Course catalogue for doctoral education

VT20

Human biology or pathology * General science courses

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2212 Human embryonic stem cells 2020-05-11 -- 2020-05-15 (English)
2214 Redox Regulation, Oxidative Stress and Selenoproteins 2020-06-01 -- 2020-06-05 (English)
2219 Bioinformatics for cell biologists * 2020-05-04 -- 2020-05-08 (English)
2363 Antigen Presentation and T Cell Activation 2020-05-25 -- 2020-05-29 (English)
2416 Causal Inference for Epidemiological Research 2020-02-11 -- 2020-02-21 (English)
2444 Cell and Gene Therapy 2020-02-24 -- 2020-02-28 (English)
2463 Career skills for scientists 2020-01-29 -- 2020-03-19 (English)
2609 Basic Course in Medical Statistics - a distance course * 2020-02-17 -- 2020-03-06 (English)
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2618 Write your research results and get them published * 2020-02-03 -- 2020-02-14 (English)
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2621 Klinisk forskning och Good Clinical Practice: protokoll, informerat samtycke och ansökan i enlighet med lagar/regler * 2020-01-27 -- 2020-01-31 (Swedish)
2644 Human physiology - an overview # 2020-01-20 -- 2020-01-31 (English)
2666 Methods for statistical analysis: From analysis of variance to multilevel modeling * 2020-03-31 -- 2020-05-20 (English)
2673 Introduction to Qualitative Methods 2020-03-05 -- 2020-04-24 (English)
2690 Basic Laboratory Safety * 2020-01-20 -- 2020-01-27 (English)
2690 Basic Laboratory Safety * 2020-05-04 -- 2020-05-11 (English)
2733 Calcium signaling 2020-06-22 -- 2020-06-26 (English)
2738 Intermediate Medical Statistics: Regression models * 2020-03-23 -- 2020-04-03 (English)
2787 Present your research! * 2020-02-17 -- 2020-02-21 (English)
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2790 How to conduct systematic reviews and meta-analyses 2020-04-20 -- 2020-05-06 (English)
2798 Applied longitudinal data analysis 2020-04-28 -- 2020-05-07 (English)
2846 Integration of Neuroimaging and Cognition in Normal Aging and Dementia 2020-05-11 -- 2020-05-15 (English)
2858 Longitudinal Data Analysis - Classical and Modern Statistical Methods 2020-05-04 -- 2020-05-15 (English)
2861 Biomedical Ecology - The microbiota in health and disease 2020-03-09 -- 2020-03-13 (English)
2870 Microscopy: improve your imaging skills - from sample preparation to image analysis 2020-01-21 -- 2020-02-07 (English)
2871 Microscopy: improve your imaging skills 2020-01-21 -- 2020-02-07 (English)
2873 Kvalitetssäkring av klinisk forskning * 2020-02-10 -- 2020-02-14 (Swedish)
2873 Quality assurance of clinical research * 2020-03-02 -- 2020-03-06 (English)
2878 Current advances in atherosclerosis research 2020-01-29 -- 2020-03-04 (English)
2912 Manuscript writing in English * 2020-05-11 -- 2020-05-15 (English)
2916 Diabetes and cardiovascular diseases 2020-02-05 -- 2020-03-04 (English)
2928 Public Health Research - Concepts and Theories 2020-06-01 -- 2020-06-12 (English)
2953 Statistics with R - from data to publication figure 2020-03-16 -- 2020-04-03 (English)
2958 Introduction to R 2020-03-30 -- 2020-04-03 (English)
2959 Fundamentals of statistical modeling 2020-05-25 -- 2020-05-29 (English)
2963 Open science and reproducible research 2020-03-23 -- 2020-04-03 (English)
2964 Medicinsk forskningsetik * 2020-02-03 -- 2020-02-07 (Swedish)
2964 Medical research ethics * 2020-03-09 -- 2020-03-13 (English)
2964 Medical research ethics * 2020-03-30 -- 2020-04-03 (English)
2964 Medical research ethics * 2020-05-04 -- 2020-05-08 (English)
2971 Introduction to R - data management, analysis and graphical presentation 2020-01-15 -- 2020-02-17 (English)
2991 Extensions to the design and analysis of case-control studies 2020-03-04 -- 2020-03-10 (English)
2996 Anaesthesia, analgesia and surgery (mice and rats) 2020-05-04 -- 2020-05-08 (English)
3022 Translational Paediatric Oncology in the Era of Immunotherapy and Omics 2020-03-30 -- 2020-04-03 (English)
3024 Advanced cancer biology 2020-01-07 -- 2020-06-09 (English)
3027 Bioinformatics analysis of gene regulation in omics data and its applications to medical problems * 2020-02-27 -- 2020-03-11 (English)
3028 Grundkurs i SPSS 2020-03-09 -- 2020-03-13 (Swedish)
3032 Mixed methods: integration of qualitative and quantitative data within applied health research 2020-04-01 -- 2020-05-01 (English)
3035 Imaging in Neuroscience: with a Focus on MEG and EEG Methods 2020-04-14 -- 2020-04-28 (English)
3036 Mouse necropsy 2020-05-27 -- 2020-06-03 (English)
3037 Exploring entrepreneurial opportunities in research 2020-02-17 -- 2020-04-03 (English)

3042 Biostatistics I: Introduction for Epidemiologists * 2020-04-01 -- 2020-04-21 (English)
3043 Biostatistics II: Logistic Regression for Epidemiologists * 2020-01-27 -- 2020-02-04 (English)
3044 Basic Bioinformatics * 2020-05-04 -- 2020-05-12 (English)
3046 Causal inference: emulating a target trial to assess comparative effectiveness 2020-03-23 -- 2020-03-25 (English)
3049 Cellular Signalling 2020-03-23 -- 2020-03-27 (English)
3067 Immunogenicity: Immune responses against biological drugs 2020-03-30 -- 2020-04-03 (English)
3073 Philosophy of science and the concept of health * 2020-03-23 -- 2020-04-03 (English)
3078 Epidemiology I: Introduction to epidemiology 2020-01-20 -- 2020-01-29 (English)
3108 Cytostatic Drugs in Research and Cancer Treatment 2020-05-04 -- 2020-05-08 (English)
3109 Pathology # 2020-05-04 -- 2020-05-15 (English)
3116 Quality of life as an outcome measure in care sciences 2020-01-20 -- 2020-01-30 (English)
3118 Forskningsetik * 2020-01-14 -- 2020-02-04 (Swedish)
3119 Vetenskapsteori * 2020-02-11 -- 2020-04-07 (Swedish)
3123 Exploring human movement 2020-02-03 -- 2020-02-14 (English)
3129 Epidemiology III. Analysis and interpretation of epidemiological data 2020-05-11 -- 2020-05-20 (English)
3133 Cardiovascular Research - an overview of the process of atherosclerosis 2020-05-11 -- 2020-05-15 (English)
3134 Basic Course in Medical Statistics * 2020-03-09 -- 2020-03-20 (English)
3137 Psychobiology of Intelligence 2020-03-24 -- 2020-04-30 (English)
3138 Epidemiology II. Design of epidemiological studies 2020-05-25 -- 2020-06-03 (English)
3139 Basic Immunology 2020-02-24 -- 2020-03-20 (English)
3142 Biostatistics III: Survival analysis for epidemiologists * 2020-02-10 -- 2020-02-19 (English)
3143 Introductory course in SAS programming 2020-05-04 -- 2020-05-08 (English)
3144 Computational modelling for cognitive neuroscience and psychiatry research 2020-01-17 -- 2020-02-20 (English)
3147 To communicate science in different contexts with focus on oral and visual communication * 2020-03-02 -- 2020-03-17 (English)
3181 Introduction to Teaching and Learning in Higher Education * 2020-03-19 -- 2020-04-16 (English)
3193 The Vascular Brain 2020-05-18 -- 2020-05-22 (English)
3199 Key Concepts and Principles for Design and Critical Interpretation of Nordic Register-Based Studies 2020-03-30 -- 2020-10-02 (English)
3214 Function B - to Design Procedures and Projects Involving Research Animals 2020-03-03 -- 2020-04-02 (English)
3218 Gene and Cell Therapy Product (ATMP) Drug Development 2020-03-30 -- 2020-04-03 (English)
3219 Basic Electron Microscopy for Cell Biologists 2020-05-04 -- 2020-05-08 (English)
3220 Basic Human Neuroscience # 2020-02-13 -- 2020-04-01 (English)
3222 Psychiatric Genetics 2020-03-23 -- 2020-03-27 (English)
3230 Genomics for Biomedical Scientists: Handle Your Gene Expression Data 2020-02-03 -- 2020-02-14 (English)
3231 Translational Molecular Brain Imaging in Neurodegenerative Disorders 2020-03-09 -- 2020-03-13 (English)
3232 Developing and Evaluating Complex Interventions: Effective implementation 2020-05-20 -- 2020-06-04 (English)
3233 Public Health Implications of an Aging Population 2020-03-23 -- 2020-04-03 (English)
3234 What is Life? The Future of Biology 2020-01-28 -- 2020-05-12 (English)
3238 Thrombosis and Hemostasis, from Mechanisms to Therapies 2020-02-17 -- 2020-02-27 (English)
3239 Biopsykosocialt perspektiv på beroendetillstånd 2020-05-18 -- 2020-05-29 (Swedish)

