

Opasraportti

FMed - Courses in English for exchange students (2019 - 2020)

Courses in English for exchange students at the Faculty of Medicine

This Course Catalogue lists courses taught in English that are available for exchange students at the Faculty of Medicine during academic year 2019-20.

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. Course 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

12.8.2019 - 20.12.2019

Spring term 2020

6.1.2020 - 29.5.2020

For arrival and orientation dates see <https://www oulu.fi/university/studentexchange/academic-calendar>

Any questions on courses should be addressed to the coordinator of the degree programme you are studying. If you wish to choose any course from the degree you are not studying please contact the coordinator responsible for that degree.

Medicine: Elisa Mejías [elisa.mejias\(at\)oulu.fi](mailto:elisa.mejias@oulu.fi)

Dentistry: Virpi Harila, [virpi.harila\(at\)oulu.fi](mailto:virpi.harila@oulu.fi)

Biomedical Engineering: Heta Helakari [heta.helakari\(at\)oulu.fi](mailto:heta.helakari@oulu.fi)

Nursing Science and Health Management: Pirjo Kaakinen, [pirjo.kaakinen\(at\)oulu.fi](mailto:pirjo.kaakinen@oulu.fi)

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

Tutkintorakenteisiin kuulumattomat opintokokonaisuudet ja -jaksot

521285S: Affective Computing, 5 op
 060701A: Anaesthesiology, 1,5 op
 080925A: Anatomy and Physiology for Biomedical Engineering, 5 op
 041201A: Basics in eHealth, 5 op
 080916S: Biomechanics of Human Movement, 5 op
 580201A: Biomedical Engineering Programming Study, 5 op
 580202S: Biomedical Engineering Project, 5 op
 080928S: Biomedical Engineering Research Methods and Seminar, 5 op
 521093S: Biomedical Instrumentation, 5 op
 521240S: Biophotonics and Biomedical Optics, 5 op
 521273S: Biosignal Processing I, 5 op
 521282S: Biosignal Processing II, 5 op
 060709A-01: Cardiology, 3 op
 080927S: Connected Health and mHealth, 5 op
 090634A: Dental anxiety, 3 op
 090622A: Dental traumas, tooth transplantations and maxillomandibular fractures, 0,5 - 1 op
 060702A: Dermatology and venereology, 3 op
 080920S: Diagnostic Imaging, 5 op
 060709A-02: Endocrinology, 3 op
 090623A: Esthetics in prosthodontics, 0,2 - 1 op
 351205P: Foundations of Health Care Education, 5 op
 351207P: Foundations of Health Care Legislation, 5 op
 351204P: Foundations of Philosophy and Research Methods in Health Sciences, 5 op
 060704A-04: Gastroenterological surgery, 4 op
 090632A: Glass fibers in periodontal and prosthetic treatment, 0,3 - 1 op
 351206P: Health Care Systems in Finland and Inter-professional Networking, 5 op
 080929S: Health Technology and Multimodal Monitoring, 5 op
 060720A: International Minisymposium, 1 op
 080926A: Introduction to Biomedical Imaging Methods, 1 - 3 op
 351203P: Introduction to Health Sciences, 5 op
 090636A: Introduction to orthodontics, 3 op
 090621A: Light curing technique in restorative dentistry - theory and simulation, 0,2 - 1 op
 090624A: Literature exam: Fixed prosthodontics, 2 - 2,5 op
 090625A: Literature exam: Prosthetic treatment of edentulous patient, 3 op
 090626A: Literature exam: Stomatognathic physiology part I, 1 op
 090627A: Literature exam: Stomatognathic physiology part II, 2 - 2,5 op
 521289S: Machine Learning, 5 op
 521466S: Machine Vision, 5 op
 080922S: Microscopy and Spectroscopic Imaging, 5 op
 060706A: Neurosurgery, 3 op
 060710A: Oncology and radiotherapy, 3 op
 090635A: Oral and craniofacial growth and development: genetic, epigenetic, clinical and experimental approach, 1 op
 090618A: Oral and maxillofacial pathology, literature exam, 3 op
 090633A: Organisation of oral health care in Finland, 1 op
 060704A-01: Orthopaedics and Traumatology, 4 op
 090617A: Other studies given by the Institute of Dentistry within the Erasmus-project, 0 - 60 op
 061001A: Paediatrics, 14 op
 090620A: Pediatric Dentistry for Erasmus Exchange Students, 1 - 3 op
 090631A: Periodontal instrumentation, phantom training, 0,3 - 1 op
 090628A: Periodontology: Clinical diagnosis, risk assessment, prognosis and treatment plan, literature exam, 1 op
 090630A: Periodontology: Periodontal surgery, literature exam, 1,5 op
 090629A: Periodontology: Periodontal therapy, literature exam, 1 op
 080917S: Project in Biomedical Technology, 5 - 10 op
 080919S: Project in Health Technology, 5 - 10 op
 080918S: Project in Medical Imaging, 5 - 10 op
 060723A: Research project, 1 - 30 op

060703A: Respiratory Medicine, 3 op
 060709A-04: Rheumatology, 1 op
 521124S: Sensors and Measuring Techniques, 5 op
 090619A: The principles of endodontics, literature exam, 2 op
 080915S: Tissue Biomechanics, 5 op
 764327A: Virtual measurement environments, 5 op
 521097S: Wireless Measurements, 5 op

Opintojaksojen kuvaukset

Tutkintorakenteisiin kuulumattomien opintokokonaisuuksien ja -jaksojen kuvaukset

521285S: Affective Computing, 5 op

Voimassaolo: 01.08.2015 -

Opiskelumuoto: Advanced Studies

Laji: Course

Vastuuyksikkö: Computer Science and Engineering DP

Arvostelu: 1 - 5, pass, fail

Opettajat: Guoying Zhao

Opintokohteen kielet: English

ECTS Credits:

5 ECTS credits

Language of instruction:

In English

Timing:

Fall, periods 1

Learning outcomes:

After completing the course, student

1. is able to explain the emotion theory and modeling
2. is able to implement algorithms for emotion recognition from visual and audio signals, and the fusion of multi-modalities
3. has the ideas of wide applications of affective computing

Contents:

The history and evolution of affective computing; psychological study about emotion theory and modeling; emotion recognition from different modalities: facial expression, speech, fusion of multi-modalities; crowdsourcing study; synthesis of emotional behaviors; emotion applications.

Mode of delivery:

Face to face teaching

Learning activities and teaching methods:

The course consists of lectures and exercises. The final grade is based on the points from exam while there are several mandatory exercises.

Target group:

Computer Science and Engineering students and other Students of the University of Oulu.

Prerequisites and co-requisites:

A prior programming knowledge with Python, possibly the bachelor level mathematical studies and/or some lower level intermediate studies (e.g. computer engineering or artificial intelligence courses). The recommended optional studies include the advanced level studies e.g. the pattern recognition and neural networks and/or computer vision courses.

Recommended optional programme components:

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Recommended or required reading:

All necessary material will be provided by the instructor.

Assessment methods and criteria:

The assessment of the course is based on the exam (100%) with mandatory exercises.

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

Grading:

The course unit utilizes a numerical grading scale 1-5, zero stands for fail.

Person responsible:

Guoying Zhao, Henglin Shi, Yante Li

Working life cooperation:

No

060701A: Anaesthesiology, 1,5 op

Voimassaolo: 01.08.2013 -

Opiskelumuoto: Intermediate Studies

Laji: Course

Vastuuyksikkö: Medicine

Arvostelu: 1 - 5, pass, fail

Opettajat: Alahuhta, Seppo Matias

Opintokohteen kielet: English

ECTS Credits:

1.5 ECTS

Language of instruction:

English

Timing:

Autumn and Spring

Learning outcomes:

Student understands the basics of general anaesthesia and monitoring during the anaesthesia. Student knows the basics of acute pain treatment and advanced life support. He/she is able to recognize the unstable patient and knows how to start the treatment.

Mode of delivery:

Independent study

Learning activities and teaching methods:

Written examination.

Target group:

3rd-6th year medical students.

Prerequisites and co-requisites:

Preclinical studies completed.

Recommended optional programme components:

None

Recommended or required reading:

Clinical Anaesthesia by Gwinnutt, Wiley-Blackwell. Pages 9–14, 25–30, 38–44, 45–47, 52–63, 70–80, 87–89, 90–98, 111–120, 123–127, 136–159, 162–171

Assessment methods and criteria:

Written examination.

Grading:

A pass/fail grading system is utilized.

Person responsible:

Professor Seppo Alahuhta

Working life cooperation:

No

080925A: Anatomy and Physiology for Biomedical Engineering, 5 op

Voimassaolo: 01.08.2017 -

Opiskelumuoto: Intermediate Studies

Laji: Course

Vastuuyksikkö: Health Sciences

Arvostelu: 1 - 5, pass, fail

Opettajat: Miika Nieminen, Kyösti Heimonen

Opintokohteen kielet: English

ECTS Credits:

5 ECTS, 135 hours of work

Language of instruction:

English

Timing:

Master studies, spring term 2020, 4th period

Learning outcomes:

The student is able to define human anatomy and describe the physiological functions, and can explain how these can be investigated using different imaging methods and measurement systems

Contents:

The course acquaints the student to human physiology and anatomy. Areas covered include

Cells and tissues,

Skin, blood, blood circulation and the fluids of the body

Musculoskeletal organs

Defense reactions of the body

Respiration

Digestion

Urine secretion

Metabolic regulation, heat regulation

Reproduction

Sensory functions

Nervous system

Mode of delivery:

Face-to-face teaching

Learning activities and teaching methods:

Lectures 28h, demonstrations 6h. Independent studying 101h. Final examination.

Target group:

Biomedical engineering and physics students

Recommended optional programme components:

The course is an independent entity and does not require additional studies carried out at the same time. Imaging methods are more closely studied in the course 080920S Diagnostic Imaging.

Recommended or required reading:

Students will be informed about the supplementary reading in the beginning of the course.

Assessment methods and criteria:

Mandatory parts of the course: participation in demonstrations, passing the final exam.

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.

Course grade is based on score of the final exam

Person responsible:

Professor Miika Nieminen

Working life cooperation:

Demonstrations will be held in hospital environment and are related to diagnostics.

Other information:

Maximum number of participants is 40 students

041201A: Basics in eHealth, 5 op

Voimassaolo: 01.08.2011 -

Opiskelumuoto: Intermediate Studies

Laji: Course

Vastuuyksikkö: Medicine

Arvostelu: 1 - 5, pass, fail

Opettajat: Jarmo Reponen

Opintokohteen kielet: English

Leikkaavuudet:

ay041201A Basics in eHealth (OPEN UNI) 5.0 op

ECTS Credits:

5 ECTS, 135 hours of work

Language of instruction:

English

(native Finnish speakers are allowed to write their essay in Finnish)

Timing:

The main course for students of the (Master's) degree programmes is held in the spring semester, 3rd period.

This course is meant also for exchange students of the Biomedical Engineering programme

The special edition course is held for exchange students of the Faculty of Medicine (medicine, health sciences) in the autumn semester, 2nd period. Other students can participate in this course depending on availability of free places (limited number of places).

Learning outcomes:

Upon completion of the course:

The student can define central information and communication technology (ICT) terms and solutions in healthcare, and can list respective applications in healthcare services and training.

The student can evaluate the societal and economic significance of information and communication technology in healthcare

The student can understand the position of e-health and telemedicine solutions as a part of the national health care information system.

The student receives an initial view of future health ICT trends from clinical perspective and possibilities to contribute to these with his/her professional background

Contents:

Terms and concepts

- societal dimensions
- delivery of health services
- electronic patient records
- data transfer within the health care system
- data transfer between the health care professionals and the patients
- citizens providing their own health data, mHealth-solutions
- national healthcare information exchange in Finland
- remote consultations, examples like teleradiology, telepsychiatry, telerehabilitation
- economical and functional assessment
- remote education in health care
- future visions of health care information systems
- changing current topics in connected health like: Artificial Intelligence, knowledge based medicine, cybersecurity etc according to availability

Mode of delivery:

Web-based teaching

Learning activities and teaching methods:

Interactivity takes place in virtual learning environment Optima or Moodle depending availability during the course. The course consists of videotaped lectures, power point presentations and links to other material available in the web. Performance of duties includes an essay, exam, participating in moderated discussions on the grounds of the lectures.

Web lectures 15h / Web exam 40h / Written essay 40h* / Self-study and participation in web discussion 40h (*Exchange student can relate their essay to the situation in their home countries)

Target group:

MSc and 3rd year BSc students of Biomedical Engineering and Medical & Wellness Technology (medical technology, biomedical engineering, biophysics, physics, other degree programs), students of Medicine and Health Sciences and Information technology and everyone who is interested. Please, note the recommended separate course timings for different groups.

Prerequisites and co-requisites:

None

Recommended optional programme components:

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

Recommended or required reading:

All recommended or required reading is offered in the virtual learning environment or in linked web pages.

Assessment methods and criteria:

Web tasks, contribution to moderated discussion, an essay and course exams and optional final exam.

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:

Professor Jarmo Reponen

Course teacher Nina Keränen, MD, MSc

Course teacher Anna Maijala MSc

080916S: Biomechanics of Human Movement, 5 op

Voimassaolo: 01.08.2012 -

Opiskelumuoto: Advanced Studies

Laji: Course

Vastuuyksikkö: Health Sciences

Arvostelu: 1 - 5, pass, fail

Opettajat: Jämsä, Timo Jaakko

Opintokohteen kielet: English

Status:

-

ECTS Credits:

5 ECTS, 135 hours of work

Language of instruction:

English

Timing:

Master's studies, spring term 4th period

Learning outcomes:

The student can describe the main challenges of movement biomechanics and principles for motion analysis.

The student understands basics of biomechanical measurement and modeling of movement.

The student can perform practical biomechanical experiments, analyze measurement data, interpret results, and report them using good scientific reporting practice.

Contents:

Musculoskeletal biomechanics. Motion sensors and motion analysis. Biomechanical modeling of movement.

Balance measurement. Fall biomechanics. Measurement of physical activity.

