Course catalogue for doctoral education

HT22
# Human biology or pathology * General science courses

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Title: Generating Genetically Modified Mice for Immunological Research

Course number: 2186  
Credits: 1.5  
Date: 2022-11-07 -- 2022-11-11  
Language: English  
Level: Doctoral level  
Responsible KI department: Department of Medicine, Solna  
Specific entry requirements: Swedish law and ethics on the protection of laboratory animals (theory).

Purpose of the course: The purpose of this course is to enable the students to acquire an in-depth theoretical understanding of the technologies used for generating precise genetic modifications in mice. The course focuses on the classic gene targeting technique (homologous recombination in embryonic stem cells), CRISPR/Cas9 (non-homologous end joining and homology directed repair), and transgenesis by pronuclear injection in zygotes (e.g. TCR transgenes). Understanding these technologies will enable the students to design experiments to test hypotheses in vivo and generate new tools to ask complex immunological questions. These skills are becoming ever more important as science is getting more complex.

Intended learning outcomes: After taking the course the student should have acquired an in-depth knowledge of how to generate genetically modified mice. The students should be able to write a scientifically sound gene targeting project plan at the end of the course. The student should acquire enough practical and theoretical knowledge to allow them to independently generate genetically modified mice. Specifically, the student should know how to design and make DNA constructs for classical gene targeting and for NEHJ and HDR using CRISPR/Cas9. The students should know how to design genotyping using e.g. Southern blotting and PCR, and finally how to use the modified mice in experiments. Furthermore, after the course the students should know how to critically analyze experiments presented in the scientific literature and judge their scientific quality.

Contents of the course: 1) Gene targeting and transgenesis in general. -A short history of gene targeting, transgenesis and CRISPR/Cas9 in mice. -When are these technologies suitable for immunological experiments? -Overview of the work process.  2) Designing and making constructs for classical gene targeting, and for CRISPR/Cas9-based NHEJ and HDR. -How to obtain the necessary information for designing a gene targeting construct. -Different approaches to make DNA constructs for gene targeting and CRISPR/Cas9-based NHEJ and HDR.  3) Conditional gene targeting (Cre-lox system).  4) Common problems in gene targeting, transgenesis, and CRISPR/Cas9; and how to solve them.  5) How to use genetically modified mice in immunological research. -Breeding strategies. -Controls.

Teaching and learning activities: Lectures will be the main form of teaching during the course. Workshops and a written examination are also critical elements of the course. For the examination, the students (in groups of 2-3) will design a gene modification project (both for classic gene targeting and with CRISPR/Cas) and present their research plan. The workshops and the take-home examination are compulsory. Absence from the workshops can be compensated by an individually written report in agreement with the course leader. Formative assessment during active participation in the workshop and summative assessment of the quality of the take-home examination in line with the intended learning outcomes of the course. Students will have a new examination opportunity within two months after the course is finished.

Examination: Formative assessment during active participation in the workshop and summative assessment of the quality of the take-home examination in line with the intended learning outcomes of the course. Students will have a new examination opportunity within two months after the course is finished.

Compulsory elements: The workshops and the take-home examination are compulsory.

Number of students: 8 - 16

Selection of students: Selection will be based on 1) the relevance of the course syllabus for the applicant’s doctoral project (according to written motivation), 2) start date of doctoral studies (priority given to earlier start date)

More information: Lectures and practical exercises Monday to Thursday between 9.00 and 16.00. Presentation of project work on Friday between 9.00 and 12.00. All lectures, exercise and presentations will be at Center for Molecular Medicine, Karolinska Universitetssjukhuset, Solna.

Course responsible:  
Alexander Espinosa  
Department of Medicine, Solna  
Alexander.Espinosa@ki.se

Contact person:  
Alexander Espinosa  
Institutionen för medicin, Solna  
Alexander.Espinosa@ki.se

https://kiwas.ki.se/katalog/katalog/pdf?term=HT22
Title: Introduction to Medical Education Research

Course number: 2193
Credits: 6.0
Date: 2022-09-14 -- 2022-12-14
Language: English
Level: Doctoral level
Responsible KI department: Department of Learning, Informatics, Management and Ethics

Specific entry requirements:
Purpose of the course: The participants should develop their understanding of what kind of issues/phenomena that are researched in medical education and get familiar with qualitative and quantitative approaches and methods used in the research field.

Intended learning outcomes: After the course the student is expected to be able to: 1. Reason and argue about the significance of the Medical Education research field in relation to the Higher Educational field. 2. Identify, analyze and describe different kinds of issues and phenomena that are researched in Medical Education. 3. Reflect on and express similarities and differences of different research approaches and methods used in Medical Education Research.

Contents of the course: The course content includes studies of the Medical Education field especially: * Significance of professional educational programmes, disciplines and subjects in the medical and health care field. * Researching different areas within medical education - student learning, teaching, course/curriculum design, assessment and evaluation. * Researching learning and teaching in clinical education and the health care field - supervision, professional development and patient education. * Qualitative and quantitative approaches and methods in Medical Education research. * Characteristics of high quality Medical Education research.

Teaching and learning activities: The course is situated within the framework of blended learning with face-to-face meetings combined with web seminars. This means that the course works well for distance learners. The course opens with introductory work conducted in the learning platform Canvas, followed by two mandatory campus days. The rest of the of the course is primarily conducted via Canvas through web seminars, individual written assignments, as well as group discussions and peer feedback. Participants need to be able to attend the campus days as well as the scheduled web seminars and group discussions through the digital learning platform Canvas. The course design is based on the student's active participation in his/her own learning process.

Examination: The examination assessment consists of two main parts: * A reflective paper based on an analysis of a self-chosen doctoral thesis within Medical Education. The analysis and reflection are expected to relate to the learning outcomes. * Written and oral self and peer assessment related to assignments and web seminars. The assessment criteria (correspondence, coherence, capacity and critical appraisal) must be fulfilled to pass the course.

Compulsory elements: Assignments, web seminars, campus days and group work are compulsory. In order to compensate for absence, students can submit a written report based on the topics discussed during the missed opportunities no later than 1 week after the course.

Number of students: 8 - 24

Selection of students: Selection will be based on 1) the relevance of the course syllabus for the applicant's doctoral project (according to written motivation), 2) start date of doctoral studies (priority given to earlier start date)

More information: This is a four-week course spread out over the semester and which requires time for independent work outside of scheduled class time. The scheduled sessions will take place on 21 & 22 September (campus days 9-16 and 9-14), 11 October (webinar), 20 October (webinar), 25 October (webinar), 9 November (webinar), 15 November (webinar), 30 November (webinar), and 12 December (hybrid campus day 9-16). Webinars are half-days from 9.00-12.00. The course is given in English.

Course responsible:
Terese Stenfors
Department of Learning, Informatics, Management and Ethics
Terese.Stenfors@ki.se

Contact person:
Maria Appelgren
Institutionen för lärande, informatik, management och etik
maria.appelgren@ki.se

Per Palmgren
Institutionen för lärande, informatik, management och etik
per.palmgren@ki.se

https://kiwas.ki.se/katalog/katalog/pdf?term=HT22
Title: Clinical achievements of reproductive medicine

Course number: 2291
Credits: 1.5
Date: 2022-09-05 -- 2022-09-09
Language: English
Level: Doctoral level
Responsible KI department: Department for Clinical Science, Intervention and Technology

Purpose of the course: The purpose of the course is to enable doctoral students to obtain a basic understanding of the biological processes involved in human reproduction. Experts in the field will provide with a fresh overview of clinical and pre-clinical research aiming at development of novel treatment possibilities but also discussing their current limitations.

Intended learning outcomes: The learning outcomes of this course are that at the conclusion of this course students should be able to show a comprehensive view of key factors involved in reproductive biology and the processes involved in fertilization and implantation. Additionally, at the end of the course students will be able to perform a critical assessment of reported achievements on reproductive medicine and their current clinical possibilities and limitations.

Contents of the course: Contents: Biology of the gametes, fertilization and early embryo development Normal and pathological implantation, early pregnancy loss, ectopic pregnancy, repeated miscarriage In vitro spermatogenesis and oocyte maturation Clinical investigation and therapeutic approach on female and male infertility Genetics in infertility Gonadal dysgenesis Stem cells research Assisted reproduction techniques (ART) In vitro systems and cultures Cloning. Somatic cell nuclear transfer Clinical aspects of fertility preservation Cryobiology systems for fertility preservation Pre-implantation genetic diagnosis Epigenetics in assisted reproduction Experimental reproductive tissue transplantation procedures: -ovarian and testicular tissue transplantation -transplantation of the uterus

Teaching and learning activities: Lectures, seminars/discussions and laboratory demonstrations.

Examination: Written examination and general group discussion of relevant parts of the examination.

Compulsory elements: All teaching activities, including the laboratory sessions, the lectures and the assessments, are obligatory. In case of not attendance to the activities, students should produce a literature work related with the subject of the missing activity upon agreement with the course organizer.

Number of students: 8 - 16

Selection of students: Selection will be based on 1) the relevance of the course syllabus for the applicant’s doctoral project (according to written motivation), 2) start date of doctoral studies (priority given to earlier start date)

More information: The course will be held in lecture rooms at Karolinska University hospital.

Course responsible:

Kenny Rodriguez-wallberg
Department of Oncology-Pathology
0858580000
kenny.rodriguez-wallberg@ki.se

Reproduktionsmedicin
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141 86
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Contact person:

Cecilia Gotherstrom
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Karolina Kublickiene
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Karolinska Universitetssjukhus-Huddinge campus
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Kenny Rodriguez-wallberg
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Reproduktionsmedicin
Karolinska Universitetssjukhuset Huddinge
141 86
Stockholm
Title: Functional Fluorescence Microscopy Imaging (fFMI) in Biomedical Research

Course number: 2348  
Credits: 3.0  
Date: 2022-11-14 -- 2022-11-25  
Language: English  
Level: Doctoral level  
Responsible KI department: Department of Clinical Neuroscience  

Specific entry requirements:

Purpose of the course: This course is a basic course on advanced fluorescence microscopy imaging and correlation spectroscopy techniques for quantitative characterization of molecular transport and interactions in live cells. The purpose of the course is to give an introduction of the underlying physicochemical principles, hands-on training and an overview of applications of these specialized techniques in biomedical research. At the end of the course, the student will have hands-on experience with live-cell imaging and specialized fluorescence microscopy and correlation spectroscopy techniques. The course is suitable for doctoral students lacking training in mathematics, physics, or optical engineering who want to apply these techniques in their research.

Intended learning outcomes: The participant who has successfully finalized all moments of the course is expected to be able to: 1. Use fundamental aspects of molecular structure to describe light-matter interactions and the emission of fluorescence; use this knowledge to discuss fluorescent properties of a fluorophore. 2. Understand the buildup of fluorescence imaging instrumentation, identify different optical elements and describe their function. 3. Describe the theoretical background behind specialized fluorescence based methodologies for studying molecular interactions in live cells. Discuss pros and cons in relation to the biological problem studied. 4. Specify instrumental requirements and design a fluorescence imaging assay for a biological problem of interest. 5. Apply a specific labeling strategy and perform a fluorescence imaging assay. 6. Communicate the results in written and oral form. 7. Discuss the adequateness of the methodology used in the scientific literature concerned.

Contents of the course: Fluorescence microscopy and associated techniques are indispensable research tools for investigating molecular mechanisms of biological processes. Versatility of fluorescence microscopy based techniques comes from the possibility to characterize fluorescence emission by spatial position, intensity, wavelength, lifetime and polarization. In addition, fluorescence microscopy and correlation spectroscopy based techniques allow us to quantitatively study the cellular dynamics of molecules and the kinetics of their interaction with high spatio-temporal resolution and ultimate, single-molecule sensitivity. These techniques bring new biological insight at an unprecedented rate and are of crucial importance for the development of life sciences. The course covers the following topics: Luminescence and the nature of light (Fluorescence, Phosphorescence, Light scattering); Fluorescent markers and their photo-physical properties (Organic fluorescent dyes for covalent conjugation (Rhodamine 6G, Alexa dyes, Cyanine dyes); Quantum dots; Intrinsically Fluorescent Proteins (Aequorea victoria (GFP, YFP), Discosoma coral (DsRFP) and Montipora (Keima) families); Selectively binding dyes (DII, DraQ 5)). Instrumentation for Confocal Laser Scanning Microscopy (CLSM): Light sources, Optical Elements, Objectives, Detectors, Read-out devices; Quantization and Sensitivity in fluorescence imaging (Instrumental sensitivity, Method sensitivity, Absolute sensitivity); Factors affecting quantitative accuracy. Point Spread Function; Spatially resolved fluorescence imaging: Multi-photon excitation, Total Internal Reflection Fluorescence (TIRF) Microscopy, Single Plane Illumination Microscopy (SPIM), Super-resolution techniques (STORM, PALM and STED). Fluorescence based methods for studying molecular diffusion and interactions in live cells (FRAP, FRET, FLIM, FCS, FCCS, ICS). Image analysis techniques for quantitative characterization of cell phenotypes (CellProfiler).

Teaching and learning activities: The course includes lectures, laboratory training, demonstrations, discussion sessions, quizzes for self-testing and short written assignments.

Examination: The final assignment consists of a project report (5-10 pages presentation in PowerPoint) and an oral presentation of the project report (10 min + 5 min for Q & A).

Compulsory elements: All sessions are compulsory. Please report any absence to the course organizers in advance by e-mail. Absence from any part of the course (lectures, laboratory sessions, discussion sessions and exam) is generally not accepted but could in special cases be compensated by an individually tailored additional module and a special written examination organized by the course committee.

Number of students: 8 - 12

Selection of students: Selection will be based on: 1. The relevance of the course syllabus for the applicant's doctoral project (according to written motivation); 2. Date for registration as a doctoral student (priority given to earlier registration date).

More information: This is a two-week course with 10 sessions that include: lectures, laboratory practice, hands-on training, written assignments, discussions, and time for self-study. The first week focuses on underlying physicochemical principles, instrumentation and hands-on training at the microscope. During this week, specialized techniques are introduced and the details are discussed in the context of a broader body of available techniques. The second week is dedicated to expert lectures on advanced applications and hands-on image analysis. The last session is reserved for assessment. Experimental exercises are carried out in the laboratory for Functional Fluorescence Microscopy Imaging (fFMI) at the Center for Molecular Medicine (CMM), Solna, L8:01, 056. Lectures are conducted in the seminar room at the Center for Molecular Medicine (CMM), Solna, L8:01, 021.

Course responsible: Vladana Vukojievic

https://kiwas.ki.se/katalog/katalog/pdf?term=HT22
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Sho Oasa
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Title: Causal Inference for Epidemiological Research

Course number: 2416
Credits: 1.5
Date: 2022-10-24 -- 2022-10-28
Language: English
Level: Doctoral level
Responsible KI department: Department of Medical Epidemiology and Biostatistics

Specific entry requirements: The students are expected to have taken Epidemiology I, Epidemiology II, Biostatistics I, and Biostatistics II. Exceptions can be made if the students have taken other courses with an equivalent content.

Purpose of the course: This course aims to present causal theory and introduces how concepts and methods can be understood within a general methodological framework.

Intended learning outcomes: After the course the student will: - be able to use counterfactuals to express and interpret causal queries - be able to judge when standard statistical methodology is appropriate for causal inference, and when it is not - be able to use Directed Acyclic Graphs to describe and analyze complex epidemiological scenarios - be able to use Instrumental Variables to analyze observational data, with additional help from a skilled statistician

Contents of the course: Causal inference from observational data is a key task of biostatistics and of allied sciences such as sociology, education, behavioral sciences, demography, economics, health services research, etc. These disciplines share a methodological framework for causal inference that has been developed over the last decades. This course presents this unifying causal theory and shows how biostatistical concepts and methods can be understood within this general framework. The course emphasizes conceptualization but also introduces statistical models and methods for causal inference. Specifically, this course strives to a) formally define causal concepts such as causal effect and confounding, b) identify the conditions required to estimate causal effects, and c) use analytical methods that, under those conditions, provide estimates that can be endowed with a causal interpretation. The (causal) methods can be used under less restrictive conditions than the traditional statistical methods. For example, Instrumental Variable methods allow one to estimate the causal effect of an exposure in the presence of unmeasured confounders of the exposure and outcome.

Teaching and learning activities: Lectures and group discussions.

Examination: There will be a take-home exam handed out at the last day of the course. Students who fail will be given the opportunity to write at a maximum 2 re-exams. Dates for the re-exams will be announced later.

Compulsory elements:
Number of students: 8 - 25
Selection of students: Eligible doctoral students will be prioritized according to 1) the relevance of the course syllabus for the applicant's doctoral project (according to written information), 2) date for registration as a doctoral student (priority given to earlier registration date). To be considered, submit a completed application form. Give all information requested, including a short description of current research training and motivation for attending, as well as an account of previous courses taken.

More information:

Course responsible:
Arvid Sjölander
Department of Medical Epidemiology and Biostatistics
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Arvid.Sjolander@ki.se

Contact person:
Gunilla Nilsson Roos
Institutionen för medicinsk epidemiologi och biostatistik
08-524 822 93
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Title: Career Skills for Scientists

Course number: 2463
Credits: 1.5
Date: 2022-08-30 -- 2022-10-20
Language: English
Level: Doctoral level

Responsible KI department: Department of Learning, Informatics, Management and Ethics

Specific entry requirements:

Purpose of the course: The goal of the course is to prepare PhD students for work life after dissertation. Be it for the next academic step, to move outside of the academic world, or simply to find out which of these who might be right for you at the moment, we aim to help you get better insight in yourself, the jobs and how to get them.

Intended learning outcomes: After the course the participants should be able to: - discuss their interests and the transferable skills achieved during doctoral training and explain the value of these skills within as well as outside academia. - discuss career options in academic and non-academic settings, covering different sectors, organizations and career paths. - apply what they have learned in the course to communicate their skills in different forms (oral, written) and situations (interviews, presentations)

Contents of the course: The course is split up in different sessions, given over multiple weeks, so you can continue with your research as much as possible. The different sessions cover exploration of your own skills and interests, information and experiences from academic careers like finding postdoc positions, exploring other career paths to start figuring out "what's out there", and preparing you CV. Throughout the course you will get many chances to put your "networking" into practice, through different presenters, the assignments where you will reach out to people, and the possibility to apply for an internship with a company or organization, which tests your CV and interviewing ability against reality.

Teaching and learning activities: The course is planned to take place online. Parts of the info is planned to be available in video format through the course web page in Canvas, part to be live sessions on Zoom for interaction with speakers and group discussion. Written homework assignments will be provided and submitted through the course web. The course demands active input and reflection from the participants, so even though it is not provided as a block of 1 week fulltime but as shorter digital sessions over multiple weeks, you will need to carve out time (equivalent to one week fulltime) to prepare and reflect, and to attend live sessions.

Examination: Digital oral presentations and written projects.

Compulsory elements: All live sessions are compulsory. Missing of live sessions will need to be compensated by extra tasks as specified during the course.

Number of students: 30 - 40

Selection of students: Five spots are reserved for KI postdocs applying for the course. Selection will be based on 1) Time left to defence/postdoc period: priority given to those who have less time left (as long as the defence is after the end of the course). State your expected end date in your motivation. 2) Written motivation. This course has many applicants and limited spots, please only apply if you are sure you want to take the course and will make time for it.

More information: The course runs over 8 weeks and is built up as follows: A) August 30th – September 29th: 10 sessions in total (five weeks). Two sessions (number 1 and 7 in-person), and eight virtual sessions on Zoom. The time of the course is from 10.00-12.00 every Tue and Thu, including private study (total +- 6h/week). B) October 3rd – October 14th: 2 weeks of individual exam prep (total +- 4h/week) + optional internship info sessions. C) October 17th – October 21st: 1 week of exam presentations in smaller groups (+- 2h). A more detailed schedule will be available to course participants on the course web. For questions about the course content, contact Y. Vladimir Pabón-Martínez (vladimir.pabonmartinez@ki.se). For practical questions about your application, contact Liisa (liisa.olsson@ki.se).

Course responsible:
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Contact person:
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Universitetsförvaltningen
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Vladimir Pabón-Martínez
Universitetsförvaltningen
vladimir.pabonmartinez@ki.se
Title: Mass spectrometry-based proteomics: When and How.

Course number: 2522
Credits: 3.0
Date: 2022-11-14 -- 2022-11-25
Language: English
Level: Doctoral level
Responsible KI department: Department of Oncology-Pathology

Specific entry requirements:

Purpose of the course: The aim of this course is to give an overview of mass spectrometry based proteomics for researchers who would like to be able to apply these techniques in their own research.

Intended learning outcomes: After completed the course, the student will be able to:
- Define and apply common proteomics terminology
- Recognize the principles of the most common proteomics techniques
- Understand the mass spectrometry based proteomics workflow: Experimental design, sample preparation and selection of techniques
- Understand proteomics to such an extent that he/she will be able to utilize proteomics core facilities or collaborate with proteomics researchers.
- Evaluate the quality of protein and peptide identifications.
- Demonstrate how modern proteomics is applied to clinical research and to evaluate when proteomics research could be beneficial to incorporate in research projects.
- Design their own research project by mass spectrometry based proteomics.

Contents of the course: Lectures and workshops on:
- Overview of proteomics
- The proteomics workflow
- Basic of separation sciences: Protein and peptides
- Introduction to Mass spectrometry
- Experimental design
- Sample preparation, immunoprecipitation and enrichment strategy
- Quantitative and qualitative proteomics by mass spectrometry
- Global and targeted proteomics
- Human protein atlas and Biological validation
- Clinical applications

A practical laboratory exercise using mass spectrometry based proteomics. This course is focusing on proteomics technologies and applications, for proteomics data analysis we recommend our KI doctoral course "Omic data analysis: From quantitative data to biological information".

Teaching and learning activities: The course contains lectures, seminars, and a practical laboratory exercise using proteomics techniques. The students will plan their own project as a case study as well make an oral laboratory report.

Examination: - Students shall describe a proteomics project (beneficially related to their research) including different aspects from the proteomics workflow. This is handed in as a written exam. - The students shall perform an oral laboratory report.

Compulsory elements: - Attendance at lectures and the practical laboratory exercise. - Attendance at examination seminar and hand in the written examination assignment. - Extra written assignments can be used to compensate absence. The students are recommended to read literatures listed below in advance of the course.

Number of students: 12 - 24

Selection of students: Selection will be based on 1) the relevance of the course syllabus for the applicant's doctoral project (according to written motivation), 2) start date of doctoral studies (priority given to earlier start date).

More information: This course is included in the doctoral programmes Allergy, immunology and inflammation (All) and Biology of Infections and Global Health Programme (BIGH). See https://ki.se/en/staff/doctoral-programmes.

Course responsible:
Henrik Johansson
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Contact person:
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https://kiwas.ki.se/katalog/katalog/pdf?term=HT22
Title: Writing Science and Information Literacy

Course number: 2561
Credits: 3.0
Date: 2022-10-31 -- 2022-12-09
Language: English
Level: Doctoral level
Responsible KI department: Karolinska Institutet University Library
Specific entry requirements:

Purpose of the course: The aim of the course is to develop the medical scientific writing and information literacy skills of the participant.

Intended learning outcomes: After this course, you will be able to demonstrate:
- an understanding of how to write an original scientific article and submit it for publication
- an understanding of the publication process, including how to use relevant resources to choose a journal in which to publish your research
- an ability to write other types of texts required for a scientific career, such as grant applications and popular science texts
- an ability to give, take and make use of constructive criticism
- an ability to search and manage the medical science literature in a structured way.

Contents of the course: Writing an original scientific article, grant applications and popular science texts; searching and managing the literature; and understanding the publication process, including using relevant resources to choose a journal and navigate peer review.

Teaching and learning activities: This online course will take place in the learning platform Canvas. Content will be taught using various learning objects, from film to group exercises. Formative feedback will be implemented by teachers, peers and via self-assessment.

Examination: The intended learning outcomes are assessed in the summative examination. Participants will write and rewrite a grant application and popular science summary based on teacher and peer feedback. Participants will also complete a number of assignments throughout the course which will aid their ability to search and manage the literature effectively, as well as choose a journal for publication.

Compulsory elements: There will be a number of obligatory assignments and assessments to be completed.
Number of students: 15 - 22

Selection of students: Selection will be based on 1) the relevance of the course syllabus for the applicant's doctoral project (according to written motivation), 2) start date of doctoral studies (priority given to earlier start date)

More information: This course takes place online. While much of the course material may be studied at the participant's own pace, four live sessions will be held via Zoom: the course introduction on Oct 31, the discussion seminars on Nov 7 and Nov 28, and the peer review session on Dec 5. The peer review session is obligatory. In addition, there are a series of assignment deadlines that must be met. These are as follows: Nov 9, Nov 15, Nov 21, Nov 25, Dec 2 and Dec 9.

Course responsible:
Gabriella Ekman
Karolinska Institutet University Library

Contact person:
-
Title: Basic Course in Medical Statistics - a distance course

Course number: 2609
Credits: 3.0
Date: 2022-09-26 -- 2022-10-07
Language: English
Level: Doctoral level

Responsible KI department: Department of Learning, Informatics, Management and Ethics
Specific entry requirements:

Purpose of the course: The aim of the course is to introduce the basic statistical methods and the fundamental principles of statistical inference and to offer basic skills that involve hands-on data analysis using statistical software.

Intended learning outcomes: The course participants shall after the course be able to: 1) perform and interpret basic descriptive statistics from frequency tables and graphical presentations, 2) perform and interpret results from basic inferential statistical analysis and tests, 3) recognize and critically examine the statistics being presented in articles within the field of medical research.

Contents of the course: Concepts being treated are descriptive vs inferential statistics, collection of data and study design, different types of data and level of measurement, independent and dependent samples, correlation and regression, hypothesis testing and different type of statistical errors in relation to the testing and data collection procedure. The major topics for the course are t-test, chi-square test, nonparametric test and regression analysis, and how to evaluate the assumptions for the different techniques.

Teaching and learning activities: The course is an online distance course. The teaching methods include video lectures, self-study, individual self-assessment tests, computer based application exercises, and statistical software demonstration videos in SPSS and R. The first and last day of the course is scheduled with an introduction the first day and mandatory seminars and group discussions the last day.

Examination: Successful completion of the computer based application exercises. The doctoral students will have to demonstrate their ability to recognize, critically examine and discuss the statistics presented in the medical articles during the seminars.

Compulsory elements: Attendance is mandatory for the seminars on the last day of the course. If the student is absent, he or she will have priority for admission to the seminars the next time the course is offered.

Number of students: 35 - 45

Selection of students: Selection will be based on: 1) start date of doctoral studies (priority given to earlier start date). Please make sure that you have entered the correct start date for doctoral education in your personal profile. 2) the relevance of the course syllabus for the applicant's doctoral project/post doctoral research (according to written motivation).

More information: Mandatory attendance via zoom.

Course responsible:
Henrike Häbel
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henrike.habel@ki.se

Contact person:
Nora Espahbodi
Institutionen för lärande, informatik, management och etik
nora.espahbodi@ki.se
Title: Basic Course in Medical Statistics - a distance course

Course number: 2609
Credits: 3.0
Date: 2022-12-05 -- 2022-12-16
Language: English
Level: Doctoral level
Responsible KI department: Department of Learning, Informatics, Management and Ethics

Specific entry requirements:

Purpose of the course: The aim of the course is to introduce the basic statistical methods and the fundamental principles of statistical inference and to offer basic skills that involve hands-on data analysis using statistical software.

Intended learning outcomes: The course participants shall after the course be able to: 1) perform and interpret basic descriptive statistics from frequency tables and graphical presentations, 2) perform and interpret results from basic inferential statistical analysis and tests, 3) recognize and critically examine the statistics being presented in articles within the field of medical research.

Contents of the course: Concepts being treated are descriptive vs inferential statistics, collection of data and study design, different types of data and level of measurement, independent and dependent samples, correlation and regression, hypothesis testing and different type of statistical errors in relation to the testing and data collection procedure. The major topics for the course are t-test, chi-square test, nonparametric test and regression analysis, and how to evaluate the assumptions for the different techniques.

Teaching and learning activities: The course is an online distance course. The teaching methods include video lectures, self-study, individual self-assessment tests, computer based application exercises, and statistical software demonstration videos in SPSS and R. The first and last day of the course is scheduled with an introduction the first day and mandatory seminars and group discussions the last day.

Examination: Successful completion of the computer based application exercises. The doctoral students will have to demonstrate their ability to recognize, critically examine and discuss the statistics presented in the medical articles during the seminars.

Compulsory elements: Attendance is mandatory for the seminars on the last day of the course. If the student is absent, he or she will have priority for admission to the seminars the next time the course is offered.

Number of students: 35 - 45

Selection of students: Selection will be based on: 1) start date of doctoral studies (priority given to earlier start date). Please make sure that you have entered the correct start date for doctoral education in your personal profile. 2) the relevance of the course syllabus for the applicant's doctoral project/post doctoral research (according to written motivation).

More information: Mandatory attendance via Zoom.

Course responsible:
Henrike Häbel
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Contact person:
Nora Espahbodi
Institutionen för lärande, informatik, management och etik
nora.espahbodi@ki.se
Title: Write Your Research Results and Get Them Published

Course number: 2618
Credits: 3.0
Date: 2022-08-22 -- 2022-09-02
Language: English
Level: Doctoral level

Responsible KI department: Department of Women's and children's health

Specific entry requirements:

Purpose of the course: The purpose of the course is to impart knowledge and practical experience in scientific writing, based on own research, including manuscript, abstract, popular science summary and scientific poster.

Intended learning outcomes: AFTER ATTENDING THE COURSE, THE COURSE PARTICIPANT SHOULD BE ABLE TO: - Explain the characteristics and disposition of different written presentation media and decide which forum is the most suitable for a specific text - Understand, and apply, the terminology associated with scientific writing - Write an abstract - Use the correct structure and language to compose a short draft for a scientific paper, following the editorial requirements - Revise a manuscript according to a checklist with the most common language and structure mistakes in scientific writing - Use the focus points in a scientific paper (where the readers focus their reading) to your advantage - Identify the main scope and focus of the research and summarize information aligned to the target group - Write a popular science summary and use popular science as a tool for presentations - Give a poster presentation - Design a scientific poster and reflect upon structure, language and style - Understand the ethics in publication
- Use the software EndNote for reference management - Search for references in databases (e.g. PubMed) and decide what sources are reliable - Respond to the reviewer's comments - Write a cover letter - Write a project plan - Reflect on own development as a writer of different texts during the course

Contents of the course: THE MAIN SCOPE OF THE COURSE is how to write about research in different contexts and forums. THE CONTENT OF THE COURSE: 1. Terminology associated to scientific writing 2. Different formats for presenting your research a) scientific paper b) abstract c) scientific poster d) cover letter e) project plan g) popular science summary (for example for your dissertation kappa, project plan, grant application) 3. The writing process: structure, language, style 4. Editorial requirements of different journals 5. Summarizing and presenting information aiming at the target audience 6. Identifying the main scope of a research project 7. References and reference management (EndNote software) 8. Data base search 9. Basic rhetoric for poster presentations 10. References 11. Ethics in publication

Teaching and learning activities: Lectures, seminars, writing exercises, group assignments and practical exercises. As part of the learning process, the course participants will be members of in-class review groups, giving feedback to their colleagues.

Examination: 1) Written assignments reflecting the intended learning outcomes of the course: draft for scientific paper, popular science summary, poster and abstract. All assignments can (but doesn’t have to) be based on own research (if applicable). 2) Evaluation sessions, where the course participants give each other constructive feedback on the written assignments as a part of the learning process 3) Poster presentation, where the course participants present their posters to a small group of their colleagues (there are no presentations in front of a larger group)

Compulsory elements: Lectures, seminars, evaluation sessions, and group assignments as well as all written assignments. Absence can be compensated: a) during next course occasion b) individual assignments

Number of students: 18 - 22

Selection of students: Selection will be based on 1) the relevance of the course syllabus for the applicant's doctoral project (according to written motivation), 2) date for registration as a doctoral student (priority given to LATER registration date).

More information: The course is given in two parallel formats: in-class and online. All lectures (including the online format) will be taught real-time and according to schedule (no pre-recorded lectures, but there will be recorded lectures available to make up for absence). <BR> The scope of the course is scientific writing (manuscript, abstract and poster) and you have the possibility to use your own research for the assignments (although it is not a requirement to bring any data) to maximize the learning experience and also to make actual progress in your studies. The course includes manuscript writing, poster design and poster presentation, cover letter writing, abstract writing and popular science writing. The popular science part is covering the skills needed to successfully write a popular science summary, e.g., for a project plan or to apply for grants, and is also helpful for oral presentations. <BR> No prior knowledge or experience of scientific writing is required, and you will benefit equally from the course, not matter if you have published your research before or not. The course will be given in a venue in central Stockholm and/or online on Zoom. <BR> Please address ALL questions to: anna.hildenbrand.michelman@ki.se or phone: 070-7890607

Course responsible:
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Contact person:
Anna Hildenbrand Wachtmeister
Institutionen för kvinnors och barns hälsa

https://kiwas.ki.se/katalog/katalog/pdf?term=HT22
Title: Write Your Research Results and Get Them Published

Course number: 2618
Credits: 3.0
Date: 2022-09-26 -- 2022-10-07
Language: English
Level: Doctoral level
Responsible KI department: Department of Women's and children's health
Specific entry requirements:

Purpose of the course: The purpose of the course is to impart knowledge and practical experience in scientific writing, based on own research, including manuscript, abstract, popular science summary and scientific poster.

Intended learning outcomes: AFTER ATTENDING THE COURSE, THE COURSE PARTICIPANT SHOULD BE ABLE TO:
- Explain the characteristics and disposition of different written presentation media and decide which forum is the most suitable for a specific text
- Understand, and apply, the terminology associated with scientific writing
- Write an abstract - Use the correct structure and language to compose a short draft for a scientific paper, following the editorial requirements - Revise a manuscript according to a checklist with the most common language and structure mistakes in scientific writing
- Use the focus points in a scientific paper (where the readers focus their reading) to your advantage
- Identify the main scope and focus of the research and summarize information aligned to the target group
- Write a popular science summary and use popular science as a tool for presentations
- Give a poster presentation - Design a scientific poster and reflect upon structure, language and style
- Understand the ethics in publication
- Use the software EndNote for reference management
- Search for references in databases (e.g. PubMed) and decide what sources are reliable
- Respond to the reviewer's comments
- Write a cover letter
- Write a project plan - Reflect on own development as a writer of different texts during the course
- Write a cover letter
- Present their posters to a small group of their colleagues (there are no presentations in front of a larger group)

Contents of the course: THE MAIN SCOPE OF THE COURSE is how to write about research in different contexts and forums. THE CONTENT OF THE COURSE: 1. Terminology associated to scientific writing 2. Different formats for presenting your research a) scientific paper b) abstract c) scientific poster d) cover letter e) project plan g) popular science summary (for example for your dissertation kappa, project plan, grant application) 3. The writing process: structure, language, style 4. Editorial requirements of different journals 5. Summarizing and presenting information aiming at the target audience 6. Identifying the main scope of a research project 7. References and reference management (EndNote software) 8. Data base search 9. Basic rhetoric for poster presentations 10. References 11. Ethics in publication

Teaching and learning activities: Lectures, seminars, writing exercises, group assignments and practical exercises. As part of the learning process, the course participants will be members of in-class review groups, giving feedback to their colleagues.

Examination: 1) Written assignments reflecting the intended learning outcomes of the course: draft for scientific paper, popular science summary, poster and abstract. All assignments can (but doesn't have to) be based on own research (if applicable). 2) Evaluation sessions, where the course participants give each other constructive feedback on the written assignments as a part of the learning process 3) Poster presentation, where the course participants present their posters to a small group of their colleagues (there are no presentations in front of a larger group)

Compulsory elements: Lectures, seminars, evaluation sessions, and group assignments as well as all written assignments. Absence can be compensated: a) during next course occasion b) individual assignments

Number of students: 18 - 22

Selection of students: Selection will be based on 1) the relevance of the course syllabus for the applicant's doctoral project (according to written motivation), 2) date for registration as a doctoral student (priority given to LATER registration date).

More information: The course is given in two parallel formats: in-class and online. All lectures (including the online format) will be taught real-time and according to schedule (no pre-recorded lectures, but there will be recorded lectures available to make up for absence). <BR> The scope of the course is scientific writing (manuscript, abstract and poster) and you have the possibility to use your own research for the assignments (although it is not a requirement to bring any data) to maximize the learning experience and also to make actual progress in your studies. The course includes manuscript writing, poster design and poster presentation, cover letter writing, abstract writing and popular science writing. The popular science part is covering the skills needed to successfully write a popular science summary, e.g., for a project plan or to apply for grants, and is also helpful for oral presentations. <BR> No prior knowledge or experience of scientific writing is required, and you will benefit equally from the course, not matter if you have published your research before or not. The course will be given in a venue in central Stockholm and/or online on Zoom. <BR> Please address ALL questions to: anna.hildenbrand.michelman@ki.se or phone: 070-7890607

Course responsible:
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Lalit.Kumar@ki.se
Title: Write Your Research Results and Get Them Published

Course number: 2618
Credits: 3.0
Date: 2022-10-31 -- 2022-11-11
Language: English
Level: Doctoral level
Responsible KI department: Department of Women's and children's health
Specific entry requirements:

Purpose of the course: The purpose of the course is to impart knowledge and practical experience in scientific writing, based on own research, including manuscript, abstract, popular science summary and scientific poster.

Intended learning outcomes: AFTER ATTENDING THE COURSE, THE COURSE PARTICIPANT SHOULD BE ABLE TO:
- Explain the characteristics and disposition of different written presentation media and decide which forum is the most suitable for a specific text
- Understand, and apply, the terminology associated with scientific writing
- Write an abstract - Use the correct structure and language to compose a short draft for a scientific paper, following the editorial requirements - Revise a manuscript according to a checklist with the most common language and structure mistakes in scientific writing - Use the focus points in a scientific paper (where the readers focus their reading) to your advantage - Identify the main scope and focus of the research and summarize information aligned to the target group - Write a popular science summary and use popular science as a tool for presentations - Give a poster presentation - Design a scientific poster and reflect upon structure, language and style
- Understand the ethics in publication - Use the software EndNote for reference management - Search for references in databases (e.g. PubMed) and decide what sources are reliable - Respond to the reviewer's comments - Write a cover letter - Write a project plan - Reflect on own development as a writer of different texts during the course

Contents of the course: THE MAIN SCOPE OF THE COURSE is how to write about research in different contexts and forums. THE CONTENT OF THE COURSE: 1. Terminology associated to scientific writing 2. Different formats for presenting your research a) scientific paper b) abstract c) scientific poster d) cover letter e) project plan g) popular science summary (for example, for your dissertation kappa, project plan, grant application) 3. The writing process: structure, language, style 4. Editorial requirements of different journals 5. Summarizing and presenting information aiming at the target audience 6. Identifying the main scope of a research project 7. References and reference management (EndNote software) 8. Data base search 9. Basic rhetoric for poster presentations 10. References 11. Ethics in publication

Teaching and learning activities: Lectures, seminars, writing exercises, group assignments and practical exercises. As part of the learning process, the course participants will be members of in-class review groups, giving feedback to their colleagues.

Examination: 1) Written assignments reflecting the intended learning outcomes of the course: draft for scientific paper, popular science summary, poster and abstract. All assignments can (but doesn't have to) be based on own research (if applicable). 2) Evaluation sessions, where the course participants give each other constructive feedback on the written assignments as a part of the learning process 3) Poster presentation, where the course participants present their posters to a small group of their colleagues (there are no presentations in front of a larger group)

Compulsory elements: Lectures, seminars, evaluation sessions, and group assignments as well as all written assignments. Absence can be compensated: a) during next course occasion b) individual assignments

Number of students: 18 - 22

Selection of students: Selection will be based on 1) the relevance of the course syllabus for the applicant's doctoral project (according to written motivation), 2) date for registration as a doctoral student (priority given to LATER registration date).

More information: The course is given in two parallel formats: in-class and online. All lectures (including the online format) will be taught real-time and according to schedule (no pre-recorded lectures, but there will be recorded lectures available to make up for absence). The scope of the course is scientific writing (manuscript, abstract and poster) and you have the possibility to use your own research for the assignments (although it is not a requirement to bring any data) to maximize the learning experience and also to make actual progress in your studies. The course includes manuscript writing, poster design and poster presentation, cover letter writing, abstract writing and popular science writing. The popular science part is covering the skills needed to successfully write a popular science summary, e.g., for a project plan or to apply for grants, and is also helpful for oral presentations.

