemistry, 5 op
781651S: Metrological Fundamentals of Analytical Chemistry, 5 op
783639S: Organic Chemistry III, 5 op
780601S: Project work, 12 op
900027Y: Special Course in Finnish: Writing Skills, 3 op
781658S: Surface Analytical Techniques, 5 op
782637S: Surface Chemistry, 5 op
900017Y: Survival Finnish, 2 op
781655S: X-Ray Crystallography, 5 op

Opintojaksojen kuvaukset

Tutkintorakenteisiin kuulumattomien opintokokonaisuuksien ja -jaksojen kuvaukset

900013Y: Beginners' Finnish Course 1, 3 op

Voimassaolo: 01.08.1995 -

Opiskelumuoto: Language and Communication Studies

Laji: Course

Vastuuyksikkö: Languages and Communication

Arvostelu: 1 - 5, pass, fail

Opintokohteen kielet: Finnish

Leikkaavuudet:

ay900013Y Beginners' Finnish Course 1 (OPEN UNI) 2.0 op

Proficiency level:

A1.2

Status:

The course is intended for the international students in every faculty of Oulu University.

Required proficiency level:

A1.1, Completion of the Survival Finnish course (900017Y) or the equivalent language skills.

ECTS Credits:

3 ECTS credits

Language of instruction:

As much Finnish as possible; English will be used as a help language.

Timing:

-

Learning outcomes:

By the end of the course the student can understand and use some familiar and common everyday expressions relating to her/himself and everyday situations. S/he can interact in a simple way provided the other person talks slowly and clearly and is willing to help. The student is able to read short simple texts and messages dealing with familiar topics. S/he also deepens her/his understanding of the Finnish language and communication styles.

Contents:

This is lower elementary course which aims to help students to learn communication skills in ordinary everyday situations. During the course, students broaden their vocabulary and knowledge of grammar and principles of pronunciation. They also practise to understand easy Finnish talk about everyday subjects, and reading and writing short and simple texts/messages.

The topics and communicative situations covered in the course are: talking about oneself, one's family, studies and daily routines, as well as asking about these things from other person, expressing opinions, describing people and things, talking about weather and seasons, the names of the months and colours.

The structures studied are: verb types, basics of the change of the consonants k, p and t in verbs and nouns, the genitive and partitive cases, possessive structure, some declension types for nouns (word types) and the basics of the local cases.

Mode of delivery:

Contact teaching and guided self study

Learning activities and teaching methods:

Lessons 2 times a week (26 h, including the final exam) and guided self study (55 h)

Target group:

International degree and post-graduate degree students and exchange students of the University

Prerequisites and co-requisites:

Completion of the Survival Finnish Course

Recommended optional programme components:

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Recommended or required reading:

Gehring, S. & Heinzmann, S. Suomen mestari 1 (chapters 3 - 5)

Assessment methods and criteria:

Regular and active participation in the weekly lessons (twice a week), homework assignments and written exam at the end of the course will be observed in assessment.

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

Grading:

Grading scale is 1-5.

Person responsible:

Anne Koskela

Working life cooperation:

-

Other information:

Sign-up in WebOodi. The course will start right after the Survival Finnish course.

900053Y: Beginners' Finnish Course 2, 5 op

Voimassaolo: 01.08.1995 -

Opiskelumuoto: Language and Communication Studies

Laji: Course

Vastuuyksikkö: Languages and Communication

Arvostelu: 1 - 5, pass, fail

Opintokohteen kielet: Finnish

Leikkaavuudet:

ay900053Y Beginners' Finnish Course 2 (OPEN UNI) 4.0 op

Proficiency level:

A1.3

Status:

The course is intended for the international students in every faculty of Oulu University.

Required proficiency level:

A1.2, completion of the Beginners' Finnish course 1 (900013Y) or the equivalent language skills.

ECTS Credits:

5 ECTS credits

Language of instruction:

As much Finnish as possible; English will be used as a help language.

Timing:

-

Learning outcomes:

By the end of the course the student can understand and use some very common everyday expressions and sentences. S/he can communicate in easy and routine tasks requiring a simple and direct exchange of information on familiar everyday matters. The student understands different kinds of short texts. S/he can for example locate important information in them. In addition, s/he has acquired more detailed knowledge of the language and culture.