Title : Writing science and information literacy

Course number : 1391
Credits : 3.0
Date : 2020-02-10 -- 2020-02-21
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 skills and information literacy of the participant.
Intended learning outcomes : After the course, you will be able to demonstrate: -understanding of how to write an original scientific article and submit it for publication. -the ability to write other types of texts required for a scientific career. -the ability to give, take and make use of constructive criticism. -the ability to search and manage the medical sciences literature in a structured way. -the ability to use resources which facilitate choosing a journal to publish your research. -the ability to describe aspects of post-publication evaluation and processing of the medical sciences literature.
Contents of the course : Basics of scientific writing, searching the literature, writing an original scientific paper, supporting the text, managing the literature, scientific writing in other contexts, choosing a journal, the publication process and evaluating published science.
Teaching and learning activities : This is a KI CAMPUS course (there is also an 100% online version with course code 2561) with face-to-face teaching including: individual writing and rewriting, lectures, working in pairs and groups, web-based teaching, demonstrations, computer exercises and individual study.
Examination : Writing an academic text and rewriting it based on peer and teacher feedback. There are also three assignments in which participants demonstrate development of their information literacy.
Compulsory elements : All scheduled teaching is compulsory (except where clearly stated otherwise). Absence can usually be compensated for by reading and individual work after consultation with course leaders.
Number of students : 20 - 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 :

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Title : Human embryonic stem cells

Course number : 2212
Credits : 1.5
Date : 2020-05-11 -- 2020-05-15
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 human reproductive biology with focus on human embryonic stem cell knowledge and cells replacement therapies 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. Finally 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: - Pre implantation Embryology - Derivation methods and culture conditions of hESCs - Nutritional requirements of the blastocyst and stem cells - Functional characteristics of different tissue culture incubators - Characterization of the embryonic stem cells and the importance of the pluripotency of these cells and what is ongoing in this field - Production of isogenics embryonic stem cells by somatic cell nuclear transfer (SCNT) - The pluripotence induction of somatic cell by transduction (the iPS cells) - Know the prospective possibilities of having a good culture system and be aware of potential development of hESC technology in the future. - Be aware of the general aspects and implication of the stem cells research and the potentiality that these represent for clinical application.
Contents of the course : 1. Embryology theory (lectures) 2. In vitro culture system (lectures) 3. Human Embryonic Stem cells culture (lectures) 4. Characterization of hESC (lectures) 5. Laboratory demonstrations 6. Genetics (lectures) 7. Introduction to different cell types (lectures) 8. Cell reprogramming (lectures) 9. Stem cells therapy and challenge today 10. Future in human embryonic stem cells (lecture) Course test, evaluation, discussions, examination and closing of course.
Teaching and learning activities : Lectures and laboratory demonstrations.
Examination : Written individual examination
Compulsory elements : The laboratory parts are obligatory. If absent at laboratory activity; student should present a literature work related with 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) date for registration as a doctoral student (priority given to earlier registration date).
More information : The course will be held at Karolinska Institutet, Department of Biosciences and Nutrition, NEO- Flemingsberg.

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Title : Redox Regulation, Oxidative Stress and Selenoproteins

Course number : 2214
Credits : 3.0
Date : 2020-06-01 -- 2020-06-05
Language : English
Level : Doctoral level
Responsible KI department : Department of Medical Biochemistry and Biophysics
Specific entry requirements :
Purpose of the course : The purpose of the course is to give doctoral students and post docs a good understanding of redox biology and redox biochemistry in living cells and organisms. The course is also designed to give the participants experience in scientific networking, and to increase generic skills in understanding, presenting and discussing frontline research topics.
Intended learning outcomes : After the course, each student should have acquired the following knowledge: - Good knowledge of structure-function relationships for the major low molecular-weight antioxidant compounds found in cells (GSH, Ascorbate, tocopherol) - Good knowledge of the major antioxidant and redox regulatory systems and redox sensitive signaling pathways (glutathione-dependent systems, thioredoxin systems, Nrf2/Keap1, Yap1, peroxiredoxins, methionine sulfoxide reductases, peroxidases, catalases, superoxide dismutase, NADPHoxidase, oxidative burst, PTP regulation, cyt c, ASK-1) - Good knowledge of selenoprotein synthesis and selenoprotein function After the course, each student should also have the skill to present and discuss a redox-regulated research project at a level generally expected for presentations held at international cutting-edge conferences in the subject.
Contents of the course : The course is planned as a joint training encompassing an international exchange graduate course, with students and lecturer's primarily recruited from Karolinska Institutet together with Medical University of South Carolina (MUSC) and the Redox Biology Center of the University of Nebraska in Lincoln (UNL), Nebraska, which are two NIH COBRE (Center of Biological Research Excellence) initatives focused on research in redox biology. The course is planned to be annually held and will have the following major components: - Students from MUSC, UNL and Karolinska Institutet - Lecturers from MUSC, Karolinska Institutet and UNL Planned lectures will contain subjects such as the following examples: - ""Glutathione S-transferases in redox regulation and glutathione dependent catalysis"" - ""Nitric oxide (NO) signaling in relation to redox state"" - ""Calcium signaling in oxidative stress and in relation to apoptosis"" - ""Glutaredoxin and thioredoxin systems"" - ""The concepts and effects of redox cycling and selenoprotein reactivity"" - ""Selenoproteomes and dedicated Cys- and/or Sec-dependent redox systems"" - ""Using protein crystallography to probe the function of redox active enzymes"" - ""Redox activities of proline in a cellular context"" - ""The effects of metals on metabolism and oxidative stress in human disease"" - ""With the sight on redox: glutaredoxin and thioredoxin systems in the ocular lens and their relation to cataract"" - ""Redox control of ion channels"" - ""How oxygen can be sensed in the carotid body"" - ""Mitochondrial production of reactive oxygen species in relation to human disease""
Teaching and learning activities : The course it is built upon a pedagogic framework of discussions between graduate students in redox biology with leading experts in the field, combined with cutting-edge lectures, training in oral presentation, career counceling sessions and a written exam for control of detailed basic knowledge in redox biology. It is the firm belief of the course organizers that this pedagogic framework should well support the students to obtain the learning objectives of the course. It should furthermore help the students to prepare for their next level of a career beyond the doctoral examination. The type of teaching will be: - Morning sessions with lectures in basic concepts as well as cutting-edge front-line research findings in the field - Afternoon sessions with student presentations followed by discussions between lecturers and students - Career discussions and future perspectives in the field of redox biology
Examination : The student skills are examined as follows: - Evaluation of the degree of participation in student-lecturer discussions and the level of initiated comments and questions during those discussions (grade pass/not pass) - Evaluation of the presentation of the student's own project (grade pass/not pass) - Results at written examination (at least 60% right answers for the grade of pass) Attendence during compulsory parts of the course as well as the grade of ""Pass"" in all three parts of the examination must be fulfilled for a final grade of ""Pass"".
Compulsory elements : Absence from any part of the course (lectures, student presentations, career discussions, exam and award ceremony) is generally not accepted but could in special cases be compensated by an individually tailored additional discussion and a special written examination organized by the course committee.
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 : This is a joint course between KI (MBB, Elias Arnér), The Redox Biology Center (RBC) at the University of Nebraska Lincoln, USA (Dept of Biochem., Donald Becker) and The Medical University of South Carolina (MUSC, Drs. Kenneth Tew and Danyelle Townsend). The course rotates every year between these three sites and is thus held every third year at KI. The course will be held at KI, Solna Campus, on June 1-5, 2020. Out of the maximum of 25 student participants at the most 10 KI students will be admitted, while the remaining students will come from the participating universities and elsewhere.

Course responsible :
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Title : Bioinformatics for cell biologists

Course number : 2219
Credits : 1.5
Date : 2020-05-04 -- 2020-05-08
Language : English
Level : Doctoral level
Responsible KI department : Department of Cell and Molecular Biology
Specific entry requirements : -
Purpose of the course : To increase the understanding of the basic principles of bioinformatics and to gain practical skills in bioinformatics analysis of sequence data.
Intended learning outcomes : After the completed course, the students will be able to utilize basic bioinformatics resources and tools, apply and integrate current, advanced computational biology methods in their research, and to make use of publicly available genome-wide sequencing data sets.
Contents of the course : The course covers the use of most common bioinformatics resources such as public data bases and tools for sequence analysis. Practical excercises and discussions bridge sequence analysis to cellular function.
Teaching and learning activities : The learning activities on the course consist of lectures and practical computer excercises. In addition, the students will be supervised in the preparation of presentations on bioinformatics to benefit their own research.
Examination : Formative examination with practical computer excercises. Summative oral examination in conjunction with the presentation of individual student projects.
Compulsory elements : The computer excercises are obligatory. Absence from the obligatory moments is compensated according to the instructions of the course director.
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 is given as practical and theoretical course in basic cell biology oriented bioinformatics. The course is organized full time at Karolinska Institutet Solna campus. All course participants must bring their own laptop for the course practicalities with the following software pre-installed (or at least downloaded):
 Python, PyCharm, Java8, R and R studio. Links to all programs will be provided. Note that we will have very limited time to solve the installation problems.
 The focus will be the subset of the following topics (depending on the interest and skills of the attendees):
 Introduction to programming languages: R and python, minor attention to other languages. No prior knowledge of programming required. Access to major online databases, NCBI, Ensembl, UCSC. Using BioMart, GEO, GO resources. The sequencing techniques, sequencing data processing, alignments, variant calling, RNA-seq data analysis. Elements of DNA sequence analysis (motifs, k-mers, DNA barcodes). Making sense of gene lists. Methods of clustering, classification, visualization. Basic statistics and data presentation.