Mode of delivery:

Face-to-face teaching

Learning activities and teaching methods:

Lectures 14h / assignment and group work 54 h /self-study 67h. Final exam.

Target group:

Master's students of Biomedical Engineering, medical and wellness technology, information technology and other related degree programs. Master's students of physics (biomedical physics). Other interested master's and postgraduate students.

Prerequisites and co-requisites:

The student needs to have basic knowledge on statistical analysis, sensors and measurement techniques and signal processing. It is also recommended to have basic knowledge on anatomy and physiology.

Recommended optional programme components:

The course is an independent entity and does not require additional studies carried out at the same time. Tissue biomechanics will be studied in the course 080915S.

Recommended or required reading:

Material given during lectures.

Assessment methods and criteria:

Accepted home exercises and lab assignments, exam.

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. Grading is made based on the exercise report and exam.

Person responsible:

Professor Timo Jämsä

Working life cooperation:

None

580201A: Biomedical Engineering Programming Study, 5 op

Voimassaolo: 01.08.2008 -

Opiskelumuoto: Advanced Studies

Laji: Course

Vastuuyksikkö: Health Sciences

Arvostelu: 1 - 5, pass, fail

Opettajat: Jämsä, Timo Jaakko

Opintokohteen kielet: Finnish

ECTS Credits:

5 ECTS credit points / 135 hours of work

Language of instruction:

Finnish / English

Timing:

The course can be taken in autumn or spring semester, or during the summer period. The course can be taken as an elective course of Bachelor or Master studies.

Learning outcomes:

Upon completion of the course, the student will be able to

- design and generate a solution to a programming problem related to biomedical engineering and
- report this in written form.

Contents:

Independent computer programming based on a defined task using modern programming tools; a written report.

Mode of delivery:

Independent work

Learning activities and teaching methods:

Student contacts the supervisor of programming task (list in folder of the course in the university's virtual learning platform) in order to agree on the topic and supervision. Student may also suggest own topic or topic from a company for responsible person, who evaluates suitability of the topic to the course. In latter cases, the supervisor is from the company.

Target group:

Degree students of Biomedical Engineering (primarily BME students of the Faculty of Medicine)

Prerequisites and co-requisites:

The required prerequisite is completion of the following courses (or student otherwise has corresponding knowledge and skills) prior to enrolling for the course: 521141P Elementary Programming 5 ECTS cr, 764327A (764627S) Virtual Measurement Environments.

Recommended optional programme components:

The course is an independent entity.

Assessment methods and criteria:

The grading is based on evaluating the fulfillment of task requirements based on the programmed software and prepared documentation.

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

Grading:

The course utilizes grading scale pass or fail

Person responsible:

Dr Maarit Kangas

Working life cooperation:

Programming task can be commissioned by a company or an other organization. Topic and supervision is agreed on together with the client.

580202S: Biomedical Engineering Project, 5 op

Opiskelumuoto: Advanced Studies

Laji: Course

Vastuuyksikkö: Health Sciences

Arvostelu: 1 - 5, pass, fail

Opettajat: Mikko Finnilä

Opintokohteen kielet: Finnish

ECTS Credits:

5 ECTS cr

Language of instruction:

Finnish / English

Timing:

The course can be taken during Master studies in autumn or spring semester, or during the summer period. However, it is recommended to be completed during the 2nd autumn semester.

Learning outcomes:

Upon completion of the course, the student will be able to solve a research or development problem and report it in writing and by giving an oral presentation.

Contents:

Performing a small scale research or development project.

Mode of delivery:

Independent work

Learning activities and teaching methods:

The student participates in project within or outside the university. Project topics are available in course folder in virtual learning platform. The student prepares a personal project plan and after the project the student prepares a written research report and presents it in a seminar. Additionally the student participates also in other seminar sessions.

Target group:

Degree students of the Medical and Wellness Technology programme and the Biomedical Engineering programme (primarily BME students of the Faculty of Medicine).

Recommended optional programme components:

The course is an independent entity.

Assessment methods and criteria:

The student prepares a project plan, participates in seminars, and reports project results in written report and in oral presentation.

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

Grading:

The course utilizes grading scale pass/fail.

Person responsible:

Post-doctoral Researcher Mikko Finnilä

Working life cooperation:

Project can be commissioned by a company or another organization. Topic and supervision are agreed on together with the client.

080928S: Biomedical Engineering Research Methods and Seminar, 5 op

Voimassaolo: 01.08.2017 -

Opiskelumuoto: Advanced Studies

Laji: Course

Vastuuyksikkö: Health Sciences

Arvostelu: 1 - 5, pass, fail

Opettajat: Jämsä, Timo Jaakko

Opintokohteen kielet: English

ECTS Credits:

5 ECTS, 135 hours of work

Language of instruction:

English

Timing:

Master studies, Autumn term, 1st period

Learning outcomes:

The student familiarizes with the principles of scientific work and research ethics.

The student can identify the essential features of scientific publications.

The student can present the central content of a scientific article to others.

The student can present critical questions related to a scientific presentation, and give and receive feedback on the presentations.

Contents:

Principles of scientific work. Ethical principles. Lectures, seminars and scientific literature. Publication forums in the field and characteristics of scientific articles. Popularization of science.

Mode of delivery:

Face-to-face teaching, remote connection will be offered for lectures and seminars

Learning activities and teaching methods:

Introduction lectures, presentations and discussion on the basis of the latest scientific publications. Each student will give two presentations and act as an opponent for two (peer-assessment).

Lectures 8h, seminars 26h, home exercise, self-study 101h.

Target group:

Biomedical Engineering MSc students

Recommended optional programme components:

The course prepares the student for thesis work.

Recommended or required reading:

Material given during lectures, selected scientific articles.

Assessment methods and criteria:

Attending seminars, making presentations and acting as an opponent. The assessment criteria are based on the learning outcomes of the course. More detailed assessment criteria can be found in e-learning platform.

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.

Grading is made based on student's presentations.

Person responsible:

Professor Timo Jämsä

Working life cooperation:

The course prepares for working life.

Other information:

Also for doctoral studies

521093S: Biomedical Instrumentation, 5 op

Voimassaolo: 01.08.2015 -

Opiskelumuoto: Advanced Studies

Laji: Course

Vastuuyksikkö: Electrical Engineering DP

Arvostelu: 1 - 5, pass, fail

Opettajat: Teemu Myllylä

Opintokohteen kielet: Finnish

Leikkaavuudet:

521107S Biomedical Instrumentation 6.0 op

ECTS Credits:

5

Language of instruction:

English.

Timing:

Period 4.

Learning outcomes:

After the course the student is capable to explain principles, applications and design of medical instruments most commonly used in hospitals. He/she can describe the electrical safety aspects of medical instruments and can present the physiological effects of electric current on humans. In addition the student is able to explain medical instrumentation development process and the factors affecting it. He/she also recognizes typical measurands and measuring spans and is able to plan and design a biosignal amplifier.

Contents:

Diagnostic instruments (common theories for medical devices, measurement quantities, sensors, amplifiers and registering instruments). Bioelectrical measurements (EKG, EEG, EMG, EOG, ERG), blood pressure and flow meters, respiration studies, measurements in a clinical laboratory, introduction to medical imaging methods and instruments, ear measurements, heart pacing and defibrillators, physical therapy devices, intensive care and operating room devices and electrical safety aspects.

Mode of delivery:

Face-to-face teaching.

Learning activities and teaching methods:

Lectures/exercises 42 h and self-study 100 h.

Target group:

Students interested in biomedical measurements.

Prerequisites and co-requisites:

None

Recommended optional programme components:

Course replaces earlier courses Biomedical measurements and Biomedical instrumentation.

Recommended or required reading:

R. S. Khandpur: Biomedical Instrumentation, Technology and Applications, McGraw-Hill, 2005 and J. G. Webster: Medical Instrumentation, Application and Design, 4th edition, John Wiley & Sons, 2010.

Assessment methods and criteria:

The course is passed by the final exam or optionally with the assignments/test agreed at the first lecture.

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

Grading:

1 - 5.

Person responsible:

Teemu Myllylä

Working life cooperation:

No.

521240S: Biophotonics and Biomedical Optics, 5 op

Voimassaolo: 01.08.2015 -

Opiskelumuoto: Advanced Studies

Laji: Course

Vastuuyksikkö: Electrical Engineering DP

Arvostelu: 1 - 5, pass, fail

Opettajat: Alexey Popov, Aliaksandr Bykau

Opintokohteen kielet: Finnish

ECTS Credits:

5

Language of instruction:

English

Timing:

Period 2

Learning outcomes:

On successful completion of the course, students will be able to categorize the basic principles of modern optical and laser-based diagnostic modalities and instruments used in advanced biomedical research and clinical medicine. They will be able to demonstrate detailed understanding and evaluate the key biophotonics techniques underlying day-to-day clinical diagnostic and therapies and industrial applications in pharmacy, health care and cosmetic products. They can operate with the selected techniques of their choice.

Contents:

The course includes in-depth coverage of state-of-the-art optical imaging and spectroscopy systems for advanced biomedical research and clinical diagnosis, fundamental properties of light such as coherence, polarization, angular momentum, details of light interaction with tissue, and modern imaging system. Coherent Optical Tomography (OCT), Laser Doppler Flowmetry, Laser Speckle Imaging (LSI), Photo-Acoustic Tomography (PAT), Tissue polarimetry; Optical and Near-Infra-Red Spectroscopy (NIRS), Confocal and Fluorescence Microscopies; Tissue Optics: Light/matter interactions, index of refraction, reflection, optical clearing, absorption, Mie scattering, Rayleigh scattering, Monte Carlo modelling.

Mode of delivery:

Face-to-face teaching.

Learning activities and teaching methods:

Lectures/exercises 42 h and self-study 100 h.

Target group:

Students interested in biomedical measurements.

Prerequisites and co-requisites:

None.

Recommended optional programme components:

A new course

Recommended or required reading:

V.V Tuchin: Handbook of Optical Biomedical Diagnostics, SPIE Press, 2002; V.V Tuchin: Handbook of Coherent Domain Optical Methods, Springer, 2nd edition, 2013. D.A Boas, C. Pitris, N. Ramanujam, Handbook of Biomedical Optics, CRC Press, 2011.

Assessment methods and criteria:

The course is passed by the final exam and with the assignments.

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

1 - 5

Person responsible:

Aliaksandr Bykau and Alexey Popov

Working life cooperation:

No.

521273S: Biosignal Processing I, 5 op**Voimassaolo:** 01.08.2005 -**Opiskelumuoto:** Advanced Studies**Laji:** Course**Vastuuyksikkö:** Computer Science and Engineering DP**Arvostelu:** 1 - 5, pass, fail**Opettajat:** Tapio Seppänen**Opintokohteen kielet:** Finnish**ECTS Credits:**

5 ECTS credits / 50 hours of work

Language of instruction:

English. Examination can be taken in English or Finnish.

Timing:

The course unit is held in the autumn semester, during period 2. It is recommended to complete the course at the end of studies.

Learning outcomes:

After completing the course, student

1. knows special characteristics of the biosignals and typical signal processing methods
2. can solve small-scale problems related to biosignal analysis
3. implement small-scale software for signal processing algorithms

Contents:

Biomedical signals. Digital filtering. Analysis in time-domain and frequency domain. Nonstationarity. Event detection. Signal characterization.

Mode of delivery:

Face-to-face teaching and guided laboratory work. The laboratory work can alternatively be performed on an online system.

Learning activities and teaching methods:

Lectures 10h, Laboratory work 20h, Self-study 20h, written examination.

Target group:

Students interested in biomedical engineering, at their master's level studies.

Students of the University of Oulu.

Prerequisites and co-requisites:

The mathematic studies of the candidate degree program of computer science and engineering, or equivalent. Programming skills, especially basics of the Matlab. Basic knowledge of digital signal processing.

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:

The course is based on selected chapters of the book "Biomedical Signal Analysis", R.M Rangayyan, 2nd edition (2015). + Lecture slides + Task assignment specific material.

Assessment methods and criteria:

Laboratory work is supervised by assistants who also check that the task assignments are completed properly. All task assignments are compulsory. The course ends with a written exam.

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

Grading:

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

Person responsible:

Tapio Seppänen

Working life cooperation:

No.

521282S: Biosignal Processing II, 5 op

Voimassaolo: 01.08.2015 -

Opiskelumuoto: Advanced Studies

Laji: Course

Vastuuyksikkö: Computer Science and Engineering DP

Arvostelu: 1 - 5, pass, fail

Opettajat: Jukka Kortelainen

Opintokohteen kielet: Finnish

Voidaan suorittaa useasti: Kyllä

ECTS Credits:

5 ECTS cr

Language of instruction:

Lectures and laboratory works are given in English. The examination can be taken in Finnish or English.

Timing:

Period 4

Learning outcomes:

After completing the course, student

1. knows the special characteristics of neural signals and the typical signal processing methods related to them
2. can solve advanced problems related to the neural signal analysis

Contents:

Introduction to neural signals, artifact removal, anesthesia and natural sleep, topographic analysis and source localization, epilepsy, evoked potentials.

Mode of delivery:

Face-to-face teaching

Learning activities and teaching methods:

Lectures (8 h) and laboratory work (20 h), written exam.

Target group:

Engineering students, medical and wellness technology students, and other students interested in biomedical engineering. Students of the University of Oulu.

Prerequisites and co-requisites:

The basic engineering math courses, digital filtering, programming skills, Biosignal Processing I.

Recommended optional programme components:

-

Recommended or required reading:

The course is based on selected parts from books "EEG Signal Processing", S. Sanei and J. A. Chambers, "Bioelectrical Signal Processing in Cardiac and Neurological Applications", L. Sörnmo and P. Laguna, and "Neural Engineering", B. He (ed.) as well as lecture slides and task assignment specific material.

Assessment methods and criteria:

Laboratory work is supervised by the assistants who will also check that the task assignments are completed properly. The course ends with a written exam.

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

Grading:

Numerical grading of the accepted exam is in the range 1-5.