Contents:

This is a post-elementary course. During the course students learn more about communication in ordinary everyday situations in Finnish. They also extend their vocabulary and knowledge of grammar. Students practise understanding simple Finnish talk and short texts.

The topics and communicative situations covered in the course are: asking for and giving directions, asking for help/favours, carrying out transactions in shops and restaurants, talking about the past, asking for and expressing opinions and feelings, accommodation, travelling, vehicles, work, professions, food, drink and parties.

The structures studied are: the local cases, nominative plural (basic form plural), imperfect (past tense of verbs), part of the imperative, more declension types for nouns (word types), more about the change of the consonants k, p and t in verbs and nouns, declension of the demonstrative pronouns and personal pronouns, more about the partitive case, basics of the object cases, postpositions and some sentence types in Finnish.

Mode of delivery:

Contact teaching and guided self study

Learning activities and teaching methods:

Lessons 2 times a week (52 h, including the tests) and guided self study (83 h)

Target group:

International degree and post-graduate degree students and exchange students of the University

Prerequisites and co-requisites:

Completion of the Beginners' Finnish Course 1

Recommended optional programme components:

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Recommended or required reading:

Gehring, S. & Heinzmann, S.: **Suomen mestari 1** (kappaleet 6-9)

Assessment methods and criteria:

Regular and active participation in the weekly lessons (twice a week), homework assignments and tests will be taken into consideration in the assessment.

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

Grading:

Grading scale is 1-5.

Person responsible:

Anne Koskela

Working life cooperation:

-

Other information:

Sign-up in WebOodi. The lessons will be held **twice a week** during a 13-week period.

782641S: Catalysis, 5 op

Voimassaolo: 01.08.2015 -

Opiskelumuoto: Advanced Studies

Laji: Course

Vastuuyksikkö: Field of Chemistry

Arvostelu: 1 - 5, pass, fail

Opintokohteen kielet: Finnish

ECTS Credits:

5 credits /134 hours of work

Language of instruction:

Finnish/English on demand

Timing:

4th or 5th year. The course is lectured every other year.

Learning outcomes:

Upon successful completion students should have a basic understanding of the theory of catalysis. Thermodynamic and kinetic background will be studied, including mechanisms of the most important catalytic reactions. Applications, preparation, characterisation and structure of homogenous, heterogeneous and enzymatic catalysts will be discussed.

Contents:

Principles of catalysis, homogeneous catalysis in solutions, polymer catalysis, zeolites, heterogeneous catalysis on surfaces.

Mode of delivery:

Face-to-face teaching

Learning activities and teaching methods:

40 hours of lectures, 94 hours of self-study

Target group:

Chemistry, optional

Prerequisites and co-requisites:

Physical Chemistry I (780347A)

Recommended optional programme components:

The course is an independent entity and does not require additional studies carried out at the same time.

Recommended or required reading:

Examination is based on the lectures.

Assessment methods and criteria:

Final examination

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

Grading:

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

Person responsible:

Prof. Jouni Pursiainen

Working life cooperation:

No

Other information:

No

782638S: Chemistry in Industrial Applications, 5 op

Voimassaolo: 01.08.2015 -

Opiskelumuoto: Advanced Studies

Laji: Course

Vastuuyksikkö: Field of Chemistry

Arvostelu: 1 - 5, pass, fail

Opintokohteen kielet: Finnish

Leikkaavuudet:

782338A Chemistry in Industrial Applications 5.0 op

ay782638S Chemistry in Industrial Applications (OPEN UNI) 5.0 op

ECTS Credits:

5 credits / 134 hours of work

Language of instruction:

Finnish/English on demand

Timing:

4th or 5th spring. The course is lectured every other year, next time during the spring 2018.

Learning outcomes:

Upon completion of the course, the student will be able to explain several chemical applications in process and environmental technology. In particular, the student knows the novel applications in which chemistry is used.

Contents:

Catalytic applications in water purification, catalytic oxidation, preparation of biofuels from biomass, biomass gasification and the utilisation of biogas, chemistry and chemical reactions in mining processes etc. (visiting lecturers from the companies)

Mode of delivery:

Face-to-face teaching and seminars

Learning activities and teaching methods:

40 hours of lectures, 10 hours of seminars, 84 hours of self-study

Target group:

Chemistry, optional

Prerequisites and co-requisites:

Physical Chemistry I and Physical Chemistry II

Recommended optional programme components:

The course is an independent entity and does not require additional studies carried out at the same time.