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Title : Antigen Presentation and T Cell Activation

Course number : 2363
Credits : 1.5
Date : 2020-05-25 -- 2020-05-29
Language : English
Level : Doctoral level
Responsible KI department : Department of Oncology-Pathology
Specific entry requirements : Basic immunology course, or otherwise have attained the same level of previous knowledge.
Purpose of the course : This course will provide a cutting edge overview of antigen presentation and T cell activation. This course is suitable for PhD students with basic immunology knowledge who want to deepen their knowledge in important aspects of various lymphocyte subsets biology.
Intended learning outcomes : By completing this course the students will be able to account for different types of antigen capture and processing, antigen presentation pathways (MHC class I and II), the MR1 and CD1 system, peptide/lipid/glycolipid presentation as well as T-cell subsets and invariant lymphocytes. The students will be able to demonstrate that they have acquired the required knowledge about T lymphocyte recognition of antigen-presentation with strong focus on lymphocyte and target cell. The students will also be able to demonstrate that they have acquired the required knowledge about T-cell activation and the effects of this in steady state or disease as well as in cell therapy.
Contents of the course : The following will be covered during the course: Antigen capture (including endocytosis, phagocytosis) and some immune evasion strategies related to this. This will be followed by a thorough walk-through of the antigen presentation pathways, both MHC class I and II, and upstream and downstream TCR activation, as well as 2nd signal, and 3rd signal (cytokine) induced T cell activation. The CD1 system, presentation of lipids, glycolipids (including microbial interference, presentation to lymphocytes such as CD1 restricted T cells and NKT cells, lymphocyte mediated regulation of antigen presentation), MR1 presentation and MAIT cell activation will be discussed. Manipulation of T cell activation by checkpoint inhibitors, the impact of tumor microenvironment, and practical applications such as immunotherapy, will also be covered.
Teaching and learning activities : The course will be based on lectures, as well as extra time for follow up discussions. In addition a smaller group work will enable the students to gain deeper knowledge in a small area of interest. The students are also given literature (see below) in order to prepare for the lectures and discussions.
Examination : To pass the course, the student has to show that the learning outcomes have been reached. The students will be assessed with a group project presented in a written report, along with individual oral presentations. The focus of the examination is gain of knowledge rather than test of knowledge.
Compulsory elements : All lectures and group sessions are considered mandatory. Missed events should be compensated for with a written report on the subject in accordance with the indications of the course organizer.
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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Title : Causal Inference for Epidemiological Research

Course number : 2416
Credits : 1.5
Date : 2020-02-11 -- 2020-02-21
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 Marginal Structural Models to analyze longitudinal 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 time-varying exposures. 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, causal methods allow one to estimate the causal effect of a time-varying exposure in the presence of time-dependent confounders that lie on the causal pathway between 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 dates are February 11, 13, 18, 20 and 21.

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Title : Cell and Gene Therapy

Course number : 2444
Credits : 1.5
Date : 2020-02-24 -- 2020-02-28
Language : English
Level : Doctoral level
Responsible KI department : Department of Medicine, Huddinge
Specific entry requirements : No specific entry requirements
Purpose of the course : Gene Therapy is a growing field with applications both in research and development as well as a therapeutic tool for patients with cancer or inherited genetic disorders. The purpose of the course is to deepen the participant’s knowledge in gene-therapeutic tools and its applications in disease. The course will focus on genetic modification of human cells and their application in cancer and will give an overview of gene-therapeutic options including viral vector production, - transduction and CRISPR technology. Furthermore, we will touch upon ethical aspects of gene therapy.
Intended learning outcomes : After the course, the student should be able to; 1. Explain mechanisms that are involved in viral gene integration in mammalian cells. 2. Apply their knowledge in molecular biology to genetic modification of mammalian cells. This means they should be able to develop cloning strategies for a gene of interest into a viral vector and propose a strategy for in vivo genetic manipulation. 3. Understand the application of CAR T and CAR NK cells 4. Apply the knowledge in cancer or single gene disorders and develop treatment schemes for patients with these disorders using gene therapy 5. Understand the regulations concerning cell and gene therapy 6. Understand the strengths and drawback of current clinical trials
Contents of the course : The first part of the course will cover the basic aspects of gene regulation, cell culture, and gene transfer methods. In addition, the recent advances in vector development will be discussed. The second part of the course will deal with studies performed with human cells, with special emphasis on the hematology field.
Teaching and learning activities : The pedagogic learning activities on the course consist of lectures, group discussions and student presentations.
Examination : Oral group presentation and individual assignment based on a case study. 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 - 35
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 full working days during Week 9, 2020. It will be taking place at the Southern campus (Huddinge).

Course responsible :
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Contact person :
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Title : Career skills for scientists

Course number : 2463
Credits : 1.5
Date : 2020-01-29 -- 2020-03-19
Language : English
Level : Doctoral level
Responsible KI department : Department of Learning, Informatics, Management and Ethics
Specific entry requirements :
Purpose of the course : This course prepares PhD students for life after dissertation. You start to explore your transferable skills and how to communicate them. You learn a lot about yourself and the many career paths there are for PhDs. The course also gives you the opportunity to expand your contacts and network. This course gives you the possibility to explore your interests, talents and skills. Course participants also get the opportunity to apply for a one month financed internship at a company or organisation whithin life sciences.
Intended learning outcomes : After the course the participants should be able to discuss options in academic and nonacademic settings. The participants should be able to identify transferable skills achieved during doctoral training and be able to explain the value of these skills within as well as outside academia. They will also be able to understand careers in different organizations in the private and public sector. They should also be able to apply what they have learned in the course to communicate their skills in different situations.
Contents of the course : The course includes an introductory reflection of the career options available for PhDs and researchers. This will be followed by sessions where academic and non-academic career paths and entrepreneurial options are presented and discussed. The course covers postdoc planning, interview training and networking exercises. In addition, the course includes the process and steps in a job application procedure and how to use communication skills in various contexts.
Teaching and learning activities : The course will be highly interactive and will consist of lectures, discussions, individual projects and student presentations.
Examination : The participants will be examined through oral group presentations and an individual written project.
Compulsory elements : It is compulsory to attend all the lectures and workshops (except where clearly stated otherwise). Absence from compulsory parts will be compensated for according to instructions of the course director with an additional individual project.
Number of students : 30 - 40
Selection of students : Selection will be based on 1) PhD students who are in their third or fourth year of doctoral education 2) written motivation letter
More information : The course will be given on Wednesdays between 13.00 and 17.00 on the first four occasions (29/1, 5/2, 12/2 and 19/2). The company mingle with the opportunity to apply for an internship will take place week 10 or 11. Examinations days (divided into 3 groups) will take place March 17, 18 and 19. The course schedule will be published in December.

Course responsible :
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Ayla De Paepe
Universitetsförvaltningen

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Title : Basic Course in Medical Statistics - a distance course

Course number : 2609
Credits : 3.0
Date : 2020-02-17 -- 2020-03-06
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 : The course is a hybrid course mixing online studies with face-to-face in-class final seminars. The course activities are video lectures, self-study, self-assessment exercises, individual computer based exercises, and statistical software demonstration videos in Statistica and SPSS. The first and last day of the course will be face-to-face with an introduction the first day and seminars and group discussions the last day.
Examination : Correct answers on the individual computer based 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. If a student joins the course when physically located in another country it is the student's responsibility to contact the course director in advance to agree on an individual supplementary task to compensate for the absence.
Number of students : 40 - 45
Selection of students : Date for registration as a doctoral student (priority given to earlier registration date). Please make sure that you have entered the correct registration date for doctoral education in your personal profile.
More information : Course dates at KI Campus Solna: February 17th (not mandatory) and March 6th (mandatory).

Course responsible :
Mesfin Tessma
Department of Learning, Informatics, Management and Ethics

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Contact person :
Elisabeth Löfgren
Institutionen för lärande, informatik, management och etik

elisabeth.lofgren@ki.se

Title : Basic Course in Medical Statistics - a distance course

Course number : 2609
Credits : 3.0
Date : 2020-04-14 -- 2020-04-27
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 : The course is a hybrid course mixing online studies with face-to-face in-class final seminars. The course activities are video lectures, self-study, self-assessment exercises, individual computer based exercises, and statistical software demonstration videos in Statistica and SPSS. The first and last day of the course will be face-to-face with an introduction the first day and seminars and group discussions the last day.
Examination : Correct answers on the individual computer based 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. If a student joins the course when physically located in another country it is the student's responsibility to contact the course director in advance to agree on an individual supplementary task to compensate for the absence.
Number of students : 40 - 45
Selection of students : Date for registration as a doctoral student (priority given to earlier registration date). Please make sure that you have entered the correct registration date for doctoral education in your personal profile.
More information : Course dates at KI Campus Solna: April 14th (not mandatory) and April 27th (mandatory).

Course responsible :
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Contact person :
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Title : Write your research results and get them published

Course number : 2618
Credits : 3.0
Date : 2020-02-03 -- 2020-02-14
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 impart knowledge and practical experience in scientific writing, based on own research, including manuscript, abstract and cover letter writing and scientific poster design.
Intended learning outcomes : AFTER ATTENDING THE COURSE, THE DOCTORAL STUDENT 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 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) - Identify the main scope and focus of the research and summarize information aligned to the target group - Apply the structure of popular science writing 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 - 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. Designing and writing a) a poster b) an abstract c) a draft for a research paper d) a cover letter e) a reply to the reviewer´s comments f) a cover letter g) a popular science paper 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, seminares, writing exercises, group assignments and practical exercises. As part of the learning process, the Ph.D students will be members of in-class review groups, giving feed-back to their colleagues.
Examination : 1) Written assignments reflecting the intended learning outcomes of the course: draft for scientific paper, popular science paper, poster, cover letter, and abstract. All assignments can be based on own research (if applicable). 2) Evaluation sessions, where the PhD students give each other feed back on the written assignments as a part of the learning process 3) Poster presentation, where the PhD students present their posters to a small group of course participants (there are no presentations in front of a larger group)
Compulsory elements : Lectures, workshops, 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 : This course is given in different formats: in-class daytime, on-line daytime, in-class evenings and on-line evenings (please see the respective course occasions for details). This course occasion is given DAYTIME IN-CLASS AND DAYTIME ON-LINE. Please state if you are applying for the in-class format, the on-line format or both. Please note: For the on-line option, all lectures and group work will be conducted in real-time (i.e. no recorded lectures) and everyone will be attending according to schedule. It will be very similar to an in-class experience as all students can see both the lecturers and the other students on-line at all times.
 The course will be given in a venue in central Stockholm. Please address ALL questions to:
anna.hildenbrand.wachtmeister@ki.se or phone: 0707890607