Person responsible:

Jukka Kortelainen

Working life cooperation:

-

060709A-01: Cardiology, 3 op

Voimassaolo: 01.08.2013 -

Opiskelumuoto: Intermediate Studies

Laji: Partial credit

Vastuuyksikkö: Medicine

Arvostelu: 1 - 5, pass, fail

Opettajat: Juhani Juntila

Opintokohteen kielet: English

Ei opintojaksokuvauksia.

080927S: Connected Health and mHealth, 5 op

Voimassaolo: 01.08.2017 -

Opiskelumuoto: Advanced Studies

Laji: Course

Vastuuyksikkö: Health Sciences

Arvostelu: 1 - 5, pass, fail

Opettajat: Jarmo Reponen

Opintokohteen kielet: English

ECTS Credits:

5 ECTS, 135 hours of work

Language of instruction:

English

Timing:

The course is held in the autumn semester period I (1st period)

Learning outcomes:

Upon completion of the course:

- The students will have knowledge about the current overall status of clinical use of health information systems and related tools (e.g. e-Health, telemedicine, Virtual Hospital, ODA-portal and other self-care portals) in Finland
- The students will have knowledge about the state of the art development in mobile health technology solutions and connected health projects.
- The students have been introduced to some practical development examples taking place in OYS Testlab and possibly in other Oulu health test labs
- The students have had an opportunity to consult with some enterprises currently working in the m-Health / Connected health domain.
- Depending on the student composition of the course, the students have learned collaboration in a multiprofessional environment in the medical information and communication technology domain.

Contents:

Terms and concepts

- overview of information and communication technology and information systems in Finnish healthcare
- new processes that activate patient: virtual hospital, self-care models
- current update about mHealth, Connected Health, Artificial Intelligence in health care, secondary use of healthcare information
- collaborative development process in multiprofessional healthcare environment
- introduction to test laboratories
- case example, depending of current R&D&I work at the time of course
- web discussions and possible group assignments

Mode of delivery:

Blended teaching

Learning activities and teaching methods:

The implementation methods of the course vary. The course will consist of a combination of self-learning materials and activating workshops and other modules. The below mentioned amounts are approximations, because the actual contents will vary according to available development projects:

- virtual learning material in the university virtual learning environment (recorded lectures, examples, additional material) /With self-learning 40 hours of students time
- activating facilitated workshops, where the iterative innovation process is introduced to the students
- + introductions to the test laboratory environment + Special Key-note lectures either in the virtual environment or as participatory lectures in seminars/With self-learning 40 hours of students time
- Discussions and participation to web tasks /With self-learning 40 h of students time
- Exams and related work/15 h hours of student time

Target group:

Students of the Master's Programs in Biomedical Engineering and Medical & Wellness Technology. The course will also be available as an elective course for medicine, health sciences, information technology and other interested degree programs.

Prerequisites and co-requisites:

None

Recommended optional programme components:

It is recommended that the student has completed the course 041201A Basics in eHealth.

Recommended or required reading:

Recommended or required reading is offered in Oulu University virtual learning environment or in linked web pages. The teachers can recommend additional material in the beginning of the course.

Assessment methods and criteria:

Web tasks, contribution to moderated discussion and workshops, and course exams.
Read more about [assessment criteria](#) at the University of Oulu webpage.

Grading:

The course utilizes a numerical grading scale 1 – 5 or fail.

Person responsible:

Professor Jarmo Reponen (responsible teacher)
Professor Minna Pikkarainen

Course assistant Anna Maijala MSc

Working life cooperation:

The facilitated workshops are meant to be organized in collaboration with OuluHealth TestLabs and enterprises according to availability.

090634A: Dental anxiety, 3 op

Voimassaolo: 01.08.2019 -

Opiskelumoto: Intermediate Studies

Laji: Course

Vastuuyksikkö: Dentistry

Arvostelu: 1 - 5, pass, fail

Opettajat: Pohjola, Vesa Olavi

Opintokohteen kielet: English

ECTS Credits:

3 ECTS credits

Language of instruction:

English

Timing:

Fall and Spring

Learning outcomes:

The student

- understands causes and prevalence of dental anxiety
- knows treatment of anxious child and adult patients

Contents:

- Causes and prevalence of dental anxiety
- Treatment of anxious child and adult patients

Mode of delivery:

Self-study

Learning activities and teaching methods:

Self-study; totals 81 hours = 3,0 ECTS credits

Target group:

Dental Exchange Students

Prerequisites and co-requisites:

No

Recommended optional programme components:

No

Recommended or required reading:

Milgrom et al. Treating fearful dental patients. A patient management handbook. Seattle Washington (337 pages)

Assessment methods and criteria:

Literature exam

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

Grading:

The literature exam utilizes verbal grading scale pass/fail.

Person responsible:

Vesa Pohjola

Working life cooperation:

No

Other information:

The courses given by the Institute of Dentistry within the Erasmus-project
Community Dentistry

090622A: Dental traumas, tooth transplantations and maxillomandibular fractures, 0,5 - 1 op

Voimassaolo: 01.08.2019 -

Opiskelumuoto: Intermediate Studies

Laji: Course

Vastuuyksikkö: Dentistry

Arvostelu: 1 - 5, pass, fail

Opintokohteen kielet: English

Voidaan suorittaa useasti: Kyllä

ECTS Credits:

0,5 ECTS credits

Language of instruction:

English

Timing:

In Spring semester (lectures and practical sessions)

(In Fall semester only a written exam)

Learning outcomes:

Upon completion of the course, the student will be able to understand the treatment options of dental traumas and will be able to perform a simple dental trauma splinting.

Contents:

Lectures and practical sessions

Substance:

- Epidemiology of dental and maxilla-mandibular traumas
- Diagnosis and examination of trauma patients
- Prevention of traumas
- First aid treatment protocols
- Treatment guidelines and options of dental traumas
- Treatment guidelines and options of maxilla-mandibular traumas
- Late complications of traumas
- Splinting of traumatized teeth
- Immobilization and osteosynthesis of maxilla-mandibular fractures

Practical part:

- Construction of flexible wire-composite splint
- Construction of rigid wire-composite splint
- Construction of arch bar splint a.m. Erich
- Construction of wire fixation a.m. Ernst

Mode of delivery:

Face-to-face teaching

Learning activities and teaching methods:

Lectures 4 h, practicalities 2 h (0.5 ECTS credits)

Target group:

Dental Exchange Students

Prerequisites and co-requisites:

Basic courses and basic knowledge in oral and maxillofacial surgery

Recommended optional programme components:

-

Recommended or required reading:

Hubb, Ellis & Tucker: Contemporary Oral and Maxillofacial Surgery, 6th Ed.2014

Hand-outs

Assessment methods and criteria:

In Spring semester lectures and practicalities

(In Fall semester only a written exam)

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

Grading:

Lectures and practical sessions pass/fail

(A written exam 0-5)

Person responsible:

Olli-Pekka Lappalainen

Working life cooperation:

-

Other information:

The courses given by the Institute of Dentistry within the Erasmus-project

[Oral and Maxillofacial Surgery](#)

060702A: Dermatology and venereology, 3 op

Voimassaolo: 01.08.2013 -

Opiskelumuoto: Intermediate Studies

Laji: Course

Vastuuyksikkö: Medicine

Arvostelu: 1 - 5, pass, fail

Opettajat: Kaisa Tasanen-Määttä

Opintokohteen kielet: English

ECTS Credits:

3,0 ECTS/81 hours of work

Language of instruction:

The tuition is arranged in Finnish. The course unit can be completed in English by group teaching.

Timing:

The course unit is held in the autumn semester C9.

Learning outcomes:

Objective of the course expressed in terms of learning outcomes: After this course the student has the knowledge and skills in diagnostics and treatment of common skin diseases in order to be able to work as a general practitioner or house officer. Furthermore, the student has the basic skills to diagnose and treat allergological and venereal diseases.

Contents:

Theoretical teaching: Special features of status and anamnesis. Structure of skin. Basics of local treatments. Basics of allergology. Common skin diseases and their clinical findings. Skin tumours. Hereditary skin diseases. Dermatopathology. Venereal and paravenereal disease.. Practical teaching: Demonstrations, patient examination, small group teaching, bedside teaching, outpatient clinic, self study (material available in the web-based study system)

Mode of delivery:

The tuition will be implemented as lectures, theme days, face-to-face teaching and web-based teaching.

Learning activities and teaching methods:

Theoretical teaching 52 h

1. Lectures 32 h
2. Interactive lectures 6 h
3. Theme days 8h
4. Examinations 6 h

(note! only 81 h of work included for the international students)

Practical teaching 20 h

1. Small group teaching in the outpatient ward 17 h
2. Small group teaching in the inpatient ward 3 h

Self study

7. Self study using web-based material.

Target group:

Medical students

Prerequisites and co-requisites:

The recommended prerequisite is the completion of studies for previous semesters.

Recommended optional programme components:

The study unit cannot be completed alternatively.

Recommended or required reading:

Books:

Hannuksela, M., Karvonen, J., Reunala, T., Suhonen, R. (eds.). Ihotaudit. Kustannus Oy Duodecim.

Recommended reading: Haahtela T., Hannuksela M., Mäkelä M., Terho, E.O. (toim.): Allergia. Kustannus Oy Duodecim.

Assessment methods and criteria:

Initial examination has to be passed before starting the practical teaching. The end-of-course examination: books, lectures and small group teaching. Obligatory presence in the theme day teaching of allergology and in the theme day of venereology.

Grading:

The course unit utilizes a numerical grading scale 1-5.

The end-of-course examination contains 10 questions which are graded from 0-3. Maximal grade is 30 points and the level of acceptance is 15 points.

Person responsible:

Clinical lecturer Laura Huilaja

Working life cooperation:

No

Other information:

Research projects / Department of Dermatology

1.Molecular biology of bullous skin diseases

Responsible person: professor Kaisa Tasanen-Määttä

1. Epidemiology of skin diseases in Finland

Responsible person: professor Kaisa Tasanen-Määttä

1. Epidemiology of skin diseases in Northern Finland Birth

Cohort (NFBC1966)

Responsible person: professor Kaisa Tasanen-Määttä

080920S: Diagnostic Imaging, 5 op

Voimassaolo: 01.08.2017 -

Opiskelumuoto: Advanced Studies

Laji: Course

Vastuuyksikkö: Health Sciences

Arvostelu: 1 - 5, pass, fail

Opettajat: Miika Nieminen

Opintokohteen kielet: English

ECTS Credits:

5 ECTS, 135 hours of work

Language of instruction:

English

Timing:

Master studies, autumn 2019, 2nd period

Learning outcomes:

The student is able to define the physical principles on which various medical imaging devices are based upon.

Contents:

The course acquaints the students to the basic physics related to imaging modalities and therapeutic systems used in hospitals. Covered topics include e.g. x-ray imaging, computed tomography, magnetic resonance imaging, nuclear medicine and ultrasound.

Mode of delivery:

Face-to-face teaching

Learning activities and teaching methods:

Lectures 26h, demonstrations 8h, exercises 4h, independent studying and preparing report 97h. Final exam.

Target group:

Students of Biomedical Engineering and Medical and Wellness technology, information technology, master degree students in physics with biophysics as major or/and medical physics as minor, other minor subject students. Also for other students of the University of Oulu.

Prerequisites and co-requisites:

Recommended: basic courses in physics and course Radiation physics, biology and safety (766116P, 761116P, 764117P or 764317A).

Recommended optional programme components:

Other courses of biomedical engineering.

Recommended or required reading:

Dowsett, Kenny, Johnston: The Physics of Diagnostic Imaging, 2nd ed., Hodder Arnold, 2006.

Assessment methods and criteria:

Mandatory parts of the course: Participation in demonstrations, writing a report relating to demonstrations and passing the final exam.

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

Grading:

The course utilizes a numerical grading scale 1-5 or fail. Course grade is based on score of the final exam. Possibility to earn additional points from mathematical exercises.

Person responsible:

Professor Miika Nieminen

Working life cooperation:

Demonstrations are held in hospital environment and are related to diagnostics.

060709A-02: Endocrinology, 3 op

Voimassaolo: 01.08.2013 -

Opiskelumuoto: Intermediate Studies

Laji: Partial credit

Vastuuyksikkö: Medicine

Arvostelu: 1 - 5, pass, fail

Opettajat: Olavi Ukkola

Opintokohteen kielet: English

Ei opintojaksokuvauksia.

090623A: Esthetics in prosthodontics, 0,2 - 1 op

Voimassaolo: 01.08.2019 -

Opiskelumuoto: Intermediate Studies

Laji: Course

Vastuuyksikkö: Dentistry

Arvostelu: 1 - 5, pass, fail

Opettajat: Ritva Näpänkangas, Kirsi Sipilä

Opintokohteen kielet: English

ECTS Credits:

2 h of work, 0.2 ECTS credits

Language of instruction:

English

Timing:

Fall and Spring semester

Learning outcomes:

Upon completion of the course, the student will be able to discuss the esthetic considerations in fixed and removable prostheses.

Contents:

Esthetic considerations in fixed and removable prostheses.

Mode of delivery:

face-to-face teaching

Learning activities and teaching methods:

Lectures (2 hours)

Target group:

Dental Exchange Students

Prerequisites and co-requisites:

Basic courses in fixed and removable prosthodontics

Recommended optional programme components:

Fixed and removable prosthodontics

Recommended or required reading:

Lecture hand-outs

Schillingburg HT, Hobo S, Whittsett LD, Jakobi R, Brachett SE: Fundamentals of fixed prosthodontics. Quintessence Publishing Co. 4th ed. Pages: 413 - 424

Assessment methods and criteria:

The course unit utilizes verbal grading scale pass/fail.

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

Grading:

The course unit utilizes verbal grading scale pass/fail.