Recommended or required reading:

Material given by the lecturer, scientific review papers

Assessment methods and criteria:

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

Grading:

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

Person responsible:

Ulla Lassi

Working life cooperation:

No

Other information:

No

782640S: Chemistry of Hydrometallurgical Processes, 5 op

Voimassaolo: 01.08.2015 -

Opiskelumuoto: Advanced Studies

Laji: Course

Vastuuyksikkö: Field of Chemistry

Arvostelu: 1 - 5, pass, fail

Opintokohteen kielet: Finnish

ECTS Credits:

5 credits / 134 hours of work

Language of instruction:

Finnish, English on demand

Timing:

4th or 5th spring.

Learning outcomes:

Upon completion of the course, the student will be able to explain chemical principles of hydrometallurgical processes and phenomena. The student knows the most important chemical reactions and variables affecting hydrometallurgical processes. Process chemistry is significant in several industrial applications, and those applications are considered during the course.

Contents:

Introduction to hydrometallurgical processes, pre-treatment of concentrates (oxidation, heat treatment), principles of dissolution (including leaching and bioleaching) and purification, chemical precipitation and other metals recovery processes (extraction, ion-exchange), electrical processes and process chemistry (electrolysis, corrosion).

Mode of delivery:

Face-to-face teaching and seminars

Learning activities and teaching methods:

40 hours of lectures, 10 hours of seminars, 84 hours of self study

Target group:

Chemistry, optional

Prerequisites and co-requisites:

Physical Chemistry I and Physical Chemistry II

Recommended optional programme components:

The course is an independent entity and does not require additional studies carried out at the same time.

Recommended or required reading:

Lecture notes (in English).

Assessment methods and criteria:

Final examination

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

Grading:

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

Person responsible:

Ulla Lassi

Working life cooperation:

No

Other information:

No

900054Y: Conversational Skills in Finnish, 3 op

Voimassaolo: 01.08.1995 -

Opiskelumuoto: Language and Communication Studies

Laji: Course

Vastuuyksikkö: Languages and Communication

Arvostelu: 1 - 5, pass, fail

Opintokohteen kielet: Finnish

Proficiency level:

B1/B2 , according to the Common European Framework.

Status:

The course is intended for the international students in every faculty of University of Oulu.

Required proficiency level:

A2.2

Completion of Intermediate Finnish 2 (900016Y) or the equivalent language skills.

ECTS Credits:

3 ECTS credits

Language of instruction:

Finnish

Timing:

-

Learning outcomes:

By the end of the course the student can interact with a degree of fluency (and spontaneity) that makes regular interaction with native speakers quite possible. S/he can describe and explain (clearly and in detail) on a wide range of objects, experiences and events, dreams, hopes and ambitions. The student can bring out opinions, give reasons and explanations for them and explain a viewpoint on a topical issue giving the advantages and disadvantages of various options. S/he is also able to give a (clear) prepared presentation and answer the questions posed by the audience.

Contents:

During the course students strengthen their communication skills in formal and informal situations. The goal is to activate the student's Finnish skills and encourage him/her to use them in different situations. There will be various types of situational dialogue, conversation and listening exercises in the course. In addition, students will conduct a short survey which will also be reported to other students in the class.

Mode of delivery:

Contact teaching and guided self study

Learning activities and teaching methods:

Lessons once a week (28-30 h), group work (15 h) and guided self study (36 h)

Target group:

International degree and post-graduate degree students, exchange students and the staff members of the University

Prerequisites and co-requisites:

Completion of Intermediate Finnish 2 (900016Y) or equivalent skills

Recommended optional programme components:

-

Recommended or required reading:

Will be provided during the course.

Assessment methods and criteria:

To pass the course, students must attend class on a regular basis and complete group work tasks and homework assignments.

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

Grading:

Grading is on a pass/fail basis.

Person responsible:

Anne Koskela

Working life cooperation:

-

Other information:

Sign-up in WebOodi.

781657S: Experimental Design, 5 op

Voimassaolo: 01.08.2015 -

Opiskelumuoto: Advanced Studies

Laji: Course

Vastuuyksikkö: Field of Chemistry

Arvostelu: 1 - 5, pass, fail

Opintokohteen kielet: Finnish

ECTS Credits:

5 credits / 134 hours of work

Language of instruction:

Finnish. English on demand.