No prior knowledge or experience of scientific writing is required, and you will benefit equally from the course, not matter if you have published your research before or not. The course will be given in a venue in central Stockholm and/or online on Zoom.

Please address ALL questions to:
anna.hildenbrand.michelman@ki.se or phone: 070-7890607

Course responsible:
Anna Hildenbrand Wachtmeister
Department of Women's and children's health
070-789 06 07
anna.hildenbrand.michelman@ki.se

Contact person:
Anna Hildenbrand Wachtmeister
Institutionen för kvinnors och barns hälsa

https://kiwas.ki.se/katalog/katalog/pdf?term=HT22
Lalit Kumar  
Institutionen för kvinnors och barns hälsa  
Lalit.Kumar@ki.se
Title: Write Your Research Results and Get Them Published

Course number: 2618
Credits: 3.0
Date: 2022-12-12 -- 2022-12-23
Language: English
Level: Doctoral level

Responsible KI department: Department of Women's and children's health

Specific entry requirements:

Purpose of the course: The purpose of the course is to impart knowledge and practical experience in scientific writing, based on own research, including manuscript, abstract, popular science summary and scientific poster.

Intended learning outcomes: AFTER ATTENDING THE COURSE, THE COURSE PARTICIPANT SHOULD BE ABLE TO: - Explain the characteristics and disposition of different written presentation media and decide which forum is the most suitable for a specific text - Understand, and apply, the terminology associated with scientific writing - Write an abstract - Use the correct structure and language to compose a short draft for a scientific paper, following the editorial requirements - Revise a manuscript according to a checklist with the most common language and structure mistakes in scientific writing - Use the focus points in a scientific paper (where the readers focus their reading) to your advantage - Identify the main scope and focus of the research and summarize information aligned to the target group - Write a popular science summary and use popular science as a tool for presentations - Give a poster presentation - Design a scientific poster and reflect upon structure, language and style - Understand the ethics in publication - Use the software EndNote for reference management - Search for references in databases (e.g. PubMed) and decide what sources are reliable - Respond to the reviewer's comments - Write a cover letter - Write a project plan - Reflect on own development as a writer of different texts during the course

Contents of the course: THE MAIN SCOPE OF THE COURSE is how to write about research in different contexts and forums. THE CONTENT OF THE COURSE: 1. Terminology associated to scientific writing 2. Different formats for presenting your research a) scientific paper b) abstract c) scientific poster d) cover letter e) project plan g) popular science summary (for example for your dissertation kappa, project plan, grant application) 3. The writing process: structure, language, style 4. Editorial requirements of different journals 5. Summarizing and presenting information aiming at the target audience 6. Identifying the main scope of a research project 7. References and reference management (EndNote software) 8. Data base search 9. Basic rhetoric for poster presentations 10. References 11. Ethics in publication

Teaching and learning activities: Lectures, seminars, writing exercises, group assignments and practical exercises. As part of the learning process, the course participants will be members of in-class review groups, giving feedback to their colleagues.

Examination: 1) Written assignments reflecting the intended learning outcomes of the course: draft for scientific paper, popular science summary, poster and abstract. All assignments can (but doesn't have to) be based on own research (if applicable). 2) Evaluation sessions, where the course participants give each other constructive feedback on the written assignments as a part of the learning process 3) Poster presentation, where the course participants present their posters to a small group of their colleagues (there are no presentations in front of a larger group)

Compulsory elements: Lectures, seminars, evaluation sessions, and group assignments as well as all written assignments. Absence can be compensated: a) during next course occasion b) individual assignments

Number of students: 18 - 22

Selection of students: Selection will be based on 1) the relevance of the course syllabus for the applicant's doctoral project (according to written motivation), 2) date for registration as a doctoral student (priority given to LATER registration date).

More information: The course is given in two parallel formats: in-class and online. All lectures (including the online format) will be taught real-time and according to schedule (no pre-recorded lectures, but there will be recorded lectures available to make up for absence). <BR> The scope of the course is scientific writing (manuscript, abstract and poster) and you have the possibility to use your own research for the assignments (although it is not a requirement to bring any data) to maximize the learning experience and also to make actual progress in your studies. The course includes manuscript writing, poster design and poster presentation, cover letter writing, abstract writing and popular science writing. The popular science part is covering the skills needed to successfully write a popular science summary, e.g., for a project plan or to apply for grants, and is also helpful for oral presentations. <BR> No prior knowledge or experience of scientific writing is required, and you will benefit equally from the course, not matter if you have published your research before or not. The course will be given in a venue in central Stockholm and/or online on Zoom. <BR> Please address ALL questions to: anna.hildenbrand.michelman@ki.se or phone: 070-7890607

Course responsible:
Anna Hildenbrand Wachtmeister
Department of Women's and children's health
070-789 06 07
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Contact person:
Anna Hildenbrand Wachtmeister
Institutionen för kvinnors och barns hälsa
Title: Brain Circuits

Course number: 2624
Credits: 1.5
Date: 2022-10-03 -- 2022-10-07
Language: English
Level: Doctoral level
Responsible KI department: Department of Neuroscience
Specific entry requirements: Knowledge of neuron function and brain anatomy is required.

Purpose of the course: The purpose of the course is to provide doctoral students in the field of neuroscience with an overview of current state-of-the-art approaches, technologies and concepts used for understanding of the brain's circuits and functions in animal models. There is a very strong emphasis on research in mice. All invited speakers have made seminal contributions to how we currently study and understand the brain, and there will be ample opportunities for the students to interact with the speakers, and discuss aspects relevant to their own work.

Intended learning outcomes: By the end of the course the student shall be able to: - explain the structure and function of the main brain circuits, - describe the principles for excitatory and inhibitory networks, including receptors and neurotransmitters, as well as the action of different chemical neuromodulators, - describe principles, use and readout of optogenetics and recording technologies, - describe principles and methods to define the structure (neoarchitecture) of brain circuits, - explain how dysfunctions of networks can manifest as neuropsychiatric disorders, - describe animal behavior tests probing specific networks and circuit (dys)functions. Specific emphasis will be put into describing the technologies currently used in the neuroscience field.

Contents of the course: The course will cover the organization and function of main circuits in the brain, including the interaction and participation of different cell types, the interplay between excitation and inhibition, and how circuit output results in behavior. Different techniques for recording, labeling and manipulation of neuronal circuits in animal models will be discussed, including electrophysiology, molecular targeting, optogenetics and viral tracing. The connection between deficient circuit functions and neuropsychiatric disorders will be included, as well as animal behavior tests probing specific circuits and circuit (dys)functions. Specific emphasis will be put into describing the technologies currently used in the neuroscience field.

Teaching and learning activities: Lectures by invited experts and group exercises.

Examination: The student should in discussions and a seminar presentation demonstrate the ability to critically evaluate original research papers on the topics covered and be able to show that the intended learning outcomes for the course are reached.

Compulsory elements: The seminar presentations are obligatory, and so are all lectures. Any absence has to be compensated for in accordance with the instructions of the course director.

Number of students: 12 - 24
Selection of students: We welcome highly motivated applicants from all areas of neuroscience. Knowledge of neuron function and brain anatomy is required. Selection will be based on 1) the relevance of the course syllabus for the applicant's doctoral project according to the written motivation in the application, 2) experience of neuroscience research as stated in the written motivation, 3) date for registration as a PhD student (priority given to advanced students).

More information: Lectures will be given by international and KI neuroscientists who have made significant contributions to the study of brain and behavior using advanced methods to define the organization and function of circuits. Lectures will cover the development and application of novel technologies (imaging activity, optogenetics, machine learning) with a focus on advances using transgenic rodents. We have a strong emphasis on engaging young neuroscientists and creating a network for future neuroscience leaders. The course will be given at Karolinska Institutet Campus Solna and/or on Zoom. Time: 9.00-17.00 (Monday to Friday). Updates regarding the course, including confirmed speakers, lecture halls etc will be posted on www.carlenlab.org

Course responsible:
Marie Carlen
Department of Neuroscience
08-52483043
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Contact person:
Dinos Meletis
Institutionen för neurovetenskap
Dinos.Meletis@ki.se
Title: Human physiology - an overview

Course number: 2644
Credits: 3.0
Date: 2022-09-19 -- 2022-09-30
Language: English
Level: Doctoral level

Specific entry requirements:

Purpose of the course: KI is a medical university with research and education in medicine and health. All PhD students have to obtain basic knowledge regarding the human body in health and disease in case they lack basic higher education knowledge in the field of medicine. The aim of the course is to give PhD students without a medical background a basic overview and introduction to human physiology. The students will gain a basic understanding of how the human organ systems function and interact under normal conditions. The content covered in this course will be beneficial for further studies where knowledge about human biology is of value.

Intended learning outcomes: After completing the course, the student will gain a basic understanding of how the human organ systems function and interact under normal conditions. The content covered in this course will be useful for further studies where knowledge about human biology is of value. More specifically, the student will be able to:
- Demonstrate knowledge and understanding of basic functions and interactions between organ systems in the human body.
- Demonstrate a critical and scientific approach to literature sources for the different course tasks.

Contents of the course:
- Overview of cellular and integrative physiology
- Basic anatomy
- Biochemistry and cell biology
- Nervous system
- Endocrinology
- Digestive system
- Cardiovascular physiology
- Renal physiology
- Respiration
- Basic immunology

Teaching and learning activities: Different learning methods such as problem based learning, lectures and a hands-on human lab session will be used. Full time during two consecutive weeks.

Examination: To pass the course, the student must demonstrate that the learning outcomes have been achieved. Oral and written examinations are used for student assessment.

Compulsory elements: Examinations and the hands-on human lab are required. Students that are absent during the quiz or the lab must perform a make-up quiz/lab. Students that are absent from the exam or do not obtain a passing grade in the first examination will be offered a second examination.

Number of students: 15 - 20

Selection of students: Selection will be based on 1) the relevance of the course syllabus for the applicant’s doctoral project (according to written motivation), 2) start date of doctoral studies (priority given to earlier start date)

More information:

Course responsible:
Stefan Reitzner
Department of Physiology and Pharmacology

stefan.reitzner@ki.se

Contact person:
Title : Introduction to Qualitative Methods

Course number : 2673
Credits : 4.0
Date : 2022-11-14 -- 2022-12-16
Language : English
Level : Doctoral level
Responsible KI department : Department of Neurobiology, Care Sciences and Society
Specific entry requirements :
Purpose of the course : The aim of the course is that the participants acquire basic knowledge about qualitative research methods including the ethical aspects of those. Hereby the course provides a good foundation for method selection and further development of knowledge of specific qualitative methods. The course is suitable for PhD students who plan to use qualitative methods in their thesis such as well as those who do not have qualitative studies in their research plan.

Intended learning outcomes : When completing the course the student should be able to: - Understand the underpinning principles for decisions regarding choice of research methods in general, and in qualitative data collection and data analysis specifically. - Be able to reason scientifically about trustworthiness, credibility and validity in qualitative research. - Understand what characterizes qualitative data and the research questions qualitative methods can answer. - Have basic knowledge about different methods of data collection and analysis in relationship to qualitative data and about the relevance of qualitative methods in health care sciences. - Formulate a research question, related to his/her own research area, which can be answered with qualitative methods.

Contents of the course : - Scientific and philosophical grounds for qualitative research. - Methods for qualitative data collection and analysis that are commonly used in health care sciences. - Credibility and validity in qualitative research.

Teaching and learning activities : The course uses various teaching methods such as lectures, seminars, group work, individual work, peer-learning and self-study work.

Examination : The course is formative examined through active participation in seminars, and summative examined through an individual written report and examination of a fellow student’s report.

Compulsory elements : Participation in lectures and seminars is mandatory. Absence from seminars is compensated by a written review on a topic related to the seminar content.

Number of students : 10 - 18
Selection of students : Selection will be based on 1) the relevance of the course syllabus for the applicant’s doctoral project (according to written motivation), 2) start date of doctoral studies (priority given to earlier start date)

More information :

Course responsible :
Lena Rosenberg
Department of Neurobiology, Care Sciences and Society

Lena.Rosenberg@ki.se

Contact person :
Title: Practical approaches to qualitative research - based on blended learning

Course number: 2674
Credits: 7.5
Date: 2022-08-22 -- 2022-11-14
Language: English
Level: Doctoral level
Responsible KI department: Department of Global Public Health
Specific entry requirements: None

Purpose of the course: Qualitative research is a powerful widely used methodology that allows researchers to understand why and how an event occurs in a given context. However, many health scientists are unfamiliar with theories and methods used in qualitative research. This course will contribute to fill this knowledge gap by providing the participants with practical skills to design, conduct, analyze and report qualitative studies.

Intended learning outcomes:
- Design a qualitative study including selecting the appropriate sampling procedure and data collection methods.
- Develop the data instruments including interview/focus groups discussions guides and observation protocols.
- Conduct the fieldwork.
- Analyze the data.
- Write up the findings.
- Critically discuss others' qualitative research, e.g. described in research proposals and manuscripts.

Contents of the course:
- Background on qualitative methodology.
- Theory of qualitative research.
- Sampling in qualitative research.
- Designing an interview/discussion guide.
- Ethical considerations in qualitative research.
- Writing a research protocol.
- Data collection methods (in-depth interviews, focus groups discussions and observation).
- Alternative methods of data collection.
- Analysis of qualitative data.
- Trustworthiness and validity.
- Other approaches to interpretation: Phenomenology, narrative research, oral history.
- Qualitative research in evaluation.
- Critical review of literature.
- Ongoing development as qualitative researcher.

Teaching and learning activities: The course will be taught with a blended learning approach, which will combine self-study and face-to-face practical training sessions. Students will be able to access course materials and interact with each other through a common e-learning platform. Practical sessions will be conducted face-to-face where a theoretical and practical training will be provided in the three dominant qualitative data collection methods, including discussion of examples used in studies. In addition, the students will conduct individual assignments that will allow them to improve their skills.

Examination: Four assignments are to be done during the course. The first three assignments will take the students through a full mini research project. The first assignment will be to write a qualitative research protocol, the second to conduct two individual depth interviews and transcribe these and the third to analyze the interview transcripts. The fourth assignment will be to write a critical review of a published qualitative paper. There will be a written examination at the end of the course, which will be emailed to the students to be returned within 48 hours. In order to obtain a pass for the whole course, students must obtain a pass in the four assignments and in the written examination.

Compulsory elements: Participation in practical sessions, on-line lectures and discussions is compulsory. Non-participation will result in additional assignments at the discretion of the course tutor.

Number of students: 8 - 15

Selection of students: Selection will be based on 1) the relevance of the course syllabus for the applicant’s doctoral project (according to written motivation), 2) start date of doctoral studies (priority given to earlier start date)

More information: This is a blending learning course that combines face-to-face and prerecorded lectures with practical training and individual assignments. Most lectures are prerecorded. We will meet face-to-face the first day of the course (August 23rd). In addition, there will be five days of face-to-face mandatory practical training that will be conducted from September 26th to September 30th. We will work from 9.00 to 16.00, Monday through Friday. The practical training will be conducted by Dr. Donald Skinner Ph.D. and Dr. Mariano Salazar Ph.D.

Course responsible:
Mariano Salazar
Department of Global Public Health
mariano.salazar@ki.se

Contact person:
Mariano Salazar
Institutionen för global folkhälsa
mariano.salazar@ki.se

https://kiwas.ki.se/katalog/katalog/pdf?term=HT22
Title: Basic Laboratory Safety

Course number: 2690
Credits: 1.8
Date: 2022-09-19 -- 2022-09-26
Language: English
Level: Doctoral level
Responsible KI department: Department of Microbiology, Tumor and Cell Biology
Specific entry requirements: Experience of and/or education in laboratory work

Purpose of the course: The purpose of the course is to enable the students to obtain an understanding of risks and of principles in safety measures in the medical science laboratory, as well as a consciousness about general and individual responsibilities for the planning and execution of applicable safety measures. The purpose is also to develop skills in performing risk analyses and writing up risk assessments.

Intended learning outcomes: After successfully completing this course you as a student should be able to evaluate the risks associated with experiments in the laboratory. The hazards could originate from chemicals, microbiological agents, cell cultures and human blood/tissues. You should also be able to identify the needs for suitable personal protective equipment, routines for waste management and transport. In addition, you should be familiar with the regulatory framework that governs these topics, the basic needs of a safe laboratory, and be able to identify the chain of responsibilities.

Contents of the course: The course aims at giving theoretical and practical knowledge on chemical and biological aspects of laboratory safety. Topics will deal with writing risk assessments, chemical health risks including allergy, cancer and flammable agents, handling and storage of dangerous chemicals, handling of microorganisms and cell cultures including human blood and tissue samples, laboratory acquired infections, bio-safety measures including personal protection devices, ventilated workplaces, genetically modified microorganisms, bio-security and dual use, transport of dangerous goods and waste management.

Teaching and learning activities: The information will be given as lectures, group discussions, practical sessions, web-tutorials and computer sessions during a total of six days.

Examination: The examination is based on an individual written examination, a risk assessment and the active participation and contributions in a group presentation. One needs to pass each of these three assessments in order to pass the course.

Compulsory elements: Presence during some of the course activities, marked in the schedule, is compulsory. Students cannot compensate for absence during compulsory activities, but are referred to coming courses for these activities.

Number of students: 30 - 40
Selection of students: Selection will be based on 1) the relevance of the course syllabus for the applicant's doctoral project (according to written motivation), 2) start date of doctoral studies (priority given to earlier start date)

More information:

Course responsible:
Maria Johansson
Department of Microbiology, Tumor and Cell Biology
Maria.Johansson@ki.se

Contact person:
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Institutionen för mikrobiologi, tumör- och cellbiologi
christina.johansson.1@ki.se

https://kiwas.ki.se/katalog/katalog/pdf?term=HT22
Title: Basic Laboratory Safety

Course number: 2690
Credits: 1.8
Date: 2022-12-05 -- 2022-12-12
Language: English
Level: Doctoral level
Responsible KI department: Department of Microbiology, Tumor and Cell Biology
Specific entry requirements: Experience of and/or education in laboratory work

Purpose of the course: The purpose of the course is to enable the students to obtain an understanding of risks and of principles in safety measures in the medical science laboratory, as well as a consciousness about general and individual responsibilities for the planning and execution of applicable safety measures. The purpose is also to develop skills in performing risk analyses and writing up risk assessments.

Intended learning outcomes: After successfully completing this course you as a student should be able to evaluate the risks associated with experiments in the laboratory. The hazards could originate from chemicals, microbiological agents, cell cultures and human blood/tissues. You should also be able to identify the needs for suitable personal protective equipment, routines for waste management and transport. In addition, you should be familiar with the regulatory framework that governs these topics, the basic needs of a safe laboratory, and be able to identify the chain of responsibilities.

Contents of the course: The course aims at giving theoretical and practical knowledge on chemical and biological aspects of laboratory safety. Topics will deal with writing risk assessments, chemical health risks including allergy, cancer and flammable agents, handling and storage of dangerous chemicals, handling of microorganisms and cell cultures including human blood and tissue samples, laboratory acquired infections, bio-safety measures including personal protection devices, ventilated workplaces, genetically modified microorganisms, bio-security and dual use, transport of dangerous goods and waste management.

Teaching and learning activities: The information will be given as lectures, group discussions, practical sessions, web-tutorials and computer sessions during a total of six days.

Examination: The examination is based on an individual written examination, a risk assessment and the active participation and contributions in a group presentation. One needs to pass each of these three assessments in order to pass the course.

Compulsory elements: Presence during some of the course activities, marked in the schedule, is compulsory. Students cannot compensate for absence during compulsory activities, but are referred to coming courses for these activities.

Number of students: 30 - 40
Selection of students: Selection will be based on 1) the relevance of the course syllabus for the applicant's doctoral project (according to written motivation), 2) start date of doctoral studies (priority given to earlier start date)

More information:

Course responsible:
Maria Johansson
Department of Microbiology, Tumor and Cell Biology
Maria.Johansson@ki.se

Contact person:
Christina Johansson
Institutionen för mikrobiologi, tumör- och cellbiologi
christina.johansson.1@ki.se
Title: Measuring Physical Activity with Focus on Wearable Monitors - Applications for Clinical and Epidemiological Studies

Course number: 2693  
Credits: 3.0  
Date: 2022-11-07 -- 2022-12-02  
Language: English  
Level: Doctoral level  
Responsible KI department: Department of Neurobiology, Care Sciences and Society  
Specific entry requirements:

Purpose of the course: The primary objective of the course is to promote high quality research in clinical and epidemiological studies through understanding of principles for measuring physical activity and methods for analyzing physical activity data. The course has the primary focus on measurement of physical activity using accelerometry and its use in different study designs. An overview of other methods to measure physical activity such as questionnaires, heart rate monitoring or a combination of different physiological measures will also be covered.

Intended learning outcomes: By the end of the course the student should be able to: 1. Reflect on the concepts relevant for the relation between physical activity and health and understand measurement principles for assessing different domains of physical activity and especially the principles of wearable monitors such as accelerometry. 2. Choose and justify the best method of choice for assessment of physical activity in accordance with different research questions, study designs and populations. 3. Discuss how the validity (measurement error) of the wearable sensor can influence the results in clinical and/or epidemiological studies in different populations. 4. Analyse physical activity data and interpret the outcomes in accordance with different research questions, study designs and populations.

Contents of the course: • Assessment of physical activity using questionnaires and wearable monitors in different types of studies • Sensor development and measurement principles • Validation and measurement bias • Different approaches handling and analyzing the data and outcomes • Statistical considerations • Interpretation of results

Teaching and learning activities: This fully online course is a mix of distance learning with online interactive lectures, demonstrations, workshops, quiz and seminars to promote a reflective, analytical and critical approach towards this research field. Students will be encouraged to be interactive in workshops and seminars. There will be hands-on experience with students wearing accelerometer throughout a week and opportunities for exploring, processing and analysis of data.

Examination: The learning outcomes will be examined by a written assignment where the students apply the course content to their own doctoral projects. The written assignments will be presented and discussed in a seminar where the students are respondents and opponents on each other’s work. After the seminar the students will be given one week to refine their work based on the feedback they are given.

Compulsory elements: The participants are expected to participate in all course sessions. Absence will be compensated with a written assignment in agreement with the course director.

Number of students: 8 - 16  
Selection of students: Selection will be based on 1) the relevance of the course syllabus for the applicant's doctoral project (according to written motivation), 2) start date of doctoral studies (priority given to earlier start date)

More information: The course will be online using the Canvas platform with synchrone lectures, demonstrations, discussions and seminars. Preliminary days are planned for Nov 7-8th, Nov 15th, Nov 22-23 and examination Dec 1-2.

Course responsible:  
Maria Hagströmer  
Department of Neurobiology, Care Sciences and Society  
08-52488836  
Maria.Hagstromer@ki.se

Contact person: -
Title: Occupational Science conceptual development and application on research

Course number: 2702
Credits: 3.0
Date: 2022-11-23 -- 2023-01-13
Language: English
Level: Doctoral level

Responsible KI department: Department of Neurobiology, Care Sciences and Society
Specific entry requirements: Students should have knowledge in models of practice in occupational therapy

Purpose of the course: The purpose of the course is to develop theoretical and conceptual understanding on occupational science including how theories and concepts within the discipline can be applied to a specific research-question or research-area. In-depth knowledge also includes development of critical thinking in application of theories and knowledge short-coming and possible development of further understanding.

Intended learning outcomes: Following the course, participants will be able to: - develop in-depth knowledge on the development of the discipline of occupational science, with focus on the development of ideas, positioning in the knowledge society and epistemological base, - reflect on conceptual questions within occupational science and its relation to other health-related concepts, including relationship to clinical- or research practice, - apply an occupational perspective on a research question or a research area on individual, contextual and societal level and discuss similarities and differences to other perspectives. - reflect on the strengths and weaknesses of a fellow students application of an occupational perspective

Contents of the course: The content of the course regards discussions about the historical roots of the ideas of occupational science and the discipline in relation to the professional application in occupational therapy. Contemporary discussions about central concepts and focuses on individual and societal level will be reviewed in the course. Connecting own research to areas and concepts within the occupational perspective will be central in the course

Teaching and learning activities: The course is a part-time distance course that uses streamed lectures to introduce the course and each of the learning outcomes. This is combined with on-line discussions and 3 group-based on-line seminars that students prepare beforehand and discuss aspects and problem in relation to each of the learning outcomes. The final examination seminar presents and discusses individual papers focusing on application of OS to a research question. Respondent and opponent-roles will be used.

Examination: The examination will be based on the following: - participating in seminar with reflections on the development of ideas in relation to own experience clinically and or in research including comments on others in the seminar, - participating in seminar with reflections on a central concept in the discipline including comments on others in the seminar, - a written assignment of 4-6 pages in which the student by using relevant concepts should apply an occupational perspective on a research question or a research area on individual, contextual and societal level. - an oral presentation of the assignment and performance in the role of opponent reflecting on a fellow students paper.

Compulsory elements: All lectures are compulsory as well as the group-based and the individual based seminar. Absence will be compensated with an individual discussion paper about the topic that has been missed.

Number of students: 8 - 10
Selection of students: Selection of students will be made from a short motivation letter (half page) on how this course is planned to support the specific research-project of the students.

More information: The course is an online course with no physical meetings. Webb-based examination seminars is planned on two alternative dates in January 2023.

Course responsible:
Hans Jonsson
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Division of Occupational Therapy
Fack 23200
SE-141 83
Huddinge

Contact person: -
Title: Intermediate Medical Statistics: Regression models

Course number: 2738
Credits: 3.0
Date: 2022-10-17 -- 2022-10-28
Language: English
Level: Doctoral level

Responsible KI department: Department of Learning, Informatics, Management and Ethics
Specific entry requirements: Basic Medical Statistics (or equivalent)

Purpose of the course: The aim of the course is to introduce intermediate statistical methods and to facilitate acquisition of skills that involve hands-on data analysis using statistical software.

Intended learning outcomes: After successfully completing this course students are expected to be able to:
Understand the basic theory behind the statistical methods introduced in the course and to evaluate their applicability and limitations. Choose a suitable statistical model for assessing a specific research hypothesis using data from a medical science study, evaluate the fit of the model, and interpret the results. Apply the methods discussed in the course on real data.

Contents of the course: The course is an introduction to more advanced statistical methods and requires that the student is familiar with the statistical concepts of descriptive and inferential statistics, and has some basic knowledge of linear regression. The course covers intermediate regression analysis, one-way and two-way analysis of variance, repeated measures ANOVA, logistic regression, and introduction to survival analysis. Concepts examined in this course include dummy variables, confounding variables, interaction between variables, influential observations and model selection.

Teaching and learning activities: The course consists of lectures, group discussions and assignments solved individually and in groups. Some group discussions and exercises are compulsory.

Examination: Assessment of the intended learning outcomes by a passing grade on the computer based exercises, and active participation in the final seminar and article presentations.

Compulsory elements: Computer based exercises, seminars, article presentations and some lectures are mandatory. The course leader assesses whether and if so, how absence can be compensated.

Number of students: 18 - 20

Selection of students: Selection will be based on: 1) start date of doctoral studies (priority given to earlier start date), 2) the relevance of the course syllabus for the applicant's doctoral project/post doctoral research (according to written motivation).

More information: The course will consist of three or four scheduled whole days per week for two weeks. Course dates are: October 17, 18, 20, 21, 24, 25, 28.

Course responsible:
Johan Zetterqvist
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Contact person:
Nora Espahbodi
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nora.espahbodi@ki.se
Title: The developing brain

Course number: 2780
Credits: 1.5
Date: 2022-09-26 -- 2022-09-30
Language: English
Level: Doctoral level
Responsible KI department: Department of Medical Biochemistry and Biophysics

Specific entry requirements:

Purpose of the course: Developmental biology lies at the heart of an effort to understanding complex biological systems. By studying how neural circuits are assembled we can extrapolate key aspects of their function as well as devise strategies for their repair. This course is given to deepen the understanding of how molecular and cellular mechanisms underlie neurobiological function and to widen the horizon of students within the strong Karolinska neuroscience community.

Intended learning outcomes: By the end of the course the student shall be able to describe the major steps contributing to the development of the nervous system and transfer new knowledge acquired in the course into their specific projects or fields of research.

Contents of the course: The course will cover the main steps of development from neural stem cells to mature circuits, including the patterning of the neural plate and thus the origin of cell types, the interplay between intrinsic and extrinsic factors, gene regulation including epigenetics, neuro-glia interactions and the role of network activity in shaping the final circuits. Different molecular and tracing technologies, and model organisms will be covered. An important aspect of the course regards molecular technologies for labeling, transcriptional analysis and genetic manipulation of defined neural populations. Connections between aberrant developmental processes and neurological disorders will be discussed.

Teaching and learning activities: Lectures by invited international experts, group work and seminar presentations.

Examination: The students should demonstrate their knowledge about the intended learning outcomes stated above including reflect on which aspects are relevant for their own research in a seminar presentation and in discussions.

Compulsory elements: All lectures and the seminar presentation (examination) are compulsory.

Number of students: 16 - 24

Selection of students: Selection will be based on 1) the relevance of the course syllabus for the applicant's doctoral project (according to written motivation), 2) the date for registration as a doctoral student (priority given to earlier registration date)

More information: This course is a full-time course and will be held at Campus Solna if possible, otherwise online. The schedule with all details will be sent out after acceptance to the course.

Course responsible:
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Contact person:
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Francois Lallemend
Institutionen för neurovetenskap
francois.lallemend@ki.se
Title : Present your research!

Course number : 2787
Credits : 1.5
Date : 2022-08-15 -- 2022-08-19
Language : English
Level : Doctoral level
Responsible KI department : Department of Women's and children's health
Specific entry requirements : None

Purpose of the course : The purpose of the course is to enable doctoral students to obtain knowledge and practical experience in presenting own research orally; adapted to different presentation formats, target groups, supporting media and situations, as well as to reflect on the development of own presentation skills.

Intended learning outcomes : After attending the course, the doctoral student should: 1. Be able to design an oral presentation in an adequate way. 2. Be able to design and use supportive media for a successful presentation. 3. Know the basics of presentation techniques and rhetoric. 4. Have gained knowledge on how to interact with the audience.

Contents of the course : The scope of the course is to design and give oral presentations of your research results in different contexts. The main content of the course: 1. DESIGN AND DISPOSITION OF AN ORAL PRESENTATION (e.g. poster presentation, short presentation of research results): a. Goals and aims b. Structure c. Simplifications to enhance understanding d. Choice of pictures e. Language f. Time management 2. PRESENTATION TECHNIQUES AND RHETORIC FOR ORAL PRESENTATIONS: a. Body language and posture b. Language and pace c. How to prepare yourself for a presentation d. How to remember what you want to present e. Building confidence (be less nervous) to present f. What to avoid doing during a presentation g. How to deal with questions from the audience 3. DESIGN AND USE OF SUPPORTING MEDIA FOR A PRESENTATION: a. Power Point slides including introduction to point power b. Scientific poster c. Flipchart and other supporting media 4. INTERACTION WITH THE AUDIENCE: a. Catching the audience's attention b. How to address the audience c. Keeping the audience's attention for a longer period of time d. Communicating with the audience e. How to make the audience trust you f. Preparing the presentation with different audiences in mind g. Different learning styles which influences the audience's attention h. How to impress your audience i. Attention curve of the audience j. How to ease the learning of the audience 5. PRACTICAL EXERCISES: a. Presenting in front of an audience: i. Poster presentation ii. Presentation of student's choice iii. Elevator Pitch iv. Power point presentation v. Video recording of presentation with feedback b. Presentation exercises in pairs or small groups c. Presenting to different audiences d. Body language e. Language and pace f. How to use your audience as an asset g. How to interact with your audience h. How to remember your presentation i. Give and receive feedback on presentations j. Deal with nervousness and stay focused on your presentation

Teaching and learning activities : Lectures, written assignments, workshops, coaching, filming, group work, and practical exercises in groups and with a learning peer.

Examination : Formative assessment during active participation in all parts of the course Summative assessment of a. Poster presentation including scientific poster, b. Power Point presentation c. Elevator pitch

Compulsory elements : Three complete presentations (designed and presented to the class): a. Poster presentation including a scientific poster b. Power Point presentation c. Elevator pitch d. Giving feedback on the other students' presentations e. Reflecting on own learning and development during the course

Number of students : 16 - 22
Selection of students : Selection will be based on 1) the relevance of the course syllabus for the applicant's doctoral project (according to written motivation), 2) start date of doctoral studies (priority given to earlier start date)

More information : The course is given in two parallel formats (in-class/on-line) with all lectures real-time and according to schedule (no pre-recorded lectures). <BR> The scope of the course is research presentations in different contexts and formats. You will practice presenting your own research results (or anything of your choice) as well as other topics to approach presentation skills from different angles. This is highly interactive course with a multitude of exercises aiming at taking your presentations to the next level, while identifying your individual strengths. The focus is on developing each student's authentic and personal style of presenting, rather than applying a "one-size-fits-all" template. Furthermore, we will deal with nervousness and other challenges you might be facing when presenting. The teachers focus on creating a safe environment, where the students can practice and try new presentation approaches and techniques. <BR> This course occasion will be given in-class (in a venue in central Stockholm) and/or on-line (please state your preference in the comments field). <BR> Please address ALL questions to: anna.hildenbrand.michelman@ki.se or phone: 0707890607

Course responsible :
Kristina Gemzell Danielsson
Department of Women's and children's health
0851772128
Kristina.Gemzell@ki.se

Contact person :
Anna Hildenbrand Wachtmeister
Institutionen för kvinnors och barns hälsa
Title : Present your research!

Course number : 2787
Credits : 1.5
Date : 2022-09-19 -- 2022-09-23
Language : English
Level : Doctoral level
Responsible KI department : Department of Women's and children's health
Specific entry requirements : None

Purpose of the course : The purpose of the course is to enable doctoral students to obtain knowledge and practical experience in presenting own research orally; adapted to different presentation formats, target groups, supporting media and situations, as well as to reflect on the development of own presentation skills.

Intended learning outcomes : After attending the course, the doctoral student should: 1. Be able to design an oral presentation in an adequate way. 2. Be able to design and use supportive media for a successful presentation. 3. Know the basics of presentation techniques and rhetoric. 4. Have gained knowledge on how to interact with the audience.

Contents of the course : The scope of the course is to design and give oral presentations of your research results in different contexts. The main content of the course: 1. DESIGN AND DISPOSITION OF AN ORAL PRESENTATION (e.g. poster presentation, short presentation of research results): a. Goals and aims b. Structure c. Simplifications to enhance understanding d. Choice of pictures e. Language f. Time management 2. PRESENTATION TECHNIQUES AND RHETORIC FOR ORAL PRESENTATIONS: a. Body language and posture b. Language and pace c. How to prepare yourself for a presentation d. How to remember what you want to present e. Building confidence (be less nervous) to present f. What to avoid doing during a presentation g. How to deal with questions from the audience 3. DESIGN AND USE OF SUPPORTING MEDIA FOR A PRESENTATION: a. Power Point slides including introduction to power point b. Scientific poster c. Flipchart and other supporting media 4. INTERACTION WITH THE AUDIENCE: a. Catching the audience's attention b. How to address the audience c. Keeping the audience's attention for a longer period of time d. Communicating with the audience e. How to make the audience trust you f. Preparing the presentation with different audiences in mind g. Different learning styles which influences the audience's attention h. How to impress your audience i. Attention curve of the audience j. How to ease the learning of the audience 5. PRACTICAL EXERCISES: a. Presenting in front of an audience: i. Poster presentation ii. Presentation of student's choice iii. Elevator Pitch iv. Power point presentation v. Video recording of presentation with feedback b. Presentation exercises in pairs or small groups c. Presenting to different audiences d. Body language e. Language and pace f. How to use your audience as an asset g. How to interact with your audience h. How to remember your presentation i. Give and receive feedback on presentations j. Deal with nervousness and stay focused on your presentation

Teaching and learning activities : Lectures, written assignments, workshops, coaching, filming, group work, and practical exercises in groups and with a learning peer.

Examination : Formative assessment during active participation in all parts of the course Summative assessment of a. Poster presentation including scientific poster, b. Power Point presentation c. Elevator pitch

Compulsory elements : Three complete presentations (designed and presented to the class): a. Poster presentation including a scientific poster b. Power Point presentation c. Elevator Pitch d. Giving feedback on the other students' presentations e. Reflecting on own learning and development during the course

Number of students : 16 - 22
Selection of students : Selection will be based on 1) the relevance of the course syllabus for the applicant's doctoral project (according to written motivation), 2) start date of doctoral studies (priority given to earlier start date)

More information : The course is given in two parallel formats (in-class/on-line) with all lectures real-time and according to schedule (no pre-recorded lectures). The scope of the course is research presentations in different contexts and formats. You will practice presenting your own research results (or anything of your choice) as well as other topics to approach presentation skills from different angles. This is highly interactive course with a multitude of exercises aiming at taking your presentations to the next level, while identifying your individual strengths. The focus is on developing each student's authentic and personal style of presenting, rather than applying a "one-size-fits-all" template. Furthermore, we will deal with nervousness and other challenges you might be facing when presenting. The teachers focus on creating a safe environment, where the students can practice and try new presentation approaches and techniques. This course occasion will be given in-class (in a venue in central Stockholm) and/or on-line (please state your preference in the comments field). Please address ALL questions to: anna.hildenbrand.michelman@ki.se or phone: 0707890607

Course responsible :
Kristina Gemzell Danielsson
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0851772128
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Contact person :
Anna Hildenbrand Wachtmeister
Institutionen för kvinnors och barns hälsa

https://kiwas.ki.se/katalog/katalog/pdf?term=HT22
Title : Present your research!

Course number : 2787
Credits : 1.5
Date : 2022-10-24 -- 2022-10-28
Language : English
Level : Doctoral level
Responsible KI department : Department of Women's and children's health
Specific entry requirements : None

Purpose of the course : The purpose of the course is to enable doctoral students to obtain knowledge and practical experience in presenting own research orally; adapted to different presentation formats, target groups, supporting media and situations, as well as to reflect on the development of own presentation skills.

Intended learning outcomes : After attending the course, the doctoral student should: 1. Be able to design an oral presentation in an aseful way. 2. Be able to design and use supportive media for a successful presentation. 3. Know the basics of presentation techniques and rhetoric. 4. Have gained knowledge on how to interact with the audience.

Contents of the course : The scope of the course is to design and give oral presentations of your research results in different contexts. The main content of the course: 1. DESIGN AND DISPOSITION OF AN ORAL PRESENTATION (e.g. poster presentation, short presentation of research results): a. Goals and aims b. Structure c. Simplications to enhance understanding d. Choice of pictures e. Language f. Time management 2. PRESENTATION TECHNIQUES AND RHETORIC FOR ORAL PRESENTATIONS: a. Body language and posture b. Language and pace c. How to prepare yourself for a presentation d. How to remember what you want to present e. Building confidence (be less nervous) to present f. What to avoid doing during a presentation g. How to deal with questions from the audience 3. DESIGN AND USE OF SUPPORTING MEDIA FOR A PRESENTATION: a. Power Point slides including introduction to power point b. Scientific poster c. Flipchart and other supporting media 4. INTERACTION WITH THE AUDIENCE: a. Catching the audience's attention b. How to address the audience c. Keeping the audience's attention for a longer period of time d. Communicating with the audience e. How to make the audience trust you f. Preparing the presentation with different audiences in mind g. Different learning styles which influences the audience's attention h. How to impress your audience i. Attention curve of the audience j. How to ease the learning of the audience 5. PRACTICAL EXERCISES: a. Presenting in front of an audience: i. Poster presentation ii. Presentation of student's choice iii. Elevator Pitch iv. Power point presentation v. Video recording of presentation with feedback b. Presentation exercises in pairs or small groups c. Presenting to different audiences d. Body language e. Language and pace f. How to use your audience as an asset g. How to interact with your audience h. How to remember your presentation i. Give and receive feedback on presentations j. Deal with nervousness and stay focused on your presentation

Teaching and learning activities : Lectures, written assignments, workshops, coaching, filming, group work, and practical exercises in groups and with a learning peer.