Person responsible:

DDS, PhD Ritva Näpänkangas

Working life cooperation:

No

Other information:

The courses given by the Institute of Dentistry within the Erasmus-project
[Prosthetic Dentistry and Stomatognathic Physiology](#)

351205P: Foundations of Health Care Education, 5 op

Opiskelumuoto: Basic Studies

Laji: Course

Vastuuyksikkö: Health Sciences

Arvostelu: 1 - 5, pass, fail

Opettajat: Jonna Juntunen

Opintokohteen kielet: Finnish

Leikkaavuudet:

ay351205P Foundations of Health Care Education (OPEN UNI) 5.0 op

ECTS Credits:

5 ECTS cr

Language of instruction:

Finnish

Timing:

Autumn term

Learning outcomes:

The student is able to describe general principles of Finnish social and healthcare education system (ISCED-classification) and main features of the programmes of the Finnish National Board of Education. The student is able to define main goals and strategies, to identify international collaboration and partners of the Finnish Ministry of Education and Culture. The student is able to structure gained knowledge in learning diary and in assessment of one's learning.

Contents:

Social and health care education system. Objectives, goals and different education and training policies of Finnish education/education system. Legislation of Finnish higher education. Internationalization of Finnish higher education institutions.

Mode of delivery:

Tutored studying in the online learning environment.

Learning activities and teaching methods:

Independent studying, reading of literature 60 h, peer evaluation of learning diaries and collaboration with other students 17 h, evaluation of retrieved information and preparation of written assignments 58 h.

Target group:

Undergraduate health science students

Prerequisites and co-requisites:

None

Recommended optional programme components:

-

Recommended or required reading:

Materials, publications on website of the Ministry of Education and Culture, legislation related to higher education, publications of Central Statistical Office of Finland/ISCED.

Assessment methods and criteria:

Independent studying, familiarizing with literature and completion of written assignments. Continuous assessment is applied. Read more about [assessment criteria](#) at the University of Oulu webpage.

Grading:

Pass / fail

Person responsible:

University teacher (nursing science)

Working life cooperation:

Working life cases are integrated into the course assignments

Other information:

This course is part of the Basic Studies in Health Sciences, which can be credited based on prior degree in health care completed at the University of Applied Sciences or applicable study modules in health sciences completed at the universities. Students who don't have prior degree in health care from university of applied sciences or applicable study modules in health sciences completed at the universities will complete Basic Studies in accordance with individually prepared electronic Personal Study Plan (e-PSP).

During the transition period of the Bachelor's Degree Programme (academic years 2018-2019, 2019-2020, 2020-2021), changes in mode of delivery, learning activities and teaching methods are possible.

351207P: Foundations of Health Care Legislation, 5 op

Opiskelumuoto: Basic Studies

Laji: Course

Vastuuyksikkö: Health Sciences

Arvostelu: 1 - 5, pass, fail

Opettajat: Moona Huhtakangas

Opintokohteen kielet: Finnish

Leikkaavuudet:

ay351207P Foundations of Health Care Legislation (OPEN UNI) 5.0 op

ECTS Credits:

5 ECTS cr

Language of instruction:

Finnish

Timing:

Autumn term

Learning outcomes:

The student is able to define principals of Finnish health care legislation. The student is able to describe and evaluate critically foundations of health care management.

Contents:

Legislation in health care (promotion of health, social and health services, staff of social and health care services, equality). Legislation in health care administration, basics of health care management.

Mode of delivery:

Tutored studying in the online learning environment

Learning activities and teaching methods:

Independent studying, reading of literature 77 h, evaluation of received information and completion of written assignments 58 h.

Target group:

Undergraduate health science students

Prerequisites and co-requisites:

None

Recommended optional programme components:

-

Recommended or required reading:

Websites and publications of the Parliament of Finland, the Ministry of Social Affairs and Health, Finland, the Central Statistical Office of Finland and the Ministry of Justice, Finland. Finnish legislation. Other relevant national and international scientific literature.

Assessment methods and criteria:

Active and independent studying. Familiarizing with literature and completion of written assignments. The course is assessed based on the written assignments. Read more about [assessment criteria](#) at the University of Oulu webpage.

Grading:

Pass / fail

Person responsible:

Doctoral candidate (health management science)

Other information:

This course is part of the Basic Studies in Health Sciences, which can be credited based on prior degree in health care completed at the University of Applied Sciences or applicable study modules in health sciences completed at the universities. Students who don't have prior degree in health care from university of applied sciences or applicable study modules in health sciences completed at the universities will complete Basic Studies in accordance with individually prepared electronic Personal Study Plan (e-PSP).

During the transition period of the Bachelor's Degree Programme (academic years 2018-2019, 2019-2020, 2020-2021), changes in mode of delivery, learning activities and teaching methods are possible.

351204P: Foundations of Philosophy and Research Methods in Health Sciences, 5 op

Opiskelumuoto: Basic Studies

Laji: Course

Vastuuyksikkö: Health Sciences

Arvostelu: 1 - 5, pass, fail

Opettajat: Heidi Siira

Opintokohteen kielet: Finnish

Leikkaavuudet:

ay351204P Foundations of Philosophy and Research Methods in Health Sciences (OPEN UNI) 5.0 op

ECTS Credits:

5 ECTS cr

Language of instruction:

Finnish

Timing:

Autumn term

Learning outcomes:

The student is able to

- define the philosophy, ethics and values of health care services.
- identify and define the norms and ethical principles, which are related to status of the client and are guiding the operations in health care
- recognize the most central ethical problems in health care, compare the ethical norms and regulations revealed in health care and patient care and related to different professional and work cultures.
- define Evidence Based Practice
- identify different stages of a research process
- define special characteristics of qualitative and quantitative research.
- recognize the main ethical principles of research in health sciences
- choose references relevant to one's research
- apply basics of scientific writing in one's own work.

Contents:

Ethical principles and professional ethics in health care, discussion of ethical questions from different perspectives and the effect of culture in health care. Evidence-based practice. Special characteristics of qualitative and quantitative research. Stages of a research process. Basics of scientific writing and referencing.

Mode of delivery:

Supervised studying in online learning environment.

Learning activities and teaching methods:

Independent studying and reading literature 80 h, evaluating the received information and writing of the assignment 40 h. Preparation for and completion of an on-line exam 15 h.

Target group:

Undergraduate students in health science

Prerequisites and co-requisites:

None required

Recommended optional programme components:

-

Recommended or required reading:

Materials and reports from webpages of the National Advisory Board on Social Welfare and Health Care "ETENE", relevant national and international scientific literature.

Assessment methods and criteria:

Active and independent studying is required. Familiarizing with literature and completion of a written assignment. This course unit will be assessed based on written assignment and on-line exam. A including self-evaluation and teacher's evaluation. This course unit utilizes continuous assessment including self-evaluation and teacher's evaluation. Read more about [assessment criteria](#) at the University of Oulu webpage.

Grading:

Pass / fail

Person responsible:

University teacher (nursing science)

Working life cooperation:

The student evaluates health care services and identifies ethical principles in order to guide the operation in health care. The student critically recognizes and compares ethical norms and regulations revealed in health care and patient care and related to different professional and work cultures.

Other information:

This course is part of the Basic Studies in Health Sciences, which can be credited based on prior degree in health care completed at the University of Applied Sciences or applicable study modules in health sciences completed at the universities. Students who don't have prior degree in health care from university of applied sciences or applicable study modules in health sciences completed at the universities will complete Basic Studies in accordance with individually prepared electronic Personal Study Plan (e-PSP).

During the transition period of the Bachelor's Degree Programme (academic years 2018-2019, 2019-2020, 2020-2021), changes in mode of delivery, learning activities and teaching methods are possible.

060704A-04: Gastroenterological surgery, 4 op

Voimassaolo: 01.08.2015 -

Opiskelumuoto: Intermediate Studies

Laji: Partial credit

Vastuuyksikkö: Medicine

Arvostelu: 1 - 5, pass, fail

Opettajat: Juvonen, Tatu Sakari

Opintokohteen kielet: English

Ei opintojaksokuvauksia.

090632A: Glass fibers in periodontal and prosthetic treatment, 0,3 - 1 op

Voimassaolo: 01.08.2019 -

Opiskelumuoto: Intermediate Studies

Laji: Course

Vastuuyksikkö: Dentistry

Arvostelu: 1 - 5, pass, fail

Opettajat: Pernu, Hilikka Elina, Ritva Näpänkangas

Opintokohteen kielet: Finnish

ECTS Credits:

0,3 ECTS credits

Language of instruction:

Finnish (handouts in English)

Timing:

Spring term

Contents:

Glass fibers in periodontal and prosthetic treatment (Stick Tech)

Mode of delivery:

Phantom practise 8 h

Learning activities and teaching methods:

Phantom practise 8 h

Target group:

Dental Exchange Students (with 3rd year dental students)

Recommended or required reading:

Handouts (in English)

Grading:

The course unit utilizes verbal grading scale pass/fail.

Person responsible:

Senior lecturers Hilikka Pernu and Ritva Näpänkangas

351206P: Health Care Systems in Finland and Inter-professional Networking, 5 op

Opiskelumuoto: Basic Studies

Laji: Course

Vastuuyksikkö: Health Sciences

Arvostelu: 1 - 5, pass, fail

Opettajat: Moona Huhtakangas

Opintokohteen kielet: Finnish

Leikkaavuudet:

ay351206P Health Care Systems in Finland and Inter-professional Networking (OPEN UNI) 5.0 op

ECTS Credits:

5 ECTS cr

Language of instruction:

Finnish

Timing:

Autumn term

Learning outcomes:

The student is able to define principles of the Finnish health care system and public health programs and compare them to programs of the World Health Organization. The student is able to identify main functions and forms of inter-professional networking in health care. The student is able to deepen one's knowledge and apply it in learning assignments. The student is able to plan and structure a new health promotion program and justify it ethically, scientifically and from a client's health perspective.

Contents:

Ministry of Social Affairs and Health, its goals and duties/responsibilities, strategies and programmes. National Institute for Health and Welfare, Finnish health care policy. Finnish social and health care services, organizations and social security. World Health Organization. Planning of an inter-professional health promotion programme. Inter-professional co-operation and support for the client.

Mode of delivery:

Tutored studying in the online learning environment

Learning activities and teaching methods:

Independent studying in the online learning environment. During the first part of the course: reading of literature 40 h and preparation of written assignments 30 h. During the second part of the course: reading of literature 35 h, writing an essay and designing a health promotion leaflet 30 h.

Target group:

Undergraduate health science students

Prerequisites and co-requisites:

None

Recommended optional programme components:

-

Recommended or required reading:

Materials, publications on the websites of the Ministry of Social Affairs and Health, the National Institute for Health and Welfare, the World Health Organization. Finnish legislation of social and health care, relevant scientific literature.

Assessment methods and criteria:

Independent studying. During the first part: reading of literature and written assignments. During the second part: creating a health promotion leaflet and preparation of a written assignment. In the written assignment, the student justifies approach chosen in the leaflet and describes the progress of the work. Continuous assessment based on self-assessment and teacher's assessment is applied. Read more about [assessment criteria](#) at the University of Oulu webpage.

Grading:

Pass / fail

Person responsible:

Doctoral candidate (health management science)

Other information:

This course is part of the Basic Studies in Health Sciences, which can be credited based on prior degree in health care completed at the University of Applied Sciences or applicable study modules in health sciences completed at the universities. Students who don't have prior degree in health care from university of applied sciences or applicable study modules in health sciences completed at the universities will complete Basic Studies in accordance with individually prepared electronic Personal Study Plan (e-PSP).

During the transition period of the Bachelor's Degree Programme (academic years 2018-2019, 2019-2020, 2020-2021), changes in mode of delivery, learning activities and teaching methods are possible.

080929S: Health Technology and Multimodal Monitoring, 5 op

Voimassaolo: 01.08.2017 -

Opiskelumuoto: Advanced Studies

Laji: Course

Vastuuyksikkö: Health Sciences

Arvostelu: 1 - 5, pass, fail

Opettajat: Teemu Myllylä

Opintokohteen kielet: English

ECTS Credits:

5 ECTS credit points /135 hours of work.

Language of instruction:

English

Timing:

The course is held in the Spring semester, during period III.

Learning outcomes:

The course provides students with a broad overview of the health technology that is currently in development and becoming for home and/or clinical use.

Students learn the concepts of multimodal monitoring and examples of its usage in clinical applications and in medical research (including human and animal studies).

Contents:

Multimodal monitoring is increasingly being employed in clinical monitoring and in the study of human physiology. It is the simultaneous measurement of multiple physiological parameters to provide better context for their interpretation and correlations, and to enable studies of relationships between different physiological signals. Besides the concepts of multimodal monitoring, this course provides students a broad overview of the health technology that is currently in development and becoming for home or clinical use. Moreover, their usage in medical applications and for different study purposes (human and animal) are dealt.

Mode of delivery:

Web-based teaching + Face-to-face teaching

Learning activities and teaching methods:

Lectures, demonstrations, seminars and self-study

Target group:

Medical and Biomedical students

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:

Reading material will be provided during the course.

Assessment methods and criteria:

The assessment of the course is based on the learning outcomes of the course, based on the seminar work and exam.

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:

Adjunct professor Teemu Myllylä

Working life cooperation:

There is no working life cooperation in this course.

060720A: International Minisymposium, 1 op

Voimassaolo: 01.08.2013 -

Opiskelumuoto: Intermediate Studies

Laji: Course

Vastuuyksikkö: Medicine

Arvostelu: 1 - 5, pass, fail

Opettajat: Olavi Ukkola

Opintokohteen kielet: English

ECTS Credits:

1.2 ECTS/32 h of student work

Language of instruction:

English

Timing:

The minisymposium is held in the autumn semester C10.

Learning outcomes:

To know what is the prevalence and trends of overweight and obesity in different parts of the world. Understand the underlying causes of obesity and its pathophysiology. Recognizing the diseases associated with excess body fat. Learn to evaluate obese subject in primary health care. Learn to define the optimal dietary approach and current available drug treatments to obesity. Understand the theoretical backgrounds, indications, surgical techniques and complications of obesity surgery.

Contents:

Prevalence and trends of overweight and obesity. Underlying causes of obesity and its pathophysiology. Disease associated with obesity. Evaluation of obese subject in primary health care. Defining optimal dietary approach and current available drug treatments to obesity. Theoretical backgrounds, indications, surgical techniques and complications of obesity surgery.