Course responsible :
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Lalit Kumar
Institutionen för kvinnors och barns hälsa

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Title : Write your research results and get them published

Course number : 2618
Credits : 3.0
Date : 2020-04-07 -- 2020-06-16
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 impart knowledge and practical experience in scientific writing, based on own research, including manuscript, abstract and cover letter writing and scientific poster design.
Intended learning outcomes : AFTER ATTENDING THE COURSE, THE DOCTORAL STUDENT 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 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) - Identify the main scope and focus of the research and summarize information aligned to the target group - Apply the structure of popular science writing 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 - 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. Designing and writing a) a poster b) an abstract c) a draft for a research paper d) a cover letter e) a reply to the reviewer´s comments f) a cover letter g) a popular science paper 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, seminares, writing exercises, group assignments and practical exercises. As part of the learning process, the Ph.D students will be members of in-class review groups, giving feed-back to their colleagues.
Examination : 1) Written assignments reflecting the intended learning outcomes of the course: draft for scientific paper, popular science paper, poster, cover letter, and abstract. All assignments can be based on own research (if applicable). 2) Evaluation sessions, where the PhD students give each other feed back on the written assignments as a part of the learning process 3) Poster presentation, where the PhD students present their posters to a small group of course participants (there are no presentations in front of a larger group)
Compulsory elements : Lectures, workshops, 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 : This course is given in different formats: in-class daytime, on-line daytime, in-class evenings and on-line evenings (see the respective course occasions for details): This course occasion is given ON-LINE AND IN-CLASS on a total of 10 TUESDAY EVENINGS 17-21 between the 7nd of April and the 16th of June. (It is 11 Tuesday in total during the period, but one day the group will be divided in two groups, i.e. it will be 10 Tuesday evenings for the individual student.) Please state if you wish to join the on-line or in-class experience or if you are open for both.
 In the on-line format, all lectures and group work will be conducted in real-time (i.e. no recorded lectures) and everyone will be attending according to schedule. It will be very similar to an in-class experience as all students can see both the lecturers and the other students on-line at all times.
 The course will be given in a venue in central Stockholm. Please address ALL questions to: anna.hildenbrand.wachtmeister@ki.se or phone: 0707890607

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Lalit Kumar
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Title : Write your research results and get them published

Course number : 2618
Credits : 3.0
Date : 2020-03-09 -- 2020-03-20
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 impart knowledge and practical experience in scientific writing, based on own research, including manuscript, abstract and cover letter writing and scientific poster design.
Intended learning outcomes : AFTER ATTENDING THE COURSE, THE DOCTORAL STUDENT 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 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) - Identify the main scope and focus of the research and summarize information aligned to the target group - Apply the structure of popular science writing 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 - 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. Designing and writing a) a poster b) an abstract c) a draft for a research paper d) a cover letter e) a reply to the reviewer´s comments f) a cover letter g) a popular science paper 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, seminares, writing exercises, group assignments and practical exercises. As part of the learning process, the Ph.D students will be members of in-class review groups, giving feed-back to their colleagues.
Examination : 1) Written assignments reflecting the intended learning outcomes of the course: draft for scientific paper, popular science paper, poster, cover letter, and abstract. All assignments can be based on own research (if applicable). 2) Evaluation sessions, where the PhD students give each other feed back on the written assignments as a part of the learning process 3) Poster presentation, where the PhD students present their posters to a small group of course participants (there are no presentations in front of a larger group)
Compulsory elements : Lectures, workshops, 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 : This course is given in different formats: in-class daytime, on-line daytime, in-class evenings and on-line evenings (please see the respective course occasions for details). This course occasion is given EVENINGS ON-LINE 17.00-21.00.
 Please note: All lectures and group work will be conducted in real-time (i.e. no recorded lectures) and everyone will be attending according to schedule. It will be very similar to an in-class experience as all students can see both the lecturers and the other students on-line at all times.
 Please address ALL questions to: anna.hildenbrand.wachtmeister@ki.se or phone: 0707890607

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Lalit Kumar
Institutionen för kvinnors och barns hälsa

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Title : Write your research results and get them published

Course number : 2618
Credits : 3.0
Date : 2020-06-01 -- 2020-06-12
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 impart knowledge and practical experience in scientific writing, based on own research, including manuscript, abstract and cover letter writing and scientific poster design.
Intended learning outcomes : AFTER ATTENDING THE COURSE, THE DOCTORAL STUDENT 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 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) - Identify the main scope and focus of the research and summarize information aligned to the target group - Apply the structure of popular science writing 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 - 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. Designing and writing a) a poster b) an abstract c) a draft for a research paper d) a cover letter e) a reply to the reviewer´s comments f) a cover letter g) a popular science paper 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, seminares, writing exercises, group assignments and practical exercises. As part of the learning process, the Ph.D students will be members of in-class review groups, giving feed-back to their colleagues.
Examination : 1) Written assignments reflecting the intended learning outcomes of the course: draft for scientific paper, popular science paper, poster, cover letter, and abstract. All assignments can be based on own research (if applicable). 2) Evaluation sessions, where the PhD students give each other feed back on the written assignments as a part of the learning process 3) Poster presentation, where the PhD students present their posters to a small group of course participants (there are no presentations in front of a larger group)
Compulsory elements : Lectures, workshops, 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 : This course is given in different formats: in-class daytime, on-line daytime, in-class evenings and on-line evenings (please see the respective course occasions for details): This course occasion is given DAYTIME IN-CLASSS AND ON-LINE. Please state if you would like to join the in-class or the online format or either one.
 For the online format, all lectures and group work will be conducted in real-time (i.e. no recorded lectures) and everyone will be attending according to schedule. It will be very similar to the in-class experience as all students can see both the lecturers and the other students online at all times.
 The course will be given in a venue in central Stockholm. Please address ALL questions to: anna.hildenbrand.wachtmeister@ki.se or phone: 0707890607

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Title : Write your research results and get them published

Course number : 2618
Credits : 3.0
Date : 2020-05-04 -- 2020-05-15
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 impart knowledge and practical experience in scientific writing, based on own research, including manuscript, abstract and cover letter writing and scientific poster design.
Intended learning outcomes : AFTER ATTENDING THE COURSE, THE DOCTORAL STUDENT 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 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) - Identify the main scope and focus of the research and summarize information aligned to the target group - Apply the structure of popular science writing 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 - 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. Designing and writing a) a poster b) an abstract c) a draft for a research paper d) a cover letter e) a reply to the reviewer´s comments f) a cover letter g) a popular science paper 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, seminares, writing exercises, group assignments and practical exercises. As part of the learning process, the Ph.D students will be members of in-class review groups, giving feed-back to their colleagues.
Examination : 1) Written assignments reflecting the intended learning outcomes of the course: draft for scientific paper, popular science paper, poster, cover letter, and abstract. All assignments can be based on own research (if applicable). 2) Evaluation sessions, where the PhD students give each other feed back on the written assignments as a part of the learning process 3) Poster presentation, where the PhD students present their posters to a small group of course participants (there are no presentations in front of a larger group)
Compulsory elements : Lectures, workshops, 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) start date of doctoral studies (priority given to earlier start date)
More information : This course is given in different formats: in-class daytime, on-line daytime, in-class evenings and on-line evenings (see the respective course occasions for details): This course occasion is given IN-CLASS and ON-LINE DAYTIME. Please state if you are applying for the in-class or on-line format or both.
 Please note: For the on-line option, all lectures and group work will be conducted in real-time (i.e. no recorded lectures) and everyone will be attending according to schedule. It will be very similar to an in-class experience as all students can see both the lecturers and the other students on-line at all times.
 The course will be given in a venue in central Stockholm. Please address ALL questions to: anna.hildenbrand.wachtmeister@ki.se or phone: 0707890607

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Lalit Kumar
Institutionen för kvinnors och barns hälsa

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Title : Klinisk forskning och Good Clinical Practice: protokoll, informerat samtycke och ansökan i enlighet med lagar/regler