Examination : Formative assessment during active participation in all parts of the course Summative assessment of a. Poster presentation including scientific poster, b. Power Point presentation c. Elevator pitch

Compulsory elements : Three complete presentations (designed and presented to the class): a. Poster presentation including a scientific poster b. Power Point presentation c. Elevator Pitch d. Giving feedback on the other students' presentations e. Reflecting on own learning and development during the course

Number of students : 16 - 22
Selection of students : Selection will be based on 1) the relevance of the course syllabus for the applicant's doctoral project (according to written motivation), 2) start date of doctoral studies (priority given to earlier start date)

More information : The course is given in two parallel formats (in-class/on-line) with all lectures real-time and according to schedule (no pre-recorded lectures). <BR> The scope of the course is research presentations in different contexts and formats. You will practice presenting your own research results (or anything of your choice) as well as other topics to approach presentation skills from different angles. This is highly interactive course with a multitude of exercises aiming at taking your presentations to the next level, while identifying your individual strengths. The focus is on developing each student's authentic and personal style of presenting, rather than applying a "one-size-fits-all" template. Furthermore, we will deal with nervousness and other challenges you might be facing when presenting. The teachers focus on creating a safe environment, where the students can practice and try new presentation approaches and techniques. <BR> This course occasion will be given in-class (in a venue in the center of Stockholm) and/or on-line (please state your preference in the comments field). <BR> Please address ALL questions to: anna.hildenbrand.michelman@ki.se or phone: 0707890607

Course responsible : Kristina Gemzell Danielsson
Department of Women's and children's health
0851772128
Kristina.Gemzell@ki.se

Contact person : Anna Hildenbrand Wachtmeister
Institutionen för kvinnors och barns hälsa
Title: Present your research!

Course number: 2787
Credits: 1.5
Date: 2022-12-05 -- 2022-12-09
Language: English
Level: Doctoral level
Responsible KI department: Department of Women’s and children's health
Specific entry requirements: None

Purpose of the course: The purpose of the course is to enable doctoral students to obtain knowledge and practical experience in presenting own research orally; adapted to different presentation formats, target groups, supporting media and situations, as well as to reflect on the development of own presentation skills.

Intended learning outcomes: After attending the course, the doctoral student should: 1. Be able to design an oral presentation in an adequate way. 2. Be able to design and use supportive media for a successful presentation. 3. Know the basics of presentation techniques and rhetoric. 4. Have gained knowledge on how to interact with the audience.

Contents of the course: The scope of the course is to design and give oral presentations of your research results in different contexts. The main content of the course: 1. DESIGN AND DISPOSITION OF AN ORAL PRESENTATION (e.g. poster presentation, short presentation of research results): a. Goals and aims b. Structure c. Simplifications to enhance understanding d. Choice of pictures e. Language f. Time management 2. PRESENTATION TECHNIQUES AND RHETORIC FOR ORAL PRESENTATIONS: a. Body language and posture b. Language and pace c. How to prepare yourself for a presentation d. How to remember what you want to present e. Building confidence (be less nervous) to present f. What to avoid doing during a presentation g. How to deal with questions from the audience 3. DESIGN AND USE OF SUPPORTING MEDIA FOR A PRESENTATION: a. Power Point slides including introduction to power point b. Scientific poster c. Flipchart and other supporting media 4. INTERACTION WITH THE AUDIENCE: a. Catching the audience's attention b. How to address the audience c. Keeping the audience's attention for a longer period of time d. Communicating with the audience e. How to make the audience trust you f. Preparing the presentation with different audiences in mind g. Different learning styles which influences the audience's attention h. How to impress your audience i. Attention curve of the audience j. How to ease the learning of the audience 5. PRACTICAL EXERCISES: a. Presenting in front of an audience: i. Poster presentation ii. Presentation of student's choice iii. Elevator Pitch iv. Power point presentation v. Video recording of presentation with feedback b. Presentation exercises in pairs or small groups c. Presenting to different audiences d. Body language e. Language and pace f. How to use your audience as an asset g. How to interact with your audience h. How to remember your presentation i. Give and receive feedback on presentations j. Deal with nervousness and stay focused on your presentation

Teaching and learning activities: Lectures, written assignments, workshops, coaching, filming, group work, and practical exercises in groups and with a learning peer.
Examination: Formative assessment during active participation in all parts of the course Summative assessment of a. Poster presentation including scientific poster, b. Power Point presentation c. Elevator pitch

Compulsory elements: Three complete presentations (designed and presented to the class): a. Poster presentation including a scientific poster b. Power Point presentation c. Elevator pitch d. Giving feedback on the other students' presentations reflecting on own learning and development during the course

Number of students: 16 - 22
Selection of students: Selection will be based on 1) the relevance of the course syllabus for the applicant's doctoral project (according to written motivation), 2) start date of doctoral studies (priority given to earlier start date)

More information: The course is given in two parallel formats (in-class/on-line) with all lectures real-time and according to schedule (no pre-recorded lectures). <BR> The scope of the course is research presentations in different contexts and formats. You will practice presenting your own research results (or anything of your choice) as well as other topics to approach presentation skills from different angles. This is highly interactive course with a multitude of exercises aiming at taking your presentations to the next level, while identifying your individual strengths. The focus is on developing each student's authentic and personal style of presenting, rather than applying a "one-size-fits-all" template. Furthermore, we will deal with nervousness and other challenges you might be facing when presenting. The teachers focus on creating a safe environment, where the students can practice and try new presentation approaches and techniques. <BR> This course occasion will be given in-class (in a venue in central Stockholm) and/or on-line (please state your preference in the comments field). <BR> Please address ALL questions to: anna.hildenbrand.michelman@ki.se or phone: 0707890607

Course responsible:
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Contact person:
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Institutionen för kvinnors och barns hälsa

https://kiwas.ki.se/katalog/katalog/pdf?term=HT22
Title: Advanced Course in SAS Programming for Health Care Data

Course number: 2868  
Credits: 1.5  
Date: 2022-11-28 -- 2022-12-02  
Language: English  
Level: Doctoral level  
Responsible KI department: Department of Medicine, Solna  
Specific entry requirements: Knowledge corresponding to the intended learning outcomes of the KI doctoral courses Introductory course in SAS programming, Epidemiology I: Introduction to Epidemiology, Biostatistics I: Introduction for epidemiologists and Biostatistics II: Logistic regression for epidemiologists.

Purpose of the course: The purpose of this course is to give students with prior experience in SAS the foundation needed to work independently with large data bases in SAS, performing the data management needed for observational studies from for instance a register linkage.

Intended learning outcomes: After this course the student should be able to - independently use a wide range of SAS functions and procedures for data management - manage data using Proc SQL, and in a given situation decide whether to use SQL or SAS Base - develop basic SAS macros - use core statistical procedures, and export results to other software. Intended learning outcomes are classified according to Bloom's taxonomy: knowledge, comprehension, application, analysis, synthesis, and evaluation (Bloom, 1956, extended by Anderson and Krathwohl, 2001).

Contents of the course: Students will develop their skills in processing data using built-in functions and procedures, including loops, learn how to merge data sets and perform operations with SAS Base and SQL coding, and the benefits and tricks of transposition, where one moves between "long" and "wide" data sets. Students will also learn how to write user written functions (macros) in SAS, and work through examples of how to analyse data with core statistical techniques, and export relevant results to edited tables. Although exercises during the course will use health care data, the same skills would be useful for studies in e.g., demography, sociology, and economics.

Teaching and learning activities: Different strategies for teaching and learning, such as interactive lectures, laboratory exercises and small group discussions, will be used. Daily, formative assessments are used to support the students' learning processes.

Examination: A computerized individual take-home examination with realistic assignments, corresponding to the learning outcomes of the course. Students will be allowed to use any literature during the exam, including access to the Internet. Students who do not pass the examination will be offered a second examination within two months.

Compulsory elements: The individual examination (summative assessment) is compulsory.

Number of students: 8 - 25

Selection of students: Eligible doctoral students will be prioritized according to 1) the relevance of the course syllabus for the applicant's doctoral project (according to written information), 2) date for registration as a doctoral student (priority given to earlier registration date). To be considered, submit a completed application form. Give all information requested, including a short description of current research training and motivation for attending, as well as an account of previous courses taken.

More information: Please note the specific entry requirements for the course.

Course responsible:  
Thomas Frisell  
Department of Medicine, Solna  
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Contact person:  
Thomas Frisell  
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thomas.frisell@ki.se
Title: Public Health Research - Concepts and Theories

Course number: 2928
Credits: 3.0
Date: 2022-08-29 -- 2022-09-23
Language: English
Level: Doctoral level
Responsible KI department: Department of Global Public Health

Specific entry requirements:

Purpose of the course: This course is designed for students in all areas related to advancing the health of the population or who want an understanding of the theories and concepts relevant when doing public health research. After this course the student should be able to put her/his research in a public health context and relate it to key public health concepts.

Intended learning outcomes: The learning outcomes are: 1. Discuss what constitutes a public health issue; 2. Reflect upon key public health concepts in relation to your own research area; 3. Discuss how theory can aid in advancing research in public health

Contents of the course: The course provides knowledge on key concepts and theories in the multidisciplinary field of public health and an overview of the development of public health as a research area. Areas that will be covered include the concept of health and how it may be measured, global health needs and priorities, health policies, health prevention and promotion as well as determinants of health and health inequalities. Theories in these areas as well as on social stratification, gender and intersectionality are explored.

Teaching and learning activities: Different strategies for teaching and learning will be used such as lectures, group-discussions, peer reviewing and article seminars. The focus will be on critically reflecting upon the knowledge and relating it to your own research.

Examination: To pass the course the student has to achieve the learning outcomes and this will be assessed in small group assignments and an individual assignment.

Compulsory elements: Group assignments, article seminars and seminar on individual assignment are compulsory. If the student is unable to attend, a written report of the questions related must be handed in.

Number of students: 10 - 20

Selection of students: Doctoral students who have previously applied to the course will be prioritized.

More information: This course is an online course running over 4 weeks. In the first three weeks there will be online teaching Monday, Wednesday and Friday. The days will be a combination of lectures, individual studies and group work. In the fourth week we only meet on the 22/9-22 (also online) where the students will present their individual assignment and get feedback from teachers and peers.

Course responsible:
Janne Agerholm
Department of Global Public Health
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Contact person:
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Title: Statistics with R - from Data to Publication Figure

Course number: 2953
Credits: 3.0
Date: 2022-10-17 -- 2022-11-04
Language: English
Level: Doctoral level
Responsible KI department: Department of Laboratory Medicine

Specific entry requirements:

Purpose of the course: Do you need to turn data into a publication figure? We offer tools and confidence for the student to independently select a statistical method for research questions in their field. The course is practical and includes implementing a basic statistical analysis in R, the leading statistical programming language in bioinformatics and medical science. Furthermore, we give a brief introduction to visualization in R, with a focus on R/ggplot2. Students can bring data from their own research project, or work on data from the course.

Intended learning outcomes: By the end of the course the student should be able to: * download and install the latest versions of R and Rstudio. * know where to look for help when working in R. * know how to import data into R. * use R for basic analysis and presentation of data in their field. * select statistical method and motivate the choice using a structured approach. * communicate efficiently with a statistician about their choice of statistical method.

Contents of the course: Basics of R. Download, install, import data, basic analysis, how to get help. Visualization of data. Learn to speak statistics. A structured approach to selecting statistical method and communicating with a statistician. Practice how to go from data to publication figure using data from your project or more or less friendly data offered by the course.

Teaching and learning activities: Distance learning with online lectures, quizzes and interaction with other students. Lectures at campus or online via ZOOM. Individual project work using your own computer. Digital poster presentation of individual work.

Examination: Poster presentation and peer review.

Compulsory elements: Online quizzes and tasks. Participation during Poster Presentation day.

Number of students: 15 - 25

Selection of students: Selection will be based on 1) the relevance of the course syllabus for the applicant's doctoral project (according to written motivation), 2) start date of doctoral studies (priority given to earlier start date)

More information: The first two weeks of the course are online-based consisting of a general introduction to programming in R, followed with a voluntary workshop. Week three focuses on your own project, from data to figure, interspersed with lectures and workshops. The course concludes with a presentation day. The third week of the course is held at the KI Campus Flemingsberg or online via ZOOM.

Course responsible:
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Eric Rullman
Institutionen för laboratoriemedicin
Eric.Rullman@ki.se
Title : Open science and reproducible research

Course number : 2963
Credits : 3.0
Date : 2022-10-03 -- 2022-10-14
Language : English
Level : Doctoral level
Responsible KI department : Department of Clinical Neuroscience
Specific entry requirements :
Purpose of the course : The purpose of the course is to provide an overview of current challenges in reproducibility and to provide tools and skills for students wishing to practice science openly.
Intended learning outcomes : After the course, students should be able to: - Analyse reproducibility problems in science, including the impact of analysis flexibility and questionable research practices, and identify practices contributing to improved reproducibility - Account for principles of replication research - Preregister research protocols and assess others' preregistered research protocols - Openly publish scientific works including data and code, and find and make use of scientific works, including data and code, published by others.
Contents of the course : - The ""reproducibility crisis"" in biomedical sciences: what is it? - Research fraud and questionable research practices - Impact of bias due to analysis flexibility - Observed statistical power and implications for inference - Comprehensive methods reporting and field-specific guidelines - Preregistration of protocols - Replication research - Open access publishing - Open materials, open data, and open code - Introduction to principles of data re-use in secondary analyses and meta-analyses
Teaching and learning activities : The course will contain lectures, seminars, workshops, and a final assignment. The purpose of the lectures is to introduce the concepts covered by the course and to situate them in context. The seminars will cover the course literature, which the students will be expected to critically appraise. Computer-assisted workshops will be used as interactive learning activities to cover some parts of the course, e.g. statistical power.
Examination : Examination consists of an assignment where students will be able to choose a topic related to the course content, and write a short report. For example, they may compare a preregistered protocol to the published scientific paper, or they may attempt to replicate results from a published paper using openly published data. This assignment will be presented before the class and students will give comments on each others' presentations.
Compulsory elements : Participation in the seminars and labs is mandatory. Absence from a seminar may be compensated by writing a short reflection paper on the literature for that seminar. Participation in the final assignment presentation session is also mandatory.
Number of students : 8 - 20
Selection of students : Selection will be based on 1) the relevance of the course syllabus for the applicant's doctoral project (according to written motivation), 2) start date of doctoral studies (priority given to earlier start date)
More information : The course will be fully online

Course responsible :
Gustav Nilsonne
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Contact person :

Title: Medical Research Ethics

Course number: 2964
Credits: 1.5
Date: 2022-09-26 -- 2022-09-30
Language: English
Level: Doctoral level
Responsible KI department: Department of Learning, Informatics, Management and Ethics

Specific entry requirements:
Purpose of the course: The objective of this course is for the doctoral student to: - understand central research ethical theories, principles and guidelines, to gain the possibility to reflect over ethical aspects of his or her own research - understand what is good research and the boundaries for what is ethically unacceptable research with regards to humans and animals, and to the researcher's own academic integrity - develop a research ethical approach within his or her own research, to others' research and to society

Intended learning outcomes: After having completed the course, the doctoral student should be able to: - give an account of research ethical theories, principles, and, to some extent, guidelines - account for common problems that arise in the area of research ethics - identify, analyze, and discuss research ethical issues and conflicts - conduct a research ethical argumentation for or against a matter

Contents of the course: - Central research ethical principles, theories and arguments - Central philosophy of science - concepts and positions, and its relevance to research ethics - Research on humans, including informed consent and its components - Animal research ethics, including arguments for and against using animals for research purposes, and the three R's. - Ethical reviews and research ethical guidelines, such as the Helsinki Declaration - Good research practice and deviations from good research practice within research, for example issues concerning fabricated data, fraud and plagiarism, and handling of authorship in scientific writing - Conflicts of interest in research, such as bias and sponsorship

Teaching and learning activities: Lectures, group work and general discussions. The course takes place on campus, but can be arranged digitally.

Examination: The doctoral student writes an essay on a research ethical theme, in relation to all intended learning outcomes, preferably related to his or her own research. A small number of students get the opportunity to orally present an ethical reflection concerning their research in front of the whole group. When the course is arranged digitally, the students' examination will be in written form only.

Compulsory elements: Attendance is mandatory for the group work and general discussions. If the student is absent, he or she can to some extent compensate by handing in written answers concerning the cases that have been discussed.

Number of students: 30 - 33
Selection of students: Selection will be based on 1) date for registration as a doctoral student (priority given to earlier registration date), 2) the relevance of the course syllabus for the applicant's doctoral project (according to written motivation).

More information: This course contains mandatory elements on each course day. The students are therefore expected to be present during each course day.

Course responsible:
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Contact person:
Annelie Jonsson
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annelie.jonsson@ki.se
Title: Medical Research Ethics

Course number: 2964
Credits: 1.5
Date: 2022-10-24 -- 2022-10-28
Language: English
Level: Doctoral level
Responsible KI department: Department of Learning, Informatics, Management and Ethics

Specific entry requirements:

Purpose of the course: The objective of this course is for the doctoral student to: - understand central research ethical theories, principles and guidelines, to gain the possibility to reflect over ethical aspects of his or her own research - understand what is good research and the boundaries for what is ethically unacceptable research with regards to humans and animals, and to the researcher's own academic integrity - develop a research ethical approach within his or her own research, to others' research and to society

Intended learning outcomes: After having completed the course, the doctoral student should be able to: - give an account of research ethical theories, principles, and, to some extent, guidelines - account for common problems that arise in the area of research ethics - identify, analyze, and discuss research ethical issues and conflicts - conduct a research ethical argumentation for or against a matter

Contents of the course: - Central research ethical principles, theories and arguments - Central philosophy of science - concepts and positions, and its relevance to research ethics - Research on humans, including informed consent and its components - Animal research ethics, including arguments for and against using animals for research purposes, and the three R's. - Ethical reviews and research ethical guidelines, such as the Helsinki Declaration - Good research practice and deviations from good research practice within research, for example issues concerning fabricated data, fraud and plagiarism, and handling of authorship in scientific writing - Conflicts of interest in research, such as bias and sponsorship

Teaching and learning activities: Lectures, group work and general discussions. The course takes place on campus, but can be arranged digitally.

Examination: The doctoral student writes an essay on a research ethical theme, in relation to all intended learning outcomes, preferably related to his or her own research. A small number of students get the opportunity to orally present an ethical reflection concerning their research in front of the whole group. When the course is arranged digitally, the students' examination will be in written form only.

Compulsory elements: Attendance is mandatory for the group work and general discussions. If the student is absent, he or she can to some extent compensate by handing in written answers concerning the cases that have been discussed.

Number of students: 30 - 33
Selection of students: Selection will be based on 1) date for registration as a doctoral student (priority given to earlier registration date), 2) the relevance of the course syllabus for the applicant's doctoral project (according to written motivation).

More information: This course contains mandatory elements on each course day. The students are therefore expected to be present during each course day. This is an online course.

Course responsible:
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Contact person:
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**Title : Medical Research Ethics**

**Course number :** 2964  
**Credits :** 1.5  
**Date :** 2022-11-21 -- 2022-11-25  
**Language :** English  
**Level :** Doctoral level  
**Responsible KI department :** Department of Learning, Informatics, Management and Ethics

**Specific entry requirements :**

**Purpose of the course :** The objective of this course is for the doctoral student to: - understand central research ethical theories, principles and guidelines, to gain the possibility to reflect over ethical aspects of his or her own research - understand what is good research and the boundaries for what is ethically unacceptable research with regards to humans and animals, and to the researcher's own academic integrity - develop a research ethical approach within his or her own research, to others' research and to society

**Intended learning outcomes :** After having completed the course, the doctoral student should be able to: - give an account of research ethical theories, principles, and, to some extent, guidelines - account for common problems that arise in the area of research ethics - identify, analyze, and discuss research ethical issues and conflicts - conduct a research ethical argumentation for or against a matter

**Contents of the course :** - Central research ethical principles, theories and arguments - Central philosophy of science - concepts and positions, and its relevance to research ethics - Research on humans, including informed consent and its components - Animal research ethics, including arguments for and against using animals for research purposes, and the three R's. - Ethical reviews and research ethical guidelines, such as the Helsinki Declaration - Good research practice and deviations from good research practice within research, for example issues concerning fabricated data, fraud and plagiarism, and handling of authorship in scientific writing - Conflicts of interest in research, such as bias and sponsorship

**Teaching and learning activities :** Lectures, group work and general discussions. The course takes place on campus, but can be arranged digitally.

**Examination :** The doctoral student writes an essay on a research ethical theme, in relation to all intended learning outcomes, preferably related to his or her own research. A small number of students get the opportunity to orally present an ethical reflection concerning their research in front of the whole group. When the course is arranged digitally, the students' examination will be in written form only.

**Compulsory elements :** Attendance is mandatory for the group work and general discussions. If the student is absent, he or she can to some extent compensate by handing in written answers concerning the cases that have been discussed.

**Number of students :** 30 - 33

**Selection of students :** Selection will be based on 1) date for registration as a doctoral student (priority given to earlier registration date), 2) the relevance of the course syllabus for the applicant's doctoral project (according to written motivation).

**More information :** This course contains mandatory elements on each course day. The students are therefore expected to be present during each course day.

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**Course responsible :**
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**Contact person :**
Annelie Jonsson  
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**Title : Introduction to R - Data Management, Analysis and Graphical Presentation**

**Course number :** 2971  
**Credits :** 2.5  
**Date :** 2022-11-07 -- 2022-12-09  
**Language :** English  
**Level :** Doctoral level  
**Responsible KI department :** Department of Laboratory Medicine  
**Specific entry requirements :** Basic statistical knowledge (e.g. taken "Basic course in medical statistics" or similar course)  
**Purpose of the course :** To increase the doctoral student's skills in data analysis and data presentation.  
**Intended learning outcomes :** After attending the course, the student will be able to use R for data management, statistical analysis and graphical data presentation. The student will be able to install new functions in R.  
**Contents of the course :** R is a powerful software/programming language for data analysis and graphical presentation. R is free-of-charge, and in most cases a useful alternative to commercial statistical software. The programming language is completely text-based, making it challenging compared to software with a graphical user interface. However, it offers greater flexibility, better control over analyses and an automatic documentation of performed analyses. The course focuses on structure and basic functions of the R programming language. A selection of functions for data management, statistical analysis and graphics is presented. The methods included are commonly used methods in clinical medical science (e.g. t-test, ANOVA, chi2-test, regression and survival analysis, box, line scatter, and bar plots). The course focuses mainly on how the various methods are applied in R and not their theoretical background, underlying assumptions or the theoretical interpretation of the results.  
**Teaching and learning activities :** Online video lectures, web-based seminars and web-based practical exercises (individual and group assignments), peer assessment of other students' solutions. The examination takes place on KI campus.  
**Examination :** Written examination.  
**Compulsory elements :** The practical exercises and the peer assessments of these are compulsory. Students unable to complete the exercises in time due to e.g. illness can get an extension of the deadline.  
**Number of students :** 15 - 20  
**Selection of students :** Selection will be based on 1) the relevance of the course syllabus for the applicant's doctoral project (according to written motivation), 2) start date of doctoral studies (priority given to earlier start date)  
**More information :** The course is web-based, with course dates 7/11 (self-studies), 9/11, 16/11, 23/11, 30/11, 7/12, 9/12. The examination is in Huddinge 9/12. Between these course dates, there will be deadlines for mandatory home assignments. Laptop required for the examination.

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**Course responsible :**  
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**Contact person :**  
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Title: Study Design in Clinical Research

Course number: 2980  
Credits: 3.0  
Date: 2022-11-07 -- 2022-11-24  
Language: English  
Level: Doctoral level  
Responsible KI department: Department of Molecular Medicine and Surgery  
Specific entry requirements: 

Purpose of the course: The purpose of the course is to give early stage doctoral students, that are going to conduct clinical research, an overview over the design and conduct of clinical research, including writing a study protocol and critically reflecting on its content.

Intended learning outcomes: At the end of the course the students should be able to: 1) Independently plan and produce a study protocol, including a thorough methodological evaluation and choice of appropriate study design; 2) Critically reflect on other students’ individual project work in a scientifically constructive way; 3) Interpret and critically evaluate scientific studies relevant to the course content.

Contents of the course: 1) Basic terms in epidemiology and clinical study design; 2) Measures of disease occurrence; 3) Observational studies, including cohort and case-control studies; 4) Systematic and random errors; 5) Experimental studies, including randomised clinical trials; 6) Quality of life in clinical research; 7) Screening and diagnosis in relation to clinical research. Throughout the course the students will work on an individual project (examination 1) for peer-review (examination 2) and the students will critically review and discuss relevant scientific articles (examination 3).

Teaching and learning activities: Lectures, seminars, individual article review, group discussions, and homework tasks. The course focuses on active learning, i.e. putting knowledge into practice and critically reflecting upon the knowledge, rather than memorising facts. Therefore, much of the focus of the course is on the individual project where students are required to develop a full study protocol including several important aspects covered in the lectures, article reviews and group discussions. Students will also peer-review each other’s projects in the examination seminar.

Examination: 1) Individual project work: To develop a written comprehensive yet concise study protocol including several important aspects of study design as discussed during the course; 2) Peer-review of other students’ projects followed by oral presentation of own project and opposition of other students projects during the group examination; 3) Critically review scientific articles relevant to the course content and participate actively in the seminars. To pass the course the student has to show that all intended learning outcomes have been reached.

Compulsory elements: Compulsory attendance includes the scheduled lectures and seminars. Absence will need to be replaced by individual assignments following discussion with the course co-ordinator, e.g. article reviews, with written or oral follow-up.

Number of students: 20 - 25  
Selection of students: Selection will be based on 1) the relevance of the course syllabus for the applicant’s doctoral project (according to written motivation), 2) start date of doctoral studies (priority given to earlier start date)

More information: The course will take place during a 3-week period, at Karolinska Institutet, Solna. The majority of lectures and seminars are scheduled during the first 4 days of the first course week. The oral exam will take place at the end of the third week (Thursday). The course entails 3 credits, requiring two weeks of fulltime work, which in addition to the lectures and seminars includes individual work on the study protocol. The lecturers are active clinical researchers.

Course responsible:  
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Contact person:  
Kalle Mälberg  
Institutionen för molekylär medicin och kirurgi  
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Title : Rare Disease Genomics

Course number : 2981
Credits : 1.5
Date : 2022-12-05 -- 2022-12-09
Language : English
Level : Doctoral level
Responsible KI department : Department of Molecular Medicine and Surgery
Specific entry requirements :
Purpose of the course : This is a course aimed at students actively involved or planning genetic analysis of rare diseases. The course is also appropriate for those working with complex diseases and cancer whose projects involve high throughput DNA sequencing. The purpose of this course is to provide the participants with knowledge and practical experience about current research strategies and tools for analysis of DNA-sequencing data in the field of rare disease genomics. The participants will also be made aware of ethical issues in relation to rare disease genomics.

Intended learning outcomes : After the course, the participants should be able: 1. To select adequate genomic technologies and data analysis strategies to answer research questions in the field of rare disease genetics or in their field of research; 2. To evaluate candidate variants and genes using publicly available databases and tools; 3. To discuss suitable approaches for functional validation of candidate variants and genes; 4. To identify and discuss on ethical issues arising from large-scale sequencing studies.

Contents of the course : The focus of the course is the use of current DNA-sequencing methods and bioinformatics tools to understand the genetic basis of rare genetic diseases. Within the overall theme of clinical and experimental approaches to diagnostics of rare genetic diseases, particular attention will be paid to annotation and classification of different types of genetic variants (single nucleotide variants and structural variants). The course will cover the use of different in-silico pathogenicity scores, phenotype ontology terms, and population and family data for variant and gene interpretation. The course will cover selected experimental strategies to validate genetic findings. The course will also cover current clinical best practice guidelines concerning ethical issues such as report of incidental findings and acquisition of informed consent.

Teaching and learning activities : The course consists of lectures, seminars, hands-on computer-based exercises, and self-studies. Students are required to bring their laptops with working internet connection.

Examination : It will be assessed whether each individual doctoral student has reached all the learning outcomes of the course through a take-home examination. Anti-plagiarism tools will be used according to KI guidelines.

Compulsory elements : All teaching and learning activities are compulsory. Absence from compulsory parts is compensated according to the instructions from the course leader.

Number of students : 15 - 20
Selection of students : Selection will be based on 1) the relevance of the course syllabus for the applicant's doctoral project (according to written motivation), 2) start date of doctoral studies (priority given to earlier start date)

More information :

Course responsible :
Anna Lindstrand
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Contact person :
Bianca Tesi
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Title: Biostatistics III: Survival analysis for epidemiologists

Course number: 2992
Credits: 1.5
Date: 2022-11-07 -- 2022-11-16
Language: English
Level: Doctoral level
Responsible KI department: Department of Medical Epidemiology and Biostatistics
Specific entry requirements: Epidemiology I, Introduction to epidemiology; Biostatistics I, Introduction for epidemiologists; Biostatistics II, Logistic regression for epidemiologists or equivalent courses.

Purpose of the course: This course focuses on the application of survival analysis methods to epidemiological studies.

Intended learning outcomes: After successfully completing this course students should be able to: - propose a suitable statistical model for assessing a specific research hypothesis using data from a cohort study, fit the model using standard statistical software, evaluate the fit of the model, and interpret the results. - explain the similarities and differences between Cox regression and Poisson regression. - discuss the concept of timescales in statistical models for time-to-event data, be able to control for different timescales using standard statistical software, and argue for an appropriate timescale for a given research hypothesis. - discuss the concept of confounding in epidemiological studies and be able to control/adjust for confounding using statistical models. - apply and interpret appropriate statistical models for studying effect modification and be able to reparameterise a statistical model to estimate appropriate contrasts. - critically evaluate the methodological aspects (design and analysis) of a scientific article reporting a cohort study.

Contents of the course: This course introduces statistical methods for survival analysis with emphasis on the application of such methods to the analysis of epidemiological cohort studies. Topics covered include methods for estimating survival (life table and Kaplan-Meier methods), comparing survival between subgroups (log-rank test), and modelling survival (primarily Poisson regression and the Cox proportional hazards model). The course addresses the concept of ‘time’ as a potential confounder or effect modifier and approaches to defining ‘time’ (e.g., time since entry, attained age, calendar time). The course will emphasise the basic concepts of statistical modelling in epidemiology, such as controlling for confounding and assessing effect modification.

Teaching and learning activities: Lectures, exercises focusing on analysis of real data using the free statistical software R, exercises not requiring statistical software, group discussions, literature review.

Examination: The course grade is based solely on a take-home examination. The focus of the exam will be on understanding concepts and their application to analysis of epidemiological studies rather than mathematical detail. The course examination will be held within two weeks of the final day of the course. Students who do not obtain a passing grade in the first examination will be offered a second examination within 2 months of the final day of the course. Students who do not obtain a passing grade at the first two examinations will be given top priority for admission the next time the course is offered. If the course is not offered during the following two academic terms then a third examination will be scheduled within 12 months of the final day of the course.

Compulsory elements: The individual examination

Number of students: 8 - 25

Selection of students: Eligible doctoral students will be prioritized according to 1) the relevance of the course syllabus for the applicant's doctoral project (according to written information), 2) date for registration as a doctoral student (priority given to earlier registration date). To be considered, submit a completed application form. Give all information requested, including a short description of current research training and motivation for attending, as well as an account of previous courses taken.

More information: The course will be held November 7, 9, 11, 14 and 16. The statistical software R will be used throughout the course. It is strongly recommended to have taken an introductory course in R or to have equivalent experience prior to taking this course. We have provided a self-assessment test (http://biostat3.net) for you to confirm that you have understood the central concepts. We advise all potential applicants to take the test prior to applying to Biostatistics III. If you attempt the test under examination conditions (i.e., without referring to the answers) we would recommend: 1. if you score 70% or more then you possess the required prerequisite knowledge 2. if you score 40% to 70% you should revise the areas where you lost marks 3. if you score less than 40% you should, at minimum, undertake an extensive review of central concepts in statistical modelling and possibly consider studying intermediate level courses (e.g., Biostatistics II) before taking Biostatistics III.

Course responsible:
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Contact person:
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https://kiwas.ki.se/katalog/katalog/pdf?term=HT22
Title: Anaesthesia, Analgesia and Surgery (mice and rats)

Course number: 2996
Credits: 1.5
Date: 2022-11-07 -- 2022-11-11
Language: English
Level: Doctoral level
Responsible KI department: Comparative medicine

Specific entry requirements: Students need to complete the "Function A" laboratory animal science course ("to carry out scientific procedures on animals"), or must have completed an equivalent course.

Purpose of the course: The course is designed to meet the learning outcomes specified by the education and training recommendations supplied as an annex to EU Directive 2010/63/EU, which has been recently endorsed by the Swedish legislation L150 (SJVFS 2019:9). Modules included are EU5-6, and EU20-22. Education and training in anaesthesia, analgesia and surgery is both essential, and a legal requirement, for all those who need to undertake such procedures on laboratory animals. Applying appropriate anaesthetic, analgesic and surgical techniques to in vivo studies enhances outcomes from research studies, reduces experimental variability, and is perceived as ethically acceptable.

Intended learning outcomes: After completion of this course, the students should be able to meet the defined learning outcomes as set out in the EU Education and Training Framework, with emphasis on modules 20, 21 and 22. Each module requires both theoretical knowledge, and acquisition and demonstration of practical skills. The list of suggested learning outcomes by such guidelines is comprehensive, but in summary, participants will acquire the knowledge and skills to anaesthetize animals safely and humanely, assess and alleviate post-surgical pain, and be able to conduct surgical procedures competently, using appropriate aseptic technique. Recognition of pain, suffering and distress, and appropriate methods of euthanasia of mice and rats (EU modules 5-6) will also be included.

Contents of the course: The course provides guidance and information to individuals who, during their research work with animals, will need to apply sedation or anaesthesia and who will undertake surgical or other painful procedures. It includes details of methods of assessing, preventing and alleviating animal pain. The use of appropriate killing methods of rodents will also be included. The course will include training in the most recently developed behavioural measures of pain, including use of grimace scales. Monitoring of animals during anaesthesia and coping with problems and emergencies are explained and demonstrated. Potential interactions between anaesthetic and analgesic agents and specific research protocols are also explained and discussed. Training is given in the principles of pre-operative animal assessment and care, preparations for surgery, aseptic technique and the principles of successful surgery. The course provides information about possible complications, post-operative care and monitoring along with details of the healing process. It also covers more practical elements for example the demonstration of commonly used instruments and provides an opportunity for trainees to practice some of the practical aspects of basic surgical technique, such as methods of suturing, using appropriate non-animal models.

Teaching and learning activities: The course will adopt a blended learning approach that combines e-learning, live sessions (in-person or webinars), discussions, interactive sessions and practical components in the laboratory. Lecture notes and video materials to introduce practical skills will be provided as well. Discussion and problem-solving webinar sessions will be provided, which will encourage students to reflect on the application of the course content in their own research area, and encourages them to discuss and explain their work with other participants. The problem based sessions will facilitate discussions. Laboratory practical sessions (4-5 hours) on anaesthesia and surgical skills will be provided.

Examination: Practical skills are formatively assessed during the laboratory sessions using direct observation of practical skills. A short answer/multiple choice question final examination is held following conclusion of the course. A pass/fail criteria will be used as a global rate for this course.

Compulsory elements: All components must be completed and active student participation in the discussion and problem solving sessions is required if the student is to be provided with certification of the successful completion of the course. Missed parts of the course as a consequence of a well-justified absence will need to be compensated after agreement with the course director e.g. with a written assignment or in future course editions.

Number of students: 6 - 12
Selection of students: Selection will be based on the relevance of the course syllabus for the applicant’s doctoral project (need to use anaesthetic or surgical techniques in rodent models), which will be according to written motivation. If necessary, additional selection criterion will be used based on the date for registration as a doctoral student (priority given to earlier registration date).

More information: The e-learning teaching materials will be made available to students one week before the scheduled live webinar sessions. This will enable students to complete them in advance of the discussions sessions, or alternatively they can complete the content during the scheduled course dates. This added flexibility should enable them to integrate course participation with their other work commitments. The live sessions (face-to-face and webinar) components of the course will be held from Monday to Friday between approx. 9am and 5pm.

Course responsible:
Rafael Frias
Comparative medicine
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https://kiwas.ki.se/katalog/katalog/pdf?term=HT22
Contact person:
Title: Advanced cancer biology

Course number: 3024
Credits: 3.0
Date: 2022-08-30 -- 2022-12-20
Language: English
Level: Doctoral level
Responsible KI department: Department of Microbiology, Tumor and Cell Biology
Specific entry requirements: Basic course in tumour biology and oncology.

Purpose of the course: The course aims to provide advanced, cutting edge pre-clinical and clinical knowledge in the field of cancer biology.

Intended learning outcomes: At the end of the course the students should: - Have acquired an updated overview of the cutting edge research activities within the fields of cell- and tumor biology. - Be able to show analytical and critical thinking when discussion advanced problems in cell- and tumor biology, beyond what is found in text books, and evaluate the relevance of the topics presented in the context of their own research activities and PhD studies. - Be able to discuss important aspects of tumor biology, including apoptosis, cell cycle, cancer stem cells, differentiation, virus and bacteria-associated cancer, tumor immunology and effects of chronic inflammation in carcinogenesis, cancer genetics and epigenetics, transcriptomics, proteomics and metabolomics of cancer, tumor microenvironment, angiogenesis, metastasis, tumor heterogeneity and development of new treatments as well as key issues in clinical cancer research.

Contents of the course: The lecturers will give a comprehensive and pedagogical overview of the research area as well as an in-depth discussion of their own research, related, but not limited, to the following topics: apoptosis, cell cycle, cancer stem cells, differentiation, virus and bacteria-associated cancer, tumor immunology and effects of chronic inflammation in carcinogenesis, cancer genetics and epigenetics, transcriptomics, proteomics and metabolomics of cancer, tumor microenvironment, angiogenesis, metastasis, tumor heterogeneity and development of new treatments as well as key issues in clinical cancer research.

Teaching and learning activities: The course will consist of about 20 lectures, with approximately 45 minutes per lecture, at least once a week during one semester. Each lecture will be followed by an open discussion between the students and the invited speaker led by one of the course organizers: this format will provide time for highlighting key issues within the specific topic and will enhance the possibility for the students to expand their networking activities due to direct contact with experts in the field. To increase the learning process and to stimulate the reflection on the course topic, the students will be required to study the most recent literature, still not present in the text books within the presented fields, prior to each seminar. Throughout the course period, the course organisers will have regular meetings with the students to follow up the learning process of each individual participant as well as to receive feedback from the students.

Examination: The students have to show that the intended learning outcomes of the course are reached. This will be individually assessed during the participation in the informal discussions after the seminars and on the basis an individual written assessment, in form of a project description where one or more topics presented during the course should be integrated within the student own research project (Max one and half A4 page, stating: the objective of the project, a brief description of the research plan, and the significance). The project description should be handed in maximum three weeks after the completion of the course to the organizers.

Compulsory elements: Attending the lectures and the written essay are compulsory. Missed seminars can be compensated by other activities after discussion with the course leader.

Number of students: 8 - 25
Selection of students: Selection will be based on 1) the relevance of the course syllabus for the applicant's doctoral project (according to written motivation), 2) start date of doctoral studies (priority given to earlier start date).

More information: The course is organized to contain approximately 20 lectures of 45 min plus 15 min discussion, held once per week during the semester by invited national and international prominent researchers. All lectures are held at the Biomedicum, Solnavägen 9, in seminar rooms at the 3rd (entrance) or 10th floor, KI Solna Campus Tuesdays at 1 pm, unless else stated.

Course responsible:
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**Title** : Grundkurs i SPSS

**Course number** : 3028  
**Credits** : 1.5  
**Date** : 2022-09-19 -- 2022-09-23  
**Language** : Swedish  
**Level** : Forskarnivå  
**Responsible KI department** : Department of Clinical Sciences, Danderyd Hospital  

**Specific entry requirements** :

**Purpose of the course** : Kursen kommer att ge dig solida grundkunskaper i statistikprogrammet SPSS inklusive kunskaper i SPSS syntax (programmeringspråk). Du lär dig bl a hur man lägger upp och strukturerar ett dataset, och hur man kan importera material från andra applikationer till statistikprogrammet SPSS och att tvätta data så att dessa blir i analyserbart skick. En av de viktigaste delarna i analysen är att beskriva det datamaterial som har samlats in samt att hur man dokumenterar sina steg med hjälp av syntax. Vi går grundligt igenom olika procedurer för att bekanta sig med olika typer av variabler. Detta inkluderar även omkodning av variabler, skapa nya variabler från befintliga och selektera ut individer som uppfyller vissa villkor. Andamålet är att hjälpa dig att effektivisera ditt arbete, dokumentera dina analyser med hjälp av syntax och snabbt komma igång med SPSS.

**Intended learning outcomes** : Efter kursen skall kursdeltagaren:  
- Ha grundläggande kunskaper om statistikprogrammet SPSS för att skapa strukturerade datafiler, modifiera data, samt skapa grafer och tabeller med hjälp av syntax.  
- Ha kunskap om de vanligaste syntax kommandona för att hantera statistiska data i SPSS.  
- Självständigt med hjälp av syntax kunna se om modellantaganden är uppfyllda som t.ex. normalfordelningsantagande - Självständigt med hjälp av syntax kunna utföra enklare tester och analyser - Ha ett förhållningssätt till datahantering som visar på grundläggande förståelse för viken av dokumentation via syntax.