Mode of delivery:

Preparing presentations using theoretical background on provided literature under the guidance of supervisors. Giving presentations and discussion in the minisymposium.

Learning activities and teaching methods:

Preparing presentations 26 h

Minisymposium 6 h

Target group:

Medical students

Prerequisites and co-requisites:

Basic knowledge of gastrointestinal tract anatomy and physiology of hormonal control of food intake.

Recommended optional programme components:

The study unit cannot be completed alternatively.

Recommended or required reading:

Provided literature and e-material.

Assessment methods and criteria:

Meetings with the supervisors, preparing the presentation, giving the presentation, answering questions raised by the presentation and participating discussions on other presentations.

Grading:

Pass-Fail. No numeric evaluation.

Person responsible:

Professor Olavi Ukkola

Docent Vesa Koivukangas

Working life cooperation:

No.

Other information:

This course is recommended for those who plan on taking the course on Endocrinology.

080926A: Introduction to Biomedical Imaging Methods, 1 - 3 op

Voimassaolo: 01.08.2017 -

Opiskelumuoto: Intermediate Studies

Laji: Course

Vastuuyksikkö: Health Sciences

Arvostelu: 1 - 5, pass, fail

Opettajat: Lassi Rieppo

Opintokohteen kielet: English

ECTS Credits:

1-3 ECTS credit points / 27-81 hours of work

Language of instruction:

English

Timing:

Master studies, spring term 4th period.

Learning outcomes:

The student understands and can describe the basic principles and main applications of imaging methods used in biomedical research.

Contents:

Differences between in vivo, ex vivo and in vitro imaging.

Light and electron microscopy.

Optical projection and coherence tomography.

Optical in vivo imaging.

Magnetic resonance imaging.

Fourier transform infrared imaging spectroscopy and Raman imaging spectroscopy.

Micro-computed tomography.

Basics of image analysis and interpretation

Mode of delivery:

Face-to-face teaching. Compulsory participation in lectures.

Learning activities and teaching methods:

Number of ECTS cr of the course and the methods of implementation vary. The course includes lectures 19h, demonstrations 8h and final exam 3 h. Number of hours left for independent study depends on the number of the ECTS cr the student wishes to complete and is from 8 to 51 hours.

Target group:

All Bachelor's, Master's and postgraduate students interested in methods of biomedical imaging.

Recommended or required reading:

Handouts and literature given in the lectures.

Assessment methods and criteria:

Participation in the lectures and demonstrations. Exam. The course can be completed with 1, 2 or 3 ECTS cr.

1 ECTS →# compulsory participation in lectures

2 ECTS →# compulsory participation in lectures and demonstrations

3 ECTS →# compulsory participation in lectures, demonstrations and final exam

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

Grading:

The 1 and 2 ECTS cr courses utilize verbal grading pass or fail. The 3 ECTS cr course utilizes a numerical grading scale 1-5. In the numerical scale zero stands for a fail.

Person responsible:

Dr Lassi Rieppo

351203P: Introduction to Health Sciences, 5 op

Opiskelumuoto: Basic Studies

Laji: Course

Vastuuyksikkö: Health Sciences

Arvostelu: 1 - 5, pass, fail

Opettajat: Moona Huhtakangas

Opintokohteen kielet: Finnish

Leikkaavuudet:

ay351203P Introduction to Health Sciences (OPEN UNI) 5.0 op

ECTS Credits:

5 ECTS cr

Language of instruction:

Finnish

Timing:

Autumn term

Learning outcomes:

The student is able to use the online learning environment and study independently. The student is able to define concept of science and field of sciences. The student is able to define and explain the position of health sciences in the field of sciences. The student is capable of identifying current national and international issues of health sciences from perspective of health management science, nursing science and teacher education in health science.

Contents:

Online learning environment. Field of sciences and the position of health sciences in it. Current issues of health sciences.

Mode of delivery:

Tutored studying in the e-learning environment

Learning activities and teaching methods:

Independent studying, learning to manage the e-learning environment 8 h, reading literature, and current national and international scientific articles 62 h, evaluation of information and preparation of written assignments 60 h, and peer evaluation of a written assignment 5 h.

Target group:

Undergraduate students in health science

Prerequisites and co-requisites:

None

Recommended optional programme components:

-

Recommended or required reading:

Literature and other material provided for in online learning environment, current scientific articles and literature relevant to the topic.

Assessment methods and criteria:

Independent studying, reading of literature, and current national and international scientific articles, evaluation of information and completion of written assignments. Continuous assessment including self-evaluation and teacher's evaluation is applied. Read more about [assessment criteria](#) at the University of Oulu webpage.

Grading:

Pass / fail

Person responsible:

Doctoral candidate (health management science)

Other information:

This course is part of the Basic Studies in Health Sciences, which can be credited based on prior degree in health care completed at the University of Applied Sciences or applicable study modules in health sciences completed at the universities. Students who don't have prior degree in health care from university of applied sciences or applicable study modules in health sciences completed at the universities will complete Basic Studies in accordance with individually prepared electronic Personal Study Plan (e-PSP).

During the transition period of the Bachelor's Degree Programme (academic years 2018-2019, 2019-2020, 2020-2021), changes in mode of delivery, learning activities and teaching methods are possible.

090636A: Introduction to orthodontics, 3 op

Voimassaolo: 01.08.2019 -

Opiskelumuoto: Intermediate Studies

Laji: Course

Vastuuyksikkö: Dentistry

Arvostelu: 1 - 5, pass, fail

Opettajat: Pirttiniemi, Pertti Mikael

Opintokohteen kielet: English

ECTS Credits:

3 ECTS credits

Language of instruction:

English

Timing:

Fall and Spring

Contents:

Introduction to orthodontics

Mode of delivery:

Literature exam

Learning activities and teaching methods:

Literature exam

Target group:

Dental Exchange Students

Prerequisites and co-requisites:

-

Recommended or required reading:

Mitchell L. An Introduction to Orthodontics, 3rd Edition, Oxford.

Assessment methods and criteria:

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

Grading:

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

Person responsible:

Professor Pertti Pirttiniemi

Working life cooperation:

No

Other information:

The courses given by the Institute of Dentistry within the Erasmus-project

[Oral Development and Orthodontics](#)

090621A: Light curing technique in restorative dentistry - theory and simulation, 0,2 - 1 op

Voimassaolo: 01.08.2019 -

Opiskelumuoto: Intermediate Studies

Laji: Course

Vastuuyksikkö: Dentistry

Arvostelu: 1 - 5, pass, fail

Opettajat: Tarja Tanner

Opintokohteen kielet: Finnish

ECTS Credits:

1 h lecture, 1 h phantom-mode teaching, 0.2 ECTS credits

Language of instruction:

English

Timing:

Spring Semester

Learning outcomes:

Student will know how to and is able to effectively light cure

Contents:

- Theory of light curing and material polymerization
- Demonstration of optimal light curing technique
- Trying out light curing on interactive MARC-patient simulator

Mode of delivery:

Face-to-face teaching

Learning activities and teaching methods:

lecture, simulation training and hand-outs

1 h lecture, 1 h phantom-mode teaching, 0.2 ECTS credits

Target group:

Dental Exchange Students

Prerequisites and co-requisites:

none

Recommended optional programme components:

restorative dentistry, dental materials

Recommended or required reading:

hand-outs

Assessment methods and criteria:

MARC-simulator test, 16 J/cm²

Grading:

Pass/fail

Person responsible:

Specializing dentist, PhD Jukka Leinonen

Working life cooperation:

No

Other information:

The courses given by the Institute of Dentistry within the Erasmus-project

[Cariology, Endodontology and Paediatric Dentistry](#)

090624A: Literature exam: Fixed prosthodontics, 2 - 2,5 op

Voimassaolo: 01.08.2019 -

Opiskelumuoto: Intermediate Studies

Laji: Course

Vastuuyksikkö: Dentistry

Arvostelu: 1 - 5, pass, fail

Opettajat: Ritva Näpänkangas, Kirsi Sipilä

Opintokohteen kielet: English

ECTS Credits:

2,5 ECTS credits

Language of instruction:

English

Timing:

Fall and Spring semester

Learning outcomes:

Student knows the principles of fixed prosthetic treatment phases.

Mode of delivery:

Literature exam

Learning activities and teaching methods:

Literature exam

Target group:

Dental Exchange Students

Prerequisites and co-requisites:

-

Recommended optional programme components:

-

Recommended or required reading:

Schillingburg HT, Hobo S, Whittsett LD, Jakobi R, Brachett SE:

Fundamentals of fixed prosthodontics. Quintessence Publishing Co. 4th ed. Pages:

6) Treatment planning for single-tooth restorations (pp. 71 – 80)

7) Treatment planning for the replacement of missing teeth (pp. 81 – 98)

8) Fixed partial denture and implant configurations (pp. 99 – 130)

9) Principles of tooth preparations (pp. 131 – 148)

12) Preparations for intracoronal restorations (pp. 193 – 201)

13) Preparations for severely debilitated teeth (pp. 203 – 228)

14) Preparations for periodontally weakened teeth (pp. 229 – 240)

21) Cementation and bonding (pp. 383 – 412)

Assessment methods and criteria:

Written exam

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

Grading:

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

Person responsible:

DDS, PhD Ritva Näpänkangas

Working life cooperation:

No

Other information:

The courses given by the Institute of Dentistry within the Erasmus-project

[Prosthetic Dentistry and Stomatognathic Physiology](#)

090625A: Literature exam: Prosthetic treatment of edentulous patient, 3 op

Voimassaolo: 01.08.2019 -

Opiskelumuoto: Intermediate Studies

Laji: Course

Vastuuyksikkö: Dentistry

Arvostelu: 1 - 5, pass, fail

Opettajat: Ritva Kuoppala, Kirsi Sipilä

Opintokohteen kielet: English

ECTS Credits:

3,0 ECTS credits

Language of instruction:

English

Timing:

Fall and Spring semester

Learning outcomes:

Student knows the principles of prosthetic treatment of edentulous patients.

Contents:

Prosthetic treatment of edentulous patient

Mode of delivery:

Literature exam

Learning activities and teaching methods:

Literature exam

Target group:

Dental Exchange Students

Recommended or required reading:Basker RM and Davenport JC: **Prosthetic Treatment of the Edentulous Patient**. Blackwell Munksgaard, 4th ed. pp. 1-306.**Assessment methods and criteria:**Read more about [assessment criteria](#) at the University of Oulu webpage.**Grading:**

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

Person responsible:

DDS, PhD Ritva Kuoppala

Working life cooperation:

No

Other information:

The courses given by the Institute of Dentistry within the Erasmus-project

[Prosthetic Dentistry and Stomatognathic Physiology](#)**090626A: Literature exam: Stomatognathic physiology part I, 1 op**

Voimassaolo: 01.08.2019 -

Opiskelumuoto: Intermediate Studies

Laji: Course

Vastuuyksikkö: Dentistry

Arvostelu: 1 - 5, pass, fail

Opettajat: Kirsi Sipilä, Ritva Näpänkangas

Opintokohteen kielet: English

ECTS Credits:

1,0 ECTS credits

Language of instruction:

English

Timing:

Fall and Spring semester

Learning outcomes:

Student knows the functional anatomy and biomechanics of the masticatory system.

Mode of delivery:

Literature exam

Learning activities and teaching methods:

Literature exam

Target group:

Dental Exchange Students

Prerequisites and co-requisites:

None

Recommended optional programme components:

The courses given by the Institute of Dentistry within the Erasmus-project

Recommended or required reading:

Jeffrey P. Okeson: Management of Temporomandibular Disorders and Occlusion. 7th edition. Mosby, pp 1-99.

Assessment methods and criteria:

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

Grading:

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

Person responsible:

Professor Kirsi Sipilä

Working life cooperation:

No

Other information:

The courses given by the Institute of Dentistry within the Erasmus-project

[Prosthetic Dentistry and Stomatognathic Physiology](#)

090627A: Literature exam: Stomatognathic physiology part II, 2 - 2,5 op

Voimassaolo: 01.08.2019 -

Opiskelumuoto: Intermediate Studies

Laji: Course

Vastuuyksikkö: Dentistry

Arvostelu: 1 - 5, pass, fail

Opettajat: Kirsi Sipilä, Ritva Näpänkangas

Opintokohteen kielet: English

ECTS Credits:

2,5 ECTS credits

Language of instruction:

English

Timing:

Fall and Spring term

Learning outcomes:

Student knows epidemiology, etiology, diagnosis and treatment of temporomandibular disorders.

Contents:

Structure and function of masticatory system

Mode of delivery:

Literature exam

Learning activities and teaching methods:

Literature exam

Target group:

Dental Exchange Students

Prerequisites and co-requisites:

None

Recommended optional programme components:

The courses given by the Institute of Dentistry within the Erasmus-project

Recommended or required reading:

Jeffrey P. Okeson: Management of Temporomandibular Disorders and Occlusion. 7th edition. Mosby, pp 102-456.

Assessment methods and criteria:

Written literature exam

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

Grading:

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

Person responsible:

Professor Kirsi Sipilä

Working life cooperation:

No

Other information:

The courses given by the Institute of Dentistry within the Erasmus-project

[Prosthetic Dentistry and Stomatognathic Physiology](#)

521289S: Machine Learning, 5 op

Voimassaolo: 01.08.2015 -

Opiskelumuoto: Advanced Studies

Laji: Course

Vastuuyksikkö: Computer Science and Engineering DP

Arvostelu: 1 - 5, pass, fail

Opettajat: Tapio Seppänen

Opintokohteen kielet: Finnish

Leikkaavuudet:

521497S-01	Pattern Recognition and Neural Networks, Exam	0.0 op
521497S-02	Pattern Recognition and Neural Networks; Exercise Work	0.0 op
521497S	Pattern Recognition and Neural Networks	5.0 op

ECTS Credits:

5 ECTS cr

Language of instruction:

English. Examination can be taken in English or Finnish.

Timing:

The course unit is held in the spring semester, during period III. It is recommended to complete the course at the end of studies.