Course number : 2621
Credits : 1.5
Date : 2020-01-27 -- 2020-01-31
Language : Swedish
Level : Forskarnivå
Responsible KI department : Department of Clinical Sciences, Danderyd Hospital
Specific entry requirements : --
Purpose of the course : Kursen ger god kunskap om det regelverk som gäller vid klinisk forskning (registerforskning och kliniska prövningar). Detta är nödvändig kunskap för alla som bedriver klinisk forskning.
Intended learning outcomes : Kunskaper om Good Clinical Practice (GCP) samt forskningsetik (Helsingforsdeklarationen). Kursen täcker de krav på GCP-utbildning som Läkemedelsverket ställer för att delta i en klinisk läkemedelsprövning. Deltagaren ska efter genomgången kurs kunna delta som en prövare i en klinisk prövning. Kunskaper om hur man praktiskt ansöker om klinisk prövning till Regional etikprövningsnämnd, Läkemedelsverket samt till Datainspektionen. Deltagaren ska efter genomgången kurs kunna skriva en ansökan till Regional etikprövningsnämnd och veta hur man skriver sådan till Läkemedelsverket samt till Datainspektionen. Kunskaper rörande regelverket för klinisk prövning (Etikprövningslagen, Dataskyddsförordningen (GDPR, General Data Protection Directory), Biobankslagen, Läkemedelsverkets författningssamling m fl). Deltagaren ska efter genomgången kurs känna till regelverket för att rätt kunna planera en klinisk prövning. Beräkning av deltagarantalet i en studie. Deltagaren ska efter genomgången kurs veta vad som påverkar studiestorlek och kunna ta fram rätt underlag för att kunna beräkna detta. Kunskap om kraven att registrera en studie i publik databas (Clinical Trial Registry) samt hur man gör för att få en studie publicerad. Deltagaren ska efter genomgången kurs kunna registrera en studie i en publik databas. Kunskaper om de krav som ställs vid registerforskning. Deltagaren ska efter genomgången kurs känna till regelverket vid registerforskning.
Contents of the course : Föreläsningar om det regelverk som gäller vid klinisk forskning (registerforskning och kliniska prövningar): Helsingforsdeklarationen, GCP, Etikprövningslagen, Dataskyddsförordningen (GDPR, General Data Protection Directory), Biobankslagen, Läkemedelsverkets författningssamling, Codex: regler och riktlinjer för forskning (codex.vr.se) m fl. Beräkning av patientantal. Genomgång av ansökningshandlingar till Regional etikprövningsnämnd, Läkemedelsverket och Datainspektionen. Hur man skriver en etikansökan och författar en patientinformation. Hur man gör för att registrera en prövning i ett Clinical Trial Registry samt regler för publicering. Praktiska GCP-råd på hur man genomför en klinisk prövning. Kursen lämpar sig också väl för de som bedriver klinisk registerforskning.
Teaching and learning activities : Föreläsningar, diskussioner och seminarier samt examinationsuppgift (studiesynopsis, etikansökan och patientinformation).
Examination : Doktorandens examinationsuppgift kommer att bedömas och diskuteras i seminarieform.
Compulsory elements : Närvaro vid undervisning/seminarier samt inlämning av examinationsuppgift (studiesynopsis, etikansökan och patientinformation). Vid frånvaro från schemalagda aktiviteter måste deltagaren genom kompletterade extra inlämningsuppgift kunna styrka motsvarande inhämtning av kunskap.
Number of students : 10 - 30
Selection of students : Urvalet baseras på 1) kursplanens relevans för den sökandes doktorandprojekt (enligt motivering), 2) startdatum för doktorandstudier
More information : Kursen består av föreläsningar och arbete i seminarieform på Danderyds sjukhus 2019-01-27--29 + 31. Examinationsuppgiften (studiesynopsis, etikansökan och patientinformation) genomförs 2019-01-28--30 och lämnas därefter in för individuell bedömning och återkoppling. Examinationsuppgiften kommer också att diskuteras och bedömas i seminarieform.

Course responsible :
Thomas Kahan
Department of Clinical Sciences, Danderyd Hospital
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Contact person :
Nina Ringart
Institutionen för kliniska vetenskaper, Danderyds sjukhus
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Title : Human physiology - an overview

Course number : 2644
Credits : 3.0
Date : 2020-01-20 -- 2020-01-31
Language : English
Level : Doctoral level
Responsible KI department : Department of Physiology and Pharmacology
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 useful 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 : 20 - 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 :

Course responsible :
Jessica Norrbom
Department of Physiology and Pharmacology

Jessica.Norrbom@ki.se

Contact person :
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Title : Methods for statistical analysis: From analysis of variance to multilevel modeling

Course number : 2666
Credits : 4.0
Date : 2020-03-31 -- 2020-05-20
Language : English
Level : Doctoral level
Responsible KI department : Department of Clinical Neuroscience
Specific entry requirements : Documented knowledge about basic statistics
Purpose of the course : To give graduate students an opportunity to learn to use a number of statistical methods.
Intended learning outcomes : After the course the participants should be able to conduct the following statistical analyses: (1) Analysis of variance; (2) Multiple regression analysis; (3) Risk- and Odds-ratios; (4) Logistic regression; (5) Cox regression; (6) Factor analysis; (7) Structural Equation Modeling; (8) Multilevel Modeling
Contents of the course : The above mentioned methods for statistical analysis.
Teaching and learning activities : The course contains lectures and computer exercises. The lectures will cover the theoretical material and contain relevant examples. In the computer exercises the methods of analysis will be used on given data. SPSS (or, on request, R) will be used in the computer exercises. No support for SAS will be available.
Examination : The participants will conduct the analyses that are included in the course and present and interpret the results from these analyses in an individual examination report.
Compulsory elements : No compulsory elements.
Number of students : 10 - 23
Selection of students : (1) Participants in the Doctoral School in Health Care Sciences; (2) Other graduate students at Karolinska; (3) Starting date of doctoral studies (priority given to those with an early date).
More information : Recorded lectures (but these are always available, so these dates are just suggestions): Mon 6/4, Mon 20/4, Mon 27/4, Mon 4/5, Mon 11/5, Mon 18/5 Workshops in the computer room: Tue 31/3, Tue 7/4, Tue 21/4, Tue 28/4, Tue 5/5, Tue 12/5, Tue 19/5

Course responsible :
Kimmo Sorjonen
Department of Clinical Neuroscience

Kimmo.Sorjonen@ki.se

Contact person :
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Title : Introduction to Qualitative Methods

Course number : 2673
Credits : 4.0
Date : 2020-03-05 -- 2020-04-24
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 - 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) date for registration as a doctoral student (priority given to earlier registration date).
More information : The course will take place at Alfred Nobels Allé 23 in Flemingsberg. Preliminary course days: March 5-6, March 12-13, March 19-20, April 2-3 and April 24. Course days are mandatory. If all participants speak Swedish, the course can be given in Swedish.

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

Lena.Rosenberg@ki.se

Contact person :
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Title : Basic Laboratory Safety

Course number : 2690
Credits : 1.8
Date : 2020-01-20 -- 2020-01-27
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 : It is recommended to take the course in the beginning of the doctoral education.

Course responsible :
Maria Johansson
Department of Microbiology, Tumor and Cell Biology

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Contact person :
Christina Johansson
Institutionen för mikrobiologi, tumör- och cellbiologi

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Title : Basic Laboratory Safety

Course number : 2690
Credits : 1.8
Date : 2020-05-04 -- 2020-05-11
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 : It is recommended to take the course in the beginning of the doctoral education

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Course responsible :
Maria Johansson
Department of Microbiology, Tumor and Cell Biology

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Contact person :
Christina Johansson
Institutionen för mikrobiologi, tumör- och cellbiologi

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Title : Calcium signaling

Course number : 2733
Credits : 1.5
Date : 2020-06-22 -- 2020-06-26
Language : English
Level : Doctoral level
Responsible KI department : Department of Clinical Science and Education, Södersjukhuset
Specific entry requirements :
Purpose of the course : The aim of this course is to enable the students to get an insight in the fundamental mechanisms of the regulation of cellular Ca2+ homeostasis, the generation and the decoding of Ca2+ signaling, the principles of the methods for measuring Ca2+ concentrations in different cellular compartments, and the general roles of Ca2+ signals in mediating cellular functions.
Intended learning outcomes : After the course the students should be able to: 1. Critically analyze and interpret how the different constituents of the Ca2+ signaling tool-kit participate in the generation and decoding of Ca2+ signals, and in maintaining Ca2+ homeostasis. 2. Choose appropriate methods for studying different aspects of Ca2+ signaling 3. Critically analyze the existing literature on Ca2+ signaling, generate new ideas and put forward new hypotheses. 4. Design new studies on Ca2+ signaling in the context that is relevant to the research areas of the students themselves
Contents of the course : 1. Phospholipase C and inositol 1,4,5 trisphosphate-mediated signaling. 2. Identity and roles of the molecular players involved in Ca2+ and phospholipid-mediated signaling. 3. Preparation of Ca2+ buffers. 4. Principles of methods used in the study of calcium and phospholipid signaling including fluorescent techniques, electrphysiology and imaging techniques. 5. Regulation of ion channels involved in Ca2+ signaling including voltage sensitive channels, Transient Receptor Potential channels, store- operated channels and intracellular C a2+ channels. 6. Roles of Ca2+ and phospholipid mediated signaling in cellular processes including in secretion and apoptosis. 7. Mechanism of generation and decoding of Ca2+ signals. 8. Spatial and temporal aspects of Ca2+ signaling. 9. How to pick research problems in the areas of Ca2+ and phospholipid signaling and how to approach the problems.
Teaching and learning activities : This course will follow the principles of active learning including the seven steps problem-based-learning (PBL), and flipped classrooms. Emphasis will be on self-directed learning through problem-solving in small groups rather than on cathedral lectures. Generous small-group interactive ""lecture sessions"" by resource personnel with ample time for questions and answers will be provided. Participants will work on selected problems designed to be starting points, in groups of about ten participants, under supervision of trained facilitators who will be available during all of the sessions. Participants will be provided with an outline of the objectives, areas expected to cover, and reprints of selected learning materials.
Examination : Each student must submit a research proposal in the area of Ca2+ signalling where they will critically analyze the existing literature, identify the gaps in the existing knowledge, put forward a new hypothesis, and choose appropriate methods to test the hypothesis. They will use conventional headings like: specific aims, background, methods, significance, and references. The proposal should be at least one A4 page long, but no longer than three pages.
Compulsory elements : Attendence in all the sessions is obligatory. In case of absence, the participant will have to submit written reports specified by the course-supervisor, 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 : The course will be held at the department of clinical research and education, Södersjukhuset from 9:00 to 16:00 during the weekdays.

Course responsible :
Shahidul Islam
Department of Clinical Science and Education, Södersjukhuset
086163950
Shahidul.Islam@ki.se

Contact person :
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Title : Intermediate Medical Statistics: Regression models

Course number : 2738
Credits : 3.0
Date : 2020-03-23 -- 2020-04-03
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 acquirement 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) 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 : The course will consist of three or four scheduled whole days per week for two weeks. Course dates are: March 23, 24, 26, 27, 30, 31 and April 3.