**Contents of the course** : olika procedurer för att lära känna olika typer av variabler. Detta inkluderar även omkodning av variabler, skapa nya variabler från befintliga och selektera ut individer som uppfyller vissa villkor, samt att med hjälp av syntax utföra grundläggande variabelomkodningar. Den beskrivande analysen omfattar både produktion av olika tabeller såväl som val av diagram. Du lär dig vilka typer av tabeller och diagram som är lämpliga beroende på de variabler du studerar. Författaren visar exempel på hur man dokumenterar vilka steg som har tagits.

**Teaching and learning activities** : Denna kurs som sträcker sig över 5 dagar (3 dagar workshop + en övningsuppgift med avslutande seminarium). Doktoranden får under kursens gång självständigt arbeta med ett datamaterial som innehåller vanliga typer av problem med datahantering för en statistisk analys är möjlig.  


**Compulsory elements** : Vid frånvaro från någon workshop får doktoranden göra kompletterande övningsuppgift/-er. Vid frånvaro från redovisning och genomgång av uppgift får doktoranden göra kompletterande övningsuppgift/-er.

**Number of students** : 10 - 15  
**Selection of students** : Urvalet baseras på 1) kursplanens relevans för den sökandes doktorandprojekt (enligt motivering), 2) startdatum för doktorandstudier


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**Course responsible** :  
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**Contact person** :  
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Title: Observation and visual methods in health care sciences research

Course number: 3029  
Credits: 4.5  
Date: 2022-10-03 -- 2022-11-11  
Language: English  
Level: Doctoral level

Responsible KI department: Department of Neurobiology, Care Sciences and Society

Specific entry requirements:

Purpose of the course: To develop knowledge about the methodological underpinnings of visual and observation methods, which are utilized within health care sciences research.

Intended learning outcomes: Based on theoretically relevant tools, upon completion of the course the student is expected to be able to: - analyse and explain the rationale for methodological approaches using participant observation, photographic data generation, and video observations. - critically compare different visual methodological approaches in relation to research questions. - demonstrate practical skills with theoretically grounded arguments for the choices made in data gathering and analysis related to different visual methods. - demonstrate critical reasoning about ethical issues concerning the collection of, and working with, visual data in healthcare sciences.

Contents of the course: Engaging the visual senses in healthcare science research can be done in many ways. Visual methods are here used to include ethnographic observations as well as photographic and video observations. The visual evokes elements of human consciousness that can serve as a compliment to words, when words are insufficient or at times not at all accessible. The course content includes studies of theoretical underpinnings of methodological and ethical issues related to visual methods. Students will work with participant observation, photography, and video as methods while exploring these techniques in different methodological paradigms. Students will also explore different analysis with data in the course or from their own research projects.

Teaching and learning activities: This course is designed to have short trigger lectures alternated with active experiential learning tasks, workshops, seminars, and individual assignments/project work. The course requires active involvement of the student through participation in the various types of learning activities.

Examination: The examination will consist of an individual oral presentation followed by a questions and answers session and an individual short written report. Results will be assessed as Pass/not pass.

Compulsory elements: All learning activities except the lectures are mandatory. Absence can only be compensated for in agreement with the course organizer.

Number of students: 8 - 16

Selection of students: Selection will be based on 1) the relevance of the course syllabus for the applicant's doctoral project (according to written motivation), 2) start date of doctoral studies (priority given to earlier start date)

More information: Course will be held on campus in Flemingsberg, but certain presentations and groupwork will be online. The course blocks will be October 3-5, October 17-19, and November 10-11. Course participants will have assignments to complete between course blocks.

Course responsible: 
Eric Asaba  
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Contact person: -
Title: Exploring Entrepreneurial Opportunities in Research

Course number: 3037
Credits: 4.5
Date: 2022-09-05 -- 2022-11-11
Language: English
Level: Doctoral level
Responsible KI department: Department of Learning, Informatics, Management and Ethics
Specific entry requirements:

Purpose of the course: This course will enhance your career opportunities inside and outside academia by facilitating and teaching discovery and identification of intellectual assets in the daily work of a researcher/PhD student, and how to apply it today and in the future. As a participant, identifying opportunities for entrepreneurship in connection to research will increase the awareness of the potential of innovation and entrepreneurship and its practical application and help you to expand the impact of your work. In order to develop a business idea - whether in an economic or social context, you need to apply a number of business concepts. Relevant business tools will be introduced in order to develop a business idea stemming from research. The final step when exploring opportunities of entrepreneurship is to communicate and test your business idea on the market. For that purpose you will learn how to package an already developed business idea for introduction into the start-up world.

Intended learning outcomes: After the course, a doctoral student shall be able to; - demonstrate an understanding of the opportunities of innovation and entrepreneurship for utilisation of research and how to apply entrepreneurial tools in the research context - assess their new skills and reflect on possible future effects, from ones individual, organisational & societal perspective - use design tools to gain an understanding for the user experience to develop solutions to user needs - use business tools such as business modelling to develop a potential business idea stemming from research, - communicate ("pitch") the business plan to people within the start-up world, such as potential investors

Contents of the course: "Exploring entrepreneurial opportunities in research" is a course divided into three modules. The first module begins with an introduction to entrepreneurship, what it is and how it can be used in the doctoral education. The doctoral students are then given a number of practical tools to identify intellectual assets within daily work to use in a minor innovation projects based on their own research. The second module begins with an introduction to prototyping using the design thinking approach. The doctoral students are then given a number of business tools to develop a business opportunity, stemming from their research, into a business model. The last module begins with an introduction to product roadmaps followed by a comprehensive business plan. The doctoral students are then given a number of practical business tools to write and test a complete business plan of the developed idea.

Teaching and learning activities: Each of the three modules includes three mandatory days on KI Campus and two days for own work. The course days are usually Monday, Wednesday and Friday. The modules are separated with 2 week intervals. This course lays the foundation for development of an already identified business idea. It begins with an introduction to prototyping using the design thinking approach. The doctoral students are then given a number of business tools to develop a business opportunity, stemming from their research, into a business model. With the individual assignments the doctoral students are given the opportunity to take a closer look at the actual benefits of the new knowledge and put it into a larger context, with value for their own research and society.

Learning activities consist of seminars and workshops as well as group and individual work.

Examination: The doctoral student is examined individually, on a written report, the design of a poster, the development of a prototype, business model and completion of a business plan.

Compulsory elements: Attendance is mandatory for all participants. The course director assesses if and in that case how absence can be compensated.

Number of students: 10 - 25

Selection of students: Selection will be based on 1) the relevance of the course syllabus for the applicant's doctoral project (according to written motivation), 2) start date of doctoral studies (priority given to earlier start date).

More information: Course days are 9 days in total. September 5, 7 and 9. October 3, 5 and 7. November 7, 9 and 11. Mondays 09:00 to 17:00, Wednesdays 09:00 to 12:00, Fridays 12:00 to 17:00.

Course responsible:
Samer Yammine
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Contact person:
Title: Epidemiology I: Introduction to epidemiology

Course number: 3041  
Credits: 1.5  
Date: 2022-09-26 -- 2022-10-05  
Language: English  
Level: Doctoral level  
Responsible KI department: Department of Medical Epidemiology and Biostatistics  
Specific entry requirements:

Purpose of the course: The aim of the course is to give an introduction to epidemiological theory and practice.

Intended learning outcomes: After successfully completing this course students are expected to be able to:  
- give examples of the contribution of epidemiology to science and discuss the importance of epidemiology as a research discipline.  
- estimate and in a general way interpret measures of disease occurrence and measures of association, and describe how a specific measure is governed by the study design.  
- explain strengths and weaknesses of common epidemiological study designs.  
- identify and explain possible sources of bias in epidemiological studies.  
- describe theoretical models for causation and discuss the principles of causal mechanisms.  
- apply knowledge of epidemiological concepts when critically reviewing scientific literature.

Contents of the course: The course gives an introduction to epidemiological theory and practice. It comprises basic principles regarding design, interpretation, and analysis of epidemiological studies. It introduces the concept of causation, concepts related to measures of disease occurrence and measures of association, common designs for epidemiological studies (with main focus on cohort studies), and the role of bias.

Teaching and learning activities: The course focuses on active learning, i.e. putting knowledge into practice and critically reflecting upon the knowledge, rather than memorising facts. Different strategies for teaching and learning will be used, such as lectures, group discussions and various forms of group exercises on selected topics.

Examination: To pass the course, the student has to show that the learning outcomes have been achieved. Assessments methods used are group assignments (formative assessments) along with an individual examination (summative assessment). The examination is viewed as contributing to the development of knowledge, rather than as a test of knowledge. Students who do not obtain a passing grade in the first examination will be offered a second chance to resubmit the examination within two months of the final day of the course. Students who do not obtain a passing grade at the first two examinations will be given top priority for admission the next time the course is offered.

Compulsory elements: The individual examination (summative assessment) is compulsory.

Number of students: 8 - 25

Selection of students: Eligible doctoral students will be prioritized according to 1) the relevance of the course syllabus for the applicant’s doctoral project (according to written information), 2) date for registration as a doctoral student (priority given to earlier registration date). To be considered, submit a completed application form. Give all information requested, including a short description of current research training and motivation for attending, as well as an account of previous courses taken.

More information: The course is extended over time in order to promote reflection and reinforce learning. Course dates are September 26, 28, 30, October 3 and 5.

Course responsible:  
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Title: Cellular Signalling

Course number: 3049
Credits: 1.5
Date: 2022-11-07 -- 2022-11-11
Language: English
Level: Doctoral level
Responsible KI department: Department for Clinical Science, Intervention and Technology

Specific entry requirements:

Purpose of the course: The purpose of the course is to enable the student to acquire a broad view of various signalling pathways and to identify common themes on protein-protein and protein-lipid interactions in human disease. The students shall learn how signal transduction occurs through a highly regulated cascade of events inside cells. The student will be given the opportunity to learn to identify and reflect on the knowledge (general methodology and theoretical concepts) gained with the benefit for the student’s own research.

Intended learning outcomes: After completed course, the student should be able to:
- show adequate knowledge on general concepts in the field of signal transduction
- discuss common methods and techniques in the field of signal transduction
- apply some of the conceptual knowledge in his/her own research project(s)
- choose relevant scientific questions, analysis methods and design a general plan to study this

Contents of the course: The course brings up current aspects in cellular signalling and the developments in methodology that has cultivated the understanding of the function of the different signalling pathways in various model systems and diseases. The course will cover major aspects of protein and lipid kinases, heterotrimeric G-proteins, small GTPases, cytokine and growth hormone receptors, secondary messengers, transcriptional regulation and signal transduction in cell-specific responses to stimuli. The course will cover the molecular basis of certain diseases related to the abrogation of signalling pathways.

Teaching and learning activities: On-campus lectures or live webinars by invited lecturers within the field. Student-focused activities to facilitate interaction and discussions on additional new topics and resources to retrieve information about a particular issue within the field of signal transduction. Self-studies and home assignment to prepare for oral examination.

Examination: Oral presentation on how concepts and methods/techniques in the field of signal transduction is, or could be, integrated into own research project. The presentation should clearly represent the knowledge gained during the course. One peer will be assigned as a critical friend to review the proposal. Oral presentation is compulsory, and it is essential to be an active participant in the follow-up discussions. It must be shown that all the intended learning outcomes of the course are achieved.

Compulsory elements: All lectures and activity moments are compulsory, missing lectures must be compensated by written résumé, while activity moments should be taken again in the next course occasion.

Number of students: 8 - 20
Selection of students: Selection will be based on 1) the relevance of the course syllabus for the applicant’s doctoral project (according to written motivation), 2) start date of doctoral studies (priority given to earlier start date).

More information: The course will be given as on-campus (Campus Flemingsberg) or webinar lectures on Monday 7/11 to Thursday 10/11 2022 between approximately 9 am and 4 pm. Allocated time slots will be provided for self-studies and mandatory home assignments. The examination seminar is on Friday 11/11.

Course responsible:
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https://kiwas.ki.se/katalog/katalog/pdf?term=HT22
Title: Imaging in Neuroscience: with a Focus on Structural MRI Methods

Course number: 3064
Credits: 1.5
Date: 2022-11-07 -- 2022-11-11
Language: English
Level: Doctoral level

Responsible KI department: Department of Neurobiology, Care Sciences and Society
Specific entry requirements: No specific entry requirements

Purpose of the course: The main purpose of the course is to enable the students to acquire a solid understanding of the tools available to analyze brain structural data measured with structural magnetic resonance imaging (sMRI). The students will get the opportunity to develop the ability to critically review results provided by different methods, to select the most adequate tools and experimental designs to answer different questions and to compare their relative advantages.

Intended learning outcomes: After attending the course, the student should be able to:
- Explain how MR images are generated, what causes artifacts and how to control for them.
- Describe how MRI is used today for dementia investigations.
- Formulate the basics of surface-based analysis and voxel-based morphometry (differences, similarities, quality control etc.).
- Formulate the basis for multivariate data analysis using structural data in combination with other type of data.
- Formulate the basis for network analysis (using graph theory) using structural data in combination with other types of data.
- Give an overview of different methods for analyzing diffusion tensor imaging (DTI) as well as other imaging modalities.

Contents of the course: The course focuses on neurodegenerative disorders and in vivo measurements of brain structure. The fundamentals of image processing will be introduced together with an overview of basic MRI physics, including noise and inhomogeneities as well as optimization of pulse sequences. The course covers the methodological approach to computerized segmentation of MRI anatomy using both surface-based and voxel-based methods. We will also present how MRI is used today in clinical practice to aid the diagnosis of dementia. Further, we will discuss methods for studying white matter integrity (DTI). We will discuss various approaches to assess the validity and reliability of the gained results. We will also cover advanced methods (multivariate data analysis and graph theory) to analyze structural data in combination with other types of data (functional MRI, demographic, cognitive and other biomarker data).

Teaching and learning activities: In-person lectures, seminars and workshops for 5 full consecutive days. The students will perform group projects including a critical assessment of relevant scientific literature.

Examination: The examination takes the form of a critical, in-depth discussion of the group project works, where a topic relevant to brain morphometry has been studied via a review of the scientific literature. Students will be individually assessed regarding their ability to discuss their own and others’ group work in relation to the intended learning outcomes of the course.

Compulsory elements: All parts of the course are mandatory. Absence from lectures can be compensated for by a written assignment. A missed seminar or workshop has to be compensated for at a later course occasion.

Number of students: 15 - 20
Selection of students: Selection will be based on 1) the relevance of the course syllabus for the applicant’s doctoral project (according to written motivation), 2) start date of doctoral studies (priority given to earlier start date)

More information: The course will be in Campus Flemingsberg, KI, every day of the week (7th - 11th November, 2022), from 9.00 to 16.00. The exact location will be announced before the course starts.

Course responsible:
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Rosaleena Mohanty
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Title: Philosophy of science and the concept of health

Course number: 3073  
Credits: 1.5  
Date: 2022-10-17 -- 2022-10-28  
Language: English  
Level: Doctoral level  
Responsible KI department: Department of Learning, Informatics, Management and Ethics  
Specific entry requirements:  
Purpose of the course: The course aim is that the doctoral student develops a theory of science approach by enabling the doctoral student to understand, employ, reflect upon and critically assess concepts and ideas of theories of science as well as their implications for in particular medical scientific practice. A further aim is to enable the doctoral student to understand, reflect upon and critically assess views on and implications of definitions of health and disease.  
Intended learning outcomes: Upon completion of the course, the doctoral student should be able to: - understand central concepts and problems of the theory of science, in particular those of relevance for the medical sciences - identify, analyse and critically assess scientific problems, approaches and arguments from a theory of science perspective, in particular in the field of medical sciences  
Contents of the course: The course contains the following parts: 1. Theory of knowledge Concepts such as knowledge, truth, and science, as well as the relations between them, are discussed and problematised. Verification/falsification, logical positivism, falsificationism and demarcation are other concepts and theoretical strands to be treated. 2. Theory of science Central concepts, theories and themes within this area are paradigm, the clinical-medical paradigm, the placebo effect, scientific anomalies, and the nature of and view on knowledge within the medical sciences (e.g. randomised clinical trials). The difference and relation between science and values are also dealt with. 3. Science, pseudo-science and scientific argumentation Demarcation in practice, the difference between science and pseudo-science, and argumentation within the sciences (in particular within the medical sciences) are in focus. 4. The concept of health The concept of health is critically assessed, for example based on notions of objectivity/subjectivity. The consequences of using different types of definitions of health are analysed. Furthermore, the concept of disease is discussed, e.g. in relation to normality.  
Teaching and learning activities: The course is given online. The teaching and learning activities used are web lectures, written examination, individual writing exercises, an individual written assignment, and reading of course literature and other distributed materials.  
Examination: Course examination consists of three parts: - Written examination - Individual writing exercises - One written individual assignment  
Compulsory elements: All parts of the course examination are mandatory.  
Number of students: 10 - 16  
Selection of students: Selection will be based on 1) the written motivation explaining why the course would benefit the doctoral studies, 2) start date of doctoral studies (priority given to earlier start date).  
More information: The course is web-based and arranged over two weeks’ time.

Course responsible:  
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Contact person:  
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Institutionen för lärande, informatik, management och etik  
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Title : Gene Regulation in the Early Human Embryo

Course number : 3080
Credits : 1.5
Date : 2022-10-10 -- 2022-10-14
Language : English
Level : Doctoral level
Responsible KI department : Department of Biosciences and Nutrition
Specific entry requirements : Knowledge in pre-implantation embryology corresponding to the course Embryology I.

Purpose of the course : The aim of the course is to instruct the participants in human reproductive biology with focus on gene regulation and pathways that control the early embryo formation. To provide understanding in complexity of the molecular mechanisms that involve the successfully development of the early cleavage embryo, so that the student can evaluate, troubleshoot and improve existing assisted reproductive technology (ART) systems.

Intended learning outcomes : At the conclusion of this course students should be able to: 1. Show a good understanding of the genetic and epigenetic aspects of the preimplantation period of mammalian development that is crucial for reproductive success. 2. Show a good understanding of the dynamic changes in gene expression during human early embryo development involving differentiation, survival, fragmentation, zygotic genome activation, cell determination, embryo patterning and apoptosis, gene profiling from oocyte development to blastocyst formation. 3. Explain the general epigenetic influence of the laboratory and clinical environment on embryo culture and physical-chemical properties of the specific culture systems. 4. Produce coherent, logical and concise explanations of data and concepts in the field of gene regulation in the early human embryo - both in writing and orally, through consideration of the course material. 5. Discuss scientific literature related to ART and reproduction physiology in a constructive and informed fashion.


Teaching and learning activities : The course runs for one week with lectures, and literature work as part of the course examination.

Examination : The examination will consist of an individual or group oral presentation on a course topic, followed by a questions and answers session and an individual written exam.

Compulsory elements : Attendance during the lectures and active part in the literature work.

Number of students : 8 - 14
Selection of students : Selection will be based on 1) the relevance of the course syllabus for the applicant's doctoral project (according to written motivation), 2) start date of doctoral studies (priority given to earlier start date)

More information : The course will be held at Karolinska Institutet, Department of Bioscience and Nutrition, NEO Huddinge.

Course responsible :
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Contact person :
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Title: Medical developmental biology

Course number: 3081
Credits: 1.5
Date: 2022-08-18 -- 2022-09-09
Language: English
Level: Doctoral level
Responsible KI department: Department for Clinical Science, Intervention and Technology

Specific entry requirements:
Purpose of the course: The main purpose of the course is to acquire a better understanding of issues, including ethical ones, in developmental and stem cell biology with direct implications for human development and disease. Furthermore, the course will expose the students to international collaboration and provide an opportunity to build an international network.

Intended learning outcomes: After the course the doctoral student is expected to be able:
- To fully understand and review the basic biology and definitions of embryonic and fetal stem cells,
- To understand and review the most fundamental genetic and epigenetic/transcriptional regulatory mechanisms guiding the development of the essential organs,
- To understand and review the basic principles of regenerative medicine and perinatal physiology.

Contents of the course: To achieve a better understanding of embryonic and fetal development, and to provide better healthcare for newborns and children, it is necessary to understand the development in basic research to be able to more rapidly apply such knowledge in clinical care. In this course, world-leading scientists in the fields of developmental biology, stem cell research, and regenerative medicine, will discuss the molecular mechanisms, cell biology, genetics and epigenetics of development in general and more specifically in a wide variety of organs, with a particular bias towards human development and disease. The nature of the course is translational and provide a wide range of knowledge from transcriptional mechanisms to basic physiology, ethics and patient care.

Teaching and learning activities: The course is based on lectures from morning to lunch by prominent lecturers. There are practical workshops and clinical visits in the afternoons. The course is considered demanding and requires full-time presence and attention.

Examination: Every student needs to make either a fifteen minute individual presentation or to present their projects by poster presentation. The oral and poster presentations are examined by at least four course leaders and the participants receive immediate feedback directly from the course leaders/examiners. Further feedback is given continuously throughout the course. Every student will in addition write a report that is handed in for evaluation at the end of the course. All students are also required to peer-review another student's examination report. The individual performance of each student will be evaluated separately.

Compulsory elements: Full presence is absolutely required. Necessary absence will be regulated with the course leader and given as extra tasks.

Number of students: 8 - 14
Selection of students: Selection will be based on 1) the relevance of the course syllabus for the applicant's doctoral project (according to written motivation), 2) start date of doctoral studies (priority given to earlier start date)

More information: The course involves full time studies during 18-24th of August at Toronto University. After this period an assignment is to be completed and evaluated by course peers. The course will therefore be completed two weeks later. Travel costs for a limited number of participating KI students will be reimbursed after completion of the course.

Course responsible:
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https://kiwas.ki.se/katalog/katalog/pdf?term=HT22
Title: Cryobiology in assisted reproductive technology

Course number: 3089
Credits: 1.5
Date: 2022-11-21 -- 2022-11-25
Language: English
Level: Doctoral level
Responsible KI department: Department of Biosciences and Nutrition

Specific entry requirements:

Purpose of the course: The aim of the course is to instruct the participants in human and mouse reproductive biology with focus on cryopreservation technology and embryo banking, as well as to give them practical experience through practical demonstrations in cryopreservation of gametes and embryos in IVF technology. To provide understanding of principles of cryobiology and components of culture systems used in assisted reproduction technology (ART). Thus the student can evaluate, troubleshoot and improve existing technology.

Intended learning outcomes: The objectives of this course are that at the conclusion of this course students should have a good understanding of: Folliculogenesis and Fertilization; Preimplantation Embryology; sperm and oocytes retrieval; criteria of selected or scoring the gametes and zygotes for cryopreservation; liquid nitrogen handling; principles of cryobiology. Students should be aware of the general aspects and implication of the cryobiology research and the potentiality that this represents for clinical application; The principles of cryobiology; The Cryoprotectants additives and how they protect the cells by stabilizing intracellular proteins; The factors that affect cellular response to freezing; The different cryopreservation protocols and what is ongoing in this field; The cross-contamination of samples in liquid nitrogen; problems in achieving a good result of cryopreservation procedure; The possible epigenetic effects of the cryopreservation procedure; testicular and ovarian tissue cryopreservation procedures; Storage of the cryopreserved samples, the advantages of the cryopreservation and embryo bank. Finally the students will improve their capacity to produce coherent, logical and concise explanations of data and concepts - both written and oral, through consideration of the course material. Students will also develop their ability to criticize scientific literature related with cryopreservations technology and reproduction physiology in a constructive and informed fashion; Be aware of potential development of cryobiology and IVF in the future.

Contents of the course: Contents. Sperm-and ovogenesis and Hormonal function. Main components of the culture system. Physical-chemical properties of culture system. Functional characteristics of different tissue culture incubators. The influence of the laboratory and clinic environment on embryo culture. The morphology of oocytes, zygotes and cleavage stage embryos as well as morulae and blastocysts. Developmental milestones. Biochemical tests for predicting developmental potential. Possible effects of culture and frozen condition on epigenetics events. Clinical aspects of frozen embryo transfer. The potential of the different cryopreservation techniques in clinic application with focus on IVF. General aspects and implication of the cryobiology in research.


Course test, evaluation, discussions, examination and closing of course.

Examination: Examination on day 5, with individual or group presentations of the literature work related to the contents of the course, discussions and feedback. Every student will be individually assessed and the students has to show that all learning outcomes have been reached.

Compulsory elements: The laboratory demonstrations are obligatory; there will be lectures combined with laboratory demo, but if the student will be absent of one laboratory section, the student should present a literature work related to the subject of the missing activity.

Number of students: 8 - 14

Selection of students: Selection will be based on 1) the relevance of the course syllabus for the applicant's doctoral project (according to written motivation), 2) start date of doctoral studies (priority given to earlier start date).

More information: The course will be held at Karolinska Institutet, Department of Bioscience and Nutrition, NEO Huddinge.

Course responsible:
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Contact person:
Title: Omics Data Analysis: From Quantitative Data to Biological Information

Course number: 3102
Credits: 3.0
Date: 2022-11-21 -- 2022-12-02
Language: English
Level: Doctoral level
Responsible KI department: Department of Oncology-Pathology
Specific entry requirements: Prior knowledge of the statistical programming language R is not a requirement, but may prove useful.

Purpose of the course: During recent years omics data has become an integral part of many biomedical and clinical research projects. This broad introductory course aims at bridging the gap between classical biomedical research, omics technologies and bioinformatics. The course will enable students to get an introduction to omics technologies and basic knowledge of omics data analysis workflows.

Intended learning outcomes: After completed course, the student will be able to:
* Understand the principles and perform the basics of high-throughput technologies (genomics, transcriptomics, proteomics) and the omics data analysis workflow
* Understand the principle aspects of study design, experimental planning and sample selection
* Perform basic quality control of data by use of boxplots, principal component analysis (PCA) etc
* Explain what normalization and other forms of data transformation means and what it does to your data
* Understand the principles of, and be able to apply, basic statistics such as t-test and false discovery rate
* Understand the principles and applications of, and be able to apply, dimensionality reduction methods such as PCA and t-distributed stochastic neighbor embedding (t-SNE) / uniform manifold approximation and projection (UMAP) to omics data
* Use tools for hierarchical clustering, functional enrichment and pathway analysis
* Use tools for gene ontology (GO) annotation/enrichment
* Create informative and clear visualizations of omics data

Contents of the course:
* The omics data analysis workflow: from quantitative data to biological information (emphasis on analysis of quantitative Omics-data (e.g. proteomics, transcriptomics))
* Introduction to omics technologies and data structures
* Omics experimental design and sample selection
* Introduction to data transformation and normalisation
* Introduction to basic statistics in omics data analysis: significance test/p-values/multiple testing correction/false discovery rate
* Introduction to dimensionality reduction PCA/t-SNE/UMAP
* Introduction to GO and enrichment analysis
* Introduction to correlation analysis and hierarchical clustering
* Introduction to network and pathway analysis
* Introduction to online bioinformatics resources and analysis tools
* Introduction to the R statistical programming language
* Introduction to data visualization
* Literature study with a critical view on how omics data is analyzed in clinical research
* Current state of the art in omics data analysis is highlighted through case studies, literature studies and demonstrations

Teaching and learning activities: The teaching activities for the course will be based on lectures, workshops and data analysis cases. The students will participate in a literature study with discussions in seminar groups as well as an independent data analysis exam project. The students will also be able to download and use some of the software in workshops during the course. For the final data analysis workshop students may be able to work on their own datasets, or datasets will be provided for them. The R statistical programming language will be used extensively in the course.

Examination: The course assessment is based on two types of assignments: a literature study with a critical view on an omics data analysis subject performed in groups and an individual written omics data analysis project illustrating the different topics covered during the course.

Compulsory elements:
* Attendance on lectures and data analysis demonstrations.
* Attendance to literature study discussion seminar.
* Attendance to examination seminar and hand in the written examination assignments.
* Extra written literature study can be used to compensate absence.

Number of students: 12 - 24

Selection of students: Selection will be based on 1) the relevance of the course syllabus for the applicant's doctoral project (according to written motivation), 2) start date of doctoral studies (priority given to earlier start date)

More information: The course is given jointly by the doctoral programmes Allergy, immunology and inflammation (Aii), Tumor Biology and Oncology (FoTO), Biology of Infections and Global Health (BIGH) and Development and Regeneration (DEVREG). See: https://staff.ki.se/doctoral-programmes

Course responsible:
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Contact person:
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Title : Pathology

Course number : 3109
Credits : 3.0
Date : 2022-10-10 -- 2022-10-21
Language : English
Level : Doctoral level
Responsible KI department : Department of Laboratory Medicine

Specific entry requirements:

Purpose of the course: The aim of the course is to enable doctoral students lacking basic higher education knowledge in medicine to understand basic pathological events, such as tissue injury, repair and inflammation and their relation to the development of diseases, and how these alterations are coupled to the microstructure of pathological tissues.

Intended learning outcomes: After the course the student should 1) understand the mechanisms behind basic pathological events; 2) be able to identify selected pathological tissues at light microscopical level and describe the components/cells and their functions; 3) be able to search for and combine information regarding a selected group of diseases, followed by an oral presentation and discussion.

Contents of the course: The course is divided into two parts. One part illustrates cell injury, adaptation, tissue repair, inflammation, cancer development and classification. Methods in molecular pathology are discussed. During the other part of the course a selected group of diseases are studied both during digital microscopy practices and as a written and an oral presentation. How basic pathological responses to inflammation or injury might be the first steps on a multi-step path to malignancy is also discussed.

Teaching and learning activities: This is a full time course with lectures, demonstrations, microscopy exercises and a project work.

Examination: Written examination and project work.

Compulsory elements: Demonstration/microscopy, pathology ""tour"" and project work are compulsory. Absence is compensated with a written report.

Number of students: 7 - 25

Selection of students: Selection will be based on 1) the relevance of the course syllabus for the applicant's doctoral project (according to written motivation), 2) start date of doctoral studies (priority given to earlier start date)

More information: This is a full time course.

Course responsible:
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Contact person:
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Title: Tumor immunology and immune therapy of cancer

Course number: 3110
Credits: 1.5
Date: 2022-11-07 -- 2022-11-11
Language: English
Level: Doctoral level

Responsible KI department: Department of Oncology-Pathology

Specific entry requirements:

Purpose of the course: The purpose of the course is to deepen the knowledge in the field of tumor immunology. More specifically, to understand how the immune system is regulated in cancer and how this knowledge can be used to treat patients with cancer.

Intended learning outcomes: After the course is completed the students will be able to (1) explain important aspects of tumor immunology, (2) indicate advantages and disadvantages of different immune therapy strategies, (3) explain mechanisms of immune escape, (4) hypothesize how different immune-based regimens may affect clinical outcome in patients with cancer.

Contents of the course: This course covers basic and applied immunology and a current review of experimental research and clinical application of tumor immunology. Both pre-clinical and clinical aspects of cancer vaccination, adoptive cell therapy, and antibody therapy will be discussed. Development of novel therapies through modification of immune cell subsets will be presented. Features of the tumor microenvironment, cancer-associated inflammation, immune surveillance and escape, and immunosuppression will also be discussed. Planning, performing, and monitoring of clinical trials are included in the course as well. One to two days are dedicated to lectures by invited international experts from the field.

Teaching and learning activities: Lectures, seminars, group discussions and case-studies.

Examination: Oral group presentation and individual assignment based on case-studies. Every student will be individually assessed.

Compulsory elements: All lectures and teaching activities are mandatory. Absence from mandatory parts of the course will have to be compensated by other relevant activities after discussion with the course leaders.

Number of students: 15 - 30

Selection of students: Selection will be based on 1) the relevance of the course syllabus for the applicant's doctoral project (according to written motivation), 2) start date of doctoral studies (priority given to earlier start date)

More information:

Course responsible:
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Contact person:
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Title: Basic course in tumor biology and oncology

Course number: 3112
Credits: 3.0
Date: 2022-09-26 -- 2022-10-07
Language: English
Level: Doctoral level
Responsible KI department: Department of Oncology-Pathology

Specific entry requirements:

Purpose of the course: The purpose of the course is to give a general overview of the molecular mechanisms that promotes the carcinogenic transformation. We aim to link the basic tumor biology concepts with the main principles of diagnosis and treatment of cancer patients in line with the modern concept of translational and personalised cancer medicine.

Intended learning outcomes: This is a basic course for all PhD-students in the field of tumor biology. After the course the students will have an understanding of the cancer problem, the modern view what cancer is, from a clinical and basic science point of view. You will get the basic foundations of cancer biology as well as acquire some ability to discuss and understand advanced problems in cancer biology. You will have an idea which are the current most important problems to solve in cancer, to improve diagnosis, prevention, treatment and quality of life. The over all aim of the course is to form a bridge between pre-clinical and clinical aspects of tumor biology and oncology for PhD students and to provide the students an understanding of all aspects of the cancer problem. This course is a basic introduction to modern cancer research and is recommended to all PhD students within basic and clinical cancer research.

Contents of the course: The course will describe the causes as well as the consequences of the transformation of a normal cell into its malignant counterpart, in order to create an understanding of cancer --from molecule to patient--, eventually also discussing the management and treatment of malignant diseases. The topics of the course include genetics, the cell cycle, apoptosis, immunology, diagnosis and treatment, all topics presented from the cancer perspective. There will be focus on a few malignant diseases, described in more detail serving as models for basic concepts of Tumor Biology and Oncology, including molecular genetics, curative treatment and palliative care, psychosocial aspects of cancer, ethics and epidemiology. All students will be offered a possibility to visit the inward clinical care and meet cancer patients.

Teaching and learning activities: The course consists of lectures, group seminars, group discussions and demonstrations. Full time during two consecutive weeks.

Examination: Written examination and group discussion with a focus on understanding of concepts, relations and how and how problems are dealt with in cancer research. Every doctoral student will be individually assessed.

Compulsory elements: This course is full time for two weeks. All seminars and some demonstrations are compulsory, also some lectures, as well as the written examination. Single missed occasions can be compensated during the course after discussion with the course director. Single missed occasions can be compensated for during the course after discussion with the course director.

Number of students: 20 - 25

Selection of students: Selection will be based on 1) the relevance of the course syllabus for the applicant's doctoral project (according to written motivation), 2) start date of doctoral studies (priority given to earlier start date)

More information:

Course responsible:
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https://kiwas.ki.se/katalog/katalog/pdf?term=HT22
Title : Endothelial Cell Function and its Relevance in Cardiovascular Disease

Course number : 3113
Credits : 1.5
Date : 2022-11-07 -- 2022-11-11
Language : English
Level : Doctoral level
Responsible KI department : Department of Medicine, Solna
Specific entry requirements :
Purpose of the course : This course is specially planned to give the participants in the area of cardiovascular research a global perspective on endothelium pathophysiology as well as advanced cutting-edge approaches used by researchers. This course will enable the participants to obtain the required knowledge to understand and study endothelial cell function in cardiovascular disease.
Intended learning outcomes : Upon completion of the course, the students should be able to: 1. show an in depth knowledge of endothelial cell function and related molecular basis; 2. evaluate endothelial cell dysfunction and its relevance to cardiovascular disease (e.g. atherosclerotic lesion, diabetes, ischemia and infection); 3. show an insight into the application of state of the art models and technologies (in vitro, in vivo, from animal model to clinic study) for studying endothelial cell function in cardiovascular disease.
Contents of the course : Endothelial cells and endothelial cell function under various physiological and pathological conditions will be discussed from molecular, cellular, organ and clinical perspectives. Topics to be covered include the roles of endothelial cells in atherosclerosis, ischemic heart disease, inflammation, hypertension and diabetes/insulin resistance, and in mechanisms of current and future treatment. The course will include examples of in vitro and animal models for evaluation of endothelial cell function as well as examples of clinical studies.
Teaching and learning activities : The course activities include daily interactive lectures and seminars given by invited scholars in the respective fields, lab demonstrations, group learning (literature review and research planning), and a group project presentation and review on the last day of the course.
Examination : The final assessment will be held in two parts: 1) a literature review and discussion in groups; 2) an oral presentation of a research project in the field of endothelial cell function, which should be designed at least partially using the knowledge from the course lectures and experimental methods from the lab demonstration. In order to pass the course, each student needs to show that he or she reached all the learning outcomes of the course.
Compulsory elements : Students need to participate in all learning activities and to complete self learning assignments. Absence maybe compensated for by an extra task in agreement with the course organizer. The final examination must be passed in order to pass the course.
Number of students : 8 - 20
Selection of students : Selection will be based on 1) the relevance of the course syllabus for the applicant's doctoral project (according to written motivation), 2) start date of doctoral studies (priority given to earlier start date)
More information :

Course responsible :
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Xiao-Wei Zheng
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Title: Molecular Immunology

Course number: 3114
Credits: 3.0
Date: 2022-09-26 -- 2022-10-07
Language: English
Level: Doctoral level

Responsible KI department: Department of Microbiology, Tumor and Cell Biology

Specific entry requirements: Basic knowledge in immunology corresponding to the learning outcomes of the courses "Basic immunology".

Purpose of the course: This course is an extension of the Basic Immunology course and is suitable for students who already have some background knowledge of immunology. The aim of the course is to expose students to the molecular aspects of the immune responses.

Intended learning outcomes: After the course, the student should be able to relate their own research project to the cutting-edge developments in other areas of immunology research. Furthermore, they should be able to present novel information about an immunological problem or a specific technique.

Contents of the course: The course covers topics of immune cellular interactions, immune cell signalling as well as the role of epigenetics and genetics in determining immune responses and immune cell development. Students will be asked to study an immunological method or problem deeply at the theoretical level.

Teaching and learning activities: Lectures, seminars and oral presentations. The course is given over 2 weeks. Invited national and international lecturers give their views on selected problems, or techniques, in immunology. The seminars take off from basic facts, and after that the speakers move on to current problems, and focus on both scientific and methodological aspects. During the course the students will be expected to present orally selected topics within the field of immunology focusing on molecular events important in the development or maintenance of immune responses. At the end of the course, the students will write an essay on these methods or problems.

Examination: Oral presentation of selected topics and a final written exam based upon take home essay questions. These questions cover current problems, theories in immunology or relate the student's own research to cutting edge developments in the other areas of immunology research.

Compulsory elements: Oral presentation of selected topics. If a student misses the presentation, a special presentation with the course leader will be arranged.

Number of students: 8 - 25
Selection of students: Selection will be based on 1) the relevance of the course syllabus for the applicant's doctoral project (according to written motivation), 2) start date of doctoral studies (priority given to earlier start date)

More information:

Course responsible:
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Contact person:
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Title: Forskningsetik

Course number: 3118
Credits: 1.5
Date: 2022-08-30 -- 2022-09-20
Language: Swedish
Level: Forskarnivå

Responsible KI department: Department for Clinical Science, Intervention and Technology

Specific entry requirements:

Purpose of the course: Få en inblick i och förståelse av centrala forskningsetiska teorier, principer och riktlinjer och därmed få möjlighet att reflektera över etiska aspekter av den egna och andras forskning.


Förståelse för vilken roll forskarens egen hederlighet och integritet har


Teaching and learning activities: Föreläsningar (ca 6t), gruppövningar, seminarier (ca 8t) och muntlig och skriftlig presentation

Examination: Vi bedömer att lärandemålen för kursen är uppnådda genom examination som består av fyra delkomponenter: i) formativ bedömning i samband med aktivt deltagande i seminarier, ii) en muntlig presentation av etiska dilemma i eget eller aktuellt forskningsområde, iii) ett skriftligt PM där synpunkter från opponent på den muntliga presentationen inarbetats, och iv) opponering på annan students presentation av etiska dilemma i forskning. Godkänd kurs innebär att det framgår att erforderliga kunskaper, färdigheter och förhållningssätt har uppnåtts genom aktivt deltagande i seminarier och godkänd muntlig och skriftlig presentation av examinationsuppgiften samt opponering på annan students presentation av etiskt dilemma.

Compulsory elements: Obligatoriskt är att delta vid introduktionstillfället och vid seminarier. Vid frånvaro kan detta kompenseras med utökat PM skrivande och muntlig presentation för kursen eller kursgivare.

Number of students: 10 - 20

Selection of students: Urvalet baseras på 1) kursplanens relevans för den sökandes doktorandprojekt (enligt motivering), 2) startdatum för doktorandstudier.


Course responsible:
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https://kiwas.ki.se/katalog/katalog/pdf?term=HT22
Title: Flow cytometry: from theory to application

Course number: 3120
Credits: 1.5
Date: 2022-10-03 -- 2022-10-07
Language: English
Level: Doctoral level
Responsible KI department: Department of Medicine, Solna
Specific entry requirements:

Purpose of the course: The course aims to provide doctoral students with: 1) a systematic introduction of flow cytometry, 2) an overview of flow cytometric applications in biomedical research, and 3) a hands-on opportunity of flow cytometry lab training designed for various levels of flow cytometer users.