Timing:

4th or 5th spring. The course is lectured every other year, next time during the spring 2020.

Learning outcomes:

After this course student becomes aware of importance experimental design and is able to apply most common experimental designs in the field of chemistry.

Contents:

Factorial designs, mixture designs, D-optimal designs, response surface methodology. Computer programmes are applied during the course in the design and analysis of experiments.

Mode of delivery:

Face-to-face teaching

Learning activities and teaching methods:

30 hours of lectures and exercises + 104 hours of self-study incl. computer aided analysis of experimental data.

Target group:

Chemistry, optional

Prerequisites and co-requisites:

Metrological Fundamentals of Analytical Chemistry (781651S)

Recommended optional programme components:

The course is an independent entity and does not require additional studies carried out at the same time.

Recommended or required reading:

Montgomery, D.C.: Design and Analysis of Experiments, 8th ed., John Wiley & Sons.

Massart, D.L., Vandeginste, B.G.M., Buydens, L.M.C., De Jong, S., Lewi, P.J. and Smeyers-Verbeke, J.:

Handbook of Chemometrics and Qualimetrics: Part A, Elsevier, 1997, partly.

Assessment methods and criteria:

Final examination or home assignment

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

Grading:

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

Person responsible:

Paavo Perämäki

Working life cooperation:

No

Other information:

No

900015Y: Intermediate Finnish Course 1, 5 op

Voimassaolo: 01.08.1995 -

Opiskelumuoto: Language and Communication Studies

Laji: Course

Vastuuyksikkö: Languages and Communication

Arvostelu: 1 - 5, pass, fail

Opintokohteen kielet: Finnish

Leikkaavuudet:

ay900015Y Intermediate Finnish Course 1 (OPEN UNI) 4.0 op

Proficiency level:

A2.1

Status:

The course is intended for the international students in every faculty of University of Oulu.

Required proficiency level:

A1.3, Completion of the Beginners' Finnish course 2 (900053Y) or the equivalent language skills.

ECTS Credits:

5 ECTS credits

Language of instruction:

Mainly Finnish

Timing:

-

Learning outcomes:

By the end of the course the student can communicate in ordinary everyday situations when the topics are familiar or connected with everyday matters. S/he can search for and locate key informational content in different kinds of texts. The student can also identify the topic and some details of the discussion around her/him. S/he can describe activities and personal experiences both orally and in writing and s/he also knows the difference between spoken/colloquial and written/standard language. The student knows how things can be expressed with different degrees of politeness and can apply that information in her/his own communication.

Contents:

The course is a lower intermediate course. During the course students strengthen their communication skills in ordinary everyday situations and acquire a wider vocabulary and more thorough knowledge of grammar. In addition, students practise understanding and producing Finnish talk and reading newspaper articles.

The topics and communicative situations covered in the course are: requesting different kinds of requests, expressing politeness, making appointments with friends, giving directions, doing the shopping, talking about the past and talking about his/her future plans, hobbies, transactions e.g. in the doctor's and post office.

The structures studied are: more about the imperative, the verb rections, the deverbal noun (-minen), passive present tense, part of the plural declension of nouns, the third infinitive (ma-infinitive), more about sentence types, perfect tense, more about object cases.

Mode of delivery:

Contact teaching and guided self study

Learning activities and teaching methods:

Lessons 2 times a week (52 h, including the tests) and guided self study (83 h)

Target group:

International degree and post-graduate degree students, exchange students and the staff members of the University

Prerequisites and co-requisites:

Completion of the Beginners' Finnish Course 2

Recommended optional programme components:

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- Recommended or required reading:**
Gehring, S. & Heinzmann, S.: **Suomen mestari 2**, (chapters 1 - 5)
- Assessment methods and criteria:**
Regular and active participation in the weekly lessons (twice a week), homework assignments and the tests will be taken into consideration in the assessment.
Read more about [assessment criteria](#) at the University of Oulu webpage.
- Grading:**
Grading scale is 1-5.
- Person responsible:**
Anne Koskela
- Working life cooperation:**
-
- Other information:**
Sign-up in WebOodi. The lessons will be held twice a week during a 13-week period.

900016Y: Intermediate Finnish Course 2, 5 op

Voimassaolo: 01.08.1995 -

Opiskelumuoto: Language and Communication Studies

Laji: Course

Vastuuyksikkö: Languages and Communication

Arvostelu: 1 - 5, pass, fail

Opintokohteen kielet: Finnish

Proficiency level:

A2.2

Status:

The course is intended for the international students in every faculty of University of Oulu.