Learning outcomes:

After completing the course, student

1. can design simple optimal classifiers from the basic theory and assess their performance.
2. can explain the Bayesian decision theory and apply it to derive minimum error classifiers and minimum cost classifiers.
3. can apply the basics of gradient search method to design a linear discriminant function.
4. can apply regression techniques to practical machine learning problems.

Contents:

Introduction. Bayesian decision theory. Discriminant functions. Parametric and non-parametric classification. Feature extraction. Classifier design. Example classifiers. Statistical regression methods.

Mode of delivery:

Face-to-face teaching, guided laboratory work and independent assignment.

Learning activities and teaching methods:

Lectures 16 h, Laboratory work 16 h, Exercise 16 h and Self-study the rest (Independent task assignment, written examination).

Target group:

Students who are interested in data analysis technology. Students of the University of Oulu.

Prerequisites and co-requisites:

The mathematic studies of the candidate degree program of computer science and engineering, or equivalent. Programming skills, especially basics of the Matlab.

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:

Duda RO, Hart PE, Stork DG, Pattern classification, John Wiley & Sons Inc., 2nd edition, 2001. Handouts.

Assessment methods and criteria:

Laboratory work is supervised by assistants who also check that the task assignments are completed properly. The independent task assignment is graded. The course ends with a written exam.

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

Grading:

The course unit utilizes a numerical grading scale 1-5. In the numerical scale zero stands for a fail. The final grade is established by weighing the written exam by 2/3 and the task assignment by 1/3.

Person responsible:

Tapio Seppänen

Working life cooperation:

No

521466S: Machine Vision, 5 op

Opiskelumuoto: Advanced Studies

Laji: Course

Vastuuyksikkö: Computer Science and Engineering DP

Arvostelu: 1 - 5, pass, fail

Opettajat: Heikkilä, Janne Tapani

Opintokohteen kielet: Finnish

ECTS Credits:

5 ECTS cr

Language of instruction:

English

Timing:

Spring, period 3.

Learning outcomes:

Upon completion of the course the student

1. understands the fundamentals of image acquisition, representation and modeling
2. can utilize elementary methods of machine vision for image recognition problems
3. can use 2D transformations in model fitting and image registration
4. can explain the basics of 3D imaging and reconstruction

Contents:

1. Introduction, 2. Imaging and image representations, 3. Light and color, 4. Binary image analysis, 5. Texture, 6. Local features, 7. Recognition, 8. Motion, 9. 2D models and transformations, 10. Perceiving 3D from 2D images, 11. 3D transformations and reconstruction.

Mode of delivery:

Face-to-face teaching, homework assignments.

Learning activities and teaching methods:

Lectures (20 h), exercises (16 h) and programming assignments (30 h), self-studying (67 h).

Target group:

Computer Science and Engineering students and other Students of the University of Oulu.

Prerequisites and co-requisites:

521467A Digital Image Processing or an equivalent course, basic Python programming skills.

Recommended optional programme components:

521289S Machine Learning. This course provides complementary knowledge on machine learning methods needed in machine vision.

Recommended or required reading:

Lecture slides and exercise material. The following books are recommended for further information: 1) Shapiro, L. G. & Stockman, G.C.: Computer Vision, Prentice Hall, 2001. 2) Szeliski, R.: Computer Vision: Algorithms and Applications, Springer, 2011. 3) Forsyth, D.A. & Ponce, J.: Computer Vision: A Modern Approach, Prentice Hall, 2002.

Assessment methods and criteria:

The course is passed with final exam and accepted homework assignments.

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

Grading:

Numerical grading scale 1-5. Zero stands for a fail.

Person responsible:

Janne Heikkilä

Working life cooperation:

No.

080922S: Microscopy and Spectroscopic Imaging, 5 op

Voimassaolo: 01.08.2017 -

Opiskelumuoto: Advanced Studies

Laji: Course

Vastuuyksikkö: Health Sciences

Arvostelu: 1 - 5, pass, fail

Opettajat: Lassi Rieppo

Opintokohteen kielet: English

ECTS Credits:

5 ECTS credit points /135 hours of work.

Language of instruction:

English

Timing:

The course is held in the spring semester during period 3. It is recommended to complete the course during Master studies. **The course is organized every second year in uneven years (next time in spring 2021).**

Current description of the course will be updated by then.

Learning outcomes:

to be updated: Upon completion of the course, the student can:

- Explain the physical and technical background of conventional optical microscopy, micro-computed tomography, atomic force microscopy, visible light imaging spectroscopy, fourier-transform infrared imaging spectroscopy and Raman imaging spectroscopy
- Understand and describe the concept and differences between grayscale image, RGB image and spectral image
- Perform microscopic and spectroscopic imaging in practice
- Perform basic quantitative analysis for microscopic images
- Perform univariate and multivariate analysis for spectral image data

Contents:

to be updated:

- Introduction to microscopy and spectroscopic imaging
- Quantitative imaging and basic image analysis methods
- Bright field microscopy and digital densitometry
- Polarized light microscopy
- Phase-contrast microscopy, differential interference contrast microscopy, and confocal microscopy
- Micro-computed tomography
- Atomic force microscopy
- Optical imaging spectroscopy, Fourier-transform infrared imaging spectroscopy and Raman imaging spectroscopy
- Univariate and multivariate spectral analysis methods

Mode of delivery:

to be updated: Face-to-face teaching

Learning activities and teaching methods:

to be updated: Lectures 20 h / Exercises 8 h / Demonstrations 6 h, Practical microscopy assignment 15 h / Self-study 86 h. Final exam.

Target group:

to be updated: Master students of Biomedical Engineering (all degree programs) and Physics (biomedical physics major and other minor subject students). The course is also suitable for other interested students with adequate prerequisites.

Prerequisites and co-requisites:

to be updated: Basic knowledge on physics, calculus, differential equations and matrix algebra is required. The ability to use Matlab software is recommended as it will be used in the exercises.

Recommended or required reading:

to be updated: Material given during lectures.

Assessment methods and criteria:

to be updated:

Accepted exercises, assignment and written final exam. The final exam is based on lectures and other given materials, and it includes definition and explanation assignments and problems (including mathematical calculations).

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

Grading:

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

Person responsible:

Dr Lassi Rieppo

Other information:

The course is organized every second year in uneven years (next time in spring 2021). Description of the course will be updated in the curriculum of the academic year 2020-21.

060706A: Neurosurgery, 3 op**Voimassaolo:** 01.08.2013 -**Opiskelumuoto:** Intermediate Studies**Laji:** Course**Vastuuyksikkö:** Medicine**Arvostelu:** 1 - 5, pass, fail**Opettajat:** Sami Tetri**Opintokohteen kielet:** English**ECTS Credits:**

3.5 ECTS credits

Language of instruction:

English

Timing:

Spring semester

Learning outcomes:

The student knows the clinical presentation, diagnostics and treatment of neurosurgical diseases and trauma. The student can evaluate the urgency of treatment of neurosurgical conditions and understands their debilitating and often life-threatening nature. The roles of prevention and rehabilitation are also stressed.

Contents:

The management of neurosurgical trauma and diseases with special emphasis on the clinical competence required of a general practitioner

Mode of delivery:

Blended teaching

Learning activities and teaching methods:

The neurosurgical course is based on full-time participation in all clinical activities of the department for a minimum of one week during February or March when the neurosurgical course is offered. Bedside learning and the importance of the patient-doctor relationship as well as work in an environment that fosters multi-professional teamwork are stressed. For ECTS credits a textbook-based final examination in April must be passed.

Target group:

For medical students in their final year of study or after passing Neurology course in their home University.

Prerequisites and co-requisites:

The required prerequisite is the completion of the following courses prior to enrolling for the course unit: A passing grade in clinical neurology is required before enrollment in the neurosurgical course.

Recommended optional programme components:

None

Recommended or required reading:

K. W. Lindsay, I. Bone, G. Fuller. Neurology and Neurosurgery Illustrated, latest edition. Churchill Livingstone.

Assessment methods and criteria:

Participation with the guidance of an assigned doctor in the clinical and academic activities of the neurosurgical department, including small group learning sessions, clinical ward rounds, meetings, and observation of surgical procedures. ECTS credit requires passing a written final examination

Grading:

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

Person responsible:

Professor Sami Tetri

Working life cooperation:

No

Other information:

Maximum of four exchange students can be accepted to the course yearly.

060710A: Oncology and radiotherapy, 3 op

Voimassaolo: 01.08.2013 -

Opiskelumuoto: Intermediate Studies

Laji: Course

Vastuuyksikkö: Medicine

Arvostelu: 1 - 5, pass, fail

Opettajat: Turpeenniemi-Hujanen, Taina Marjatta

Opintokohteen kielet: English

ECTS Credits:

3.5 ECTS credits

2.5 ECTS without exam

Language of instruction:

English

Timing:

September-December

Learning outcomes:

Upon completion of this curricular unit, student should be able to understand principles of cancer etiology, diagnosis, therapeutic modalities and their adverse events, and palliative care.

Contents:

The diagnostics, oncological therapeutic modalities and monitoring of adult solid malignancies and lymphomas.

Mode of delivery:

Blended teaching.

Learning activities and teaching methods:

- Pre-examination (3 h, at home)
- Lectures / tutorials (10 h) concerning the entities of breast cancer, colorectal cancer, lymphomas, and lung cancer
- Group work:
 - Ward rounds with professor (6 x 2 h/week, including 2x2h in palliative care)
 - Demonstration of the planning of a CT-based radiotherapy and radiotherapy treatment (3 h)
 - Group practice of clinical problem-solving: Evaluation of the case reports (3 h)
- Final examination (2h)

Target group:

4-6th year medical students.

Prerequisites and co-requisites:

It is preferred that student has completed basic courses of pathology, clinical chemistry, radiology, internal medicine, and surgery prior to enrolling for the course unit.

Recommended optional programme components:

None

Recommended or required reading:

Jim Cassidy, Donald Bissett, Roy Spence, and Miranda Payne: Oxford Handbook of Oncology (3 ed.), 2011

<http://www oulu.fi/library/> -> [Subject Guides](#) -> [E-books](#) -> [Oxford Medical Handbooks](#) -> [Oxford Handbook of Oncology \(3 ed.\)](#)

Assessment methods and criteria:

Preliminary and final examinations must be passed. Preliminary examination and all other course units must be passed before participation in the final examination. Half of the maximum points should be gained in order to pass the exam. If maximum is 40 points then the passing the exam requires 20 points.

Evaluation is based on final examination (essays).

Grading:

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

The grade is given only to the students who take the final examination.

Person responsible:

Professor Taina Turpeenniemi-Hujanen

Working life cooperation:

No

Other information:

The course will be organized only when there are at least five students.

090635A: Oral and craniofacial growth and development: genetic, epigenetic, clinical and experimental approach, 1 op

Voimassaolo: 01.08.2019 -

Opiskelumuoto: Intermediate Studies

Laji: Course

Vastuuyksikkö: Dentistry

Arvostelu: 1 - 5, pass, fail

Opettajat: Pirttiniemi, Pertti Mikael

Opintokohteen kielet: English

ECTS Credits:

Lectures 10 h (1 ECTS credit)

Language of instruction:

English

Timing:

Fall and Spring

Learning outcomes:

Upon completion of the course, the student will be able to explain normal and abnormal development of the teeth, oral structures and occlusal morphology in humans. In addition to this the student will be able to explain pre-, peri- and postnatal development of dentition and different oral structures, in specific the effect of disturbing factors during pregnancy and child's early development as well as genetic factors on the developing phenotype.

The student also knows how to guide mandibular growth, can explain the mechanism of regulation, influence of functional orthodontic appliances and growth of maxilla and neurocranium.

Having completed the course, the student is able to explain the interaction between facial structures and breathing function and also the expression and etiology of asymmetric growth.

Contents:

Within these lectures normal and abnormal development of the teeth, oral structures and occlusal morphology in humans is critically examined. Included are pre-, peri- and postnatal development of dentition and different oral structures, in specific the effect of disturbing factors during pregnancy and child's early development as well as genetic factors on the developing phenotype. Further, guiding of mandibular growth, mechanism of regulation, influence of functional orthodontic appliances, growth of maxilla and neurocranium are lectured. The interaction between facial structures and breathing function, and the expression and etiology of asymmetric growth are also the topics of lectures.

Mode of delivery:

Face-to-face-teaching

Learning activities and teaching methods:

Lectures 10 hours. Advanced studies available

Target group:

Dental Exchange Students

Prerequisites and co-requisites:

-

Recommended optional programme components:

-

Assessment methods and criteria:

Taking part into the lectures. (Written exam)

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

Grading:

The course unit utilizes verbal grading scale pass/fail.