Intended learning outcomes: Through this one-week course, the participants will acquire the knowledge of flow cytometry principles. They will know flow cytometric sample preparation and analysis, protocol set-up, major flow cytometric applications, as well as data interpretation and presentation.

Contents of the course: The course covers basic knowledge and main applications of flow cytometry, and contains both lectures and laboratory/group work. Experts in different fields of flow cytometric application are invited to give the lectures. The participants will be able to learn: a) Principles of flow cytometry: working mechanisms of flow cytometer; molecular and cellular probes for flow cytometry; quality control; and safe procedures and instrument maintenance. b) Basic skills: flow cytometric protocol design; sample handling and storage; data processing and analysis, and data presentation. c) Major applications of flow cytometry in biomedical research: leukocyte phenotyping, endothelial cell analysis, stem cell analysis, apoptosis, platelet measurement, cell function analysis (including membrane potential, oxidative metabolism, intracellular calcium mobilization, pH, and intracellular organelles), as well as nucleic acid analysis.

Teaching and learning activities: The course includes 28 hr lectures and 12 hr hands-on lab work.

Examination: The exam consists of two parts: a 30 min written test on flow cytometric principles; and a 60 min hands-on lab work examining flow cytometric lab skills.

Compulsory elements: The participants must attend hands-on lab sections during two afternoons. The students who have missed these sections can book extra lab section time within 4 weeks to compensate the absence.

Number of students: 20 - 32

Selection of students: Selection will be based on: 1) The relevance of flow cytometry for the applicant's project (according to written motivation) 2) Urgency of flow cytometry training for the applicant's project (according to written motivation) 3) Previous application (priority given to those who have applied previously)

More information: Course will be given during week 40 (Oct 3-7, 2022; 9:00-16:30). The major part of the course activities will resume its normal onsite format, as before the pandemic. The course will have one half-day or whole-day on-site lab sessions. Course lecture hall will be booked at T4:00, Blochsalen, Karolinska University Hospital-Solna. Lectures will be given by 14-15 lecturers, usually half of them from institutions outside KI, with two to three lecturers from abroad. All the lecturers are well-established experts in their lecture subjects of flow cytometric applications. The course has been given 1-2 times/year at KI for 22 years. It has been highly appreciated by the participants throughout the years, with a median general satisfaction score never below 8 (out of 9; referred to paper-based course evaluation between 2001-2013), and highly remarked with the electronic course evaluation (since 2014). <br> The course is given jointly by the doctoral programmes Cardiovascular Research (CVR) and Allergy, immunology and inflammation (Aii). See: https://staff.ki.se/doctoral-programmes.

Course responsible:
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Clinical Pharmacology Unit
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Title : Experimental techniques in study of metabolic and endocrine disorders

Course number : 3121
Credits : 1.5
Date : 2022-10-10 -- 2022-10-21
Language : English
Level : Doctoral level
Responsible KI department : Department of Molecular Medicine and Surgery
Specific entry requirements :
Purpose of the course : This course will enable the doctoral student to acquire the necessary knowledge to address experimentally key points of metabolic characterization of experimental models in diabetes research.

Intended learning outcomes : After the course the students will be able i) to measure glucose transport in isolated rodent skeletal muscle; ii) to measure lipolysis in isolated adipocytes; iii) to dissect out mouse pancreatic islets and measure the insulin release; iv) to judge and analyze obtained data. The students will also be able to describe the possibilities and limitations of the above techniques.

Contents of the course : The course is laboratory based, aiming to give all participants hands on experience with isolation of pancreatic islets, skeletal muscle and adipose tissue. Techniques for measurement of glucose transport in isolated rodent skeletal muscle, of lipolysis in isolated adipocytes, and for studying insulin release from pancreatic islets will be covered. Theoretical and practical considerations will be presented and discussed.

Teaching and learning activities : The course meets for five days full time, including three full day laboratory practical sessions. The first day will consist of several lectures to give a background to the metabolic questions which will be addressed in the practical part of the course. Our aim is to provide the student with a hands on experience of each technique covered. In order to achieve this, for the laboratory work the course participants will be subdivided into smaller groups.

Examination : Summative assessment of the laboratory notebook notes from each student, of a short oral presentation of the project work, of the discussions with the course leader and the other students, and of a short summary of the project work by each group.

Compulsory elements : All three laboratory tasks are compulsory; as an exception, a written task could be given to a participant to compensate absence.

Number of students : 9 - 18
Selection of students : Selection will be based on 1) the relevance of the course syllabus for the applicant's doctoral project (according to written motivation), 2) start date of doctoral studies (priority given to earlier start date)

More information : Lectures and labs will be at week 41 from Monday October 10th to Thursday October 13th at KI Campus Solna and Campus Flemingsberg. Examination and presentations will be on Friday October 21st, one week later at KI Campus Solna.

Course responsible :
Alexander Chibalin
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Contact person :
-
Title: The Global Diabetes Epidemic

Course number: 3122  
Credits: 3.0  
Date: 2022-11-14 -- 2022-11-25  
Language: English  
Level: Doctoral level  
Responsible KI department: Department of Molecular Medicine and Surgery  
Specific entry requirements:  

Purpose of the course: This course will enable the doctoral student to acquire the necessary knowledge to integrate clinical and research knowledge and understanding, competence and skills, judgement and approach in the field of diabetes mellitus in order to facilitate a role as a future scientist, public health specialist and/or clinician in this field.  

Intended learning outcomes: After the course the student should be able to show an understanding about the global burden of diabetes in the world, the complications of diabetes disease, the pathogenesis of diabetes as well as prevention and treatment of diabetes.  

Contents of the course: Diabetes has now become a high public health concern, due to the escalating epidemic of diabetes in both young and older adults, and the emergence of type 2 diabetes in children. The number of people with diabetes worldwide is set to double in the next 20 years, as a result of increasing obesity, sedentary lifestyle and longevity. While some of this increase will be observed in Europe and North America, it is clear that the bulk of the epidemic will be observed in non-European origin populations, in countries undergoing rapid westernization [1, 2]. The course will provide an overview of the global epidemic of diabetes disease, classifications of diabetes, pathogenesis of type 1, LADA and type 2-diabetes, diabetes complications, prevention and treatment of diabetes and its complications [3-13].  

Teaching and learning activities: The course consists of lectures, diagnostics, diabetes care and coaching, a project task and examination. Two weeks full time.  

Examination: Formative assessment during carrying out of the project task and of the practical training. Summative assessment during the final seminar where the student will present the project and discuss their own and others' project with the course leaders and the other course participants.  

Compulsory elements: The project task is mandatory for all students and cannot be compensated for. The practical training can only be compensated for in case students can show that it is part of their own professional work already. Missing a lecture can be compensated for by writing an essay about the subject in agreement with the organizer of the course.  

Number of students: 8 - 15  
Selection of students: Selection will be based on 1) the relevance of the course syllabus for the applicant's doctoral project (according to written motivation), 2) start date of doctoral studies (priority given to earlier start date).  

More information: The Course date is: 14th-25th November 2022. The Course will be hold in accordance to recommendation from Karolinska Institutet. At the moment we plan to hold the course at Centrum för diabetes at Solnavägen 1E.  

Course responsible:  
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Title: Human Cell Culture. Methods and Applications

Course number: 3127
Credits: 1.5
Date: 2022-09-26 -- 2022-09-30
Language: English
Level: Doctoral level

Responsible KI department: The institute of Environmental Medicine

Specific entry requirements:

Purpose of the course: The purpose of the course is to enable doctoral students to acquire state-of-the-art knowledge and good understanding of human cell culture.

Intended learning outcomes: After the course the students should be able to: - Describe the theory and give examples of practical applications of human cell culture. - Explain basic and state-of-the-art methods applied to cell cultures. - Discuss possibilities and challenges in cell culture work.

Contents of the course: Cell culture reflecting stem, transit amplifying, differentiated and terminally differentiated tissue states. Monolayer and organotypic culture involving one or more cell types. Applicability of cell cultures as alternatives to laboratory animal experiments. Mechanisms regulating cell growth and viability, differentiation and apoptosis. Assessment of cell transformation to immortal and malignant phenotypes. Isolation of specific cells, e.g., epithelial cells, characterisation of cultured cells. Handling and sterile techniques, choice of materials and media for cell culture, e.g., serum-dependent vs. serum-free culture conditions. Cell cloning and gene transfer. Practical handling of cultures: thawing/freezing, passage, expansion and long-term storage. Handling of normal and tumor tissue for optimizing obtainment of cultures. High-throughput screening technologies. Tissue engineering practices. Transcriptomics, proteomics and informatics methods for biomedical research with cell lines. Discussion of participants' own culture experience and problems.

Teaching and learning activities: Interactive lectures, laboratory work, computer exercises and group discussions on pitfalls and possibilities with cell cultures.

Examination: Examination is in the form of a written assignment and oral presentation.

Compulsory elements: Participation in interactive lectures, group discussions, laboratory work and oral examination is compulsory. Absence from compulsory elements can compensated by participation at the next course occasion.

Number of students: 8 - 15

Selection of students: Selection will be based on 1) the relevance of the course syllabus for the applicant's doctoral project (according to written motivation), 2) start date of doctoral studies (priority given to earlier start date)

More information: Master students in toxicology will also attend the course.

Course responsible:
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Contact person:
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Title: Basic Course in Medical Statistics

Course number: 3134
Credits: 3.0
Date: 2022-11-07 -- 2022-11-18
Language: English
Level: Doctoral level
Responsible KI department: Department of Learning, Informatics, Management and Ethics

Specific entry requirements:

Purpose of the course: The aim of the course is to introduce the basic statistical methods and the fundamental principles of statistical inference and to offer basic skills that involve hands on data analysis using statistical software.

Intended learning outcomes: The course participants shall after the course be able to; 1) perform and interpret basic descriptive statistics from frequency tables and graphical presentations, 2) perform and interpret results from basic inferential statistical analysis and tests, 3) recognize and critically examine the statistics being presented in articles within the medical field of research.

Contents of the course: Concepts being treated are descriptive vs inferential statistics, collection of data and study design, different types of data and level of measurement, independent and dependent samples, correlation and regression, hypothesis testing and different type of statistical errors in relation to the testing and data collection procedure. The major topics for the course are t-test, chi-square test, nonparametric test and regression analysis, and how to evaluate the assumptions for the different techniques.

Teaching and learning activities: This course is a Team-Based Learning (TBL) course. TBL is a specific form of learning method that integrates individual assessment and group work with immediate feedback. Focus will be on solving statistical problems in a team setting. This two weeks course consists of online preparation through video lectures and exercises, and several TBL sessions (in class meeting). The time in between TBL sessions will be spent reading the course material, and preparing for the assessment and group application exercises.

Examination: Individual and group readiness assurance tests, as well as application exercises.

Compulsory elements: In class attendance during TBL sessions are mandatory for passing grade. If a student misses one of the five TBL sessions a supplementary exercise will be given. If the student misses more than one TBL session it is recommended that the student takes the course at another occasion (since absence also affects the other members of the team).

Number of students: 35 - 45

Selection of students: Selection will be based on 1) the relevance of the course syllabus for the applicant’s doctoral project (according to written motivation), 2) date for registration as a doctoral student (priority given to earlier registration date).

More information: This course is a TBL-course, former course number was 1383. TBL, Team-Based Learning, is a special form of learning that integrates individual work, group work and immediate feedback. Focus will be on solving statistical problems in group/team setting. Apart from individual work, the students are expected to be physically present for 2-3 full days per week for two weeks. These dates are November 7 (10-12), November 8 (10-16:00), November 10 (10-16:00), November 14 (10-16:00), November 16 (10-16:00) and November 18 (9-12:00)

Course responsible:
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Contact person:
Nora Espahbodi
Institutionen för lärande, informatik, management och etik
nora.espahbodi@ki.se
Title: Epidemiology II. Design of Epidemiological Studies

Course number: 3138
Credits: 1.5
Date: 2022-12-05 -- 2022-12-14
Language: English
Level: Doctoral level

Responsible KI department: The institute of Environmental Medicine

Specific entry requirements: Knowledge in epidemiology equivalent to "Epidemiology I: Introduction to epidemiology" or corresponding courses.

Purpose of the course: The course focuses on key considerations in designing and critically interpreting different types of case-control studies, as well as matching in cohort and case-control studies.

Intended learning outcomes: After successfully completing this course you as a student are expected to be able to:
- in a self-directed manner, formulate the principles of different types of common epidemiological study designs.
- mainly independently, explain how a specific measure of disease occurrence and measure of association is governed by the study design.
- in a self-directed manner, explain and discuss epidemiological concepts, including accuracy, in the context of different epidemiological study designs.
- draw conclusions from epidemiological scientific papers and to review and criticize these regarding study design, results and accuracy.

Learning outcomes are classified according to Bloom's taxonomy: knowledge, comprehension, application, analysis, synthesis, and evaluation.

Contents of the course: The course focuses on issues related to study design with emphasis on case-control methodology and different types of sampling strategies, study base, study efficiency, matching in epidemiological studies, induction time, interpretation of epidemiological evidence.

Teaching and learning activities: Lectures, group discussions and various forms of group exercises on selected topics, will be used. The course focuses on active learning, i.e. putting knowledge into practice and critically reflecting upon the knowledge, rather than memorising facts.

Examination: To pass the course, the student has to show that the learning outcomes have been achieved.
Assessments methods used are group tasks (formative assessments) along with a written individual task (summative assessment). The examination is viewed as a contributing to the development of knowledge, rather than as a test of knowledge. Students who do not obtain a passing grade in the first examination will be offered a second examination within two months of the final day of the course. Students who do not obtain a passing grade at the first two examinations will be given top priority for admission the next time the course is offered.

Compulsory elements: The individual examination.

Number of students: 8 - 25

Selection of students: Eligible doctoral students are prioritized according to 1) the relevance of the course syllabus for the applicant's doctoral project (according to written motivation), 2) date for registration as a doctoral student. Give all information requested, including a short description of current research training and motivation for attending, as well as an account of previous courses taken.

More information: The course is extended over time in order to promote reflection and reinforce learning. Course dates are December 5, 7, 9, 12 and 14.

Course responsible:
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Contact person:
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Institutet för miljömedicin

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17177
Stockholm
Title: To Communicate Science in Different Contexts with Focus on Oral and Visual Communication

Course number: 3147
Credits: 3.0
Date: 2022-11-14 -- 2022-11-29
Language: English
Level: Doctoral level
Responsible KI department: Department of Learning, Informatics, Management and Ethics
Specific entry requirements:

Purpose of the course: The course aims are to enable course participants to orally and visually present one’s own research that has been adapted to different target groups and to reflect on one’s own as well as one’s peers presentation skills and abilities.

Intended learning outcomes: After the course the student is expected to be able to: 1. Orally present their own research adapted to different target groups. 2. Understand how visuals and media can support research and presentation to different target groups. 3. Use feedback and reflect on one’s own and others presentation skills 4. Understand the importance and application of dialogue in science communication

Contents of the course: During the course each participant will be given the opportunity to develop practical and theoretical knowledge in: -Communication, perception and learning -Presentation techniques, stage presence -Dialogue mechanics like feedback, team collaboration and how to understand target groups -Use of different media

Teaching and learning activities: Part of the theoretical material will be organized in canvas, the workshops will take place on campus. The course design is based on reflective practice and includes self directed learning, lectures and literature seminar to process theoretical knowledge, and practical training in presentation skills.

Examination: The assessment consists of three different tasks: 1. Reflective statement based in experience, feedback and research/literature within communication and learning. 2. Oral presentation in a popular scientific context. 3. Professional presentation. To pass the course the participant needs to show evidence that they reached the learning outcomes by delivering the above mentioned elements and hand in a learning reflection journal on the last day.

Compulsory elements: Workshops and presentations from guest lecturers. Absence from the compulsory sessions or assessment seminar can be compensated through supplementary activity in dialogue with the course organiser.

Number of students: 18 - 30
Selection of students: Selection will be based on 1) the relevance of the course syllabus for the applicant's doctoral project (according to written motivation), 2) start date of doctoral studies (priority given to earlier start date)

More information: This course prepares PhD students for science communication in different contexts. You will explore different communication concepts, presentation designs and work on your stage and presentation techniques. You will reflect on your presentation skills and abilities to communicate science, given contextual and disciplinary differences. The course is equivalent to two-weeks full-time studies. Scheduled class room sessions are on the following dates: 14-15, 21-22, 28 and 29 November 2022. The course is given in English.

Course responsible:
Anna Birgersdotter
Department of Learning, Informatics, Management and Ethics
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Contact person:
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Title: Embryology I

Course number: 3150
Credits: 1.5
Date: 2022-09-12 -- 2022-09-16
Language: English
Level: Doctoral level
Responsible KI department: Department of Biosciences and Nutrition

Specific entry requirements:

Purpose of the course: The aim of the course is to instruct the participants in human reproductive biology with focus on assisted reproduction technologies (ART), as well as to give them practical experience through practical demonstrations in embryological and micro-manipulation techniques. To provide understanding of the components of culture systems used in ART, so that the student can evaluate, troubleshoot and improve existing systems.

Intended learning outcomes: At the conclusion of this course students should show a good understanding of:
- Laboratory environment, input materials. Physical-chemical properties of culture system. Functional characteristics of different workstations for ART and their benefits. The influence of the laboratory and clinic environment on embryo culture. The morphology of oocytes, zygotes and cleavage stage embryos as well as morulae and blastocysts. Developmental milestones. Student should be aware of the general aspects and implication of the stem cells research and the potentiality that this represent for clinical application. Morphological aspects of the blastocysts for derivation of ICM and Derivation methods. Characterization of the embryonic stem cells and the importance of the pluripotency of these cells. The different differentiation assay on stem cells and what is ongoing in this field. The production of isogonics embryonic stem cells by somatic cell nuclei transfer or therapeutic clone (SCNT). Finally the students will improve their capacity to produce coherent, logical and concise explanations of data and concepts - both written and oral, through consideration of the course material. Students will also develop their ability to criticize scientific literature related with ART and reproduction physiology in a constructive and informed fashion.

Contents of the course:
- Sperm theory (lecture) 1. Anatomy of the testis, sperm production and maturation, fertilization. 2. Cryopreservation of spermatozoa. 3. Sperm preparation for IVF and ICSI, criteria for ICSI.

Teaching and learning activities: The course runs for one week with lectures, and practical demonstration in embryo-micro manipulation techniques (intra-cytoplasmatic sperm injection and Embryo biopsy for PGD).

Examination: Individual written exam on the last day of the course.

Compulsory elements: The laboratory demonstrations are obligatory. The student should compensate for absence at a laboratory demonstration by presenting a literature report in agreement with the course leader.

Number of students: 8 - 14

Selection of students: Selection will be based on 1) the relevance of the course syllabus for the applicant's doctoral project (according to written motivation), 2) start date of doctoral studies (priority given to earlier start date).

More information: The course will be held at Karolinska Institutet, Department of Bioscience and Nutrition, NEO Huddinge.

Course responsible:
Jose Inzunza
Department of Biosciences and Nutrition
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141 86
Stockholm

Contact person:
Title: Mechanisms of Gene Regulation in Metabolism

Course number: 3157
Credits: 1.5
Date: 2022-10-14 -- 2022-10-20
Language: English
Level: Doctoral level
Responsible KI department: Department of Physiology and Pharmacology

Specific entry requirements:

Purpose of the course: The students of this course will get a broad perspective of how the regulation of gene expression is linked to metabolic and endocrine regulation in different tissues. The course will also cover molecular and physiological aspects related to inter-organ communication, and how this is essential to maintain metabolic homeostasis.

Intended learning outcomes: At the end of the course students will understand and be able to discuss the different mechanisms that regulate gene expression. They will be able to describe how these processes can affect metabolic disease and disease progression. The students will be able to choose the most appropriate methodologies to study diverse aspects of gene regulation in metabolism.

Contents of the course: This course aims at giving students an overview of the current understanding of how metabolism and metabolic dysfunction are controlled at the level of gene regulation. During one week, students will focus on the genetic and epigenetic mechanisms that affect transcriptional output in diverse organs and tissues in health and disease situations. This will include: basic mechanisms of gene transcription, transcription factors and coregulators, mRNA splicing and genetic variability, the chromatin landscape and associated DNA and histone modifications, noncoding RNAs and regulation of gene expression. Attention will be given to single gene analysis as well as global regulation of gene expression. In each module the student will be introduced to the basic concepts in the field and analyze situations in which dysregulation of the processes under examination leads to metabolic disease. Each module will include a chapter dedicated to the presentation and discussion of current experimental approaches relevant to research in that particular field of science.

Teaching and learning activities: This course will consist mainly of lectures and group discussions covering both theoretical and practical questions related to the different areas of gene regulation and metabolism. Some sessions will be dedicated to problem solving and presentation of state-of-the-art methodologies relevant to research in each field.

Examination: Examination will consist of an oral presentation in which students discuss an example of metabolic disorder caused by dysregulation of gene expression and propose a research plan to further study that problem. Students will be able to discuss each other's presentations. The research plan should include appropriate methodology learned during the course.

Compulsory elements: Presence at lectures, group work, and final presentation and discussion is mandatory. To compensate for absence a written essay on the missed topic must be performed.

Number of students: 8 - 30

Selection of students: Selection will be based on 1) the relevance of the course syllabus for the applicant's doctoral project (according to written motivation), 2) start date of doctoral studies (priority given to earlier start date).

More information: International guest speaker will be announced later.

Course responsible:
Duarte Ferreira
Department of Physiology and Pharmacology

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Contact person: -
Title: Clinical Trials in Cardiovascular Research

Course number: 3173  
Credits: 1.5  
Date: 2022-12-08 -- 2022-12-14  
Language: English  
Level: Doctoral level  
Responsible KI department: Department of Medicine, Solna  
Specific entry requirements:

Purpose of the course: Purposes of the course are to: - Improve knowledge and skills related to clinical trial planning and design as well as successful running of different types of clinical trials (observational studies, registries, randomized trials); - Provide an overview of some recent key trials in the cardiovascular arena.

Intended learning outcomes: After the course, the participants should be able to: - know how to design, plan and run a successful clinical trial - account for the relevant regulatory aspects involved in the process of designing and running a clinical trial - analyze and interpret trial data - critically review literature of clinical trials - predict important statistical issues (e.g. different types of adjustments for confounders, biases, how to perform subgroup analysis in trials, statistical methods for meta-analyses) related to different trial designs (e.g. observational studies, registries, randomized trials and meta-analyses).

Contents of the course: Lectures/Seminars/Workshops on the following topics: - Different designs of clinical trials - Requirements from regulatory agencies and post marketing surveillance - Upcoming and ongoing cardiovascular clinical trials (e.g. antithrombotics, lipidology, diabetes, heart failure) - Implementation of GCP and ethical principles in clinical trials - Statistical issues in clinical trials - How to interpret clinical trials

Teaching and learning activities: - Lectures/workshops, debates on important clinical trials (2 days) - Home-based studying and preparation of the exam - group work (2 days) - Presentation and discussion of your own design of a clinical trial (1 day)

Examination: Home-based group assignment (design of a clinical trial on a topic of students' choice) which will be presented/discussed on the examination date. Each individual will be assessed on the basis of the achievement of the intended learning outcomes of the course.

Compulsory elements: Participants should attend all the sessions except the GCP training (which is not mandatory and will be performed only if the course won’t be virtual) and be involved in group work and presentation of the home assignment. The students who have missed course sessions will be assigned extra reading and home work to compensate the absence.

Number of students: 8 - 50

Selection of students: Selection will be based on 1) the relevance of the course syllabus for the applicant's doctoral project (according to written motivation), 2) start date of doctoral studies (priority given to earlier start date)

More information: December 8th and 9th: frontal teaching/workshops. December 12th and 13th: home study and preparation of the exam in groups of 4/5 students (home-based). December 14th: exam. Location: Karolinska University Hospital/Karolinska Institutet, Solna or Zoom/other virtual platform depending on the regulations for Covid-19 in December.

Course responsible:
Gianluigi Savarese  
Department of Medicine, Solna

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Contact person: -
Title : Mucosal Immunology

Course number : 3178
Credits : 3.0
Date : 2022-10-18 -- 2022-11-01
Language : English
Level : Doctoral level
Responsible KI department : Department of Medicine, Huddinge

Specific entry requirements : Basic knowledge in immunology corresponding to the course 2302.

Purpose of the course : The primary purpose of the course is to introduce doctoral students to key concepts that underlie immune function in mucosal tissues (gut, lung) and to develop their skills to apply these concepts to their own research. Another purpose of the course is to inspire students by giving them the opportunity to interact with scientists who are performing cutting-edge research in the area of mucosal immunology.

Intended learning outcomes : After the course, the doctoral student should be able to: Understand and explain the differences between the mucosal immune system and the immune system in lymphoid organs. Discuss how the microbiota shapes immune function. Explain how altered mucosal immune function and changes in the microbiota can cause inflammatory disease. Critically evaluate experimental approaches that are used to study the mucosal immune system. Use the gained knowledge to critically assess experimental data related to mucosal immunology.

Contents of the course : The following main topics will be covered during the course: gut immune system, lung immune system, microbiota and its interaction with the immune system, role of immune-microbiota interaction in inflammatory diseases (with focus on gut and lung).

Teaching and learning activities : The teaching is mainly through lectures/seminars by the course leaders and other scientists from Karolinska Institutet who work in the field of mucosal immunology. The lectures include introduction to the various topics as well as examples of specific research projects from the lecturer's research group. This will allow the student to become familiar with experimental approaches that are used to study the mucosal immune system. In addition, there will be seminars by external speakers with expertise in mucosal immunology. At the end of each course day, there will be an interactive Question & Answer session to summarize the main points. There will also be group work by the students in the form a scientific figure quiz to learn how to interpret experimental data. Finally, one course day will consist of a practical laboratory session to illustrate how to study the gut and lung immune system.

Examination : The course examination will be in the form of individual and group assignments that are presented orally. As the individual assignment, students will be given scientific questions related to mucosal immunology. The answers are presented by each student individually as short talk presentation. There will also be group work by the students in the form a scientific figure quiz to learn how to interpret experimental data. Both individual and group presentations are peer-reviewed by the course leaders and the other students. Each student has to show that all intended learning outcomes have been reached.

Compulsory elements : Students are required to attend all course days, to actively participate in the group work, and to take the course exam in order to pass the course. Absence can be compensated with an individually written report.

Number of students : 8 - 25
Selection of students : Selection will be based on 1) the relevance of the course syllabus for the applicant's doctoral project (according to written motivation), 2) start date of doctoral studies (priority given to earlier start date).

More information : The course is given full-time on-site at the KI Solna campus during 2 x three days (October 18-20 and October 25-27) with the exam on November 1 (afternoon). Students should reserve two additional days for work on assignments.

Course responsible :
Tim Willinger
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Contact person :
Eduardo Villablanca
Institutionen för medicin, Solna
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Title: Basic Immunology

Course number: 3187  
Credits: 3.0  
Date: 2022-09-05 -- 2022-09-30  
Language: English  
Level: Doctoral level  
Responsible KI department: Department of Clinical Neuroscience  
Specific entry requirements: Knowledge in basic cell biology  

Purpose of the course: To give doctoral students the possibility to acquire a solid knowledge and understanding of fundamental principles in immunology. All other courses in the doctoral education program Aii (Allergy, immunology and inflammation) assume that students have taken the Basic Immunology course, or otherwise have attained the same level of previous knowledge and understanding.

Intended learning outcomes: To be able to: - Explain the basic principles of innate and adaptive immunity and how different components of the immune system cooperate. - Describe and compare principles of immune-related diseases in a clinical perspective. - Apply knowledge gained on the function of the immune system to propose an experimental project in immunology in the form of a written assignment, that will be discussed in pairs. - Review a chosen immune cell type/process/disease, which will be presented as a group project.

Contents of the course: The course is separated into two parts. In part 1 we discuss basic immunological mechanisms within the innate and adaptive immune response. In part 2 we apply the knowledge in clinical settings such as defence against infection, autoimmune and allergic diseases or transplantation.  
Part 1: An overview of the immune system, T cells, B cells, Antigen presenting cells, Innate lymphoid cells, Innate vs adaptive immune responses.  
Part 2: Immune defence against bacterial and viral infections, Primary immunodeficiencies, Autoimmune disease, Allergy, Vaccination, Clinical Immunology, Transplantation, Tumour Immunology. Questions and discussions. Presentation of projects.

Teaching and learning activities: The course consists of lectures and seminars arranged during mornings five days per week. In the afternoon, students are assigned for reading to prepare for the next day's topics as well as project work, further reading, meeting with mentors and a written assignment. Course literature will be available on the course platform in advance of the course start and will be the basis for active discussion during the lectures. We will run exercises and immunological quizzes connected to the different parts of the course, so that the student will be able to digest the relatively big material. On the last day of the course the project work will be presented orally.

Examination: Each student will be examined on the project work and the written assignment, as well as its contributions during the discussions. The project work will be evaluated by the group project mentor and by the course organizers during the oral presentations of the work. The individual written assignment is evaluated by the course organizers and will be discussed in pairs.

Compulsory elements: All activities included in the course are compulsory. Absence needs to be compensated for in agreement with the course director.

Number of students: 12 - 32

Selection of students: Selection will be based on 1) the relevance of the course syllabus for the applicant's doctoral project (according to written motivation), 2) start date of doctoral studies (priority given to earlier start date).

More information: This will be a in-person course run in two blocks of 5 days: 22/09/05 to 22/09/09 and then again 22/09/26 to 22/09/30. Lectures will be held during the mornings (8:00 to 12:00) at the Center for Molecular Medicine (CMM), Visionsgatan 18, KI Solna Campus. Literature will be provided in advance. Afternoons are reserved for reading in preparation for the subsequent days as well as for both individual and group projects. While our intention is primarily to run a physical course, we might have to reconsider and run it remotely depending on the development of the pandemic.

Course responsible: Andre Ortlieb
Department of Clinical Neuroscience

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Contact person: -
Title: Function B - to Design Procedures and Projects Involving Research Animals

Course number: 3214
Credits: 3.0
Date: 2022-08-30 -- 2022-10-06
Language: English
Level: Doctoral level
Responsible KI department: Comparative medicine
Specific entry requirements: Previous education in laboratory animal science to carry out scientific procedures on animals (i.e. Function A).

Purpose of the course: The course provides education to doctoral students who will be involved in the design of scientific procedures involving research animals as part of their research. This course also provides education in laboratory animal science to doctoral students who are not necessarily involved with studies using animals but will need to be able to analyze scientific literature and/or data that have been generated from animal studies.

Intended learning outcomes: After completion of this course, students should be able to meet the defined learning outcomes as set out in the EU Education and Training guidelines, specifically for modules 7, 9, 10-11. The list of suggested learning outcomes by the EU guidelines is comprehensive, but in summary, participants will acquire the knowledge to design and evaluate procedures involving research animals. At the end of the course participants should be able to: • Describe appropriate methods of handling and restrain, and appropriate techniques needed to carry out or plan minimally invasive procedures without anesthesia. [EU 7] • Demonstrate a broader and deeper level of understanding of legal requirements and responsibilities, ethics, animal welfare, and the 3Rs in relation to animal research. [EU 9] • Recognize principles of good experimental design of animal studies. [EU 10] • Relate principles of good scientific practice in research using animals. [EU 11]

Contents of the course: This course follows the latest EU guidelines for the education and training of persons designing procedures and projects using animals, i.e. Function B, as stated in the EU Directive 2010/63 and the Swedish legislation (SJVFS 2017:40) on the protection of animals used for scientific purposes. In particular, this course will cover the Function B-specific modules established in the European Union guidelines such as modules EU 7 (Minimally invasive procedures without anesthesia for rodents and lagomorphs), EU 9 (Ethics, animal welfare, and the 3Rs - level 2), EU 10 (Design of procedures and projects - level 1), and EU 11 (Design of procedures and projects - level 2). The course contents are based on the EU Education and Training Framework and include: • Procedures on animals. • Regulations affecting animal research. • Ethics, animal welfare and the 3Rs. • Experimental design and statistical analysis of animal studies. • Good scientific practice in animal research.

Teaching and learning activities: Face-to-face seminar lectures, e-learning, individual work (home study), group work, student's presentations, in-class discussions and interactions.

Examination: A final exam containing short answer questions and/or multiple choice questions will be used to assess theoretical knowledge. Feedback will also be given to student's presentations.

Compulsory elements: All parts of the course and active participation is compulsory. Missed parts must be compensated. In order to participate in the final exam, at least 70% of the lectures must have been attended. Missed parts must be compensated for in agreement with the course leader.

Number of students: 6 - 12
Selection of students: This course is primarily aimed at experienced senior researchers, but postdocs and doctoral students at the last stage of their studies will be accepted. Preference will be given to participants working with animal models.

More information: Teaching days will be held in 8 separate days (Tue 30/8, Thu 1/9, Thu 8/9, Thu 15/9; Thu 22/9, Thu 29/9, Tue 4/10, and Thu 6/10) between approx. 9 am and 5 pm. The course includes international, national, and local experts in the field of laboratory animal science. This course is FELASA-accredited and follows the specific learning outcomes for Function B modules in accordance with the EC Education and Training Framework, recently endorsed by the new Swedish L150 (SJVFS 2019:9).

Course responsible:
Rafael Frias
Comparative medicine
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Contact person:
-
Title : Basic Human Neuroscience

Course number : 3220
Credits : 10.0
Date : 2022-11-28 -- 2023-01-13
Language : English
Level : Doctoral level
Responsible KI department : Department of Neuroscience
Specific entry requirements :

Purpose of the course : The purpose of this course is to provide students without a previous education in biomedicine/medicine knowledge in basic human neuroscience equivalent to that of the medical programme. It will satisfy the requirement for a course providing a grounding in human biology/physiology and/or pathology.

Intended learning outcomes : After the course, the doctoral student shall have obtained a thorough knowledge about the human nervous system that includes the following: 1) Macro- and microscopic organization and development of the nervous system; 2) Cellular neurobiology including signaling in the nervous system; 3) Structure and function of sensory systems underlying vision, somatosensation and pain, hearing and balance, smell and taste; 4) Structure and function of motor systems underlying the planning, initiation and regulation of movements. 5) Higher central nervous system functions including neuropsychology and regulation of behavior.

Contents of the course : The course will follow the curriculum of the Neuroscience course for medical students. The content consists of lectures, seminars and practicals that provide knowledge and understanding of nervous system organization and development, cellular neurobiology, sensory and motor functions, and higher nervous system functions.

Teaching and learning activities : Lectures, laboratory practicals, oral exam seminars, and neuroanatomy and neurohistology workshops.

Examination : Three formative oral exam seminars, one formative practical test in neuroanatomy, and a final summative written exam.

Compulsory elements : The three oral exam seminars, the practical test in neuroanatomy and the final exam.

Number of students : 1 - 6

Selection of students : Doctoral students that work in a neuroscience-related project but lack a basic education in biomedicine/medicine will get priority. The start date of doctoral studies will also be considered.

More information : The course is given in parallel with the neuroscience course in the biomedicine programme. All teaching activities will take place in Solna Campus. To obtain a detailed schedule send an e-mail to lennart.brodin@ki.se. The course will meet the requirement for a course providing the grounding in human biology/physiology and/or pathology, but cannot be counted as a project specific course.

Course responsible :
Lennart Brodin
Department of Neuroscience
0852486902
Lennart.Brodin@ki.se

Contact person :
Title: Genomics for Biomedical Scientists: Handle Your Gene Expression Data

Course number: 3230  
Credits: 3.0  
Date: 2022-09-26 -- 2022-10-07  
Language: English  
Level: Doctoral level  
Responsible KI department: Department of Microbiology, Tumor and Cell Biology

Purpose of the course: The biomedical field has experienced a revolution thanks to the development of the massive parallel sequencing technologies. We can now obtain the complete genetic information of a patient in a few days at low costs. However, there is a gap between the application of classical molecular biology tools and the full use of the current genomic and computational approaches. To bridge this gap, the course is designed to give students an introduction to genomic approaches in gene regulation. The emphasis is that the students learn to apply genomic tools in their research without prior knowledge in computational biology. The students will also be made aware of ethical aspects in relation to technical progress.

Intended learning outcomes: At the end of the course the student should be able to: - Understand the crosstalk across the different levels of gene expression regulation, with special emphasis on chromatin organization, polymerase activity and RNA biology. - Know the principles of high-throughput technologies applied to the study of gene expression, their advantages and limitations. - Get a deeper understanding about investigating the dynamics of chromatin and gene regulation, and how deregulation of such states contributes to human diseases. - Design genome-wide experiments for studying the transcriptome and chromatin state, and to critically evaluate results obtained with those approaches. - Use common bioinformatics tools to analyse ChIP-Seq and RNA-Seq experiments. - Make use of publicly available genome-wide databases and publications to complement their own research

Contents of the course: The course covers the use of genome-wide approaches for the study of gene expression regulation and how these approaches have become key for biomedical research. Particular attention will be paid to the understanding of advantages and limitations of those approaches, and applications to the study of human disease. The course will include both lectures and hands-on data analysis session, and provide the students tools to successfully navigate through the jungle of public available genome-wide datasets.

Teaching and learning activities: Prior knowledge of programming is not required. The learning activities used in the course include lectures, practical training in data analysis, group discussions and problem-based learning activities. The students will be able to use gene expression data analysis software during the course. Students will be grouped in learning groups and present the results of their analysis of a preselected dataset from a recent publication in form of an oral presentation as well as design and develop a research project in which they apply what they have learned into their own ongoing research. Students will also be encouraged to actively participate in the course during the quiz and Q&A (question and answer) sessions. There will be substantial time for practising and discussing after the lectures.

Examination: The students will be examined for all learning outcomes. The examination is based on: - The student's contribution to the discussions during the course. - The performance during the bioinformatic hands-on sessions. - The student's individual contribution to the analysis and presentation at the last day of the course.

Compulsory elements: Students will be asked to describe a (e.g. their own) research problem prior to the course. The seminars, group discussions and presentations are compulsory. Absence cannot be compensated for.

Number of students: 8 - 16

Selection of students: Selection will be based on 1) the relevance of the course syllabus for the applicant's doctoral project (according to written motivation), 2) start date of doctoral studies (priority given to earlier start date)

More information: The course most likely takes place at SciLifeLab in Solna (alternatively at Biomedicum in Solna). In the case that physical attendance is not recommended due to the SARS-CoV-2 pandemic, the course will be given online. The course will provide theoretical training combined with hands-on training. Part of the practical training can be performed remotely. Students are encouraged (but it is not obligatory) to work on their own RNAseq and ChIPseq data during the course. We will use Galaxy for the data analysis.

Course responsible:  
Claudia Kutter  
Department of Microbiology, Tumor and Cell Biology  
claudia.kutter@ki.se

Contact person:  
Vicente Pelechano Garcia  
Institutionen för mikrobiologi, tumör- och cellbiologi  
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https://kiwas.ki.se/katalog/katalog/pdf?term=HT22
Claudia Kutter
Institutionen för mikrobiologi, tumör- och cellbiologi

claudia.kutter@ki.se
Title: Public Health Implications of an Aging Population

Course number: 3233  
Credits: 3.0  
Date: 2022-09-26 -- 2022-10-14  
Language: English  
Level: Doctoral level  
Responsible KI department: Department of Neurobiology, Care Sciences and Society  
Specific entry requirements: 

Purpose of the course: The purpose of the course is for students to gain an increased understanding of the public health implications that arise from an aging population, as highlighted by the WHO's Decade of Healthy Ageing 2020-2030. The students will be trained to identify the challenges and opportunities related to the ongoing demographic changes in society, both from a life course and public health perspective.  

Intended learning outcomes: After completing this course, students are expected to be able to: 1. Identify and discuss public health implications that arise from an aging population. 2. Reflect on how these implications can be related to her/his research. 3. Reflect on key concepts from the course, and apply them to her/his research.  

Contents of the course: The course provides knowledge on key concepts in the multidisciplinary field of aging research. Attention will be given to the following themes and related challenges and opportunities for public health:  
- Health trends and the interplay between morbidity and mortality in later life (e.g., compression and expansion of morbidity)  
- Concepts of "Aging well" (e.g. active and healthy aging)  
- The changing life course (e.g. gradual retirement, re-partnering, and attitudes and norms towards aging and old age)  
- Health inequalities in old age, and how they are shaped by experiences and behaviors throughout the life course  
- Aging within health and social care systems  

Teaching and learning activities: Different strategies for teaching and learning will be used, such as lectures, seminars, group discussions, and peer reviewing, in order to promote an analytical and critical approach to the course content. The doctoral students' proactive participation will be required.  