Required proficiency level:

A2.1, Completion of the Intermediate Finnish course 1 (900015Y) or the equivalent language skills.

ECTS Credits:

5 ECTS credits

Language of instruction:

Finnish

Timing:

-

Learning outcomes:

By the end of the course the student can communicate in various informal situations in Finnish. The student understands the main points of messages and talk around her/him. S/he can produce simple connected text on topics which are familiar or of personal interest and describe experiences and also report heard content to others.

Contents:

The course is an upper intermediate course. During the course students learn the necessary written and oral skills to be able to cope in informal situations arising during everyday life, work and study. In the course, students practise understanding more Finnish talk and written texts, and finding information and talking about it to other people. In the classes the main stress is on oral exercises and group work.

The topics and communicative situations covered in the course are: transactions e.g. in clothes shops and on the phone, Finnish small talk, reacting in different situations, information and facts about Finnish feast culture and features of colloquial/spoken language.

The structures studied are: the perfect and pluperfect, revision of all the verb tenses, comparison of adjectives, conditional, more about the plural declension of nouns (particularly the plural partitive case), more about object and predicative cases, the passive imperfect.

Mode of delivery:

Contact teaching and guided self study

Learning activities and teaching methods:

Lessons twice a week (52 h, including the tests) and guided self study (83 h)

Target group:

International degree and post-graduate degree students, exchange students and the staff members of the University

Prerequisites and co-requisites:

Completion of the Intermediate Finnish Course 1 or equivalent skills

Recommended optional programme components:

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Recommended or required reading:Gehring, S. & Heinzmann, S.: **Suomen mestari 2 (chapters 6 - 9)****Assessment methods and criteria:**

Regular and active participation in the weekly lessons (twice a week), homework assignments and the tests will be taken into consideration in the assessment.

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

Grading:

Grading scale is 1-5.

Person responsible:

Anne Koskela

Working life cooperation:

-

Other information:

Sign-up in WebOodi.

781627S: Main Group Chemistry, 5 op

Opiskelumuoto: Advanced Studies

Laji: Course

Vastuuyksikkö: Field of Chemistry

Arvostelu: 1 - 5, pass, fail

Opettajat: Laitinen Risto

Opintokohteen oppimateriaali:

Atkins, P., Overton, T., Rourke, J., Weller, M. ja Armstrong, F., , 2006

Opintokohteen kielet: Finnish

ECTS Credits:

5 ECTS credits / 134 hours of work

Language of instruction:

Finnish / English

Timing:

4th or 5th year. Next time in the fall semester 2017.

Learning outcomes:

Upon completing the course, the student is familiar with some current aspects of main group chemistry.

Contents:

Periodic table of the elements, hydrogen, alkali metals, alkaline earth metals, semi-metals and non-metals. The contents vary from year to year.

Mode of delivery:

Face-to-face teaching

Learning activities and teaching methods:

Lectures 28 hours, exercises 14 hours

Target group:

Chemist, chemistry teachers

Prerequisites and co-requisites:

Inorganic Chemistry I (780353A or 781301A) and Inorganic Chemistry II (780391A, 781302A tai 781642S)

Recommended optional programme components:

The course is independent and does not require other, simultaneous studies.

Recommended or required reading:

Overton, T., Rourke, J., Weller, M. ja Armstrong, F.: Inorganic Chemistry, 6. painos, Oxford University Press, Oxford 2014. Chapters 9-18. Lecture material.

Assessment methods and criteria:

The course will be assessed by a home examination.

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

Grading:

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

Person responsible:

Risto Laitinen

Working life cooperation:

No

Other information:

No

781651S: Metrological Fundamentals of Analytical Chemistry, 5 op

Voimassaolo: 01.08.2015 -

Opiskelumuoto: Advanced Studies

Laji: Course

Vastuuyksikkö: Field of Chemistry

Arvostelu: 1 - 5, pass, fail

Opintokohteen kielet: Finnish

ECTS Credits:

5 credits / 134 hours of work

Language of instruction:

Finnish. English on demand.

Timing:

4th or 5th spring. The course is lectured every other year, next time during the spring 2020.