Person responsible:

Professor Pertti Pirttiniemi

Working life cooperation:

No

Other information:

The courses given by the Institute of Dentistry within the Erasmus-project

[Oral Development and Orthodontics](#)

090618A: Oral and maxillofacial pathology, literature exam, 3 op

Voimassaolo: 01.08.2019 -

Opiskelumuoto: Intermediate Studies

Laji: Course

Vastuuyksikkö: Dentistry

Arvostelu: 1 - 5, pass, fail

Opettajat: Salo, Tuula Anneli

Opintokohteen kielet: English

ECTS Credits:

3 ECTS credits

Language of instruction:

English

Timing:

Fall and Spring

Mode of delivery:

Literature exam (4 h)

Learning activities and teaching methods:

Literature exam (4 h)

Target group:

Dental Exchange Students

Recommended or required reading:

Regezi JA, Sciubba J, Jordan RCK. Textbook: Oral & Maxillofacial Pathology: Clinical Pathologic Correlations. 7th edition. WB Saunders Co. Philadelphia, PA, 2008

Assessment methods and criteria:

Literature exam (4 h)

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

Grading:

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

Person responsible:

Professor Tuula Salo

Working life cooperation:

No

Other information:

The courses given by the Institute of Dentistry within the Erasmus-project Diagnostics and Oral Medicine, [Oral and Maxillofacial Pathology](#)

090633A: Organisation of oral health care in Finland, 1 op

Voimassaolo: 01.08.2019 -

Opiskelumuoto: Intermediate Studies

Laji: Course

Vastuuyksikkö: Dentistry

Arvostelu: 1 - 5, pass, fail

Opettajat: Marja-Liisa Laitala

Opintokohteen kielet: English

ECTS Credits:

1,0 ECTS credit

Language of instruction:

English

Timing:

Fall and Spring

Learning outcomes:

The student

- knows implementation of public oral health cares
- understands regulations of oral health care
- visit to public oral health centre

Contents:

Nordic health services

Regulations of oral health care

Visits to oral health center(s)

Mode of delivery:

Lectures and on-site visits (12 hours, 1.0 ECTS credits)

Learning activities and teaching methods:

Lectures and on-site visits (12 hours, 1.0 ECTS credits)

Target group:

Exchange Students

Prerequisites and co-requisites:

No

Recommended optional programme components:

No

Recommended or required reading:

Niiranen T, Widström E & Niskanen T: Oral health care reform in Finland – aiming to reduce inequity in care provision. BMC Oral Health 2008; 8:3

Assessment methods and criteria:

Lectures and on-site visits (12 hours, 1.0 ECTS credits)

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

Grading:

The course unit utilizes verbal grading scale pass/fail

Person responsible:

Marja-Liisa Laitala

Working life cooperation:

No

Other information:

The courses given by the Institute of Dentistry within the Erasmus-project
Community Dentistry

060704A-01: Orthopaedics and Traumatology, 4 op

Voimassaolo: 01.08.2015 -

Opiskelumuoto: Intermediate Studies

Laji: Partial credit

Vastuuyksikkö: Medicine

Arvostelu: 1 - 5, pass, fail

Opettajat: Juvonen, Tatu Sakari

Opintokohteen kielet: English

Ei opintojaksokuvauksia.

090617A: Other studies given by the Institute of Dentistry within the Erasmus-project, 0 - 60 op

Voimassaolo: 01.08.2019 -

Opiskelumuoto: Intermediate Studies

Laji: Course

Vastuuyksikkö: Dentistry

Arvostelu: 1 - 5, pass, fail

Opintokohteen kielet: English

Voidaan suorittaa useasti: Kyllä

Language of instruction:

English

Contents:

E.g. following our students clinical work (27 h = 1 ECTS credit) or other dental studies during the exchange

Target group:

Dental Exchange Students

Assessment methods and criteria:

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

061001A: Paediatrics, 14 op

Voimassaolo: 01.08.2016 -

Opiskelumuoto: Intermediate Studies

Laji: Course

Vastuuyksikkö: Medicine

Arvostelu: 1 - 5, pass, fail

Opettajat: Terhi Tapiainen

Opintokohteen kielet: English

ECTS Credits:

14 ECTS

Language of instruction:

English

Timing:

The course unit is held in the autumn semester (weeks 33-43).

Learning outcomes:

Upon completion the student is able:

-to diagnose and treat the most common pediatric diseases as a general practitioner or as a first-year resident in a hospital

-to provide first aid to acutely and critically ill children

-to understand pediatric preventive health care and health education

Contents:

Growth and development, medical history and clinical examination of a child, allergology, endocrinology, diabetology, gastroenterology, hematology, infectious diseases, cardiology, pediatric surgery, pediatric neurology, nephrology, neonatology, oncology, emergency medicine

Mode of delivery:

Blended teaching

Learning activities and teaching methods:

Theme-day 4 h

Small group teaching

- Group teaching 39h

- Ward rounds and learning at wards, following of the own patient 24h

- Outpatient clinic learning 26 h

- Attending to the paediatric emergency (including patient examinations and 7 case records) 12 hours

Seminars 16 h

Student-visit 4 h

Practical training, 2 weeks in Oulu University Hospital

The admission exam 1h (web-based)

The patient exam 1 h

The final exam 4 h

Self-study 133 h

Target group:

Medical Students

Prerequisites and co-requisites:

The prerequisites for the course unit are previous studies (C1-8 course units)

Recommended optional programme components:

No alternative course units.

Recommended or required reading:

Marcdante Karen J & Kliegman Robert M (edit.) Nelson Essentials of Pediatrics, Seventh Edition, 1 Elsevier (2015).

E-book available from the Oulu University Library.

Assessment methods and criteria:

The assessment of the course unit is based on the learning outcomes of the course unit.

Preliminary test is multiple choice test. Required literature: text book. The preliminary test is evaluated from 0 to 50 points (the approval limit is 20 points). Exam should be passed during one week from the beginning of the course.

Attending to all compulsory teaching (evaluated pass/ fail).

Patient cases exam (evaluated from 0 to 20. approval limit is 5 points). Grading 1-5/ fail.

The final exam (evaluated from 0-60 points, approval limit is 35 points. Grading 1-5/ fail.

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

Grading:

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

The final grade of the course is formed of final exam (85%) and patient cases exam (15%)

Person responsible:

Mika Rämetsä

Terhi Tapiainen

Working life cooperation:

Yes. Each student will follow the work of pediatricians taking care of patients in two weeks in Oulu University Hospital.

090620A: Pediatric Dentistry for Erasmus Exchange Students, 1 - 3 op

Voimassaolo: 01.08.2019 -

Opiskelumuoto: Intermediate Studies

Laji: Course

Vastuuyksikkö: Dentistry

Arvostelu: 1 - 5, pass, fail

Opintokohteen kielet: Finnish

ECTS Credits:

3 ECTS credits

Language of instruction:

English

Timing:

Fall and Spring Semester

Learning outcomes:

Textbook: Welbury, Duggal, Hosey (eds.) Paediatric Dentistry, 4th ed. Oxford University Press 2012.

Contents:

Textbook: Welbury, Duggal, Hosey (eds.) Paediatric Dentistry, 4th ed. Oxford University Press 2012.

Mode of delivery:

Written exam

Learning activities and teaching methods:

Written exam

Target group:

Dental Exchange Students

Prerequisites and co-requisites:

-

Recommended optional programme components:

-

Recommended or required reading:

Textbook: Welbury, Duggal, Hosey (eds.) Paediatric Dentistry, 4th ed. Oxford University Press 2012.

Assessment methods and criteria:

Written exam

Grading:

Pass/fail

Person responsible:

Professor Vuokko Anttonen

Working life cooperation:

No

Other information:

The courses given by the Institute of Dentistry within the Erasmus-project
[Cariology, Endodontology and Paediatric Dentistry](#)

090631A: Periodontal instrumentation, phantom training, 0,3 - 1 op

Voimassaolo: 01.08.2019 -

Opiskelumuoto: Intermediate Studies

Laji: Course

Vastuuyksikkö: Dentistry

Arvostelu: 1 - 5, pass, fail

Opettajat: Syrjälä, Anna-Maija Hannele

Opintokohteen kielet: Finnish, English

ECTS Credits:

8 hours of student working, 0,3 ECTS credits

Language of instruction:

English

Timing:

Periodontal phantom training is organized during spring semester

Learning outcomes:

The aim of the study module is that student manage basic principles of periodontal instrumentation with hand instruments and ultrasonic scalers

Contents:

Study module includes basic principles of periodontal instrumentation with hand instruments and ultrasonic scalers

Mode of delivery:

Study module includes reading independently before training chapters dealing with periodontal instrumentation in textbook of periodontology and during phantom training information of basic principles of periodontal instrumentation with hand instruments and ultrasonic scalers and phantom training

Learning activities and teaching methods:

Independent reading of textbook of periodontology 4 hours and phantom training 4 hours

Target group:

Dental Exchange Students

Prerequisites and co-requisites:

Not applicable

Recommended or required reading:

Carranza`s Clinical Periodontology, 12th edition, pages 480-514, 621-627

Assessment methods and criteria:

Presence during phantom training

Grading:

The course unit utilizes verbal grading scale pass/fail.

Person responsible:

Anna-Maija Syrjälä, Senior research fellow

Working life cooperation:

Not applicable

Other information:

The courses given by the Institute of Dentistry within the Erasmus-project
 Periodontology and Geriatric Dentistry

090628A: Periodontology: Clinical diagnosis, risk assessment, prognosis and treatment plan, literature exam, 1 op

Voimassaolo: 01.08.2019 -

Opiskelumuoto: Intermediate Studies

Laji: Course

Vastuuyksikkö: Dentistry

Arvostelu: 1 - 5, pass, fail

Opettajat: Pekka Ylöstalo

Opintokohteen kielet: English

ECTS Credits:

1 ECTS credit

Language of instruction:

English

Timing:

Spring term

Contents:

Clinical diagnosis, risk assessment, prognosis and treatment plan

Mode of delivery:

Written (literature) exam

Learning activities and teaching methods:

Written (literature) exam

Target group:

Dental Exchange Students

Recommended or required reading:Carranza's Clinical Periodontology 11th ed. Chapters 30-40, pages 340-436.**Assessment methods and criteria:**

Written literature exam

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

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

Person responsible:

Professor Pekka Ylöstalo

Working life cooperation:

No

Other information:The courses given by the Institute of Dentistry within the Erasmus-project
Periodontology and Geriatric Dentistry**090630A: Periodontology: Periodontal surgery, literature exam, 1,5 op**

Voimassaolo: 01.08.2019 -

Opiskelumuoto: Intermediate Studies

Laji: Course

Vastuuyksikkö: Dentistry

Arvostelu: 1 - 5, pass, fail

Opettajat: Pekka Ylöstalo

Opintokohteen kielet: English

ECTS Credits:

1,5 ECTS credits

Language of instruction:

English

Timing:

Spring term

Contents:

Periodontal surgery

Mode of delivery:

Written (literature) exam

Learning activities and teaching methods:

Written (literature) exam

Target group:

Dental Exchange Students

Recommended or required reading:Carranza's Clinical Periodontology 11th ed. Chapters 52-66, pages 511-618.**Assessment methods and criteria:**Read more about [assessment criteria](#) at the University of Oulu webpage.**Grading:**

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

Person responsible:

Professor Pekka Ylöstalo

Working life cooperation:

No

Other information:

The courses given by the Institute of Dentistry within the Erasmus-project
Periodontology and Geriatric Dentistry

090629A: Periodontology: Periodontal therapy, literature exam, 1 op**Voimassaolo:** 01.08.2019 -**Opiskelumuoto:** Intermediate Studies**Laji:** Course**Vastuuyksikkö:** Dentistry**Arvostelu:** 1 - 5, pass, fail**Opettajat:** Pekka Ylöstalo**Opintokohteen kielet:** English**ECTS Credits:**

1 ECTS credit

Language of instruction:

English

Timing:

Spring term

Contents:

Periodontal therapy

Mode of delivery:

Written (literature) exam

Learning activities and teaching methods:

Written (literature) exam

Target group:

Dental Exchange Students

Recommended or required reading:

Carranza's Clinical Periodontology 11th ed. Chapters 41-51, pages 437-510.

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

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

Person responsible:

Professor Pekka Ylöstalo

Working life cooperation:

No

Other information:

The courses given by the Institute of Dentistry within the Erasmus-project
Periodontology and Geriatric Dentistry

080917S: Project in Biomedical Technology, 5 - 10 op**Voimassaolo:** 01.08.2012 -**Opiskelumuoto:** Advanced Studies**Laji:** Course**Vastuuyksikkö:** Health Sciences**Arvostelu:** 1 - 5, pass, fail**Opettajat:** Lassi Rieppo**Opintokohteen kielet:** Finnish**ECTS Credits:**

5 – 10 ECTS credit points / 135 - 270 hours of work

Language of instruction:

Finnish / English

Timing:

The course can be taken in Master phase in autumn or spring semester, or during the summer period.

Learning outcomes:

Upon completion of the course, the student will be able to solve a research or development problem and report it in writing and in oral presentation.

Contents:

Performing a small scale research or development project.

Mode of delivery:

Independent work

Learning activities and teaching methods:

The student participates in a research project within or outside the university. The student prepares a personal project plan according to separate specifications and presents the plan in seminar. The student participates in seminars of other students at least once. At the end of the project, the student prepares a written research report and presents it in a seminar.

Target group:

Degree students of Biomedical Engineering

Recommended optional programme components:

The course is an independent entity.

Assessment methods and criteria:

The student participates in a research project within or outside the university. The student prepares a personal project plan according to separate specifications and presents the plan in seminar. The student participates in seminars of other students at least once. At the end of the project, the student prepares a written research report and presents it in a seminar.

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

Grading:

The course utilizes grading scale pass or fail

Person responsible:

Dr Lassi Rieppo

Working life cooperation:

Project can be commissioned by a company or another organization. Topic and supervision must be agreed on together with the client.

080919S: Project in Health Technology, 5 - 10 op

Voimassaolo: 01.08.2012 -

Opiskelumuoto: Advanced Studies

Laji: Course

Vastuuyksikkö: Health Sciences

Arvostelu: 1 - 5, pass, fail

Opintokohteen kielet: Finnish

ECTS Credits:

5 – 10 ECTS credit points / 135 - 270 hours of work

Language of instruction:

Finnish / English

Timing:

The course can be taken in Master phase in autumn or spring semester, or during the summer period.

Learning outcomes:

Upon completion of the course, the student will be able to solve a research or development problem and report it in writing and in oral presentation.

Contents:

Performing a small scale research or development project.

Mode of delivery:

Independent work

Learning activities and teaching methods:

The student participates in a research project within or outside the university. The student prepares a personal project plan according to separate specifications and presents the plan in seminar. The student participates in seminars of other students at least once. At the end of the project, the student prepares a written research report and presents it in a seminar.

Target group:

Degree students of Biomedical Engineering

Recommended optional programme components:

The course is an independent entity.

Assessment methods and criteria:

The student participates in a research project within or outside the university. The student prepares a personal project plan according to separate specifications and presents the plan in seminar. The student participates in seminars of other students at least once. At the end of the project, the student prepares a written research report and presents it in a seminar.

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

Grading:

The course utilizes grading scale pass or fail

Person responsible:

Dr Maarit Kangas

Working life cooperation:

Project can be commissioned by a company or another organization. Topic and supervision must be agreed on together with the client.