Examination: To pass the course the student has to achieve the learning outcomes. This will be assessed through active participation in mandatory seminars, an individual written assignment reflecting on the course content in relation to her/his own research and also written and oral reflection on a peer's individual assignment. 

Compulsory elements: The students are required to participate in scheduled activities, including lectures, group discussions and seminars. The course directors assess how absence should be compensated.  

Number of students: 10 - 25  
Selection of students: Eligible doctoral students will be selected based on 1) the relevance of the syllabus for the applicant's doctoral project, and 2) date for registration as doctoral student (priority given to earlier registration date). To be considered, include a short description of doctoral project.  

More information: The course will use a hybrid format, including both on-site and online parts. Lectures will be given Monday through Friday the first week (September 26 to 30). The examination assignment is due on Tuesday October 11, and the examination seminar takes place on Thursday, October 13.  

Course responsible:  
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Department of Neurobiology, Care Sciences and Society  
08-524 858 10  
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Contact person:  
Charlotta Nilsen  
Institutionen för neurobiologi, vårdvetenskap och samhälle  
charlotta.nilsen@ki.se
Title: Clinical and Molecular Bacteriology

Course number: 4215
Credits: 1.5
Date: 2022-10-10 -- 2022-10-14
Language: English
Level: Doctoral level
Responsible KI department: Department of Neuroscience

Specific entry requirements:

Purpose of the course: The purpose of this course is to introduce students to a variety of topics relating to both clinical and molecular bacteriology and the interaction between clinical and basic research.

Intended learning outcomes: At the end of the course the students should have a good overview of and will be able to show good understanding of:
- The forefront of clinical, public health and experimental research in antibiotic resistance and bacterial pathogenesis
- Ongoing clinical and molecular bacteriology research at Karolinska Institutet / Karolinska University Hospital
- A range of different experimental techniques and approaches used in bacteriology research.

Contents of the course: Topics of the course will include:
- Molecular pathogenesis of bacteria
- Clinically important bacterial infections and antibiotic resistance
- The role of the bacterial microbiota in health and disease
- Innovation and emerging technologies and techniques in bacteriology

Teaching and learning activities: This one week course will consist of lectures/ seminars by leading researchers/clinicians in the field of Bacteriology as well as group and individual assignments. Active participation is expected in lectures, seminars and group assignments.

Examination: The learning outcomes will be assessed through individual written assignments and group oral presentations. Each student will need to show that all the learning outcomes of the course are achieved.

Compulsory elements: Lectures/seminars have compulsory attendance which may be compensated by a given written assignment in exceptional circumstances.

Number of students: 8 - 20

Selection of students: Selection will be based on 1) the relevance of the course syllabus for the applicant’s doctoral project (according to written motivation), 2) start date of doctoral studies (priority given to earlier start date)

More information: The course will be held in Biomedicum, Solnavägen 9, room B0813.

Course responsible:
Keira Melican
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Contact person:
Benedict Chambers
Institutionen för medicin, Huddinge
Benedict.Chambers@ki.se
Title: Immunometabolism: Implications for Health and Disease

Course number: 5214
Credits: 1.5
Date: 2022-11-14 -- 2022-11-18
Language: English
Level: Doctoral level
Responsible KI department: Department of Medicine, Solna

Specific entry requirements: Basic knowledge of immunology (corresponding to the KI doctoral education course Basic Immunology, 3 hp), molecular biology and biochemistry is required.

Purpose of the course: This course intends to enable doctoral students to obtain an in-depth knowledge on the emerging field of immunometabolism, more specifically, the interplay between immunological and metabolic processes. This will add an extra dimension to our understanding of the immune system in health and disease.

Intended learning outcomes:
1. Identify the concept of immunometabolism and differentiate it from other types of cellular metabolisms.
2. Summarize a number of different mechanisms that modulate the metabolism of the immune response in a healthy state.
3. Understand the molecular mechanisms underlying energy metabolism and immunology into the development of metabolic and inflammatory diseases.
4. Compare and contrast scientific papers in the immunometabolism field into a coherent conclusion.
5. Argue and judge scientific data about immunometabolism and the application on inflammatory and metabolic diseases.
6. Analyse the two major metabolic pathways of the cell: glycolysis and oxidative phosphorylation with equipment for measure of energy metabolism in real time.

Contents of the course:
Our understanding of molecular pathways that govern metabolism and immunology has evolved largely in parallel. However, current evidence points to a close interplay between immunological and metabolic processes. It is now clear that the behavior of cells of our immune system including monocytes, macrophages and lymphocytes is largely determined by the status of their intracellular energy metabolism. The course will specifically focus on the molecular mechanisms of metabolism, such as oxidative phosphorylation and glycolysis that underlie immune cell functioning. Furthermore, the concept of immunometabolism will be applied to various pathological conditions ranging from host defense against infections, cancer and cardiometabolic diseases and related complications. Of note, during the course it will be discussed how targeting of metabolism in immune cells can lead to tangible therapeutic advancements.

Teaching and learning activities: Lectures, laboratory practice and presentation by participants.

Examination: A course participant has to achieve all intended learning outcomes for the course in order to pass the course. This is tested during: 1) Individual journal club presentations by the students followed by discussions. The topics will be related to a relevant aspect of immunometabolism. 2) The laboratory practice.

Compulsory elements: All course activities are mandatory. Absence can be compensated for in exceptional circumstances by a written assignment in agreement with the course leader.

Number of students: 8 - 30

Selection of students: Selection will be based on 1) the relevance of the course syllabus for the applicant’s doctoral project (according to written motivation), 2) start date of doctoral studies (priority given to earlier start date).

More information: This course is given jointly by the doctoral programmes Cardiovascular Research (CVR), Allergy, immunology and inflammation (AiI) and Metabolism and Endocrinology (MetEndo). See: https://staff.ki.se/doctoral-programmes The course is held from Monday to Friday. Theory lectures in the morning and lab practice in the afternoon.

Course responsible:
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Noah Moruzzi
Institutionen för molekylär medicin och kirurgi
noah.moruzzi@ki.se
Title: Stress, Sleep, and Health

Course number: 5216  
Credits: 3.0  
Date: 2022-10-31 -- 2022-11-11  
Language: English  
Level: Doctoral level  
Responsible KI department: Department of Clinical Neuroscience

Specific entry requirements:

Purpose of the course: Stress- and sleep disturbances are common in the discourse of modern societies, and can affect wellbeing and health. The purpose of the course is to provide an overview of how stress and sleep affect mental and physical health. The course will also offer an opportunity to develop critical thinking about research findings, and to apply a cross-disciplinary mechanistic perspective across physiological and pathological conditions. The students will be given good opportunities to network with each other and to interact with leading national and international researchers in this area of research.

Intended learning outcomes: At the end of the course, the doctoral student shall be able to: 1) understand, describe, and critically discuss central theoretical and empirical issues regarding how stress and sleep affect health, and the basic mechanisms by which this association occurs; 2) critically reflect on the literature in the field; 3) identify knowledge gaps, and design an adequate research plan for a study of the effects of stress and sleep on health, and to critically discuss the chosen design in relation to pertinent literature.

Contents of the course: The course will consist of lectures and seminars that will provide an overview of the essential concepts and the research on stress, sleep, and health. In particular, how acute stress, chronic stress, circadian rhythms, and sleep disturbances affect physiological systems such as the immune system and metabolism, and mental health and cognition, will be discussed. Lectures/seminars will also describe neuronal underpinnings of such effects, and possible treatments to improve stress- and sleep-related disorders. Models/tasks to study the effect of stress and sleep will also be presented and discussed.

Teaching and learning activities:  
- Lectures and seminars, which will provide an overview of the essential concepts and the research in the different areas of relevance for the use of the doctoral student in the preparation of the examination assignment (time to prepare the written and oral presentations is included in the course).  
- Journal club where specific papers will be discussed - Meet-the-experts session, where the students will have the opportunity to meet and interact with leading national and international researchers in areas of interest.  
- The doctoral student will have access to supervision in the preparation of the written examination  
Note that the course will be held in a hybrid form (some teaching activities online, and some teaching activities that are available either on site or online at the student’s choice) if the situation allows it, or online.

Examination: The examinations will consist of short written and oral presentations of a mock research project that is well motivated in background of the current state of knowledge/lack of knowledge in the research area of relevance. The oral presentations will take place during a seminar in the end of the course.

Compulsory elements: - Written and oral examination – Participation in the examination seminar. In case of absence from the scheduled examination seminar, another occasion for examination can be arranged as agreed upon with the course leader. The compulsory elements can be adapted, for instance by providing more support or additional time to finish the assignments, on a case-by-case basis (e.g. students with special needs).

Number of students: 8 - 30

Selection of students: Selection will be based on 1) the relevance of the course syllabus for the applicant’s doctoral project (according to written motivation), 2) start date of doctoral studies (priority given to earlier start date)

More information: Note that the course will be held in a hybrid form (some teaching activities online, and some teaching activities that are available either on site or online at the student’s choice) if the situation allows it, or online. The compulsory elements can be adapted, for instance by providing more support or additional time to finish the assignments, on a case-by-case basis (e.g. students with special needs).

Course responsible:  
Julie Lasselin  
Department of Clinical Neuroscience  
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Contact person:  
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Julie Lasselin  
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https://kiwas.ki.se/katalog/katalog/pdf?term=HT22
Title: Artificial Intelligence and Machine Learning for Biomedical and Clinical Research

Course number: 5223  
Credits: 3.0  
Date: 2022-11-21 -- 2022-12-02  
Language: English  
Level: Doctoral level  
Responsible KI department: Department of Microbiology, Tumor and Cell Biology  
Specific entry requirements: At least 1.5 credits from a course in basic statistics.

Purpose of the course: To increase knowledge about Machine Learning (ML) and Artificial Intelligence (AI) applications in biological and medical research, introduce first-hand experience and skills with different frameworks. The course requires no preliminary programming skills as well as no preliminary expertise in ML and AI. This course is given at a basic/novice level with no expertise in ML/AI and preliminary programming skills required, though experience in data analysis using RStudio/MatLab or similar analytic environment is an advantage.

Intended learning outcomes: After the completed course, the participants will be able to describe and discuss general aspects of ML and AI in a biomedical or medical context including ethical dilemmas and challenges. Practically, they should be able to prepare and analyse different data types related to own research, such as texts, omics, genomic sequences, images etc. using a range of ML and AI exploration and classification techniques as well critically analyse the outcome and estimate performance.

Contents of the course: Basic information about AI and ML, multivariate dataset preparation, classic methods of univariate and multi-dimensional analysis (Principal Component Analysis, Linear Discrimination Analysis, Factor Analysis), variable selection and sparse regression models (lasso regression, ridge regression, elastic net), supervised and unsupervised learning with neural networks, federated learning, performance estimation methods.

Teaching and learning activities: The course consists of lectures, group discussions, and hands-on labs. Previous experience from practical experience applying modelling in a computer-based environment (e.g. in R, SAS, STAT, Matlab or Python), is strongly recommended.

Examination: The student will be examined by their (a) labs accomplishment (b) final project report and (c) written reviews of projects of 2 other students.

Compulsory elements: All planned activities including lab and group works are mandatory. Absence has to be compensated with a report on the lab work, which student will have to do.

Number of students: 8 - 16

Selection of students: Selection will be based on 1) the relevance of the course syllabus for the applicant's doctoral project (according to written motivation), 2) start date of doctoral studies (priority given to earlier start date)

More information: The course takes place at Campus Solna. It is full time and intensive, and there are obligatory practical exercises. For any questions about course contents and practicals, email iurii.petrov@scilifelab.se who is the main teacher of the course.

Course responsible:
Andrey Alexeyenko  
Department of Microbiology, Tumor and Cell Biology  
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Contact person:
Matti Nikkola  
Institutionen för cell- och molekyläriologi  
Matti.Nikkola@ki.se
Title: Advanced Scientific Writing

Course number: 5227
Credits: 1.5
Date: 2022-09-12 -- 2022-09-16
Language: English
Level: Doctoral level
Responsible KI department: Department of Women's and children's health

Specific entry requirements: Knowledge corresponding to basic doctoral courses in scientific writing at KI and some experience of scientific writing.

Purpose of the course: This is an advanced course in scientific writing, specifically designed for post docs and PhD students in the later part of their education. The aim is to improve the participants’ ability to write, revise and review original scientific articles.

Intended learning outcomes: After passing the course, the participant will: - have a better understanding of how to write an original scientific article, including use of the proper structure and language - be aware of and, thereby, able to avoid the common mistakes involved in writing scientific articles - have the ability to offer constructive criticism regarding these matters to other scientists (e.g., co-workers, as peer reviewers for journals) - be able to assess constructive criticism of their manuscripts from other scientists and revise accordingly

Contents of the course: This is an advanced course in scientific writing that requires prior knowledge and experience in writing research articles. The participant will be writing and revising manuscripts based on their own research (written, at least in part, before the course begins) as well as peer reviewing the manuscripts of other course participants. The teachers will focus on giving feedback in great detail on the scientific articles of the students and also guiding the revision of the manuscripts after the review sessions.

Teaching and learning activities: Lectures, individual writing and revising of manuscript, individual and group peer reviewing of the manuscripts of other course participants, group discussions including feedback from the teachers.

Examination: Writing and rewriting a manuscript based on the comments and feedback from the other course participants and teachers, thoughtful peer reviewing of the manuscripts of other course participants, active participation in group exercises.

Compulsory elements: All scheduled teaching, unless stated otherwise or the participant informs the teachers in advance of an acceptable reason for not being present. Absence can be compensated for by individual work specified by the teachers or in connection with the next time the course is taught.

Number of students: 8 - 14
Selection of students: Selection will be based on 1) personal motivation including prior experience of manuscript writing 2) the relevance of the course syllabus for the applicant's doctoral project (according to written motivation), 3) start date of doctoral studies (priority given to earlier start date)

More information: The course is given in two parallel formats (in-class/on-line) with all lectures real-time and according to schedule (no pre-recorded lectures). This is an advanced course on scientific writing for Post Docs and PhD students in the later part of their education. The focus is on writing and revising your own manuscript with a lot of individual coaching and group assignments. In order to participate, a requirement is to already have a manuscript draft to work on. Please address ALL questions to: anna.hildenbrand.michelman@ki.se or phone: 0707890607

Course responsible:
Anna Hildenbrand Wachtmeister
Department of Women's and children's health
070-789 06 07
anna.hildenbrand.michelman@ki.se

Contact person: -
Title: Advanced Scientific Writing

Course number: 5227
Credits: 1.5
Date: 2022-11-28 -- 2022-12-02
Language: English
Level: Doctoral level
Responsible KI department: Department of Women's and children's health
Specific entry requirements: Knowledge corresponding to basic doctoral courses in scientific writing at KI and some experience of scientific writing.

Purpose of the course: This is an advanced course in scientific writing, specifically designed for post docs and PhD students in the later part of their education. The aim is to improve the participants’ ability to write, revise and review original scientific articles.

Intended learning outcomes: After passing the course, the participant will: - have a better understanding of how to write an original scientific article, including use of the proper structure and language - be aware of and, thereby, able to avoid the common mistakes involved in writing scientific articles - have the ability to offer constructive criticism regarding these matters to other scientists (e.g., co-workers, as peer reviewers for journals) - be able to assess constructive criticism of their manuscripts from other scientists and revise accordingly.

Contents of the course: This is an advanced course in scientific writing that requires prior knowledge and experience in writing research articles. The participant will be writing and revising manuscripts based on their own research (written, at least in part, before the course begins) as well as peer reviewing the manuscripts of other course participants. The teachers will focus on giving feedback in great detail on the scientific articles of the students and also guiding the revision of the manuscripts after the review sessions.

Teaching and learning activities: Lectures, individual writing and revising of manuscript, individual and group peer reviewing of the manuscripts of other course participants, group discussions including feedback from the teachers.

Examination: Writing and rewriting a manuscript based on the comments and feedback from the other course participants and teachers, thoughtful peer reviewing of the manuscripts of other course participants, active participation in group exercises.

Compulsory elements: All scheduled teaching, unless stated otherwise or the participant informs the teachers in advance of an acceptable reason for not being present. Absence can be compensated for by individual work specified by the teachers or in connection with the next time the course is taught.

Number of students: 8 - 12
Selection of students: Selection will be based on 1) personal motivation including prior experience of manuscript writing 2) the relevance of the course syllabus for the applicant’s doctoral project (according to written motivation), 3) start date of doctoral studies (priority given to earlier start date)

More information: The course is given in two parallel formats (in-class/on-line) with all lectures real-time and according to schedule (no pre-recorded lectures). This is an advanced course on scientific writing for Post Docs and PhD students in the later part of their education. Focus will be on writing and revising your own manuscript with a lot of individual coaching. In order to participate, a requirement is to already have a manuscript draft to work on. Please address ALL questions to: anna.hildenbrand.michelman@ki.se or phone: 0707890607

Course responsible:
Anna Hildenbrand Wachtmeister
Department of Women's and children's health
070-789 06 07
anna.hildenbrand.michelman@ki.se

Contact person:
-
Title: Global Sexual and Reproductive Health and Rights: Methods, Concepts and Implications for Policy and Practice

Course number: 5228
Credits: 3.0
Date: 2022-10-10 -- 2022-10-21
Language: English
Level: Doctoral level
Responsible KI department: Department of Women's and children's health
Specific entry requirements:

Purpose of the course: Understanding of how sexual and reproductive health and rights (SRHR) are shaped, and its effects on future generations is crucial for all researchers involved in global health, maternal health and many other areas related to health. This course will provide participants with practical and theoretical tools as well as background to review and carry out research in SRHR.

Intended learning outcomes: At the end of the course the student should be able to: 1. Understand the state of the art in SRHR, including global trends, progress, challenges and gaps in research 2. Examine SRHR Policies and understand their relation to SRHR outcomes, as well as translate research into policy 3. Explain how structural factors – including social, political, economic and ethical factors - influence SRHR 4. Utilize, analyse and interpret qualitative and quantitative data and measurements in SRHR 5. Demonstrate skills in scientific writing, and reviewing and critiquing scientific papers 6. Apply skills for successful interdisciplinary collaboration

Contents of the course: 1. Introduction to core concepts and state of the art in SRHR in a global context 2. Underlying causes of (in)equities in SRHR 3. Intercultural and interdisciplinary academic collaboration 4. Scientific societal outreach 5. SDGs and other policy initiatives and their relation to SRHR globally 6. Critiquing the literature in SRHR

Teaching and learning activities: This course is fully online. Learning activities will include online lectures, joint readings, panel debates, group discussions and individual assignments, all encouraging maximum collaboration between the students from the different institutions.

Examination: - In preparation of the course, students will bring a recent version of a research protocol or paper that they are writing on/related to their research topic. The evaluation will consist of a revised version of the protocol/paper - Diary - Peer review of other students' protocol/paper - The students will be divided in groups and given a specific SRHR topic to write a debate article/commentary on - Contribution to the discussions during the seminars - Assignments will be graded pass/fail

Compulsory elements: Hand in the assignments, participate in discussions.

Number of students: 8 - 10

Selection of students: We will give priority to PhD students registered at Karolinska Institutet. Selection will be based on 1) the relevance of the course syllabus for the applicant's doctoral project (according to written motivation), 2) start date of doctoral studies (priority given to earlier start date)

More information: The course will be organised jointly by ANSER institutions (https://www.ugent.be/anser/en) in an online environment. The course benefits of the fact that teachers will be recruited from the full ANSER membership, bringing together 39 academic institutions from different parts of the world.

Course responsible:
Elin Larsson
Department of Women's and children's health
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Contact person:
Anna Kågesten
Institutionen för global folkhälsa
anna.kagesten@ki.se
Title: Advanced presentation techniques: Oral Presentation of Own Research

Course number: 5231
Credits: 1.5
Date: 2022-11-14 -- 2022-11-18
Language: English
Level: Doctoral level
Responsible KI department: Department of Women’s and children’s health
Specific entry requirements: Basic course in presentation techniques or similar knowledge level.

Purpose of the course: The purpose of the course is to build skills and increase the participant’s confidence in presenting own research results. This is an advanced course in presentation skills requiring prior experience of presenting your research. The course is specifically targeting postdocs and PhD students in the later part of their education.

Intended learning outcomes: After passing the course, the participant will: - be able to structure and build compelling presentations based on own research results - have skills in how to consistently deliver in an engaging manner - be capable of building instant rapport and get an audience on their side every time - understand the best use of voice, body language and posture - be able to make their mark and be remembered - understand how to deal with challenges during presentations, e.g. hostile audience members, difficult questions, technology problems, nervousness and blacking out - have knowledge of a broad variety of presentations styles in order to find their own - be able to use supportive media - be able to design presentation slides that support the message

Contents of the course: The course is highly personalized, tailored to the specific needs of the individual participants. A variety of techniques will be presented and tried out to enable the participants to develop in their own way to become more professional at presenting, yet remaining authentic. The course includes: - presentation structure - presentation techniques - dealing with the audience - overcoming challenges, e.g. hostile audience members, questions, nervousness, technology issues - body language, voice and presence on stage - filming of an elevator pitch, which the participants get to keep after the course to use e.g. on a webpage - how to design successful PowerPoint presentation slides - how to use supporting media

Teaching and learning activities: Lectures, group work, exercises, individual coaching and filming.

Examination: Presentations and participating in exercises during the course.

Compulsory elements: All scheduled teaching and group work is compulsory. Absence can be compensated for during individual assignments or during the next course occasion.

Number of students: 8 - 14

Selection of students: Selection will be based on 1) Personal motivation including previous experience and/or relevant courses on the topic 2) the relevance of the course syllabus for the applicant’s doctoral project (according to written motivation), 3) start date of doctoral studies (priority given to earlier start date)

More information: The course is given in two parallel formats (in-class/on-line) with all lectures real-time and according to schedule (no pre-recorded lectures). Welcome to apply for PhD course 5231 Oral presentation of your own research! This is an advanced presentation techniques course for Postdocs and PhD students, who have some previous experience of presenting their research results and want to further improve their skills. Focus will be on presenting your own results in different formats and includes a lot of individual coaching. The course will be given in a venue in central Stockholm and/or online using the platform Zoom. Please address ALL questions to: anna.hildenbrand.michelman@ki.se or phone: 0707890607

Course responsible:
Anna Hildenbrand Wachtmeister
Department of Women’s and children’s health
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Contact person:
Title: Tumor Microenvironment

Course number: 5232
Credits: 1.5
Date: 2022-10-10 -- 2022-10-14
Language: English
Level: Doctoral level

Responsible KI department: Department of Oncology-Pathology

Specific entry requirements: Basic course in tumor biology and oncology or corresponding knowledge

Purpose of the course: The purpose of the course is to provide: -A systematic overview on the cellular, structural and chemical composition of the tumor microenvironment (TME) -A platform for scientific discussions on how differences in the tumor microenvironment can influence tumor progression and therapy response -Practice in what to consider when selecting a relevant TME model system and how to analyze the tumor microenvironment ex vivo and in vivo -A context for reflection on advances and challenges with existing and future TME-targeting therapies

Intended learning outcomes: After completion of the course, the students should be able to: - Describe the main cellular and acellular components of the TME - Discuss principal mechanisms of TME communication - Systematically identify and compare properties of different TMEs and their clinical impact - Critically evaluate different methods and model systems for TME studies and motivate their use from a context-dependent perspective (level of complexity, ethics, clinical relevance, etc)

Contents of the course: The course content is structured as follows: -Components of the TME are introduced (cancer-associated fibroblasts, endothelial cells, pericytes, immune cells, ECM and associated factors etc). Processes like angiogenesis and lymphangiogenesis are discussed together with conditions like hypoxia and acidosis. -TME properties are related to malignant growth, invasion, metastasis, and response to therapy from a clinical perspective. The specific TME of selected tumor types will be further studied in depth according to the participants’ interest. -Model systems and tools for TME studies are presented (organoids, digital image analysis etc.).

Teaching and learning activities: The course consists of lectures, group work and discussions, literature search, and a hands-on demonstration of digital image analysis using clinical tissue samples. TME characteristics of different tumor types will be explored by problem-based learning (starting from a clinical case). The course is designed to stimulate interactive learning. Digital platforms like Canvas and Zoom will be used and internet connection is therefore needed.

Examination: The course assignments consist of: (1) Daily Canvas quiz in groups (formative assessment) (2) Oral group presentation (3) Essay, 1 page (summative assessment)

Compulsory elements: All parts of the course are mandatory and require full attendance. Absence must be compensated for by other activities (after discussion with the course organizer).

Number of students: 10 - 20

Selection of students: Selection will be based on 1) the relevance of the course syllabus for the applicant’s doctoral project (according to written motivation), 2) start date of doctoral studies (priority given to earlier start date)

More information:

Course responsible:
Monika Ehnman
Department of Oncology-Pathology
Monika.Ehnman@ki.se

Contact person:
Title: Improving Use of Medicines, Focusing on Antibiotics

Course number: 5236
Credits: 1.5
Date: 2022-09-12 -- 2022-09-16
Language: English
Level: Doctoral level
Responsible KI department: Department of Global Public Health
Specific entry requirements:

Purpose of the course: This course will help participants to understand, discuss and apply key concepts of medicines in health systems and use of medicines across countries on different income levels. The special focus will be on the global antibiotic use and growing threat of antibiotic resistance. Participants will have opportunities to exchange knowledge and experience throughout the lectures in the course. Further opportunities for networking will be provided during group assignments with other participants in multicultural and multidisciplinary context.

Intended learning outcomes: At the end of the course students will be able to: - Recognise the role of medicines in health systems as well as understand and discuss the importance of systems approach in medicines use. - Identify, analyse and discuss factors influencing antibiotic use and resistance in various contexts and its impact on global health. - Propose and evaluate different methods to improve use of medicines, and in particular antibiotics considering various contexts.

Contents of the course: The following content will be covered during the course: - The tools used in drug utilisation research such as ATC/DDD, together with methods to collect appropriate data to show the level of medicine use in a given population. - Access to essential medicines as one of the six building blocks of well-functioning health systems and the role of essential medicines in universal health coverage. - Examples of antibiotic use from countries on different income levels and from different parts of the health system. - Factors affecting antibiotic use, both on macro- and micro-level. - The methods to monitor global, national and local antibiotic consumption and resistance. - The burden of antibiotic resistance and economic consequences. - Lectures on introduction to changing behaviour, methods to improve use of medicines (in particular antibiotics) including the role of guidelines and various kinds of information or educational interventions directed to health care professionals, general public or policy makers. - Methods to evaluate such interventions - One Health approach: use of antibiotics in livestock, antibiotic residues and resistance in the environment

Teaching and learning activities: This is a blended-learning course i.e. a combination of classroom and online activities. During the course learning platforms and e-meeting tools e.g. Canvas and Zoom are used. Learning activities include synchronous (i.e. real-time, on campus) and asynchronous (video recorded, on-line) lectures, seminars and group work. The course is extended over 1-2 weeks but is equivalent to one-week full-time work.

Examination: To pass the course the participants need to demonstrate that the intended learning outcomes have been achieved. A written individual assignment and presentation of group work constitute the examination of the course. Each student will be individually assessed.

Compulsory elements: It is compulsory to attend all the synchronous lectures and to participate in the group work concluded with the presentation. Absence in the mandatory lectures has to be communicated with the course organizers and if needed compensated by extra individual assignments.

Number of students: 8 - 25
Selection of students: Selection will be based on 1) the relevance of the course syllabus for the applicant’s doctoral project (according to written motivation), 2) start date of doctoral studies (priority given to earlier start date).

More information: This is a fulltime course Monday-Friday the course week. It is onsite, but distance participation is possible. The course will be held at Widerströmska huset, venue will be informed later
Title: Human Viral Diseases: Mechanisms and Pathogenesis

Course number: 5237
Credits: 1.5
Date: 2022-10-17 -- 2022-10-21
Language: English
Level: Doctoral level
Responsible KI department: Department of Medicine, Huddinge
Specific entry requirements: Ingen

Purpose of the course: The aim of the course is to enable students to acquire a good knowledge on mechanisms and pathogenesis related to viral infection in humans.

Intended learning outcomes: The course should give knowledge of molecular virology with special consideration to the role of virology within medicine. On completion of the course the student is expected to:
- Be able to account for taxonomic subdivision of viruses.
- Be able to account for the most important human pathogenetic viruses.
- Be able to account for the molecular mechanisms of the virus life cycle.
- Be able to account for emerging viruses and pandemics.
- Be able to account for viral pathogenesis.
- Be able to account for virological methods in research.
- Be able to account for viral immunology, antiviral therapy and vaccination.

Contents of the course: Virus taxonomy, important human pathogenic viruses, virus structure, infection process at cell level and organism level, pathogenesis, epidemiology, molecular interactions between viruses and host cells, genetic stability of viruses, influence on host cell growth control, immune response against viruses, virus vaccines, antiviral drugs, virus vectors for gene therapy.

Teaching and learning activities: The course will be given over one week (full time). The teaching is mainly through lectures/seminars. The lectures include introduction to the various topics (described above).

Examination: Written exam containing open questions.

Compulsory elements: All seminars and lectures. Absence needs to be compensated for in agreement with the course leader. More than one day of absence cannot be compensated for.

Number of students: 8 - 25

Selection of students: Selection will be based on 1) the relevance of the course syllabus for the applicant’s doctoral project (according to written motivation), 2) start date of doctoral studies (priority given to earlier start date).

More information:

Course responsible:
Magdalini Lourda
Department of Medicine, Huddinge
Magdalini.Lourda@ki.se

Contact person:
Benedict Chambers
Institutionen för medicin, Huddinge
Benedict.Chambers@ki.se

Magdalini Lourda
Institutionen för medicin, Huddinge
Magdalini.Lourda@ki.se
Title: Health Risk Assessment of Endocrine Disruptors

Course number: 5241
Credits: 1.5
Date: 2022-09-26 -- 2022-09-30
Language: English
Level: Doctoral level

Responsible KI department: The institute of Environmental Medicine

Specific entry requirements:

Purpose of the course: The purpose of the course is to give the student knowledge and understanding of molecular mechanisms and adverse effects of endocrine disruptors as well as of methodologies to study and identify such substances and to assess the health risks.

Intended learning outcomes: After the end of the course the student should be able to: - Describe molecular mechanisms and potential adverse effects of endocrine disruptors - Explain methodologies to study endocrine disruptors - Apply methodology for identification of endocrine disruptors according to EU scientific criteria and guidance - Identify and discuss challenges in health risk assessment of endocrine disruptors

Contents of the course: Endocrine disruptors are defined as an exogenous substance or mixture that alters function(s) of the endocrine system and consequently causes adverse health effects in an intact organism, or its progeny, or (sub)populations. Endocrine disruptors act via hormone receptors and by altering hormone levels and have been implicated in several endocrine-related diseases. The course will include molecular mechanisms of endocrine disruptors, from molecular initiating events to adverse effects. Methodologies for identification and analysis of the endocrine disruptors will be addressed. Identification of endocrine disruptors based on EU scientific criteria and guidance will be addressed. Attention will be given to future challenges in health risk assessment of endocrine disruptors.

Teaching and learning activities: Teaching and learning activities include lectures, exercises and group assignments.

Examination: Examination is in the form of a written examination and an oral presentation.

Compulsory elements: Participation in the exercises and group assignments is compulsory. Absence can be compensated with an individual task.

Number of students: 8 - 15

Selection of students: Selection will be based on 1) the relevance of the course syllabus for the applicant's doctoral project (according to written motivation), 2) start date of doctoral studies (priority given to earlier start date)

More information: Master students in toxicology and professionals from authorities and companies internationally will also attend the course. The course will be given online using Zoom.

Course responsible:
Johanna Zilliacus
The institute of Environmental Medicine
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Contact person:
Johanna Bergman
Institutet för miljömedicin

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Nobels väg 13
17177
Stockholm
Title: Animal Research: Critical, Challenging and Creative Thinking

Course number: 5277
Credits: 1.5
Date: 2022-11-23 -- 2022-11-24
Language: English
Level: Doctoral level
Responsible KI department: Comparative medicine

Specific entry requirements: Previous education in how to plan, conduct, analyze and report scientific research involving the use of animals, animal derived material or animal derived data (ideally Function B or equivalent training, and some practical research experience e.g. Function A or equivalent).

Purpose of the course: This course is designed to support doctoral students, and young researchers to enhance the reproducibility of their research through the development of critical, challenging and creative thinking skills. Participants will be encouraged to review how they plan, conduct, analyze and communicate their research activities, as well as to reflect upon the contribution they make locally, nationally, or internationally within the scientific/academic community, and Society in general. It is intended for individuals whose research involves the use of animals, animal derived material or animal derived data irrespective of whether the work requires licensed approval.

Number of students: 6 - 12

Selection of students: This course is primarily aimed at doctoral research students, but other scientists at the beginning of their career may also be accepted. Preference will be given to doctoral research students working with animal models for their projects.

Contents of the course:

Session 1: An introduction to animal use in research. This includes the historical context for animal use in research, the range of Societal viewpoints on the use of animals in research and ethical theories unpinning them, and discussion of how and why some research becomes controversial. Following this session participants will write and receive feedback on a non-technical summary of their research project.

Session 2: Animal research integrity. This includes: discussion of the research framework as it relates to the responsible use of animals in bioscience research; expectations regarding openness and transparency and good practices relating to the dissemination of research outputs. Participants will discuss the culture of research and real-life examples of non-compliance, ethical issues and common misconduct issues.

Session 3: Common pitfalls in experimental design, how to identify and avoid them. This includes: topics to help maximise the robustness, reliability and reproducibility of results (how to maximise statistical power, sources of bias, identifying the experimental unit, hypothesis testing); a brief introduction to systematic reviews and meta-analysis; plus tools and resources that are available to support the effective planning and reporting of research involving the use of animals, including the PREPARE and latest ARRIVE 2.0 guidelines. During this session participants will use the latest ARRIVE 2.0 guidelines to assess a research paper, what is/is not reported, and how this impacts the results, conclusions, and study reproducibility.

Session 4: Introduction to animal welfare and the 3Rs in practice. This includes: what is animal welfare and why it is important; factors to consider throughout an animal's lifetime experience; potential sources of uncontrolled variables and confounding factors; and an introduction to concepts such as the refinement loop and marginal gains. Participants will then write and receive feedback on a draft experimental protocol to apply what they have learnt, identify opportunities to implement the 3Rs and any additional training/mentoring needs they may have.

Teaching and learning activities: Face-to-face seminar lectures, or live online webinar sessions, individual work (home study), group work, class discussions and interactions.

Examination: The students written assignments will be assessed. Written feedback will be given. Each participant will also be offered 1:1 meeting following the course conclusion to discuss the implement of their learning and any additional training or support they may require.

Compulsory elements: All parts of the course and active participation is compulsory. Missed parts must be compensated. In order to complete the course all four sessions must be attended and written activities completed.

Intended learning outcomes:

Participants will acquire the skills to critically review, plan, conduct, disseminate and communicate research involving the use of animals, animal derived materials and/or animal derived data in accordance with contemporary good practice. At the end of the course participants should be able to:

- Communicate their research in an open and transparent manner to both scientific and lay audiences, with an informed understanding of the range of societal opinions that exist on this topic and the ethical issues that this type of research gives rise to;
- Recognise what responsible, ethical, good practice research conduct means in the context of their individual research project, and why it is important to maximise the impact, quality, reproducibility and reliability of their research data;
- Design and plan their experiments using a range of tools and resources that are available to support them to be innovative, think critically, challenge the status quo and implement best practice;
- Understand what good animal welfare means and how it impacts upon research quality and reproducibility;
- Consider all the factors that impact upon the lifetime experience of animals used in research, and reflect on how the 3Rs can be effectively implemented during the course of their own research project/activities.

Purpose of the course:

This course is designed to support doctoral students, and young researchers to enhance the reproducibility of their research through the development of critical, challenging and creative thinking skills. Participants will be encouraged to review how they plan, conduct, analyze and communicate their research activities, as well as to reflect upon the contribution they make locally, nationally, or internationally within the scientific/academic community, and Society in general. It is intended for individuals whose research involves the use of animals, animal derived material or animal derived data irrespective of whether the work requires licensed approval.

Number of students: 6 - 12

Selection of students: This course is primarily aimed at doctoral research students, but other scientists at the beginning of their career may also be accepted. Preference will be given to doctoral research students working with animal models for their projects.

More information: Face-to-face lectures (or live webinars) will be held on 2 separate days between approx. 9 am and 5 pm., but the students will need to complete pre-course material in advance.

Course responsible:
Rafael Frias
Comparative medicine
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Contact person:
Title: Get started with R – Programming Basics, Data Analysis and Visualisation

Course number: 5300
Credits: 3.0
Date: 2022-08-22 -- 2022-09-05
Language: English
Level: Doctoral level
Responsible KI department: Department of Neurobiology, Care Sciences and Society

Specific entry requirements:

Purpose of the course: The course is practical and aims at teaching students how to: Use the programming environment R and RStudio, which includes installation, how to handle errors, problem solve and access helper documents. Use basic concepts of programming, such as data types, logical and arithmetic operators, if else conditions, loops and functions. Use common R packages to perform basic statistical analysis (e.g., t-test, chi2-test, correlation) and visual presentation (e.g., boxplot, histogram and heat-map) of data in R.

Intended learning outcomes: After attending the course the student should know: • How to download, install and navigate R and RStudio • How to solve common problems arising from data formatting and handling • Common programming concepts and how to employ them in R • How to import data and packages in R • How to use R for basic statistical analysis and visual presentation of data

Contents of the course: Course participants start the course by installing and familiarising with the R and RStudio environment. This includes version control, as well as structuring and documenting code for publication. Next, basic concepts shared between all programming languages are introduced, such as data types and operators. Students will also learn how to use recommended naming conventions, syntax and how to comment code. Methods for importing packages and data is then introduced and students will learn how to search for help and get examples of common problems that may arise. Finally, students will practice using packages for data management, statistical analysis and visual presentation. Methods include distribution tests, power-analysis, t-test, chi2-test, correlation, boxplot, scatterplot and bar plot. Visual presentation will mainly use the ggplot2 package, providing a good example of object-oriented programming in R. Throughout all lectures focus will be on application and understanding of the methods used, not statistical assumptions or interpretation of the results. Examples will primarily be taken from experimental research and tasks will use dataframes available upon installation of R. However, when possible students are encouraged to use their own data. The last day of the course can either be used to continue to apply R on own data or to learn procedures that can be performed with R which most other statistical software’s cannot. Such as, managing folders and files, querying databases and importing codes and algorithms.

Teaching and learning activities: Distance learning with online interactive lectures. Group and individual exercises where a teacher will be available to help. Assignments and Canvas quizzes that the student completes on their own. Reviewing other students’ code and interaction with other students. Individual project work. Four days each week will consists of lectures in the morning introducing concepts and tasks in the afternoon, where these concepts are put to practice. The last day of each week will be a larger exercise where the student is required to combine introduced concepts into a whole. This exercise will be reviewed by a fellow student who will have the opportunity to comment on ways to improve the work. The 11th (last) day is optional and described in the previous paragraph.

Examination: Project presentation and review.

Compulsory elements: Canvas quizzes and tasks. Individual projects and reviews of other students’ project. Participation during project presentation and review. Students who miss obligatory elements will complete extra tasks associated with the specific element. Course participants unable to participate during the project presentation will have the presentation for the course administrator but will miss the opportunity to get their work reviewed by other participants.

Number of students: 15 - 25
Selection of students: Selection will be based on 1) the relevance of the course syllabus for the applicant’s doctoral project (according to written motivation), 2) start date of doctoral studies (priority given to earlier start date)

More information: From Monday to Thursday, the course consists of Zoom lectures in the morning (8:30 - 11:00) after which (11:00-16:00) quizzes and tasks will be provided for the student to complete alone. Both Fridays students will hand in an exam assignment, which will be presented and reviewed by another student. The 11th day of the course is not obligatory, but intended for students who want to learn about functions available in R that most other statistical software can not do.

Course responsible:
Billy Langlet
Department of Neurobiology, Care Sciences and Society
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Contact person:
Title: Clinical Trials in Heart Failure Research

Course number: 5307
Credits: 1.5
Date: 2022-10-06 -- 2022-10-11
Language: English
Level: Doctoral level
Responsible KI department: Department of Medicine, Solna
Specific entry requirements: Epidemiology I and Biostatics I or equivalent knowledge
Purpose of the course: To enable students to learn the principles of study designs and data analyses/interpretation for clinical trials in heart failure.