Learning outcomes:

Upon completion of the course, student should have acquired knowledge and understanding of most common statistical techniques that are applied in validation of analytical methods and in quality control in analytical laboratories.

Contents:

Significance tests, analysis of variance, regression methods, measurement uncertainty, validation and optimization of analytical methods.

Mode of delivery:

Face-to-face teaching

Learning activities and teaching methods:

30 hours of lectures + 20 hours of exercises + 84 hours of self-study.

Target group:

Chemistry, optional

Prerequisites and co-requisites:

Introduction to Analytical Chemistry (780111P or 780119P)

Recommended optional programme components:

The course is an independent entity and does not require additional studies carried out at the same time.

Recommended or required reading:

Massart, D. L., Vandeginste, B.G.M., Buydens, L.M.C., De Jong, S., Lewi, P.J. and Smyers-Verbeke, J.: Handbook of Chemometrics and Qualimetrics: Part A, Elsevier, 1997, partly.

Assessment methods and criteria:

Final examination.

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

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

Person responsible:

Paavo Perämäki

Working life cooperation:

No

Other information:

No

783639S: Organic Chemistry III, 5 op

Opiskelumuoto: Advanced Studies

Laji: Course

Vastuuyksikkö: Field of Chemistry

Arvostelu: 1 - 5, pass, fail

Opettajat: Juha Heiskanen, Johanna Kärkkäinen

Opintokohteen kielet: Finnish

ECTS Credits:

5 credits / 134 hours of work

Language of instruction:

Finnish/English on demand

Timing:

4th autumn – .

Learning outcomes:

After this course, the student is familiar with various organic chemistry reactions, can profoundly explain and analyze mechanisms, and predict reaction outcome.

Contents:

Fixed chapters from the textbook.

Mode of delivery:

Self-study

Learning activities and teaching methods:

134 hours of self study

Target group:

Chemistry, optional

Prerequisites and co-requisites:

Organic Chemistry I (780389A) and Organic Chemistry II (780393A/783643S).

Recommended optional programme components:

The course is an independent entity and does not require additional studies carried out at the same time.

Recommended or required reading:

Clayden, J., Greeves, N., Warren, S., Wothers, P.: Organic Chemistry, Oxford University Press, 2001 or Clayden, J., Greeves, N., Warren, S.: Organic Chemistry, Oxford University Press, 2nd edition, 2012.

Assessment methods and criteria:

Contact the responsible teacher to arrange the final examination.

Grading:

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

Person responsible:

Juha Heiskanen and Johanna Kärkkäinen

Working life cooperation:

No

Other information:

No

780601S: Project work, 12 op

Opiskelumuoto: Advanced Studies

Laji: Course

Vastuuyksikkö: Field of Chemistry

Arvostelu: 1 - 5, pass, fail

Opintokohteen kielet: Finnish

ECTS Credits:

12 ECTS credits / 240 hours of work

Language of instruction:

Finnish, English on demand

Timing:

4th autumn-spring

Learning outcomes:

After the laboratory project the student knows a research work and methods of his/her field and has readiness to perform the Pro Gradu Thesis.

Contents:

Laboratory work and written report

Mode of delivery:

Face-to-face teaching

Learning activities and teaching methods:

240 hours of work including laboratory research and a report.

Target group:

Chemistry, compulsory

Prerequisites and co-requisites:

B.Sc. studies in chemistry including the course Research Training (780301A) completed.

Recommended optional programme components:

The course is an independent entity and does not require additional studies carried out at the same time.

Recommended or required reading:

Material given by teachers

Assessment methods and criteria:

Laboratory research and a report.

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

Grading:

The course utilizes verbal grading scale pass/fail.

Person responsible:

Matti Niemelä

Working life cooperation:

No

Other information:

Responsible teachers for the course: Chemistry Degree program Professors, Docents, Lectures and Doctor level researchers.

900027Y: Special Course in Finnish: Writing Skills, 3 op

Voimassaolo: 01.08.1995 -

Opiskelumuoto: Language and Communication Studies

Laji: Course

Vastuuyksikkö: Languages and Communication

Arvostelu: 1 - 5, pass, fail

Opintokohteen kielet: Finnish

Proficiency level:

B1/B2, according to the Common European Framework.

Status:

The course is intended for the international students in every faculty of University of Oulu.

Required proficiency level:

A2.2 Completion of the Finnish for Advanced Students (900020Y) or the equivalent language skills.