080918S: Project in Medical Imaging, 5 - 10 op

Voimassaolo: 01.08.2012 -

Opiskelumuoto: Advanced Studies

Laji: Course

Vastuuyksikkö: Health Sciences

Arvostelu: 1 - 5, pass, fail

Opettajat: Simo Saarakkala

Opintokohteen kielet: Finnish

ECTS Credits:

5 – 10 ECTS credit points / 135 - 270 hours of work

Language of instruction:

Finnish / English

Timing:

The course can be taken in Master phase in autumn or spring semester, or during the summer period.

Learning outcomes:

Upon completion of the course, the student will be able to solve a research or development problem and report it in writing and in oral presentation.

Contents:

Performing a small scale research or development project.

Mode of delivery:

Independent work

Learning activities and teaching methods:

The student participates in a research project within or outside the university. The student prepares a personal project plan according to separate specifications and presents the plan in seminar. The student participates in seminars of other students at least once. At the end of the project, the student prepares a written research report and presents it in a seminar.

Target group:

Degree students of Biomedical Engineering

Recommended optional programme components:

The course is an independent entity.

Assessment methods and criteria:

The student participates in a research project within or outside the university. The student prepares a personal project plan according to separate specifications and presents the plan in seminar. The student participates in

seminars of other students at least once. At the end of the project, the student prepares a written research report and presents it in a seminar.

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

Grading:

The course utilizes grading scale pass or fail

Person responsible:

Professor Simo Saarakkala

Working life cooperation:

Project can be commissioned by a company or another organization. Topic and supervision must be agreed on together with the client.

060723A: Research project, 1 - 30 op

Voimassaolo: 01.08.2014 -

Opiskelumuoto: Intermediate Studies

Laji: Course

Vastuuyksikkö: Medicine

Arvostelu: 1 - 5, pass, fail

Opintokohteen kielet: Finnish, English

ECTS Credits:

1.0-30.0 ECTS credits

Language of instruction:

English

Timing:

1st-6th year

Learning outcomes:

The research project / thesis in the degree programmes of Medicine, Dentistry, Nursing and Medical Technology is a scientific work which shows the student's ability to scientific thinking and research. The student gets acquainted with scientific research and is able to evaluate research publications, the student is capable of independent and responsible work as part of a scientific community, develops his/her problem solving skills as well as critical and ethical thinking, and increases his/her readiness to scientific communication.

Mode of delivery:

Writing a study plan which includes a research plan. Supervised research work and writing a thesis or a scientific paper (student as first or second writer).

Learning activities and teaching methods:

Formulation of research plan and independent research work under the supervision of a named person. Writing a thesis and in some cases oral presentation.

Target group:

Students of Medicine, Dentistry, Nursing and Medical Technology

Prerequisites and co-requisites:

None.

Recommended optional programme components:

None.

Recommended or required reading:

Will be agreed with a supervisor.

Assessment methods and criteria:

Accepted research plan, accepted thesis or scientific paper, in some cases oral presentation. Thesis can be also assessed at home university.

Grading:

Pass / fail.

Person responsible:

Depends on the project.

Working life cooperation:

No.

Other information:

Some knowledge of research work and/or studies of research methods is advisable.

060703A: Respiratory Medicine, 3 op**Voimassaolo:** 01.08.2013 -**Opiskelumuoto:** Intermediate Studies**Laji:** Course**Vastuuyksikkö:** Medicine**Arvostelu:** 1 - 5, pass, fail**Opettajat:** Riitta Kaarteenaho**Opintokohteen kielet:** English**ECTS Credits:**

3 ECTS credits

Language of instruction:

English

Timing:

Autumn Semester

Learning outcomes:

Upon completion of the course the student is familiar with the major causes of pulmonary symptoms, pathogenesis, diagnosis, differential diagnosis and treatment of the most common respiratory diseases. Student has also gained an overview on more rare respiratory diseases. After the course the student is able to perform and interpret the most important diagnostic procedures in solving pulmonary problems.

Contents:

The aim of the course is to provide students with knowledge of the major causes of pulmonary symptoms (dyspnea, cough, hemoptysis, wheezing and sputum) and familiarize them with the pathogenesis, diagnosis, differential diagnosis and treatment of the most common respiratory diseases. These diseases include asthma, COPD, pneumonia, tuberculosis, thoracic malignancies, pleural effusion, and sleep-related breathing disorders. An emphasis will be on the conditions that can be diagnosed and treated in the primary care.

Students will also gain an overview on more rare respiratory diseases, such as interstitial lung diseases, pulmonary vasculitis, lung manifestations of rheumatic and other systemic diseases. After the course, students will be able to perform and interpret the most important diagnostic procedures in solving pulmonary problems: lung function tests (including peak expiratory flow and spirometry), measurement of oxygen saturation, analysis of blood gases and sputum analysis. The students will know principles of acute respiratory failure and use of non-invasive ventilation.

Mode of delivery:

Mostly face-to-face teaching.

Learning activities and teaching methods:

Obligatory: 8 hours of small group teaching and lectures, 80 hours of independent work.

Target group:3rd-6th year medical students.**Prerequisites and co-requisites:**

It is preferred that the student has completed basic courses of pathology, clinical chemistry and radiology prior to enrolling for the course unit.

Recommended optional programme components:

None

Recommended or required reading:

Palange P, Simonds AK. ERS handbook. Respiratory Medicine. 2nd edition.
Available as an e-book in library of University of Oulu.

Assessment methods and criteria:

Evaluation is based on examination. All course units must be passed before participation in the examination.

Grading:

The course unit utilizes a numerical grading scale 1-5. In the numerical scale zero stands for a fail. The grade is given only to the students who take the examination.

Person responsible:

Professor Riitta Kaarteenaho

Working life cooperation:

No

Other information:

The course will be organized only when there are at least four students.

060709A-04: Rheumatology, 1 op

Voimassaolo: 01.08.2013 -

Opiskelumuoto: Intermediate Studies

Laji: Partial credit

Vastuuyksikkö: Medicine

Arvostelu: 1 - 5, pass, fail

Opettajat: Karjalainen, Anna Helena

Opintokohteen kielet: English

Ei opintojaksokuvauksia.

521124S: Sensors and Measuring Techniques, 5 op

Opiskelumuoto: Advanced Studies

Laji: Course

Vastuuyksikkö: Electrical Engineering DP

Arvostelu: 1 - 5, pass, fail

Opettajat: Alexey Popov, Aliaksandr Bykau

Opintokohteen kielet: Finnish

ECTS Credits:

5

Language of instruction:

English.

Timing:

Period 2.

Learning outcomes:

After the course the student is capable to explain the operating principles of different sensors and can select a right sensor for each measuring target. He/she is able to quantify the requirements that affect sensor selection as well as recognize and evaluate the uncertainty of a measurement. In addition the student is able to plan and design sensor signal conditioning circuits.

Contents:

Methods for measuring displacement, velocity, acceleration, torque, liquid level, pressure, flow, humidity, sound and temperature. Ultrasound, optical and nuclear measurement techniques and applications, material analyses such as pH measurement and gas concentration, pulp and paper measurements and smart sensors.

Mode of delivery:

Pure face-to-face teaching.

Learning activities and teaching methods:

Lectures 26h, exercises 12h and self-study 100h.

Target group:

4 year students.

Prerequisites and co-requisites:

No.

Recommended optional programme components:

No.

Recommended or required reading:

H. N. Norton: Handbook of Transducers, Prentice Hall P T R, 1989 or 2002; lecture and exercise notes.

Assessment methods and criteria:

The course is passed by a final exam and passed exercises.

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

Grading:

1-5

Person responsible:

Aliaksandr Bykau ja Alexey Popov

Working life cooperation:

No.

090619A: The principles of endodontics, literature exam, 2 op**Voimassaolo:** 01.08.2019 -**Opiskelumuoto:** Intermediate Studies**Laji:** Course**Vastuuyksikkö:** Dentistry**Arvostelu:** 1 - 5, pass, fail**Opettajat:** Kristiina Oikarinen-Juusola**Opintokohteen kielet:** English**ECTS Credits:**

2 ECTS credits

Language of instruction:

English

Timing:

The course unit is held in the Fall and Spring semester.

Learning outcomes:

The student is expected to master the basics of endodontics which is evaluated by a written exam.

Contents:

The Principles of Endodontics

Mode of delivery:

Literature exam

Learning activities and teaching methods:

Literature exam (2 hours)

Target group:

Dental Exchange Students

Prerequisites and co-requisites:

-

Recommended optional programme components:

-

Recommended or required reading:

More information from the course director Kristiina Oikarinen-Juusola

Assessment methods and criteria:

Literature exam (2 hours)

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

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

Person responsible:

Kristiina Oikarinen-Juusola

Working life cooperation:

No

Other information:

The courses given by the Institute of Dentistry within the Erasmus-project

[Cariology, Endodontology and Paediatric Dentistry](#)**080915S: Tissue Biomechanics, 5 op****Voimassaolo:** 01.08.2012 -**Opiskelumuoto:** Advanced Studies**Laji:** Course**Vastuuyksikkö:** Health Sciences**Arvostelu:** 1 - 5, pass, fail

Opettajat: Simo Saarakkala

Opintokohteen kielet: English

ECTS Credits:

5 ECTS credit points /135 hours of work

Language of instruction:

English

Timing:

The course is held in the autumn semester, during period 2. It is recommended to be completed during Master studies.

Learning outcomes:

The student can describe the main biomechanical characteristics of different tissues as well as their failure mechanisms.

The student can perform practical biomechanical experiments, analyze measurement data, interpret results, and report them using good scientific reporting practice.

The student understands how numerical modeling can be used to solve problems in tissue biomechanics.

Contents:

Introduction to tissue biomechanics. Most important biomechanical parameters and material models. Experimental measurements of biomechanical properties of tissues. Structure, composition and mechanical properties of different tissues. Biomechanical modeling of tissues.

Mode of delivery:

Face-to-face teaching

Learning activities and teaching methods:

Lectures 20h / mathematical exercises 10h / Interactive lecture and group work 4 h / Assignment 8h / Self-study 93h. Final exam.

Target group:

Master students of Biomedical Engineering (all specializations). The course is also suitable for other interested degree and postgraduate students with adequate prerequisites.

Prerequisites and co-requisites:

It is recommended that the student has basic knowledge of cell biology, anatomy and physiology, mechanics, differential equations, and matrix algebra.

Recommended optional programme components:

The course is an independent entity and does not require additional studies carried out at the same time. Motion biomechanics will be studied in the course 080916S Biomechanics of Human Movement.

Recommended or required reading:

Material and reading given during the course

Assessment methods and criteria:

Mandatory parts of the course: Accepted assignment with written report and written final exam.

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:

Professor Simo Saarakkala

764327A: Virtual measurement environments, 5 op

Opiskelumuoto: Intermediate Studies

Laji: Course

Vastuuyksikkö: Health Sciences

Arvostelu: 1 - 5, pass, fail

Opettajat: Jämsä, Timo Jaakko

Opintokohteen kielet: Finnish

Leikkaavuudet:

764627S Virtual measurement environments 5.0 op

ECTS Credits:

5 ECTS, 135 hours of work

Language of instruction:

Finnish (or English)

Timing:

Bachelor studies, autumn term, 2nd period

Learning outcomes:

The student will learn how to construct software environments for measurements and data analysis important in biomedical engineering and physics.

Contents:

The course gives basic skills to use measuring and analyzing programmes applied not only in academic research but also in R&D of the companies, and their programming environments (Matlab, LabView).

Mode of delivery:

Face-to-face teaching

Learning activities and teaching methods:

Lectures 12 h, project work 65 h, self-study 58 h

Target group:

Bachelor students of Medical and Wellness Technology and Physics. Also for other students of the University of Oulu.

Prerequisites and co-requisites:

Basics / basic skills in programming

Recommended optional programme components:

The course is independent entity and does not require additional studies carried out at the same time. The course can also be completed as a part of advanced studies with the course code 764627S.

Recommended or required reading:

Lecture and exercise notes, other given material

Assessment methods and criteria:

Completion of projects.

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

Grading:

The course utilizes a numerical grading scale 1-5 or fail. In the numerical grading scale zero stands for a fail. Grading is made based on the projects.

Person responsible:

Professor Timo Jämsä

Working life cooperation:

None

521097S: Wireless Measurements, 5 op

Voimassaolo: 01.08.2015 -

Opiskelumuoto: Advanced Studies

Laji: Course

Vastuuyksikkö: Electrical Engineering DP

Arvostelu: 1 - 5, pass, fail

Opettajat: Juha Saarela

Opintokohteen kielet: English

Leikkaavuudet:

521114S	Wireless Measurements	4.0 op
521114S-01	Wireless Measurements, exam	0.0 op
521114S-02	Wireless Measurements, exercise work	0.0 op

ECTS Credits:

5 ECTS credits / 128h

Language of instruction:

In Finnish or in English if two or more foreign students participate.

Timing:

Period 3.

Learning outcomes:

1. can tell and justifying argument the benefits and challenges of using wireless measurement solutions
2. can apply the most important standards when designing wireless measurement solutions
3. can apply wireless technologies in industrial, traffic, environmental, home and healthcare measurements

Contents:

Basics of wireless measurement technologies and standards, wireless sensors and sensor networks, wireless building and smart home applications, wireless measurement applications in traffic, wireless environmental measurements and wireless human health monitoring.

Mode of delivery:

Face-to-face teaching.

Learning activities and teaching methods:

Lectures 22h. Seminars 6-12h depending on the number of students participating the course. The students prepare seminar presentations about contemporary topics selected by themselves or proposed by the teacher and give 10 minutes presentation to other students in the seminars.

Target group:

Master level students regardless of master's programme.

Prerequisites and co-requisites:

No prerequisites, but basics of measurements systems are recommended.

Recommended optional programme components:

The course replaces previous courses with same name, but different credits and code.

Recommended or required reading:

Lecture notes and seminar reports is Optima.

Assessment methods and criteria:

The course is passed with a written final exam (70 %) and a contemporary seminar (30 %).

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

Grading:

Grade is on numerical scale 1-5.

Person responsible:

Juha Saarela

Working life cooperation:

No.