Intended learning outcomes: At the end of the course, the participants are supposed to be able to:

- choose the adequate trial design to conduct an interventional study
- apply important ethical principles while designing a clinical trial
- design a clinical trial which satisfies the requirements of the regulatory agencies
- choose and use key statistical methods for running randomized controlled trials and meta-analyses of randomized controlled trials
- critically interpret data from randomized controlled trials and meta-analyses of randomized controlled trials

Contents of the course: The lectures will cover:

1) Key elements in randomized controlled trials design: methods for randomization; differences between superiority and non-inferiority trials; different types of endpoint analysis (e.g. first to time event vs. recurrent event analysis), interpretation of subgroup analyses
2) Novel randomized controlled trial design: registry based randomized controlled trials, adaptive, basket & umbrella & platform designs
3) Key aspects differentiating randomized controlled trials from registry-based studies
4) Systematic Reviewers and Meta-analyses of randomized controlled trials: different designs and main methods

The “Hands-on” workshops will cover:

1) Power and sample size calculations
2) Survival analysis including competing, recurrent event analysis, interaction analysis
3) Key statistical methods for meta-analysis
4) Adjusting and matching in registry-based studies (e.g. propensity score): how to run it and why it does not replace randomization

Teaching and learning activities: The course will consist of:

- two and half days distance learning via Zoom or using prerecorded lectures and provided readings
- two days on-site lectures/workshops
- half day: exam

The formats of course activities include:

- Distance learning with critical readings of course literature
- On-site lectures/seminars
- Debates on relevant clinical trials
- Workshops
- Group work

Examination: Home-based assignment including open questions and multiple choice questions. All learning outcomes of the courses need to be achieved to pass the course.

Compulsory elements: Participants should attend all the sessions and the exam to pass the course. The students who have missed course sessions will be assigned extra reading and home work to compensate for the absence.

Number of students: 8 - 20

Selection of students: Selection will be based on 1) the relevance of the course syllabus for the applicant's doctoral project (according to written motivation), 2) start date of doctoral studies (priority given to earlier start date)

More information: October 6: home study/distance learning using provided readings.<br> October 7 (afternoon) TO October 9 (lunch time): frontal teaching/workshops.<br> October 10: home study using provided readings / recorded lectures.<br> October 11 (half day): exam<br> Location: Frontal teaching/workshops on October 7 (lunch time) TO October 9 will be held in SORRENTO, ITALY.

Course responsible:
Gianluigi Savarese
Department of Medicine, Solna

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Contact person:
Title : Biostatistics II: Logistic Regression for Epidemiologists

Course number : 5314
Credits : 1.5
Date : 2022-09-19 -- 2022-09-23
Language : English
Level : Doctoral level
Responsible KI department : Department of Global Public Health
Specific entry requirements : Knowledge in epidemiology and biostatistics equivalent to Epidemiology I: Introduction to epidemiology and Biostatistics I: Introduction for epidemiologists or corresponding courses
Purpose of the course : The course introduces statistical methods for the analysis of categorical outcome data.
Intended learning outcomes : After successfully completing this course you as a student are expected to be able to: - choose the appropriate regression model for studying a specific research hypothesis using data collected from an epidemiological study, implement the model using standard statistical packages, assess the goodness of fit, and interpret the results, - explain the concept of confounding in observational studies and use statistical models to control/adjust for confounding, - apply appropriate statistical models to study and interpret effect modification, - carefully read an epidemiological paper to critically review the methodological aspects of the article, with emphasis on the study assumptions, design, analysis and interpretation. Intended learning outcomes are classified according to Bloom’s taxonomy: knowledge, comprehension, application, analysis, synthesis, and evaluation (Bloom, 1956, extended by Anderson and Krathwohl, 2001).
Contents of the course : The course focuses on the formulation and application of the logistic regression model in the analysis of epidemiological studies to estimate relative and absolute effect measures. Topics covered include a brief introduction to binary outcome data, measures of associations in two-by-two tables, univariable and multivariable models, interpretation of parameters for continuous and categorical predictors, flexible modeling of quantitative predictors, confounding and interaction, model fitting and a glance to model diagnostics.
Teaching and learning activities : Lectures, computer based assignments with applications focusing on analysis of real data sets, using statistical packages such as Stata or R, hand based exercises, group discussions and literature review.
Examination : The student has to show that the learning outcomes have been achieved to pass the exam. The course grade is based on the individual written examination (summative assessment). The focus of the examination will be on the understanding of the underlying principles of categorical data models and their application to analysis of epidemiological studies, and therefore less emphasis will be given to mathematical details. Students who do not obtain a passing grade in the first examination will be offered a second examination within two months of the final day of the course. Students who do not obtain a passing grade at the first two examinations will be given priority for admission to the next course's offering. If the course is not offered during the following two academic terms then a third examination will be scheduled within 12 months of the final day of the course.
Compulsory elements : The individual take-home written examination (summative assessment).
Number of students : 8 - 25
Selection of students : Eligible doctoral students are prioritized according to 1) the relevance of the course syllabus for the applicant's doctoral project (according to written motivation), 2) date for registration as a doctoral student. Give all information requested, including a short description of current research training and motivation for attending, as well as an account of previous courses taken. Prior knowledge in any software, e.g. Stata, R or SAS is strongly recommended.
More information : Prior knowledge in any software, e.g. Stata, R or SAS is strongly recommended.

Course responsible :
Nicola Orsini
Department of Global Public Health

Nicola.Orsini@ki.se

Contact person : -
Title: Fundamentals of Stata Language

Course number: 5315  
Credits: 1.5  
Date: 2022-09-12 -- 2022-09-16  
Language: English  
Level: Doctoral level  
Responsible KI department: Department of Global Public Health

Specific entry requirements:

Purpose of the course: This course aims at introducing students to the fundamental elements of the statistical software Stata. Motivating examples arising from health-related research will be used to demonstrate how to use the programming language. Learning activities will give students the possibility to learn Stata the hard yet easier way – that is – problem, code, and run.

Intended learning outcomes: After successfully completing this course you as a student should be able to:  
- describe quantitative, categorical, and string data  
- recode existing variables  
- explain how to work with time and space variables  
- select an appropriate visualization according to the data  
- illustrate how to control and automatize code  
- draw random variables from realistic mechanisms  
- compare distributions of statistics under repeated sampling  
- write do-files for preparing and analysing research data  
- create well-structured do-files to facilitate reproducible research

Contents of the course: This course is providing the basics to import, and describe common forms of data; create tables of descriptive statistics eventually stratified; generate new variables; recode existing variables; and visualize either empirical data or theoretical data. Advanced topics include define a new function; avoid replication of code by looping; and simulate a plausible data generating mechanism. Learning activities will be based on real or hypothetical studies arising in health-related research.

Teaching and learning activities: Lectures, group work, exercises, and individual coding workout using Stata®.

Examination: Individual written examination. Students who do not obtain a passing grade in the first examination will be offered a second chance to resubmit the examination within two months of the final day of the course. Students who do not obtain a passing grade at the first two examinations will be given top priority for admission the next time the course is offered.

Compulsory elements: The individual examination (summative assessment) is compulsory.

Number of students: 8 - 25

Selection of students: Eligible doctoral students will be prioritized according to 1) the relevance of the course syllabus for the applicant’s doctoral project (according to written information), 2) date for registration as a doctoral student (priority given to earlier registration date). To be considered, submit a completed application form. Give all information requested, including a short description of current research training and motivation for attending, as well as an account of previous courses taken.

More information: The content on how Stata can be used to analyze epidemiological data is not covered in this course. Students should bring their own laptop with a Stata license (any version will do).

Course responsible:  
Nicola Orsini  
Department of Global Public Health

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Contact person:  
Veronique Henriksson Milliot  
Institutionen för medicin, Solna

veronique.henriksson@ki.se
Title : Fundamentals of using Python in Health Related Research

Course number : 5316
Credits : 1.5
Date : 2022-10-17 -- 2022-10-21
Language : English
Level : Doctoral level
Responsible KI department : Department of Global Public Health
Specific entry requirements : Epidemiology I: Introduction to epidemiology; Biostatistics I: Introduction for epidemiologists and Biostatistics II: Logistic regression for epidemiologists, or equivalent courses.

Purpose of the course : This course aims at introducing students to the fundamental elements of the Python programming language. Motivating examples arising from health-related research will be used to demonstrate how to use the programming language to answer a variety of relevant questions. Learning activities will give students the possibility to learn Python the hard yet easier way – that is – problem, code, and run.

Intended learning outcomes : After successfully completing this course you as a student should be able to:  • import and describe different types of data  • produce high quality figures of statistics  • estimate multivariable regression models (linear, logistic) including spline analysis  • conduct statistical inference based on the statistical model  • simulate plausible data generating mechanisms  • automatize code using looping and comprehension

Contents of the course : The course is a full-time hands-on practice of Python language answering relevant health related questions based on either empirical or simulated data. The participant will learn how to import a dataset, create visualizations of distributions and statistics, estimation using popular regression models (linear, logistic), inference (likelihood based statistical tests, pointwise confidence intervals) on predicted responses or changes in predicted responses, draw pseudo-random values from theoretical probability distributions, Monte-Carlo simulations of common data generating mechanisms (interaction, non-linearity), and basic elements of programming such as creating new functions and avoid looping using comprehensions.

Teaching and learning activities : Lectures, group work, exercises, and individual coding workout using Python.
Examination : Individual written examination. Students who do not obtain a passing grade in the first examination will be offered a second chance to resubmit the examination within two months of the final day of the course. Students who do not obtain a passing grade at the first two examinations will be given top priority for admission the next time the course is offered.

Compulsory elements : The individual examination (summative assessment) is compulsory.
Number of students : 8 - 25
Selection of students : Eligible doctoral students will be prioritized according to 1) the relevance of the course syllabus for the applicant's doctoral project (according to written information), 2) date for registration as a doctoral student (priority given to earlier registration date). To be considered, submit a completed application form. Give all information requested, including a short description of current research training and motivation for attending, as well as an account of previous courses taken.

More information : The participant is expected to have sufficient familiarity with the computer to be able to install Python (https://www.python.org), Jupyter Notebook (https://jupyter.org/) as well as the following modules: pandas, matplotlib, numpy, scipy, statsmodels (https://pypi.org/project/pip/) prior to the course start.

Course responsible :
Nicola Orsini
Department of Global Public Health
Nicola.Orsini@ki.se

Contact person :
Title : Sex and Gender Perspectives in Biomedical Research

Course number : 5318  
Credits : 1.5  
Date : 2022-10-24 -- 2022-10-28  
Language : English  
Level : Doctoral level  
Responsible KI department : Department for Clinical Science, Intervention and Technology  
Specific entry requirements : Second cycle - Master´s level study in medicine or biomedicine  
Purpose of the course : "Every cell has sex and every person is gendered". This course encourages students to examine the validity and implications of this statement in the field of experimental and clinical medical research, and, in particular, in relation to their PhD projects. It will focus on what the current evidence and regulations suggest in respect to implementation of sex and gender perspectives (gender dimension) in the field of experimental and clinical medicine with further implementation in cardiovascular, metabolic, neurological, immunological and renal fields of medicine and in experimental and clinical research towards personalized medicine.

Intended learning outcomes : After completion of both the online module and the face-to-face part of the course, students are expected to be able: I) to account for sex and gender in biomedical research involving animals, cells or tissues; II) to account for sex and gender when considering aspects of experimental and clinical research in humans. III) to account for gender dimension in the research content in their PhD projects and potential grant applications.

Contents of the course : This short course consists of two modules. The first module consists of a web-based course developed by Canadian Institute of Gender and Health with the title SEX AND GENDER IN BIOMEDICAL RESEARCH, as well as individual work designed by course organizers mainly including web based tools for requirement of relevant information. The face-to-face module will concentrate on research topics in the selected research fields. It will include a number of in-house seminars/workshops with guest lecturers (Meet an Expert - Get Inspired) who will facilitate and enhance the learning process as it draws on team-based learning approaches, while promoting a sense of community among the students. Examples of experimental and clinical research towards cardiovascular, neurological, metabolic health, sex-specific cell signaling in health and disease, female and male models for the disease of interest will be linked with presentations of subjects of importance regarding sex/gender perspectives in the diseases development, and with presentation of symptoms, availability and feasibility of treatment regimens and outcomes. Finally, the advice for successful execution of implementation of gender dimension in the research projects and potential grant applications will be discussed with leading experts in the field for Horizon Europe grant applications.

Teaching and learning activities : The course consists of an online creative, flexible and free-accessible module SEX AND GENDER IN BIOMEDICAL RESEARCH that anyone can take in one's own pace (about one day to complete) and face-to-face days with seminars/workshops with guest lecturers (Meet an Expert - Get Inspired). The participants should write a reflective report (1-2 A4 pages;) followed by preparation of a group presentation/s on the topic of interest with application of sex and gender perspective in the content for the selected project or application for a grant for a final presentation day.

Examination : Exam format: I) assessment of the web-based course: pass when acquiring the answer to 90% of the questions. II) presentations of assigned work, either individually or in group.

Compulsory elements : All sections of the course are mandatory and cannot be compensated for.

Number of students : 8 - 20

Selection of students : Selection will be based on 1) the relevance of the course syllabus for the applicant's doctoral project (according to written motivation), 2) start date of doctoral studies (priority given to earlier start date)

More information : the course is planned to be IRL event with combintion to some lectures on zoom and combined with seminars and workshops "meet an expert get inspired.

Course responsible :  
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Leah Hernandez-Munoz
Institutionen för klinisk vetenskap, intervention och teknik

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Title: Migration and Health

Course number: 5319
Credits: 2.0
Date: 2022-11-07 -- 2022-11-18
Language: English
Level: Doctoral level
Responsible KI department: Department of Global Public Health

Specific entry requirements:

Purpose of the course: The objective of the course is to give the students a deepened understanding of research on migration and health and how this is relevant, not only in studies with a specific focus of health outcomes in migrants health but in public health at large. The course will cover theoretical concepts like e.g. ethnicity as well as quantitative and qualitative methods in this field. The course aims to increase the student's skills in using theoretical concepts in studies using empiric methods. During this course, the student will get introduced to different theoretical frameworks for studying migration health as well as the challenges with studying migration related concepts in public health research.

Intended learning outcomes: At the end of the course, the student is supposed to be able to 1) describe different theoretical frameworks for understanding migration health. 2) describe relevant designs for studies assessing migration health. 3) discuss own results related to migration health or ethnic differences. 4) evaluate research within the scientific area of migration health and assess when migration is a relevant determinant of health.

Contents of the course: During this course the student will get introduced to different theoretical frameworks for studying how migration influences health. The concept of ethnicity will be discussed too as well as the challenges with studying ethnicity in public health research. Different designs and methods for studying migration health, both qualitative and quantitative, will be discussed and compared.

Teaching and learning activities: The teaching activities will be based on lectures and workshops, in which the students will actively interact with teachers and each other. Lectures by invited speakers are mixed with lectures by local experts. Literature studies are followed up by seminars with student presentations and discussions.

Examination: The course assessment is based on two activities 1) student performance during interactive classes and workshops where the student is expected to actively participate in exercises, 2) a written examination focusing on the own research.

Compulsory elements: Article seminars are mandatory as participation in group discussions is part of the examination. Missed participation in other learning activities can be compensated with individual written assignments in agreement with the course leader.

Number of students: 10 - 20

Selection of students: Selection will be based on 1) the relevance of the course syllabus for the applicant's doctoral project (according to written motivation), 2) start date of doctoral studies (priority given to earlier start date)

More information:

Course responsible:
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Contact person:
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Title: Clinical Oncology for Pre-clinical Doctoral Students

Course number: 5505
Credits: 1.5
Date: 2022-09-05 -- 2022-09-09
Language: English
Level: Doctoral level

Responsible KI department: Department of Oncology-Pathology
Specific entry requirements: The course is in English but understanding Swedish is recommended since the course is partly based at the clinic.

Purpose of the course: The aim of this course is to introduce preclinical PhD students, with no or little education in clinical oncology and who do research within the field of cancer, to clinical cancer care and modern concepts of cancer treatments in order to educate a new generation of pre-clinical cancer researchers and to give a broad overview of translational cancer research focusing on clinical oncology. In the future, these researchers will be the backbone of Cancer Tumor Boards and part of the clinical decision-making in cancer.

Intended learning outcomes: After completing the course, the participants should be able to:
- Understand clinical cancer management, personalized cancer medicine and outcome evaluation in cancer in order to make decisions based on scientific evidence.
- Understand the concept of modern cancer treatments in relation to basic cancer biology.
- Reflect on and discuss the concept of clinical trials, the role of translational research and the challenges thereof.
- Reflect on and discuss the most important problems that need to be solved in cancer.
- Reflect on and discuss future goals in cancer prevention, diagnostics and therapy.

Contents of the course:
- Participation in the scheduled clinical work and multidisciplinary cancer conferences.
- Seminars and group discussions.
- A central concept of the course is clinically centered teaching where the student will follow a clinician specialized in the field of the student’s area of research. The course deals with clinical oncology, new concepts in cancer management, clinical trials and how to apply translational cancer research in the clinic. Further the student will be encouraged to consider the practical importance of cancer research and what it means to have a clinical perspective in research. Different types of cancer will be represented.

Teaching and learning activities: The course consists of group seminars, group discussions and participation in the clinical work including multidisciplinary conferences in the clinical field of the student’s area of research. Full time for one week.

Examination: Assessment is conducted through participation in the clinical work and the course seminars where the student is expected to demonstrate an ability to discuss on principles in personalized cancer management in relation to translational cancer research. To pass the course, the participant is required to have achieved all intended learning outcomes of the course and completed all assignments as well as participated actively in group discussions during the course.

Compulsory elements: The group seminars and clinical participation are compulsory. Single missed occasions can be compensated during the course after discussion with the course director.

Number of students: 8 - 8

Selection of students: Selection will be based on 1) the relevance of the course syllabus for the applicant’s doctoral project (according to written motivation), 2) start date of doctoral studies (priority given to earlier start date)

More information:

Course responsible:
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Contact person:
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Title: Vetenskapsteorier

Course number: 5537
Credits: 3.0
Date: 2022-11-01 -- 2022-11-29
Language: Swedish
Level: Forskarnivå

Responsible KI department: Department for Clinical Science, Intervention and Technology

Specific entry requirements:

Purpose of the course: Få en kunskap om, färdighet i och förståelse för grundläggande vetenskapsteoretiska teorier, principer och diskurs som bildar basen för vetenskaplig metod och kritik.


Contents of the course: En introduktion till vetenskapsteorin och en förståelse för olika slag av vetenskapligt kunskapsökande. En grundläggande orientering om vetenskapsteoretiska frågor ges. Följande teman behandlas: begreppet kunskap, vetenskap - pseudovetenskap, hypoteser - hypotesprövning, orsaker - förklaringar, vetenskapliga värderingar - samhälle

Teaching and learning activities: Undervisningstillfällen med föreläsningar, gruppövningar, seminarier samt muntlig och skriftlig examination anordnas en eftermiddag per vecka under totalt fem veckor.

Examination: Vi bedömer att lärandemålen för kursen är uppnådda genom examination som består av fyra delkomponenter: i) formativ bedömning i samband med aktivt deltagande i seminarier ii) en muntlig presentation av vetenskapsteoretiska aspekter i eget alternativt andra (centrala) forskningsfrågor inom den egna disciplinen iii) ett skriftligt PM där synpunkter från opponent på den muntliga presentationen inarbetats iv) opponering på annan students presentation av vetenskapsteoretiska aspekter i egen eller alternativt andra (centrala) forskningsfrågor inom den egna disciplinen. Godkänd kurs innebär att det framgår att de erforderliga kunskaper, färdigheter och förhållningssätt har uppnåtts genom aktivt deltagande i seminarier och godkänd muntlig och skriftlig presentation av examinationsuppgiften samt opponering på annan students presentation av etiskt dilemma.

Compulsory elements: Obligatoriskt är att delta vid introduktionstillfället och vid seminarier. Vid frånvaro kan detta kompenseras med utökad PM skrivande muntlig och presentation för kursen eller för kursgivaren.

Number of students: 10 - 15

Selection of students: Urvalet baseras på 1) kursplanens relevans för den sökandes doktorandprojekt (enligt motivering), 2) startdatum för doktorandstudier.


Course responsible:
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https://kiwas.ki.se/katalog/katalog/pdf?term=HT22
Title: Overview course in Cancer Drug Discovery

Course number: 5541
Credits: 1.5
Date: 2022-10-17 -- 2022-10-21
Language: English
Level: Doctoral level
Responsible KI department: Department of Oncology-Pathology

Specific entry requirements: Students must have completed Basic course in tumor biology and oncology.

Purpose of the course: This course describes the steps, processes and approaches needed for drug discovery with a focus on oncology. Through lectures and interactive workshops, the students will learn about current drug discovery techniques, from screening for hit discovery to the synthesis of the final drug candidate through lead optimization. Aspects of clinical testing and precision medicine will also be addressed. In this five-day course, students will attend lectures by prominent scientists from academic and industry active in the fields of drug screening, drug library design and logistics, disease models, drug development, medicinal chemistry, image analysis, chemoinformatics, precision medicine, and clinical trials. The students will also participate in a group-based learning project to design their own screening strategy, and site-visits to drug discovery companies based in Stockholm, as well as the screening platform at SciLifeLab Chemical Biology Consortium Sweden. At the end of the course, the students should have a good overview and understanding of the drug discovery workflow in cancer research, allowing them to pinpoint potential career directions for their own scientific paths.

Intended learning outcomes: At the end of the course the student is expected to be able to: Knowledge and understanding - Describe, define and understand the different drug discovery approaches used in both academia and industry. - Familiarity of the drug discovery process through to clinical implementation. Competence and skills - Ability to describe the concepts and terminology of drug discovery in cancer. - Understanding the different screening strategies and the associated benefits and shortcomings. - Ability to describe and understand how a compound can become a drug and its clinical implications. Judgement and approach - Demonstrate the ability to understand the concepts of drug discovery. - Evaluate how a drug discovery campaign can be used to discover new anti-cancer drugs. - Evaluate how drug discovery techniques can be currently used in a clinical setting for precision medicine.

Contents of the course: The main blocks of the course include: Drug discovery in pharma and academia: a perspective - Chemoinformatics - Drug Library design - Model systems Drug discovery strategies - Target-based in vitro screens - Cell-based phenotypic screens - Virtual screens - High-throughput phenotypic screening - High content imaging - Image analysis - Multi-parametric analysis - Target identification - Thermal Shift (CETSA and others) - CRISPR - Transcriptomics (cMap) - PISA Lead optimization and Medicinal chemistry - Journey from compound to drug - ADME and toxicity - Clinical trials and patient stratification - Diagnostics - Drug repurposing in personalised cancer medicine Workshop: design your screening strategy to target one of the hallmarks of cancer.

Teaching and learning activities: Lectures, workshops and site-visits.

Examination: The examinations will consist in a written (2 pages) and short oral presentation of a mock drug discovery project that is well motivated in background of the current state of knowledge/lack of knowledge in the cancer research area of choice or their own scientific path. Each student should actively participate (ask questions or comment) the other students' presentations at the final session of the course. One needs to show that all intended learning outcomes are reached for a pass.

Compulsory elements: Attendance to all lectures and workshops is compulsory. Attendance will be compensated for using summaries of literature articles addressing the topics corresponding to the missed lectures.

Number of students: 8 - 25
Selection of students: Selection will be based on 1) the relevance of the course syllabus for the applicant's doctoral project (according to written motivation), 2) start date of doctoral studies (priority given to earlier start date).

More information:

Course responsible: Brinton Seashore-Ludlow
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Contact person: Tom Erkers
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Title : Research for Societal Impact

Course number : 5546
Credits : 1.5
Date : 2022-11-07 -- 2022-11-18
Language : English
Level : Doctoral level
Responsible KI department : Department of Learning, Informatics, Management and Ethics
Specific entry requirements :

Purpose of the course : The course aims to allow doctoral students to reflect on the importance of academic research and how this can lead to societal change. Starting from and building on the doctoral students' existing knowledge, experience, and research, the course will lay the foundation for understanding factors influencing the societal impact of academic research, improved interdisciplinary collaborations, and enhanced communication skills among researchers and society.

Intended learning outcomes : Upon completing the course, the student should be able to: • Put their research in relation to societal challenges and communicate to a broader community within academia and the general public how their research might contribute to overcoming a societal challenge. • Identify relevant research topics at the intersection of different fields and evaluate the potential for collaboration, innovation, and societal impact. • Set up and manage interdisciplinary projects (research or development) utilising relevant entrepreneurship tools to generate societal value.

Contents of the course : The course will introduce the students to different pathways to create impact from research to society, collaborate across disciplines, and communicate science within academia and the general public. The 2030 Agenda for Sustainable Development, adopted by all United Nations Member States in 2015, and the 17 Sustainable Development Goals (SDGs) will be used as inspiration.

Teaching and learning activities : The course uses a student-centred educational model building on the doctoral students existing knowledge, experience, and research. Following the introduction, most learning will be conducted through practical work in teams. The participants will work in interdisciplinary project teams with participants from different schools and/or faculties. The teams can either choose to address challenges that have already been identified by stakeholders (i.e. UNOPs, the United Nations office for project service) or identify their own. At the end of the course, the teams will present their work to peers and a panel of stakeholders.

Examination : • Slide presentation based on the project outcome (a possible pathway to create societal impact). • An individual written reflection on the learning experience, including expectations, outcomes, and future application.

Compulsory elements : • Oral presentation of one's own research. • Oral presentation and opposition of team project.

Number of students : 30 - 40

Selection of students : Selection will be based on 1) the relevance of the course syllabus for the applicant's doctoral project (according to written motivation), 2) start date of doctoral studies (priority given to earlier start date)

More information : This course prepares doctoral students to create societal impact by collaborating across disciplines. Building on your existing knowledge, experience, and research, the course will lay the foundation for understanding the societal impact of academic research, improved interdisciplinary collaborations, and enhanced communication skills among researchers and society. The course is equivalent to one week of full-time studies. Scheduled classroom sessions are on the following dates: 7-8 November and 18 November. The course is given in English and in collaboration with the Stockholm School of Entrepreneurship.

Course responsible :
Hanna Jansson
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Contact person : -
Title: Methods for Systematic Review, from Idea to Project Plan

Course number: 5555
Credits: 4.5
Date: 2022-08-29 -- 2022-11-04
Language: English
Level: Doctoral level
Responsible KI department: Department of Neurobiology, Care Sciences and Society

Specific entry requirements:

Purpose of the course: Systematic literature reviews are important for summarizing preceding scientific knowledge and experiences, and for identifying potential knowledge gaps. The aim of the course is to introduce the methodology of research synthesis, to gain skills for performing systematic reviews, and to be able to evaluate the process critically. A secondary aim is to stimulate in-depth knowledge and understanding within the participants' own research area.

Intended learning outcomes: After completing the course, the participants are expected to:
1) have developed skills in the use of research synthesis,
2) be able to critically evaluate procedures for systematic reviews.

Contents of the course:
• Introduction to methods of systematic literature review.
• Formulation of a research question according to PICO (population, intervention, control, outcome), PEO (Population, exposure/diagnosis, outcome) or SPICE (setting, population, intervention, comparison, evaluation).
• Choose of appropriate reporting tool (e.g., PRISMA; STROBE).
• Search string construction.
• Study quality assessment using different risk of bias tools.
• Setting up a protocol (PM), with focuses on an aspect of relevance to the participant's own doctoral project.
• Critical evaluation and discussion of weaknesses and strengths in their own and co-students' protocols and reviews.

Teaching and learning activities: The course is a digital part-time course and includes 2 blocks (1-3 days each), and a final seminar day. Teaching and learning activities include lectures, independent work, peer-learning by evaluation of others' work, and group discussions. The focus of the blocks is to gain skills that are necessary to conduct a systematic review (e.g., formulate proper research question(s) and relevant inclusion criteria, to perform a preliminary literature search, to critically assess the risk of bias of some of the included studies), and to understand the role of the chosen component/aspect within the participant's own doctoral project. For the final seminar, the participant writes an individual PM (in PROSPERO format) describing the methods that are planned to be used to answer the research question regarding the chosen components, and a co-student's examination assignment is discussed.

Examination: The course is examined individually, orally, and in writing, in the form of a project plan (PM) for a literature review based on systematic approaches and according to the grading criteria. To pass the course, the learning goals must be fulfilled, which requires active participation in compulsory parts, and an approved result for the following activities:
1) An individual essay in the form of a project plan for a literature review on (a) selected research question(s) and based on a systematic approach. The focus of this assignment will be on how the student has formulated the selected research question(s) and inclusion criteria. a) how the student has critically assessed the included studies and the procedures in their own review, and c) how the student has provided a critical discussion regarding research question(s) and methods.
2) Active participation in the final seminar where the individual assignment is presented and discussed.

Compulsory elements: Participation in group discussions online. Performing the examination assignment and participate in the final seminar day. Provide peer feedback on course and examination assignments. Absence from the final seminar day must be compensated by a critical discussion (in writing) regarding another student's PM submitted to the final seminar.

Number of students: 8 - 20

Selection of students: The selection is based on 1) participation in research program PUF-V, 2) the curriculum's relevance for the applicant's doctoral project (including motivation), and 3) the student's performance in compulsory parts.

More information: Preliminary schedule:
* Course start: 29 aug 29-30 aug<br> * First meetings: 5-7 sept (meeting with the library)<br> * Own work: 28-30 sept<br> * Second meetings: 21-21 oct<br> * Final seminar (examination): 4 nov <br>

Course responsible:
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Contact person:
-
Title : Genome Instability in Cancer Development and Therapy

Course number : 5557
Credits : 1.5
Date : 2022-10-24 -- 2022-10-28
Language : English
Level : Doctoral level
Responsible KI department : Department of Medical Biochemistry and Biophysics
Specific entry requirements :

Purpose of the course : The course aims at providing the students with a comprehensive overview of genome instability and its role in cancer development and progression. Genome instability can on one hand be beneficial, creating possibility for natural selection during evolution. On the other hand, it can lead to severe consequences when the level of genomic alterations causes development of cancer. Mutations and other deviations of DNA can be the consequence of inefficient or error-prone DNA repair processes and can originate from a wide range of sources including genotoxic stress due to transcription, DNA replication, DNA structures or chromatin topology. The students will at the end of the course have become acquainted with the DNA damage response and the different mechanisms involved in sensing, tolerating and repairing DNA damage and how this is exploited in cancer treatment. The student will gain a deeper understanding of how the DNA damage response connects to different cellular responses such as chromatin remodelling and epigenetics, as well as transcription, replication, cell cycle progression and apoptosis. Possibilities for design of anti-cancer treatment strategies, both with regards to DNA damaging chemo- and radiotherapy as well as emerging treatments targeting key players in the DNA damage response (targeted therapies), will be discussed and applied to the students own research projects.

Intended learning outcomes : After successfully completing this course the students will be able to: - identify different types of genome instability and describe their role in cancer development and progression - discuss and explain different mechanisms involved in sensing, tolerating and repairing DNA damage and how this is exploited in cancer treatment - understand the mechanism of action of DNA damaging inducing anti-cancer treatments and drugs targeting the DNA damage response - describe and understand state-of-the-art strategies for targeting the DNA damage response in cancer - critically assess different molecular biology assays to study DNA repair and replication in cells and how this can be applied in their own research - understand and theorize about how the DNA damage response connects to different cellular responses such as chromatin remodelling and epigenetics, as well as transcription, replication, cell cycle progression and apoptosis and apply this knowledge in their own research projects.

Contents of the course : The course will cover the topics stated in the learning outcomes, including key sources and biological responses to DNA damage, state-of-the-art techniques to detect DNA damage and genomic alterations in vitro and in vivo and the consequences of genome instability for cancer development and therapy success.

Teaching and learning activities : The course consists of lectures and seminars by experts in their fields and group exercises such as journal clubs. To promote active learning, lectures and seminars are followed by discussions between the students and the speakers and the students will apply knowledge from the course in their own research projects in the examination.

Examination : To pass the course the students must show that they have reached the learning outcomes of the course. The course assignment will consist of: 1) an individual oral presentation about integrating topics from the course into the students’ own research projects in line with the intended learning outcomes of the course. 2) the students are expected to ask questions on each other’s presentations and be able to discuss and answer questions from fellow students and course leaders in line with the intended learning outcomes of the course.

Compulsory elements : Attending the lectures, seminars, group exercises and the examination seminar are compulsory. Absence can be compensated by other activities after discussion with the course leader.

Number of students : 8-20

Selection of students : Selection will be based on 1) the relevance of the course syllabus for the applicant's doctoral project (according to written motivation), 2) start date of doctoral studies (priority given to earlier start date).

More information : The course involves lectures and seminars by both national and international experts in the field of genome stability and cancer biology, together with journal clubs. The students will have ample opportunity to interact with the speakers and discuss relevant biology as well as general queries about scientific practice. Although the majority of the course will be conducted on KI campus (Biomedicum/SciLifeLab) promoting interactions between the students, the course will also be held via digital platforms (Zoom) to cover the global scope of cutting-edge genome instability research.

Course responsible :
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Contact person :
Sean Rudd
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Title: Teaching and Learning in Higher Education: An Online Doctoral Course

Course number: 5558
Credits: 4.5
Date: 2022-09-05 -- 2022-12-02
Language: English
Level: Doctoral level
Responsible KI department: Department of Learning, Informatics, Management and Ethics

Specific entry requirements:

Purpose of the course: The course aims to prepare students for teaching in higher education and contribute to the professional development as teacher.

Intended learning outcomes: Intended Learning Outcomes At the end of the course, students are expected to be able to: - Analyse different roles of a professional university teacher and current conditions related to teaching-learning within higher education. - Understand and be able to employ core educational concepts of teaching and learning in Higher Education. - Design teaching in regards to outcome- and competency based curriculum frameworks in relation to theories of learning or research on student learning in higher education.

Contents of the course: - Roles and conditions related to being a professional university teacher - Pedagogical core concepts - Students learning in higher education - Different forms of teaching and learning activities - Design of teaching for learning

Teaching and learning activities: This online course is based on peer- and self-regulated learning strategies and theories of experiential learning, collaboration, and meaningful learning. This means that active participation during course sessions is an essential part of the course content. The learning environment is digital and where participants meet both synchronously and asynchronously through Canvas and Zoom. The course is primarily focused on individual written assignments and peer-feedback and participants must be prepared for some substantial scholarly work. Students get the opportunity to experience a variety of teaching-learning activities and teaching techniques related to e.g. lectures, different forms of seminars and group work. The variety of forms is planned to facilitate learning and serve as models for own teaching. Diversity and equal treatment in relation to teaching and learning are considered during the course.

Examination: Participants will through a written essay describe and review a teaching experience (or if needed participated as a student) within higher education, reason about the experience based on pedagogical theories/principles. The essay maybe written in English or Swedish and will be presented orally.

Compulsory elements: - Participation during three webinars. The webinars, scheduled for 1.5 hours each, are used to follow up two of the assignments and will be held in Zoom. - Provide feedback based on peer-review of one written essay. Absence from compulsory sessions will need to be compensated through written tasks.

Number of students: 12 - 18

Selection of students: Selection will be based on 1) the relevance of the course syllabus for the applicant's doctoral project (according to written motivation), 2) start date of doctoral studies (priority given to earlier start date)

More information: This is a three-week course spread out over the term and which requires time for independent work outside of scheduled class time. The first two days of the course are devoted to getting familiar with the course in Canvas and presenting oneself to the other course participants. Scheduled sessions are on the following dates: 7 September (Virtual Campus Day), 5 October (Webinar), 19 October (Webinar), 10 November (Webinar) and 29 November (Virtual Campus Day). The course is given in English.

Course responsible:
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Contact person:
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Title: Vascular Cell Biology

Course number: 5560
Credits: 3.0
Date: 2022-09-26 -- 2022-10-07
Language: English
Level: Doctoral level

Responsible KI department: Department of Molecular Medicine and Surgery
Specific entry requirements: Function A course: Carrying out minor procedures in rodents

Purpose of the course: The objective of the course is to build up knowledge in the field of cardiovascular biology and disease using translational approaches. More specifically, the course provides an overview of the healthy and diseased vessel wall from the cellular and molecular perspective, including vascular development, biomechanics, blood flow and role of inflammation, lipid metabolism and smooth muscle cells. The course is designed to lay a solid foundation for the student commitment to basic, clinical, and translational cardiovascular research utilizing the most advanced technologies and expertise in the field. Through team work and joint presentations/discussions, students should increase their skills for collaborative networking, scientific presentation and communication to peers and to the public.

Intended learning outcomes: Knowledge and understanding - At the basic level students should be able to account for the various cell types and extracellular matrix components in the vessel wall, and critically review/discuss the potential cellular transdifferentiations in pathological conditions relevant to cardiovascular disease. - They should be able to interpret the complex interactions among the different components, biomechanical and systemic influences within the vessel wall, and use it to explain the causality in the development of vascular disease. Competence and skills - By conducting laboratory projects during the course, students should be able to make a synthesis of the theoretical and practical knowledge and envision how that knowledge could be applicable in their own research projects. - They should be able to discuss and compare state-of-the-art laboratory, translational and animal techniques applied for specific questions in this research area. Judgement and approach - Students should be able to demonstrate awareness of the ethical perspectives related to the biobanking and animal research, which will be incorporated and discussed during the course. - They should be able to demonstrate insight into the possibilities and limitations of research, its role in society and the responsibility of the individual for how it is used.

Contents of the course: The course will provide a theoretical and practical introduction to the basic cell types, extracellular components and their transformations present in the healthy and diseased vascular wall. Focus will also be on the signaling and basic biological process of cell activation, migration, proliferation and turnover involved in the vessel wall homeostasis during vascular development (angiogenesis, angiogenesis), as well as the main vascular pathologies and vascular remodeling during injury and healing reactions. The impact of vessel biomechanics and components from the systemic blood flow on cell plasticity will also be covered.

Teaching and learning activities: The learning methods in this course include both individual and group studies, exemplified through literature reading, journal club discussions and practical workshops related to the intended learning outcomes. Seminars with expert lecturers from KI and externally invited, will initiate and enhance the learning process. A practical laboratory project, where the students will test relevant methods for vascular research (in vitro, in situ and in vivo) and produce their own results, will be integrated. Course leaders will serve as facilitators for discussions, promote networking and collaboration skills during team work.

Examination: All learning outcomes of the course must be reached to pass the course. Every participant will be individually assessed and examination will be based on several formats: i) oral presentations of assigned group work. Time for group work will be designated during the whole course where teams prepare a presentation based on the experimental project they have designed and results they produced during laboratory work, supervised by the seminar leaders. ii) participation during journal club discussion among the teams (evaluation of methods, results, discussion, etc.) facilitated by the seminar leaders.

Compulsory elements: The course is work-intensive. Presence is strongly recommended during the whole course, but is compulsory during group work, practical experimental tasks and examination. Absence is allowed in exceptional circumstances only and will have to be compensated with a written assignment in agreement with the course leader.

Number of students: 10 - 30
Selection of students: The course is popular and if there are more applicants that the course can admit, priority will be given based on the: 1) relevance of the course plan for the student's project and 2) start date for doctoral studies (written motivation needed)

More information: The course in Vascular Cell Biology has been given for over 20 years in different formats. The course is work intensive and will encompass classical lectures, mini-symposium, journal club discussions and laboratory placements for group work. The course will also be open for several MSc Biomedicine students on each occasion.

Course responsible:
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Ljubica Matic
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Title: Protein Structure, Function and Disease

Course number: 5561
Credits: 4.5
Date: 2022-09-15 -- 2022-12-08
Language: English
Level: Doctoral level

Responsible KI department: Department of Biosciences and Nutrition
Specific entry requirements: Completed Master studies in the field of biochemistry, biotechnology, biomedicine, biophysics, chemical neuroscience or related subjects.

Purpose of the course: The course deals with the molecular properties of proteins concerning their molecular structure and implementation in biology as well as protein misfolding and the relation to neurodegenerative diseases. It covers the general architecture of proteins, the relation of structure to function and mechanisms of regulations of protein function. It includes recent insights into the molecular mechanisms of protein aggregation and the link to neurodegenerative diseases. Moreover, it gives an overview about recent developments within methods for protein structure and dynamics determination, in particular X-ray crystallography, electron microscopy and nuclear magnetic resonance. The course will also train the participants to prepare scientific presentations and critically assess research literature.