ECTS Credits:

3 ECTS credits

Language of instruction:

Finnish

Timing:

-

Learning outcomes:

By the end of the course the student can write coherent and detailed descriptions and summaries about various matters. S/he is able to summarize text and justify his/her own statements of opinions. In addition, the student knows the steps of the writing process and understands the significance of a text's function and target audience. S/he can also differentiate between formal and informal writing styles.

Contents:

During the course students develop their writing skills in Finnish and are guided in the drafting of different text types and documents needed in studies and work. In the course students learn how to write informal and formal letters, an argument-essay, a summary, a job application and a report.

Mode of delivery:

One contact lesson at the beginning of the course and guided independent studying using online

Learning activities and teaching methods:

The course will be held online using an Optima environment.

Target group:

International degree and post-graduate degree students, exchange students and the staff members of the University

Prerequisites and co-requisites:

Completion of the Intermediate Finnish Course 2

Recommended optional programme components:

-

Recommended or required reading:

Web based material.

Assessment methods and criteria:

To pass the course, the student must complete all the required writing assignments.
Read more about [assessment criteria](#) at the University of Oulu webpage.

Grading:

Grading is on a pass/fail basis.

Person responsible:

Anne Koskela

Working life cooperation:

-

Other information:

Sign-up in WebOodi or by emailing the contact teacher.

781658S: Surface Analytical Techniques, 5 op

Voimassaolo: 01.08.2015 -

Opiskelumuoto: Advanced Studies

Laji: Course

Vastuuyksikkö: Field of Chemistry

Arvostelu: 1 - 5, pass, fail

Opintokohteen kielet: Finnish

ECTS Credits:

5 credits / 134 hours of work

Language of instruction:

Finnish, in English as a book examination

Timing:

4th or 5th autum. The course is lectured every other year.

Learning outcomes:

Upon completion the student should have acquired knowledge and understanding of function of main surface analytical techniques and applications of them.

Contents:

Field emission scanning electron microscope, Energy filtered transmission electron microscope, Computer controlled electron probe microanalyzer and X-ray photoelectron spectroscopy, sample preparation, applications.

Mode of delivery:

Blended teaching

Learning activities and teaching methods:

Activating learning methods: group work 25 h, portfolio 17 h, self-study 92 h

Target group:

Chemistry, optional

Prerequisites and co-requisites:

Inorganic Chemistry I (780353A or 781301A)

Recommended optional programme components:

The course is an independent entity and does not require additional studies carried out at the same time.

Recommended or required reading:

Brandon & Kaplan, Microstructural Characterization on Materials, Wiley, 2008

Assessment methods and criteria:

This course unit utilizes continuous assessment, group works and portfolio.

Grading:

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

Person responsible:

Minna Tiainen

Working life cooperation:

No

782637S: Surface Chemistry, 5 op

Voimassaolo: 01.08.2015 -

Opiskelumuoto: Advanced Studies

Laji: Course

Vastuuyksikkö: Field of Chemistry

Arvostelu: 1 - 5, pass, fail

Opintokohteen kielet: Finnish

ECTS Credits:

5 credits / 134 hours of work

Language of instruction:

Finnish/English on demand

Timing:

4th or 5th autumn. The course is lectured every other year, next time during the autumn 2017.

Learning outcomes:

Upon completion of the course, the student will be able to explain the essential phenomena of surface chemistry, such as surface tension, interfaces and surface reactions. The student knows the properties of liquid surfaces and interfaces, and the role of surface active agents. The student will be able to explain properties of surfaces and surface phenomena. The student knows the most important surface structures and methods used in surface science studies. Surface phenomena are significant in several industrial applications, and those applications are theoretically studied during the course.

Contents:

Properties of liquid-gas, liquid-liquid, solid-gas and solid-liquid interfaces. Surface structures, Surface phenomena and Surface analytical methods. A wide range of applications are considered on molecular level, such as emulsions, foams, flotation, nucleation, surface active agents.

Mode of delivery:

Face-to-face teaching

Learning activities and teaching methods:

50 hours of lectures, 84 hours of self-study

Target group:

Chemistry, optional

Prerequisites and co-requisites:

Physical Chemistry I and Physical Chemistry II

Recommended optional programme components:

Previous courses Surface Chemistry I and Surface Chemistry II

Recommended or required reading:

Adamson, A.W.: Physical Chemistry of Surfaces, 6. painos, John Wiley & Sons, New York, 1997 (partly); Somorjai, G.A.: Introduction to Surface Chemistry and Catalysis, John Wiley & Sons, New York, 1994 (partly). Final examination is based on the lectures.