Course responsible :
Mesfin Tessma
Department of Learning, Informatics, Management and Ethics

Mesfin.Tessma@ki.se

Contact person :
Elisabeth Löfgren
Institutionen för lärande, informatik, management och etik

elisabeth.lofgren@ki.se

Title : Present your research!

Course number : 2787
Credits : 1.5
Date : 2020-02-17 -- 2020-02-21
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 asequate way. 2. Be able to design and use supportive media for a successful presentation. 3. Know the basics of presentation techniques and rethoric. 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 feed back on the other students' presentations e. Reflecting on own learning and development during the course
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) start date of doctoral studies (priority given to earlier start date)
More information : PhD course 2787 Present your research is given both as a daytime class and as an evening class (please see the respective course occasions). This course occasion is given DAYTIME.
 The course will be given in a venue in central Stockholm. Please address ALL questions to: anna.hildenbrand.wachtmeister@ki.se or phone: 0707890607
 The course focuses on research presentations in different contexts. The course is highly interactiveand the teachers focus on the individual students and make a great effort to create an environment, where the students feel safe to practice and try new presentation approaches.

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
070-789 06 07
Anna.Hildenbrand.Wachtmeister@ki.se

Title : Present your research!

Course number : 2787
Credits : 1.5
Date : 2020-04-08 -- 2020-06-03
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 asequate way. 2. Be able to design and use supportive media for a successful presentation. 3. Know the basics of presentation techniques and rethoric. 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 feed back on the other students' presentations e. Reflecting on own learning and development during the course
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) start date of doctoral studies (priority given to earlier start date)
More information : PhD course 2787 Present your research is given both as a daytime class and as an evening class (please see the respective course occasion for details): This course occasion is given on seven WEDNESDAY EVENINGS 17-21 during the time 8th of April-3rd of June. (A couple of the dates are in half class and the students may choose what dates fit their schedule the best.) Some work at home will be required between the course occasions.
 The course will be given in a venue in central Stockholm. Please address ALL questions to: anna.hildenbrand.wachtmeister@ki.se or phone: 0707890607
 The course focuses on research presentations in different contexts. The course is highly interactiveand the teachers focus on the individual students and make a great effort to create an environment, where the students feel safe to practice and try new presentation approaches.

Course responsible :
Kristina Gemzell Danielsson
Department of Women's and children's health
0851772128
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Contact person :
Anna Hildenbrand Wachtmeister
Institutionen för kvinnors och barns hälsa
070-789 06 07
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Title : Present your research!

Course number : 2787
Credits : 1.5
Date : 2020-04-20 -- 2020-04-24
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 asequate way. 2. Be able to design and use supportive media for a successful presentation. 3. Know the basics of presentation techniques and rethoric. 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 feed back on the other students' presentations e. Reflecting on own learning and development during the course
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) start date of doctoral studies (priority given to earlier start date)
More information : PhD course 2787 Present your research is given both as a daytime class and as an evening class (please see the respective course occasions). This course occasion is given DAYTIME.
 The course will be given in a venue in central Stockholm. Please address ALL questions to: anna.hildenbrand.wachtmeister@ki.se or phone: 0707890607
 The course focuses on research presentations in different contexts. The course is highly interactiveand the teachers focus on the individual students and make a great effort to create an environment, where the students feel safe to practice and try new presentation approaches.

Course responsible :
Kristina Gemzell Danielsson
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0851772128
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Contact person :
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Title : Present your research!

Course number : 2787
Credits : 1.5
Date : 2020-05-25 -- 2020-05-29
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 asequate way. 2. Be able to design and use supportive media for a successful presentation. 3. Know the basics of presentation techniques and rethoric. 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 feed back on the other students' presentations e. Reflecting on own learning and development during the course
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) start date of doctoral studies (priority given to earlier start date)
More information : PhD course 2787 Present your research is given both as a daytime class and as an evening class (please see the respective course occasions). This course occasion is given DAYTIME.
 The course will be given in a venue in central Stockholm. Please address ALL questions to: anna.hildenbrand.wachtmeister@ki.se or phone: 0707890607
 The course focuses on research presentations in different contexts. The course is highly interactiveand the teachers focus on the individual students and make a great effort to create an environment, where the students feel safe to practice and try new presentation approaches.

Course responsible :
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Title : Present your research!

Course number : 2787
Credits : 1.5
Date : 2020-06-22 -- 2020-06-26
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 asequate way. 2. Be able to design and use supportive media for a successful presentation. 3. Know the basics of presentation techniques and rethoric. 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 feed back on the other students' presentations e. Reflecting on own learning and development during the course
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) start date of doctoral studies (priority given to earlier start date)
More information : PhD course 2787 Present your research is given both as a daytime class and as an evening class (please see the respective course occasions). This course occasion is given DAYTIME.

 The course will be given in a venue in central Stockholm. Please address ALL questions to: anna.hildenbrand.wachtmeister@ki.se or phone: 0707890607
 The course focuses on research presentations in different contexts. The course is highly interactiveand the teachers focus on the individual students and make a great effort to create an environment, where the students feel safe to practice and try new presentation approaches.

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Title : How to conduct systematic reviews and meta-analyses

Course number : 2790
Credits : 3.0
Date : 2020-04-20 -- 2020-05-06
Language : English
Level : Doctoral level
Responsible KI department : Department of Microbiology, Tumor and Cell Biology
Specific entry requirements : Students need to have basic knowledge of biostatistics (corresponding to KIs Basic Course in Medical Statistics or Biostatistics I) and it is recommended to have basic knowledge in epidemiology (corresponding to Epidemiology I course).
Purpose of the course : Meta-analyses are becoming the gold standard method of reviewing and summarising the scientific literature, and they have contributed greatly to the current body of scientific knowledge. This course aims to introduce the concepts and procedures of systematic reviews and meta-analyses, and will help applicants to get started with their own study.
Intended learning outcomes : At the end of the course the students should be able to: 1) Understand and demonstrate the value, principles and the different concepts related to systematic reviews and meta-analyses, in particular compared to other types of studies (incl. narrative reviews, original research); 2) Identify the strengths, limitations and pitfalls of systematic reviews and meta-analysis; 3) Independently formulate study hypotheses, and plan and generate a study protocol to perform a systematic review and meta-analysis, justifying the selection of the eligible studies and statistical methodology; 4) Apply basic methods of meta-analyses; 5) Critically reflect on other students individual project work and provide feedback in a scientifically constructive way (peer-review); 6) Interpret and critically evaluate scientific studies relevant to the course content.
Contents of the course : The course is designed for PhD students, in particular those who are at an early stage of their research education, and those with an interest in conducting systematic reviews and meta-analysis. The content of the course is as follows: 1) Basic concepts in systematic reviews and meta-analyses, 2) strengths, problems and limitations of systematic reviews and meta-analyses, 3) How to write a study protocol for a systematic review, 4) How to perform a systematic literature search (including a practical seminar organised by Karolinska Institutet library), 5) Data-extraction and quality assessment of included studies, 6) Statistical methods used in meta-analyses and interpretation, 7) Examination. This is a hands-on course, covering theoretical concepts and discussion of strengths, limitations and problems of systematic reviews and meta-analyses. We will also discuss publication guidelines, strategies to identify eligible studies, quality assessment of research papers, how to use Endnote to facilitate the systematic search, Excel for data-management, and different statistical methods and programs.
Teaching and learning activities : Interactive lectures, seminars, individual article review, group discussions, practical sessions (one on systematic literature search, one on statistical methods) and homework tasks 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. 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, peer assessment, article reviews and group discussions. Students will also peer-review each other's projects and this will form the basis for the final examination seminar. Throughout the course, the students will work on an individual project and will have to peer-review the project of another student. Further, students will critically review and discuss relevant scientific articles. There will be several group discussions with other students and experienced teachers, with a focus on peer-assessment (discussing each other's projects), and the lectures are interactive allowing for critical discussions.
Examination : 1) Individual project work: To develop a written comprehensive yet concise study protocol including several important aspects as discussed during the course; 2) Peer-review of other students' projects followed by an oral presentation of their own project and opposition of other students projects during the group examination; 3) Critically review scientific articles relevant to the course content. 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 (i.e. full first week of the course + exam). One is required to come well prepared for each seminar (see reading list). 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. Attendance is also compulsory for the examination, which includes discussion of the study protocol of each student + opposition for another student.
Number of students : 18 - 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). Since a basic understanding of biostatistics is required, and a basic understanding of epidemiology is recommended, please state relevant experience.
More information : All lectures and seminars will be organised at KI Solna campus. The first week is the most intense week, with lectures and workshops every day. The second week the student is expected to work on their individual study protocol, and we organise an "open office" on Wednesday before lunch, so all students can receive 1-to-1 feedback, for which attendance is not mandatory (although previous years almost all students attended). The exam will take place during the last day of the course (Wednesday whole morning) for which attendance is mandatory (in exceptional circumstances presence through Skype may be permitted). Please notify the course leader if you cannot attend one or more of the sessions during the first week. Absence will need to be replaced by

individual assignments following discussion with the course leader.