Intended learning outcomes: At the end of the course the students are expected to be able to:
• Understand how protein architecture is related to protein function
• Explain how protein dynamics, catalysis, binding sites and cofactors determine the protein structure-function relationship
• Identify and discuss control mechanisms of protein function, including competitive binding and cooperativity of ligands, post-translational modification and enzyme reactions
• Understand the principles and apply some tools for sequence alignment, homology modeling and structure prediction methods from protein sequence
• Show up-to-date knowledge of the working principles for major methods for protein structure and dynamics determination as well as microscopic nucleation mechanisms underlying protein aggregation

Contents of the course: The course is divided into two parts. The first part of the course is based on the course book "Protein Structure and Function" and related research articles and consists of:
• Protein structure (from primary to quaternary structure, protein stability and protein flexibility, etc.)
• From structure to function (binding sites, catalysis, cofactors, etc.)
• Control of protein function (mechanisms of regulation, binding ligands, post-translational modifications, etc.)
• Deriving protein function from sequence (sequence alignment, homology modeling, structure prediction, etc.)
The second part is based on lectures from the course directors and from invited specialists in the field, including:
• Neurodegenerative disorders and protein misfolding
• Molecular mechanisms of protein aggregation
• Recent developments in protein structure and dynamics methods, including:
  o X-ray crystallography
  o Electron microscopy
  o Nuclear magnetic resonance

Teaching and learning activities: The course consists of:
• Student presentations of research articles related to Chapters in the course book. If suitable examples from the student's own research can be included.
• Questions for student presentations by students (two students are assigned as "opponents" for each presentation) and audience.
• Written tasks, including practical of bioinformatics tools, related to the content of the Chapters, which are handed in before each session.
• Presentations by several invited specialists of the field.

Examination: The course content will be examined by written tasks as well as student presentations and oral examination of the topic by the course directors.

Compulsory elements: Attendance of lectures, student presentations and exercise sessions is compulsory. Absence needs to be compensated for by a written task related to the lecture subject in agreement with the course director. Further, the students need to submit written tasks and perform one scientific presentation about a research article.

Number of students: 8 - 15

Selection of students: Selection will be based on 1) the relevance of the course syllabus for the applicant's doctoral project (according to written motivation), 2) start date of doctoral studies (priority given to earlier start date).

More information: The course lectures will be held on a mainly bi-weekly basis (ca. 2-3 h for 9 occasions), distributed throughout the course period. The course will take place on Thursdays at Neo, Karolinska Institutet, Flemingsberg.
Title: Stem Cells and Organoids Models with Focus on Regenerative Medicine

Course number: 5562
Credits: 1.5
Date: 2022-10-17 -- 2022-10-21
Language: English
Level: Doctoral level

Responsible KI department: Department of Biosciences and Nutrition

Specific entry requirements:

Purpose of the course: The purpose of the course is to enable doctoral students to obtain a basic understanding of stem cell biology with focus on production and study of organoids in vitro culture, cell-based therapies, genome engineering and translational medicine. Experts in the field will provide a fresh overview of clinical and pre-clinical research aiming at development of novel treatment possibilities, but also discussing current limitations and general ethical aspects. In addition the students will be enabled to improve their capacity to produce coherent, logical and concise explanations of data and concepts - both written and orally, through consideration of the course material.

Intended learning outcomes: At the conclusion of this course students should be able to show a comprehensive view of: - Preimplantation Embryology - Derivation methods and culture conditions of hESCs - Nutritional requirements of the blastocyst and stem cells - Functional characteristics of different 3D-tissue culture incubators - Characterization of the organoids and the importance of the 3D bioprinting of these cells and what is ongoing in this field - Production of isogenic embryonic stem cells by somatic cell nuclear transfer (SCNT) - The pluripotence induction of somatic cells by transduction (the iPS cells) - Know the prospective possibilities of having a good culture system and be aware of potential development of organoids technology in the future. - Be aware of the general aspects and implication of the stem cells and organoids research and the potentiality that these represent for research and clinical application.


Teaching and learning activities: Lectures from experts in the field, laboratory demonstrations, course test, evaluation, discussions, examination and closing of course.

Examination: Constructive feedback and evaluation that supports learning (that is formative assessment) is included during active participation in all parts of the course. A summative assessment including an individual written assignment is carried out at the end of the course.

Compulsory elements: The laboratory parts are obligatory. Absence at the laboratory demonstration needs to be compensated for by a literature review in accordance with the instructions from the course leader.

Number of students: 8 - 14

Selection of students: Selection will be based on 1) the relevance of the course syllabus for the applicant's doctoral project (according to written motivation), 2) start date of doctoral studies (priority given to earlier start date)

More information: The course will be held at Karolinska Institutet, Department of Biosciences and Nutrition, NEO Huddinge. This course has previously been given with course number 2212

Course responsible:
Jose Inzunza
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141 86
Stockholm

Contact person:
-
Title: Advances in Biomaterials for Biomedicine and Clinical Applications

Course number: 5565
Credits: 1.5
Date: 2022-10-24 -- 2022-10-28
Language: English
Level: Doctoral level
Responsible KI department: Department of Neuroscience

Specific entry requirements:

Purpose of the course: The purpose of this course is to introduce doctoral students to cutting edge technological advances in the field of Biomaterials and how these advances can be applied in both basic medical science and the clinic. The course content is tuned to doctoral students with an interest in the interface between bioengineering, material science, medical technology, biotechnology and medical science. The course content will be of interest to those working in many fields from Cell Biology and Infection Biology to Orthopedics and Odontology.

Intended learning outcomes: After completing the course, the student has the ability to:
- Identify the main classes of biomaterials and their respective applications
- Understand the need for and limitations of biomaterials and medical devices
- Analyze and reflect over the use of biomaterials in clinical settings and preclinical evaluations
- Analyze and discuss the scientific literature in biomaterial and medical devices
- Analyze and reflect over the sustainability aspects of biomaterials, both environmental and societal impact of the current status of the studies and future dissemination of the technology

Contents of the course: The course consists of both lectures and demonstrations by experts in the field. The course includes descriptions of various types of biomaterials covering a wide range of biomedical applications. Topics include:
- Polymer-based materials
- Inorganic materials
- In vitro evaluations and applications of biomaterials and devices
- Clinical implications of biomaterials
- Bacteria biofilms and their interactions with implants and medical devices
- Point of care testing
- Bioelectronic devices
- Minimally invasive medical devices
- Regulations and Entrepreneurship

Teaching and learning activities: The course consists of lectures and/or demonstrations given by experts on the topics. This is combined with group work and seminars where the student discusses and presents the topics of the course.

Examination: Students will be examined on having achieved the ILOs for the course 1) during their participation in the group presentation and 2) by a written examination with a writing assignment.

Compulsory elements: Attendance at lectures/demonstrations and seminars. Compensation for missed lectures may be possible through a literature review. Preparation and active participation in a group presentation.

Number of students: 8 - 30

Selection of students: Selection will be based on 1) the relevance of the course syllabus for the applicant's doctoral project (according to written motivation), 2) start date of doctoral studies (priority given to earlier start date)

More information: The course will be held at KI Solna campus.

Course responsible:
Keira Melican
Department of Neuroscience
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Contact person:
Anna Herland
Institutionen för neurovetenskap
anna.herland@ki.se
Title : Computational Modelling for Cognitive Neuroscience and Psychiatry Research

Course number : 5567  
Credits : 1.5  
Date : 2022-10-20 -- 2022-11-17  
Language : English  
Level : Doctoral level  
Responsible KI department : Department of Neurobiology, Care Sciences and Society  
Specific entry requirements : Background in medicine, biomedicine, biology, psychology, cognitive science, medical imaging, computational biology or similar. Basic knowledge on statistics and programming will be needed in the course.  
Purpose of the course : The purpose of the course is to introduce doctoral students to computational techniques for modelling and analyzing behavioral data for cognitive neuroscience and psychiatry research, providing them with practical experience applying these techniques.  
Intended learning outcomes : After successful course completion, the students will be acquainted with several key computational models and have enough understanding to enable them to 1) critically interpret the results of the studies in the field; and 2) identify and choose the most appropriate methods to model their data.  
Contents of the course : Basic concepts in computational modelling such as parameter fitting and model comparison; introduction to reinforcement learning; classical models for decision-making tasks (drift diffusion model, intertemporal choice, two-armed bandit). Applications in psychiatry: psychosis, addiction, depression, anxiety.  
Teaching and learning activities : Lectures, hands-on practical sessions, article discussion in seminars.  
Examination : The examination consists of two moments: 1) presentation and active discussion in the seminars; 2) a practical assignment where students will define a problem in cognitive neuroscience or psychiatry and describe how to study it with the approaches explained in the course (theoretical framework, experiments, modelling and analysis, expected outcomes). The assignments will be presented in front of the other students in the last session.  
Compulsory elements : Attending the lectures, seminars, and hands-on sessions is mandatory. Absence from a lecture may be compensated by writing an essay on the corresponding topic. The examination is compulsory (seminars, as well as report and presentation of the practical assignment).  
Number of students : 10 - 20  
Selection of students : Selection will be based on 1) the relevance of the course syllabus for the applicant's doctoral project (according to written motivation), 2) start date of doctoral studies (priority given to earlier start date)  
More information : The course will be held once a week, every Thursday, for a period of 5 weeks.

Course responsible :  
Marc Guitart-Masip  
Department of Neurobiology, Care Sciences and Society  
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Contact person :  
Andreas Olsson  
Institutionen för klinisk neurovetenskap  
0852482459  
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Title: Data Management in Survey Design

Course number: 5568  
Credits: 2.0  
Date: 2022-10-17 -- 2022-10-28  
Language: English  
Level: Doctoral level  
Responsibe KI department: Department of Global Public Health  
Specific entry requirements: Knowledge about general data protection regulation (GDPR) and about documentation and handling of research data corresponding to what’s included in the compulsory introduction to doctoral education at KI.  
Purpose of the course: This course is designed for students who work with survey based research or who are interested in understanding the principles of data management. The focus of the course will be on how to formulate relevant questions for data collection that are possible to be understood and answered accurately and truthfully by respondents. Further the course will cover the process of transferring these answers to clean, accurate, and useful data that can be analysed with the aim to answer your research question. The course also includes the ethical and legal components of your responsibilities as a researcher. After completing this course, the students will be better equipped to manage data throughout the entire research data lifecycle from project planning to the end of the project.

Intended learning outcomes: After the course the participants should be able to: 1. Explain the importance of having a data management plan 2. Develop a data management plan that is aligned with the research plan 3. Apply basic principles of survey design 4. Implement the ethical principles throughout the data management planning

Contents of the course: During this course the students will learn the basic principles of data management starting from project inception, all the way through to archiving. These principles will help the students to optimize their research outputs, increase the impact of their research, and support open scientific inquiry. The course includes: -Key data management concepts -Practice and challenges of data management -Hands-on experience with an online data management

Teaching and learning activities: Different strategies for teaching and learning will be used such as lectures, group-discussions, and seminars. The focus will be on critically reflecting upon the evidence and viewpoints and relating it to your own research.

Examination: To pass the course the student must achieve the learning outcomes, and this will be assessed by an individual written assignment.

Compulsory elements: The peer-reviewing assignment and examination are compulsory elements during the course and cannot be compensated for.

Number of students: 10 - 20

Selection of students: Selection will be based on 1) the relevance of the course syllabus for the applicant’s doctoral project (according to written motivation), 2) start date of doctoral studies (priority given to earlier start date)

More information:

Course responsible:  
Ritva Rissanen  
Department of Global Public Health  
rittva.rissanen@ki.se

Contact person:
Title : Linear Regression Analysis in Neuroscience: Model Choice, Implementation, Analysis Errors and Interpretation

Course number : 5569
Credits : 3.0
Date : 2022-09-19 -- 2022-10-07
Language : English
Level : Doctoral level
Responsible KI department : Department of Neurobiology, Care Sciences and Society
Specific entry requirements : Basic Course in Medical Statistics (for example KI courses in basic statistics for doctoral students) and being familiar with basic statistical software.

Purpose of the course : The course covers both theoretical and practical regression aspects, with a focus on the application and errors of regression modelling in Neuroscience. The main purpose is for students to understand basic regression analysis principles through a variety of examples with Neuroscience data and help students adapt them to the needs of their research questions using the statistical languages R and/or Python. The course content has been developed to solve regression problems often faced in Neuroscience and all examples will be based on Neuroscience studies.

Intended learning outcomes : After the course the student should be able to: - Understand how regression analysis works and decide when regression should/should not be used depending on the research question. - Understand the implementation of regression in a basic statistical programming language from scratch and with packages. After the course the student should be able to understand: - Regression optimization, the warnings and errors produced and their relation to study design and available data (singularity, autocorrelation, small sample sizes, heterogeneous residuals, outliers), and model output. After the course the student should be able to: - Search for alternative models that can tackle a scientific question more accurately. - Understand fixed and random effects. After the course the student should have a good understanding of: how/why regression works by using simulated and real datasets from the field of Neuroscience (including brain imaging, neuropsychology, proteomics and other fluid markers).

Contents of the course : The course is divided in two parts: Part one: 1) Statistical hypothesis testing versus statistical modelling (Introduction). 2) Linear regression (main course focus). Part two: 3) Polynomial linear regression (additional focus). 4) Quantile regression (additional focus). 5) Random and fixed effects (additional focus).

Teaching and learning activities : Teaching is in the form of lectures. Student activities will consist of written and oral assignments. The students will receive the time schedule before the course to adjust their working activity accordingly.

Examination : Written and oral assignments as well as a written summative examination.
Compulsory elements : Lectures, student group discussion and presentation. The course leader assesses whether and if so, how absence can be compensated.

Number of students : 10 - 25
Selection of students : Selection will be based on 1) the relevance of the course syllabus for the applicant's doctoral project (according to written motivation), 2) start date of doctoral studies (priority given to earlier start date)

More information : The course consists of classroom lectures (or Zoom lectures if required) in the morning (9:00 - 12:00) and quizzed and tasks in the afternoon (13:00 - 16:00), Monday - Friday on week 1, Wednesday - Friday on week 2 and Monday - Tuesday on week 3. Friday on week 3 there will be a classroom exam from 9:00 to 10:30. The remaining days of the course are free.

Course responsible :
Billy Langlet
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Contact person : -
Title: Research Management for Quality Data Collection

Course number: 5571
Credits: 1.5
Date: 2022-11-14 -- 2022-11-18
Language: English
Level: Doctoral level
Responsible KI department: Department of Global Public Health

Specific entry requirements: Knowledge about general data protection regulation (GDPR) and about documentation and handling of research data, corresponding to the compulsory introduction to doctoral education at KI.

Purpose of the course: The course intents to equip PhD students with research management skills for quality data collection (quantitative and qualitative). The course will include aspects of project management including communication and leadership skills, and elements of equitable partnerships as well as convey knowledge, skills and practical applications of assuring quality data collection, data management and its related ethical and data safety issues. The suggested course should assist students preparing for data collection.

Intended learning outcomes:
• Understand project management including time plans, aspects of budgeting, communication, human resource management and leadership
• Preparing a data collection plan including testing and piloting, training of data collectors, quality assurance in electronic applications (scrip, ranges) as well as repeated interviews, accompanied interviews, reflection and feedback and data collection in sensitive situations
• Data collection using REDCap https://www.project-redcap.org/, designing data entry screens to match the questionnaire.
• Ethical issues in field operations, community engagement, information to communities, community entry, how to attain high participation etc.
• Intercultural aspects including ethics applications / GDPR / data transfer
• Data safety (safe servers, encrypting, handling of paper copies of consents etc.)
• Research documentaries including electronic notebook (ELN) for multi-country project

Contents of the course:
• The project cycle and tools to support research management including data management flow, costing of projects, etc
• Leadership skills for project management including human resource management / inter-professional working
• Data management aspects
• How to test and pilot research instruments and train of field workers
• How to design quality assurance in electronic applications (scrip, ranges)
• How to collect data in sensitive situations
• How to use REDCap program (https://www.project-redcap.org/) for designing data entry screens
• Research management including ethics, GDPR, data repositories, data management plans, data sharing.
• Risk assessment and risks management, etc

Teaching and learning activities:
• Distance learning course material in CANVAS
• Group interactions over zoom, practical’s on reflection, zoom teaching etc.
• Reading course literature

Examination: 1000 word data collection protocol.

Compulsory elements: Assignment and defined feedback to peers.
Number of students: 8 - 15

Selection of students: Knowledge about general data protection regulation (GDPR) and about documentation and handling of research data, corresponding to the compulsory introduction to doctoral education at KI.

More information:

Course responsible:
Claudia Hanson
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Contact person:
Veronique Henriksson Milliot
Institutionen för medicin, Solna
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Title: Neurodegenerative Disorders I: Genes, Mechanisms and Clinical Aspects

Course number: 5572
Credits: 1.5
Date: 2022-10-17 -- 2022-10-21
Language: English
Level: Doctoral level

Responsible KI department: Department of Neurobiology, Care Sciences and Society

Specific entry requirements:

Purpose of the course: The purpose of the course is for participants to gain knowledge concerning genetics, molecular mechanisms as well as clinical features and treatment strategies of neurodegenerative disorders. To gain and apply new knowledge, participants will (in addition to lectures by experts in the field) prepare and give own oral presentations as well as ask and answer questions in the group during the course week. The course will allow interaction between PhD-students and students of the KI Master's programme in biomedicine (elective course in their second year), all with a special interest in neuroscience.

Intended learning outcomes: The student should after the course: Be able to discuss and give examples of 1) genetics, molecular mechanisms and cellular processes of neurodegeneration, 2) how genetic dysfunctions help us understand the molecular mechanisms of disorders and 3) mechanisms of protein turnover, degradation and aggregation in relation to neurodegenerative disorders. The student should at the end of the course 4) have achieved basic knowledge about epidemiology, symptoms, inheritance, pathology and current treatments (symptomatic or curative) of the most common neurodegenerative disorders such as Alzheimer disease, Parkinson disease, frontotemporal dementia, amyotrophic lateral sclerosis and multiple sclerosis. 5) In addition, the student should be able to discuss the relevance (pros and cons) of different disease models, i.e. give examples of how well different models can model the clinical picture as well as possible disease mechanisms.

Contents of the course: The course will cover topics related to the degeneration of neural cells, apoptosis and necrosis as well as the cellular and biochemical reactions to neurodegeneration. During the course we will also present and discuss genetics, epidemiology, pathology, symptoms, diagnosis and treatment strategies of the most common neurodegenerative disorders such as Alzheimer disease, Parkinson disease, frontotemporal dementia, amyotrophic lateral sclerosis and multiple sclerosis. Molecular mechanisms of current and future treatment strategies, disease models and their potential will be presented and discussed. In addition, the students may within group assignments study other neurodegenerative diseases such as dementia with Lewy bodies, ataxias and prion diseases.

Teaching and learning activities: The course runs daytime for 1 week full-time with a mix of lectures by invited scientists, participants group assignments as well as individual studies.

Examination: The examination part includes: the group assignments, short formative examination questions at the end of some of the days during the course week, the oral presentations by the students and the following general discussion between all participants. All students are individually assessed.

Compulsory elements: In order to achieve the learning outcomes all participants are expected to be present the whole week. The group assignments, the oral presentations by the students and the following general discussion between all participants are compulsory. Students that are absent from these parts will have to individually submit a written presentation of the subject.

Number of students: 10 - 25

Selection of students: If a selection of course participants is necessary, we will prioritize 1) students for whom the course is mandatory, 2) students with an educational plan encompassing the topics of the course, and 3) PhD-students with an early registration date and that are close to finalizing the doctoral studies.

More information: The course will be held at Karolinska Institutet, Solna. <br> This course is replacing two previous courses: 2600 Neurogenetics (see course evaluation https://survey.ki.se/Report/5cWbCliXwqq) and 2629 Neurodegenerative Disorders I - From Molecule to Treatment (see evaluation link below).

Course responsible:
Elisabet Åkesson
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Contact person:
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Helena Karlström
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Eva Kallstenius
Institutionen för neurobiologi, vårdvetenskap och samhälle
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Title: Functional Cognitive Neuroanatomy

Course number: 5573  
Credits: 1.5  
Date: 2022-10-10 -- 2022-10-14  
Language: English  
Level: Doctoral level  
Responsible KI department: Department of Neuroscience  
Specific entry requirements:

Purpose of the course: This course aims to provide a basis in cognitive neuroscience and the neuroanatomy that supports it. The course will enable participants to get a good understanding of how the brain makes decisions, forms long term memories and handles emotions.

Intended learning outcomes: After the course the students should be able: to describe the field of cognitive neuroscience to explain how the brain can make decisions, form lasting memories and compute emotional states. to show where in the brain and by which structures these different functions are controlled.

Contents of the course: The course consists of theoretical sessions and practical work related to decision-making, memory formation and emotion. It will also include the neuroanatomy related to these functions using both MRI and human brains. The participants will be actively involved in group work dealing with practical and theoretical aspects of cognitive neuroanatomy.

Teaching and learning activities: Lectures, seminars and practical group work in the dissection room.
Examination: Practical exam on neuroanatomy and oral presentation for the theoretical part.
Compulsory elements: Lectures, seminars, group work in the dissection room and the final exam are obligatory. To compensate for absence participants will be given individual tasks that involve the respective theoretical or practical item missed.

Number of students: 8 - 20

Selection of students: Selection will be based on 1) the relevance of the course syllabus for the applicant’s doctoral project (according to written motivation), 2) start date of doctoral studies (priority given to earlier start date)

More information:

Course responsible:  
Tobias Karlsson  
Department of Neuroscience  
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Contact person:  
Konstantina Kilteni  
Institutionen för neurovetenskap  
konstantina.kilteni@ki.se
Title: Lipid Metabolism and Inflammation in Cardiovascular Disease

Course number: 5574
Credits: 1.5
Date: 2022-09-12 -- 2022-09-16
Language: English
Level: Doctoral level
Responsible KI department: Department of Medicine, Solna

Specific entry requirements:

Purpose of the course: This course enables the participants to obtain the up-to-date and in-depth knowledge on lipids and lipid metabolism in cardiovascular diseases, importance of lipid mediators of inflammation and its resolution, analytical methods, emphasizing both pre-clinical research and clinical aspects of cardiovascular diseases.

Intended learning outcomes: At the end of the course, the participant should be able to:
- discuss lipid- and lipoprotein metabolism, lipid mediator biosynthesis and identify the most common analytical methods used in the field.
- explain the pathophysiological importance of lipid metabolism in cardiovascular disease and be able to classify lipid mediators of inflammation and its resolution and their relevant pathways.
- identify potential and currently available approaches targeting lipid mediator related inflammatory pathways for preventing or treating cardiovascular diseases.
- discuss challenges and developments in cardiovascular research and lipid metabolism-directed therapeutics.

Contents of the course: Topics to be covered include discussion on lipids and lipoproteins, lipid metabolism, lipid mediator biosynthesis, receptors, omega-3 fatty acids, analytical methods (e.g. GC-MS and LC-MS-MS), inflammation and its resolution in cardiovascular disease, therapeutics and state of the art in the area of both pre-clinical research and clinical aspects. Also, the participants will be encouraged and have the possibility during the course to apply these perspectives on their own projects. Critical review of contemporary key papers in the field will be performed in adjunct to lectures and seminars.

Teaching and learning activities: The course is a full-time one week course. The teaching is partly in lecture/seminar form but also includes project work with group discussions. Time will be dedicated for an individual task focusing on different aspects covered in the lectures/seminars. The task will be presented at the end of the course followed by open discussions.
- Lectures
- Seminars
- Individual work
- Debates of clinical issues
- Presentation and discussion of assigned individual work

Examination: Presentation of a project selected from assigned topics based on the course seminars. Critical evaluation and discussion of the other participants presentations.

Compulsory elements: The participants must attend the seminars, critical reviews of papers and the oral exam (presentation).

Number of students: 8 - 25

Selection of students: Selection will be based on 1) the relevance of the course syllabus for the applicant's doctoral project (according to written motivation), 2) start date of doctoral studies (priority given to earlier start date)

More information: The course will be held Monday to Friday from 9:00 – 16:00, including breaks and individual study time. Location TBA. This course has previously been given with number 5240.

Course responsible:
Sven-Christian Pawelzik
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Contact person:
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Hildur Arnardottir
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Title: Advanced Global Health Economics with a focus on Economic Evaluation

Course number: 5575
Credits: 3.0
Date: 2022-10-10 -- 2022-10-28
Language: English
Level: Doctoral level
Responsible KI department: Department of Global Public Health
Specific entry requirements: KI doctoral course Global health economic course, or corresponding knowledge.

Purpose of the course: The aim of this course is to build on the understanding obtained in the Global Health Economics course and to learn about economic evaluations and performing a health economic analysis from different economic perspectives (healthcare and societal). The course will allow the students to deepen their understanding about the different components of economic evaluations such as costs, outcomes and modelling methodology. Hence, they will analyse and apply the theoretical knowledge by building a model to compare treatments and healthcare interventions. It will also focus on the unique challenges and limitations commonly faced when modeling communicable and non-communicable diseases while analysing some published economic evaluations. Finally, the course will focus on communicating the results of cost effectiveness analysis considering its limitations.

Intended learning outcomes: At the end of the course the students will be able to:

• Understand the different types of economic evaluations, models, their advantages, limitations and use in health economics

• Describe the different components and assumptions needed for an economic evaluation

• Describe the different health outcomes used in economic evaluations and the methodology of computing disability adjusted life years (DALYs) and quality adjusted life years (QALYs)

• Understand the assumptions needed to be taken while preparing an economic evaluation and justify the choices

• Build a health economic model to assess a health-related intervention

• Understand and apply sensitivity analyses for an economic model (one-way/ two-ways sensitivity analysis and monte–Carlo simulation)

• Critically assess an economic model through identifying areas for improvement and limitations

• Write and communicate the results of an economic evaluation

Contents of the course: Health economics is the use of economic theory and methodology to analyze how scarce resources are used in the health sector and in relation to health. One of the main tools of health economics is cost effectiveness analysis models which can inform policies about prioritization of healthcare interventions. The course will explore and explain the different steps needed to build a cost effectiveness analysis, the types of outcomes that are commonly used including QALYs and DALYs, the modelling approach including assumptions and real-life data. The course will allow students to build an economic model, explore the different approaches and possibilities in term of communicable and non-communicable disease modelling. Students will have the chance to understand and reflect on the limitations and results of economic models with an emphasis on sensitivity analysis. The course provides training in modelling and cost effectiveness analyses and presentations, both written and oral.

Teaching and learning activities: The course will have a blended learning approach with the combination of face-to-face lectures, online practical assignments/discussions, self-study and oral presentations and a final written assignment. Face-to-face lectures and other activities will be conducted over the two- week period. Practical assignments in the form of discussions and exercises will be discussed with the group (if applicable online) and peer feedback will be given.

Examination: Course assignments dedicated to building a model, oral presentation and final written assignment will be graded as fail or pass. In order to pass the course, the student need to pass the oral presentation and the written assignment. The course assignments will guide the students through the steps needed to design a health economic study and build a model. The aim of the examination is to test the students on what they have learned over the duration of the course and how well they can apply it. The written assignment will have to be submitted through the KI online learning platform the last day of the course.

Compulsory elements: Participation in the group work, oral presentation, and submitting a final written assignment will be mandatory. Absence can be compensated by an assignment from the course leader.

Number of students: 8 - 20
Selection of students: Selection will be based on 1) the relevance of the course syllabus for the applicant's doctoral project (according to written motivation), 2) start date of doctoral studies (priority given to earlier start date)

More information:

Course responsible:
Jad Sheddarwy
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Birger Forsberg  
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Title: Extensions to the Design and Analysis of Controlled Epidemiological Studies

Course number: 5577  
Credits: 1.5  
Date: 2022-11-16 -- 2022-11-25  
Language: English  
Level: Doctoral level  
Responsible KI department: Department of Medical Epidemiology and Biostatistics  
Specific entry requirements: Epidemiology I, Introduction to epidemiology; Epidemiology II, Design of epidemiological studies; Biostatistics I, Introduction for epidemiologists; Biostatistics II, Logistic regression for epidemiologists; and Biostatistics III: Survival analysis for epidemiologists, or equivalent courses  
Purpose of the course: This course aims to enable practicing epidemiologists to make more efficient use of already-available epidemiological data, and to design studies that are more efficient and that will extend possibilities for future analysis.  
Intended learning outcomes: After successfully completing this course you as a student are expected to be able to: - select a suitable epidemiological design for addressing a specified research question and justify the choice of design compared to other options. - compare the risk estimates obtained by different sampling strategies from the same underlying cohort and interpret these estimates for common designs. - compare and contrast the purpose of time-matching and confounder-matching in (nested) case-control studies, and generalise the resulting risk sets to a wide range of standard and non-standard designs. - compute weights that enable the reconstruction of an underlying study base from a (nested) case-control sample and recognise that two-stage designs, extended/extreme designs and reused case-control data, can all be analysed using appropriate weights to reflect the sampling - discuss the designs of published studies with particular attention to the choice of controls and devise more efficient alternatives.  
Contents of the course: The overall aim of this course is to present more flexible and informative approaches to the design and analysis of epidemiological studies, in order to make efficient use of costly data. The course will introduce methods for designing more efficient studies that exploit available population data and/or reuse data from prior studies conducted in well-defined cohorts (such as national registers). The focus will be on different sampling designs in terms of their (biased) representation of the underlying cohort, and how to reconstruct the correct numbers at-risk to produce unbiased parameter estimates, including several important quantities (other than the odds ratio). The course will demonstrate how (i) extended efficient designs can be analysed with standard methods, and (ii) extended methods of analysis can provide additional estimates from standard designs.  
Teaching and learning activities: Lectures interspersed with tutorials consisting of workshops and journal club sessions. In the workshops, participants will develop and refine a study design to address a clinical/epidemiological research question which will be presented and discussed. Journal clubs will consist of discussion and debate concerning key papers that will be assigned.  
Examination: The course grade will be based on a take-home assignment involving a proposed epidemiological study. The participant will submit a short, written report and an oral presentation where they will present and defend their proposal. A passing grade must be obtained for both the written and oral section in order to obtain a passing grade for the course. Students who do not obtain a passing grade on one of these sections will be allowed to revise that part of their work and be re-examined under the same conditions. The exam will have a strong emphasis on intuitive understanding and ability to explain/communicate rather than on technical or mathematical detail. The take-home examination will be explained on the first day of the course, assigned on the last day, and due within ten days of the end of the course. Students who do not obtain a passing grade in the first examination will be offered a second examination within 2 months of the final day of the course.  
Compulsory elements: The individual examination  
Number of students: 8 - 25  
Selection of students: Eligible doctoral students will be prioritized according to 1) the relevance of the course syllabus for the applicant's doctoral project (according to written information), 2) date for registration as a doctoral student (priority given to earlier registration date). To be considered, submit a completed application form. Give all information requested, including a short description of current research training and motivation for attending, as well as an account of previous courses taken.  
More information: The course is extended over time in order to promote reflection and reinforce learning. The course will be held the dates November 16, 18, 21, 23 and 25.
Title : Quality Assurance of Clinical Research

Course number : 5580
Credits : 1.5
Date : 2022-09-05 -- 2022-09-30
Language : English
Level : Doctoral level
Responsible KI department : Department of Medicine, Solna
Specific entry requirements :

Purpose of the course : This course is suitable for any kind of clinical researcher at KI. The purpose of the course is to carry insights to the participant how to create trustful data, and how to become a trusted researcher. The course brings information of what is required to act safely and in accordance with local rules, national legislation and international treaty's when involved in clinical research. Whether your research is interventional or non-interventional, using quantitative or qualitative methodology, you will after this course know how to act to secure your research persons, your data and your professional career.

Intended learning outcomes : Knowledge and understanding: Conclude which legislations affects clinical research and how they do it. Deduce how clinical research integrity is affected by fabrication, falsification and plagiarism. Account for common problems that may arise in clinical research. Competence and skills: Differentiate the responsibilities between the investigator, the study team members, and the sponsor in a clinical study. Analyse the validity of a research project proposal or publication with a risk-benefit analysis. Translate general research quality systems into own research area. Judgement and approach: Critically identify good clinical scientific practices and deviations from it in clinical research. Judge data validity and their reproducibility. Handling bias, sponsorship, and scientific authorship in a paper.

Contents of the course : This course presents different quality systems in clinical research including good clinical practice (GCP). In more detail the course also discusses: How and when the informed consent shall be asked for in relation to the research. Why you can't substitute research persons. What to consider when constructing a study protocol. How to handle violations to the protocol. Why you need to screen for unwanted effects. What is the responsibility on your shoulders as an investigator? What you can do to safeguard your research and career.

Teaching and learning activities : You should have some basic experience using Canvas as this software is our learning management system. The course is provided in a digital format with video lectures, readings, discussion postings and self-tests. It is divided into two phases. These correspond to one-week full time course distributed over four weeks. The course is self-paced. In the first phase digital lectures are provided on research quality. There are self-tests after each lecture. The first phase includes the GCP course. The second phase lets the student pick an article from a selection of different research areas for an in-depth critical analysis using the analysing tools provided. Finally, the student has to present how quality is applied to, or how it could be incorporated, in the students' own research area. The faculty is available and on stand-by during the study period (office hours). The study path of each student is monitored.

Examination : Having cleared all preceding moments including self-tests and mandatory multiple choice test, an individual final examination with short answer questions is taken. The theme for this refers to implementation of the quality standards in the students own research field. If the final exam is not cleared a new final exam will be offered at next course occasion.

Compulsory elements : There will be a mandatory attendance check upon study start. If no-show, the seat will be cancelled and referred to another student on the waiting list for the course. Each self-test must be passed to be considered completed. There is a mandatory multiple choice test to pass halftime into the second phase. To be able to take the final exam all preceding moments must have been cleared.

Number of students : 25 - 35
Selection of students : The selection of students will be based on 1) Date for starting doctoral studies 2) Date for halftime.

More information : The course is digital, selfpaced and open during 4 weeks. The course uses Canvas, KI learning system. It is good to have some experience of Canvas, or take the students introduction course to Canvas before taken this course. The course content corresponds to 1,5 point (1 week fulltime). (Previous course number was 2873).

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Contact person : -
Title : Quality Assurance of Clinical Research

Course number : 5580
Credits : 1.5
Date : 2022-10-10 -- 2022-11-04
Language : English
Level : Doctoral level
Responsible KI department : Department of Medicine, Solna

Specific entry requirements :

Purpose of the course : This course is suitable for any kind of clinical researcher at KI. The purpose of the course is to carry insights to the participant how to create trustful data, and how to become a trusted researcher. The course brings information of what is required to act safely and in accordance with local rules, national legislation and international treaty's when involved in clinical research. Whether your research is interventional or non-interventional, using quantitative or qualitative methodology, you will after this course know how to act to secure your research persons, your data and your professional career.

Intended learning outcomes :

Knowledge and understanding: Conclude which legislations affects clinical research and how they do it. Deduce how clinical research integrity is affected by fabrication, falsification and plagiarism. Account for common problems that may arise in clinical research. Competence and skills: Differentiate the responsibilities between the investigator, the study team members, and the sponsor in a clinical study. Analyse the validity of a research project proposal or publication with a risk-benefit analysis. Translate general research quality systems into own research area. Judgement and approach: Critically identify good clinical scientific practices and deviations from it in clinical research. Judge data validity and their reproducibility. Handling bias, sponsorship, and scientific authorship in a paper.

Contents of the course : This course presents different quality systems in clinical research including good clinical practice (GCP). In more detail the course also discusses: How and when the informed consent shall be asked for in relation to the research. Why you can't substitute research persons. What to consider when constructing a study protocol. How to handle violations to the protocol. Why you need to screen for unwanted effects. What is the responsibility on your shoulders as an investigator? What you can do to safeguard your research and career.

Teaching and learning activities : You should have some basic experience using Canvas as this software is our learning management system. The course is provided in a digital format with video lectures, readings, discussion postings and self-tests. It is divided into two phases. These correspond to one-week full time course distributed over four weeks. The course is self-paced. In the first phase digital lectures are provided on research quality. There are self-tests after each lecture. The first phase includes the GCP course. The second phase lets the student pick an article from a selection of different research areas for an in-depth critical analysis using the analysing tools provided. Finally, the student has to present how quality is applied to, or how it could be incorporated, in the students’ own research area. The faculty is available and on stand-by during the study period (office hours). The study path of each student is monitored.

Examination : Having cleared all preceding moments including self-tests and mandatory multiple choice test, an individual final examination with short answer questions is taken. The theme for this refers to implementation of the quality standards in the students own research field. If the final exam is not cleared a new final exam will be offered at next course occasion.

Compulsory elements : There will be a mandatory attendance check upon study start. If no-show, the seat will be cancelled and referred to another student on the waiting list for the course. Each self-test must be passed to be considered completed. There is a mandatory multiple choice test to pass halftime into the second phase. To be able to take the final exam all preceding moments must have been cleared.

Number of students : 25 - 35
Selection of students : The selection of students will be based on 1) Date for starting doctoral studies 2) Date for half-time.

More information : The course is digital, selfpaced and open during 4 weeks. The course uses Canvas, KI learning system. It is good to have some experience of Canvas, or take the students introduction course to Canvas before taking this course. The course content corresponds to 1,5 point (1 week fulltime). (Previous course number was 2873).

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https://kiwas.ki.se/katalog/katalog/pdf?term=HT22
Title: Construction and Validation of Measurement in Behavioral Science

Course number: 5585
Credits: 4.5
Date: 2022-09-08 -- 2022-09-30
Language: English
Level: Doctoral level
Responsible KI department: Department of Learning, Informatics, Management and Ethics
Specific entry requirements: Knowledge of basic statistics including correlations and regression analysis.

Purpose of the course: During this course doctoral students will develop an ability to plan a process of creating a new measurement instrument and/or critically evaluating and validating an existing measurement instrument for the specific use in the student's own research.

Intended learning outcomes: After completing this course a doctoral students will be able to: - Explain the measurement process taking into account test theories (classical and latent variables) as well as a theory behind a construct that is being measured; - Carry out statistical analyses to estimate reliability and validity of a measurement instrument; - Critically evaluate validity evidence taking into account the specific purpose of a measurement instrument; - Plan a study design with an aim to develop a new measurement instrument (or validate an existing one) and test its reliability and validity.

Contents of the course: The course covers those aspects of classical test theory and modern latent variables theory that are necessary for doctoral students to successfully use a measurement instrument in their research projects. These include the following topics: test construction, item analysis, reliability, validity, validity evidence, and validation strategy. Moreover, during the course students will not only learn the basics of test theories, but will also study which methods of statistical data analyses may be used to evaluate these theoretical principles in practice. We will discuss the following statistical methods: descriptive statistics, correlation, linear regression, internal consistency analysis, and factor analysis.

Teaching and learning activities: The teaching of the course is coaching-based, and thus it will follow the needs of each individual student's research project as well as the needs and previous knowledge of the entire group of students. Students will be able to choose to what extent they want to work individually or in small groups, to what extent they would like to be supervised in their work, and whether they want to work on their own data or on an example dataset provided. The course is equivalent to three weeks of full time study. However, during those three weeks only four days are planned for lectures and group discussions. The remaining time is reserved for students' own work on three examination assignments. Two of these assignments require students to run statistical analyses following the provided tutorials. Students will be able to individually decide how advanced statistics they would like to learn and which statistical program they want to use. The course will start with short presentations of students' project work (students will be asked to prepare this before the course starts), followed by a goal setting workshop. Each student will be encouraged to set individual goals for the course that will drive his or her learning. Moreover, after the opening session the content of the lectures will be adjusted accordingly to the level of previous knowledge in the particular group of students. During the first week of the course we will discuss basics of test construction, reliability of measurement, and latent variables theory. At the end of this week students will be required to submit a report presenting reliability and item analysis of a measurement instrument. During the second week students will be required to submit a report presenting factor analyses and regression/correlation analyses of an example instrument. At the end of the second week we will discuss the concept of validity, types of validity evidence, and validation strategies. We will also analyze an example validation process. Finally, the third week will be reserved for writing and peer reviewing final reports presenting a validation study design of a measurement instrument that students want to use in their own research.

Examination: The examination consists of two parts. First, to pass a course student will have to submit on time two short but complete reports summarizing case studies analyzed as examples during the course. Second, a student will have to submit on time one longer paper presenting his or her own strategy for development and/or validation of a measurement instrument as applied to a specific use in student's own research. This paper will be graded pass or fail.

Compulsory elements: Participation in open questions seminars and feedback seminars is compulsory, but there will be a possibility to attend online. Submission of the two short reports and the final paper is obligatory.

Number of students: 8 - 20
Selection of students: Selection will be based on 1) the relevance of the course syllabus for the applicant's doctoral project (according to written motivation), 2) start date of doctoral studies (priority given to earlier start date)

More information: Live sessions are scheduled for 8/09 (Friday), 13/9 (Tuesday), 19/09 (Monday), and 26/09 (Monday). Rooms will be booked at KI Solna campus. All lectures, discussions, and seminars will be available for online participation on request.

Course responsible:
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