Assessment methods and criteria:

Final Examination

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

Grading:

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

Person responsible:

Ulla Lassi

Working life cooperation:

No

Other information:

No

900017Y: Survival Finnish, 2 op

Voimassaolo: 01.08.1995 -

Opiskelumuoto: Language and Communication Studies

Laji: Course

Vastuuyksikkö: Languages and Communication

Arvostelu: 1 - 5, pass, fail

Opintokohteen kielet: Finnish

Leikkaavuudet:

ay900017Y Survival Finnish Course (OPEN UNI) 2.0 op

Proficiency level:

A1.1

Status:

The course is intended for the international students in every faculty of Oulu University.

Required proficiency level:

No previous Finnish studies.

ECTS Credits:

2 ECTS credits

Language of instruction:

Finnish and English

Timing:

-

Learning outcomes:

By the end of the course the student can understand and use some very common everyday expressions and phrases, and s/he can locate informational content in simple texts and messages. The student also knows the basic characteristics of Finnish language and Finnish communication styles.

Contents:

This is an introductory course which aims to help students to cope with the most common everyday situations in Finnish. During the course, students learn some useful everyday phrases, some general features of the vocabulary and grammar, and the main principles of pronunciation.

The topics and communicative situations covered in the course are: general information about the Finnish language, some politeness phrases (how to greet people, thank and apologize), introducing oneself, giving and asking for basic personal information, numbers, some time expressions (how to tell and ask the time, days of the week, time of day), food, drink and asking about prices.

The structures studied are: personal pronouns and their possessive forms, forming affirmative, negative and interrogative sentences, the conjugation of some verbs, the basics of the partitive singular and some local cases for answering the 'where'-question.

Mode of delivery:

Contact teaching, on-line learning and independent work. There will be organized also one on-line group in each semester.

Learning activities and teaching methods:

Lessons 2 times a week (26 h, including the final exam) and guided self study (24 h)

Target group:

International degree and post-graduate degree students and exchange students of the University

Prerequisites and co-requisites:

-

Recommended optional programme components:

-

Recommended or required reading:

Will be provided during the course.

Assessment methods and criteria:

Regular and active participation in the weekly lessons (twice a week), homework assignments and written exam at the end of the course will be observed in assessment.

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

Grading:

Grading scale is on a pass/fail basis.

Person responsible:

Anne Koskela

Working life cooperation:

-

Other information:

Sign-up in WebOodi.

781655S: X-Ray Crystallography, 5 op

Voimassaolo: 01.08.2015 -

Opiskelumuoto: Advanced Studies

Laji: Course

Vastuuyksikkö: Field of Chemistry

Arvostelu: 1 - 5, pass, fail

Opintokohteen kielet: Finnish

ECTS Credits:

5 ECTS credits / 134 hours of work

Language of instruction:

Finnish / English

Timing:

4th or 5th year. Next time in the fall semester 2017.

Learning outcomes:

Upon completing the course, the student is familiar with the basic principles of X-ray crystallography and is able to carry out a simple crystal structure determination.

Contents:

The production and detection of X-rays, basic principles of X-ray crystallography: unit cell, crystal systems, lattices, and space groups, basic concepts of powder diffraction and single-crystal diffraction, determination of crystal structures.

Mode of delivery:

Face-to-face teaching

Learning activities and teaching methods:

Lectures 32 hours, demonstrations 12 hours, independent work 90 hours including the the determination of a crystal structure, which will be carried out by working in pairs.

Target group:

Chemistry, chemistry teachers

Prerequisites and co-requisites:

Inorganic Chemistry I (780353A or 781301A), Inorganic Chemistry II (780391A, 781302A or 781642S)

Recommended optional programme components:

The course is independent and does not require other, simultaneous studies.

Recommended or required reading:

Massa, W.: Crystal Structure Determination, 2. painos, Springer, Berlin, 2004.
Lecture material.

Assessment methods and criteria:

The course will be assessed by a the report of the crystal structure determination.

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

Grading:

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

Person responsible:

Risto Laitinen

Working life cooperation:

No

Other information:

No