Course responsible :
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Contact person :
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Title : Applied longitudinal data analysis

Course number : 2798
Credits : 2.5
Date : 2020-04-28 -- 2020-05-07
Language : English
Level : Doctoral level
Responsible KI department : Department of Medical Epidemiology and Biostatistics
Specific entry requirements : Knowledge in epidemiology and biostatistics equivalent to ""Epidemiology I: Introduction to epidemiology"", ""Biostatistics I: Introduction for epidemiologists"" and ""Biostatistics II: Logistic regression for epidemiologists"" or corresponding courses.
Purpose of the course : The course gives an introduction to modern methods for the analysis of longitudinal and repeated measures studies which are commonly used in epidemiological studies and in clinical trials.
Intended learning outcomes : After successfully completing this course you as a student are expected to be able to: - Describe the statistical methods utilized to analyze longitudinal data in a variety of settings and with a variety of types of outcome variables. - Analyze a scientific problem that requires repeated measurements, identify an appropriate design, and identify the statistical methods required to analyze the data. - Utilize statistical software (e.g., Stata) to perform longitudinal analyses of data generated from randomized and observational studies with repeated measures designs. - Apply modern methods for the analysis of longitudinal data to a range of settings encountered in biomedical and public health research. - Interpret and communicate the clinical/scientific meaning of the results of a longitudinal analysis. 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 gives an introduction to modern methods for the analysis of longitudinal and repeated measures studies which are commonly used in epidemiological studies and in clinical trials. The defining feature of a longitudinal study is that measurements of the response are taken repeatedly through time on the same individuals. The primary goal of a longitudinal study is to characterize an outcome (and potentially change in that outcome over time) and the factors that influence the outcome (and its change). A feature of longitudinal data that complicates analysis is the positive correlation (i.e., lack of independence) among repeated observations and possible heterogeneity of variability across measurement occasions. The course covers the following topics: Introduction to longitudinal data, notation for correlated data, modeling the mean response (analysis of response profiles, parametric and semi-parametric trends), modeling the covariance, growth curves (trajectories), fixed effects models, and mixed effects models (that include random effects). This course is focused on general regression models for longitudinal data when the response variable is either continuous (linear models) or discrete (e.g., binary or count data that require logistic and Poisson models). Topics covered in the course will include: introduction to generalized linear models (e.g., linear, logistic, and Poisson regression), extensions of generalized linear models to longitudinal data, marginal models and generalized estimating equations (GEE), random effects models for continuous and categorical data (generalized linear mixed models), and contrasting marginal and mixed effects models. The course is intended for all students interested in epidemiology, biostatistics and public health.
Teaching and learning activities : Lectures, computer lab with exercises focusing on analysis of real data sets using statistical software (Stata), group discussions, literature review.
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) and an individual written take-home examination (summative assessment). The focus will be on understanding concepts and their application to analysis of epidemiological studies, rather than mathematical detail. 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. If the course is not offered during the following two academic terms, a third examination will be scheduled within 12 months of the final day of the course.
Compulsory elements : The individual written examination (summative assessment).
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 dates are April 28, 29, 30 and May 4, 5, 6, 7. Course leader is Nicholas P. Jewell, Professor of Biostatistics and Epidemiology at the London School of Hygiene & Tropical Medicine, London, UK and at the University of California, Berkeley, USA.

Course responsible :
Rino Bellocco
Department of Medical Epidemiology and Biostatistics

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Title : Integration of Neuroimaging and Cognition in Normal Aging and Dementia

Course number : 2846
Credits : 2.0
Date : 2020-05-11 -- 2020-05-15
Language : English
Level : Doctoral level
Responsible KI department : Department of Neurobiology, Care Sciences and Society
Specific entry requirements : Previous knowledge in cognitive processes, brain anatomy, neuroimaging and statistics (intermediate statistics) is a requirement.
Purpose of the course : The purpose of the course is to provide methodological tools to link neuroimaging data to cognitive performance and interpret such relationships in the field of normal and pathological aging.
Intended learning outcomes : After attending the course, the graduate student will be able to (1) describe and differentiate neural and cognitive profiles that accompany normal aging and different types of dementia (2) select the most appropriate methods in order to address scientific questions pertaining to neural correlates of cognitive functions, (3) identify, combine and test different risk factors for dementia (genetic, biological, environmental) on brain integrity and cognition, (4) compute analyses in the most commonly used neuroimaging softwares (e.g., SPM, Freesurfer).
Contents of the course : This course focuses on the study of the neural bases of cognitive decline in normal aging and dementia. The main neuroimaging methods included in this course are: Structural MRI (including volumetry and DTI), functional MRI, molecular PET and MRI (neurotransmission (e.g., dopamine) and markers of Alzheimer's disease amyloid-beta, iron). Each day of the course constitutes a specific subtopic. Day 1 is about ""the essentials"" on dementia, cognitive trajectories and neural changes in normal aging and dementia. On Days 2 and 3, cognitive and neuroimaging data will be integrated (day 2: structural and functional MRI; day 3: molecular neuroimaging PET/MRI, and multimodal and multivariate imaging). On Day 4, genetic, biological and environmental modifiers of cognition and neural integrity are considered. Presented findings will be discussed within the influential cognitive and brain reserve concepts during a seminar. On day 5, a workshop will conclude the week to foster the students' critical thinking and creativity when designing a study to test specific hypotheses.
Teaching and learning activities : The course contains: (1) short lectures that provide up-to-date knowledge about the brain correlates of cognitive decline in normal aging and dementia, (2) seminars where methods linking neuroimaging and cognitive data are discussed based on the literature, (3) hands-on sessions where the students compute analyses on real data. Each subtopic (e.g., atrophy and cognition in normal aging and dementia) includes one lecture with relevant literature, a seminar on the methods used to address the question of interest and/or hands-on implementing the methods on real data.
Examination : The students will be evaluated on group presentations during seminars and on an individual written examination consisting of an essay describing how the student can test his/her hypotheses related to his/her thesis based on the knowledge and methods acquired during the course. After the end of the course, one week is given to allow the students to send the essay.
Compulsory elements : All parts of the course are compulsory. Absence is compensated for by a written assignment.
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 : The course takes place every day from ca 9:00 to 16:00 with a lunch break and other short breaks in the morning and afternoon. Address: Karolinska Institutet, Widerströmska huset, Tomtebodavägen 18A, 171 65 Solna. Exact rooms will be announced later.

Course responsible :
Grégoria Kalpouzos
Department of Neurobiology, Care Sciences and Society

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Contact person :
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Title : Longitudinal Data Analysis - Classical and Modern Statistical Methods

Course number : 2858
Credits : 3.0
Date : 2020-05-04 -- 2020-05-15
Language : English
Level : Doctoral level
Responsible KI department : Department of Learning, Informatics, Management and Ethics
Specific entry requirements : Knowledge about regression models.
Purpose of the course : The aim of the course is to introduce statistical models and methods for the analysis of longitudinal data and to develop statistical skills of analyzing dependent data.
Intended learning outcomes : After successful completion of the course the student will be able to: 1. Understand the underlying characteristics of longitudinal data 2. Identify appropriate tests for longitudinal studies 3. Manage longitudinal datasets and prepare these for statistical analysis using statistical software program SPSS 4. Apply both simple and complex statistical methods of longitudinal data 5. Use SPSS to perform the above mentioned statistical analysis 6. Present and interpret the results of analysis.
Contents of the course : The main focus will be on frequently used statistical methods and how these should be used to provide more insight concerning research questions in longitudinal studies. Thus the course covers both classical and modern methods to analyze longitudinal data. Topics include Univariate repeated measures analysis of variance, Multivariate repeated measures analysis of variance, Drawbacks and limitations of classical methods; General linear models for longitudinal data; Linear mixed effects models. The underlying mathematical theory will not be stressed, and the main focus will be on concepts and applications.
Teaching and learning activities : Teaching methods include lectures, computer based exercise and seminars. Participants will have access to materials from a number of studies and are given the opportunity to use the statistical software program, SPSS during practice sessions. In addition, you will have seminars, group discussion and presentations.
Examination : Assessment of attainment of the intended learning outcomes by a passing grade on the computer based exercises, and the performance during the final seminar.
Compulsory elements : Computer based exercises, seminars, 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) 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 : The course will consist of four scheduled whole days per week for two weeks. Course dates: May 4-5, 7-8, 11-12 and 14-15.

Course responsible :
Mesfin Tessma
Department of Learning, Informatics, Management and Ethics

Mesfin.Tessma@ki.se

Contact person :
Elisabeth Löfgren
Institutionen för lärande, informatik, management och etik

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Title : Biomedical Ecology - The microbiota in health and disease

Course number : 2861
Credits : 1.5
Date : 2020-03-09 -- 2020-03-13
Language : English
Level : Doctoral level
Responsible KI department : Department of Microbiology, Tumor and Cell Biology
Specific entry requirements :
Purpose of the course : To support the acquisition of a broad knowledge and systematic understanding of the composition and function of the microbiota during the life cycle, how it might be influenced by diet and disease, and of host-microbe cross-talk. To introduce tools and methodologies that will enable the participants of the course to study the microbiota.
Intended learning outcomes : After finishing the course the student should be able to show an in-depth and up-to-date specialist knowledge about: - the composition and function of the microbiota and its cross-talk with the host, - the establishment of the microbiota during different stages of life, and its impact on the development and function of the immune system and host tissues, - the role of how an altered microbial function and/or dysbiosis might occur in connection with different diseases/disturbances. The student should be able to show familiarity with, and insight in: - methods to study the microbiota as well as basic data analyses and interpretation, - the microbiota as the largest metabolic organ in the body and its physiological and pathophysiological role in health and disease, - the role of the host-microbiota cross-talk in health and disease.
Contents of the course : The course will cover the aspects of the composition and function of the microbiota from birth, during life and the ageing period, how it might be influenced by diet and disease, and host-microbe crosstalk. Sequencing techniques and principles for basic bioinformatics data analyses will be introduced and compared to biochemical methods. Novel findings will be discussed by lecturers in the research front-line on the translational topics of microbiota in relation to human diseases. The course is suitable for clinical and pre-clinical doctoral students and researchers for which the microbiota is of significance.
Teaching and learning activities : The course combines lectures, student workshops, and practical laboratory work as follows: -lectures by well established front-line researchers in their respective fields, -laboratory sessions covering analysis of the students' own intestinal E. coli microbiota, -workshops/combined with focused literature studies within defined areas which will be summarized in terms of student seminars, -peer learning using the competence of the lecturers and course attendees.
Examination : Summative examination includes laboratory work and student presentations that are evaluated by the respective tutor at the specific course module and written examination of the course content.
Compulsory elements : Laboratory work and student seminars. Participants that are absent from the laboratory part and seminars will have to present a written paper on the subject and in agreement with the indications of the course director.
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 : Lectures will be at Biomedicum B0313 (except for Thursday March 12th, 11.00-12.00, when it will be in room B0412). The course lab section will be at Scheeles väg 2, Karolinska Institutet, Solna Campus.

Course responsible :
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Contact person :
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Emma Fransson
Institutionen för mikrobiologi, tumör- och cellbiologi

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Title : Microscopy: improve your imaging skills - from sample preparation to image analysis

Course number : 2870
Credits : 6.0
Date : 2020-01-21 -- 2020-02-07
Language : English
Level : Doctoral level
Responsible KI department : Department of Biosciences and Nutrition
Specific entry requirements : Participants must have used a microscope to acquire digital images of fluorescently labelled samples during the past 1 year and be able to prepare their own samples at own department at the start of the course.
Purpose of the course : The aim for this course is to improve the microscopy skills of students and researchers who have already used a microscope to acquire digital images of fluorescent samples and want to improve their skills.
Intended learning outcomes : At the end of the course, the participants will be able to: 1- Describe the difference between wide field and confocal microscopes as well as the different types of confocal microscopes and choose which system is most suited to their experiments 2- Pick the best combination of fluorophores for their experiment by matching their spectra with the microscope light source and filters, identify and eliminate bleed-through and cross-excitation problems 3- Explain objective specifications and limitations and choose the appropriate objective for their own experiments 4- Describe how to fix, mount and handle their sample in a way that is optimal for imaging 5- Find their sample and the area of interest without bleaching it 6- Adjust the condenser for proper DIC imaging (Koehlering) 7- Explain how to set the following parameters on a confocal or a wide field system to best match the requirements of their sample and reliably answer their scientific question: resolution, pixel size, averaging, scan speed, illumination power, detector gain and offset, camera readout rate, exposure time and camera binning 8- Explain which applications require a hardware or a software autofocus, a spectral detector, a resonance scanner, light sheet, two-photon or super resolution microscopy 9- Explain the advantages in using the automation of a microscope system to collect multidimensional data 10- Explain how to deal with images before publication in scientific journals 11- Run a simple image analysis on freeware (ImageJ/FIJI, Cell Profiler) and describe the imaging requirements for automated image analysis 12- Critically comment on their peers' imaging settings and troubleshoot their images
Contents of the course : The course is NOT aimed at training people to use the LCI unit microscopes. The focus is instead on providing the students with enough theoretical and practical knowledge so that, when they go back to their lab, they are able to properly use the hardware available there and so that they fully understand each parameter they need to set in the software. The aim is to provide them with the tools to acquire on ANY wide field or confocal microscope, images that exactly match their samples and answer their scientific questions in a reliable way. The participants will learn the theory and many practical tricks about the parameters and hardware used in wide field and confocal imaging, how to identify and avoid imaging artefacts, deal with the challenges of imaging fluorescent volumes, get started with automated image analysis, as well as how to handle scientific images for publication. They will also hear many tricks about fixation, mounting and handling of their sample in a way that is optimal for imaging and they will learn about more advanced microscopy techniques. Through the workshop where we will image their own sample, they will get tons of personalized tips on how to improve the preparation and imaging of their own sample.
Teaching and learning activities : Lectures, videos, workshops, peer review, image troubleshooting in groups, project presentations.
Examination : The final mark (pass or fail) will depend on the results of: 1. The weekly assignments 2. The skills shown in each workshop 3. The written examination at the end of the course. The student has to show that all intended learning outcomes of the course have been reached.
Compulsory elements : Attendance to all sessions is compulsory. Any absence must be reported to the course leader 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 exceptional cases be compensated by a written additional assignment to ensure the learning outcomes of the day have been reached. If it is not possible to compensate, the student will be given a chance to complete the course by attending the missing sessions the following year.
Number of students : 10 - 16
Selection of students : The selection will be made based on the wwritten motivation in the application. The application must describe the student's research project, their past experience using fluorescence microscopy and how useful this technique is to their research project. The participants will be selected based on the usefulness of the course to their research project.
More information : The detailed program of the course can be found on the LCI website (https://ki.se/en/bionut/welcome-to-the-lci-facility). Presence at the course is mandatory 3 days/week during 3 consecutive weeks, from 09:00 to 17:00 as well as for the examination, on the last day of the 3rd week. The course counts for 4 weeks because some time before, during and after these 3 weeks is used in preparing samples and to complete assignments. The venue is the Live Cell Imaging facility at KI Flemingsberg campus in the Neo building. This course is run in parallel with course 2871 “Microscopy: improve your imaging skills”.

Course responsible :
Sylvie Le Guyader

Department of Biosciences and Nutrition

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Contact person :
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Title : Microscopy: improve your imaging skills

Course number : 2871
Credits : 4.5
Date : 2020-01-21 -- 2020-02-07
Language : English
Level : Doctoral level
Responsible KI department : Department of Biosciences and Nutrition
Specific entry requirements : The participants to this course must have used a microscope to acquire digital images of fluorescently labelled samples within the past 1 year.
Purpose of the course : The aim for this course is to improve the microscopy skills of students and researchers who have already used a microscope to acquire digital images of fluorescent samples and want to improve their skills.
Intended learning outcomes : At the end of the course, the participants will be able to: 1- Describe the difference between wide field and confocal microscopes as well as the different types of confocal microscopes 2- Pick the best combination of fluorophores for their experiment by matching their spectra with the microscope light source and filters, identify and eliminate bleed-through and cross-excitation problems 3- Explain objective specifications and limitations 4- Explain the theory behind settings the following parameters on a confocal or a wide field system to best match the requirements of their sample and reliably answer their scientific question: resolution, pixel size, averaging, scan speed, illumination power, detector gain and offset, camera readout rate, exposure time and camera binning 5- Explain which applications require a hardware or a software autofocus, a spectral detector, a resonance scanner, light sheet or two-photon microscopy or super resolution 6- Explain the advantages in using the automation of a microscope system to collect multidimensional data 7- Explain how to deal with images before publication in scientific journals 8- Run a simple image analysis on freeware (ImageJ/FIJI, Cell Profiler) and describe the imaging requirements for automated image analysis
Contents of the course : The students will learn the theory about the parameters and hardware used in in wide field and confocal imaging, how to identify and avoid imaging artefacts, deal with the challenges of imaging fluorescent volumes, as well as how to handle scientific images for publication. They will also learn about more advanced techniques.
Teaching and learning activities : Lectures, videos, peer review, image troubleshooting in groups.
Examination : The final mark (pass or fail) will depend on the results of: 1. The weekly assignments 2. The skills shown in each workshop 3. The written examination at the end of the course. The student has to show that all intended learning outcomes of the course have been reached.
Compulsory elements : Attendance to all sessions is compulsory. Any absence must be reported to the course leader 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 exceptional cases be compensated by a written additional assignment to ensure the learning outcomes of the day have been reached. If it is not possible to compensate, the student will be given a chance to complete the course by attending the missing sessions the following year.
Number of students : 1 - 20
Selection of students : The selection will be made based on the application text. The application must describe the student's research project, their past experience using fluorescence microscopy and how useful this technique is to their research project. We aim to improve the skills of people who have already done microscopy. It is mandatory that students have acquired images on a microscope within the past 1 year. The participants will be selected based on the usefulness of the course to their research project.
More information : The detailed program of the course can be found on the LCI website (https://ki.se/en/bionut/welcome-to-the-lci-facility). Presence at the course is mandatory 3 days per week during 3 consecutive weeks, mostly (with exceptions) from 10:00 to 15:00 (see detailed program), as well as for the examination, on the last day of the 3rd week. The rest of the time is used in preparing assignments. The course counts for 4 weeks because some time before, during and after these 3 weeks is used for assignments. The venue is the Live Cell Imaging facility at KI Flemingsberg campus in the Neo building. This course is run in parallel with course 2870 ”Microscopy: improve your imaging skills - from sample preparation to image analysis”.

Course responsible :
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Contact person :
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Title : Kvalitetssäkring av klinisk forskning

Course number : 2873
Credits : 1.5
Date : 2020-02-10 -- 2020-02-14
Language : Swedish
Level : Forskarnivå
Responsible KI department : Department of Medicine, Solna
Specific entry requirements :
Purpose of the course : Kursen ger deltagaren kunskap och förståelse för vad som krävs för att kvalitetssäkra klinisk forskning. Du kommer efter kursen veta hur man ska göra för att säkert och i enlighet med lokala och nationella regelverk, etiska riktlinjer och internationella överenskommelser genomför klinisk forskning. Kursen är användbar för dem som arbetar med translationell eller klinisk laboratorieforskning. Den är också värdefull för forskare som arbetar med kvalitetsregister i vården, annan registerforskning och epidemiologisk forskning. Särskilt stort värde har kursen för de forskare som arbetar med interventioner av olika slag som medicinsk teknik eller kliniska prövningar. Utöver den kompetens kursen ger dig kommer du att kunna avlägga test för erhållande av ett internationellt gångbart certifikat i ICH-GCP (International Conference on Harmonisation - Good Clinical Practice). Oavsett forskningsområde kommer du förstå vikten av att sätta patientens säkerhet främst, och hur man gör för att skapa säkra data som andra kan lita på.
Intended learning outcomes : Kunskap och förståelse - Ha kunskap om hur man dokumenterar data så att samtliga moment i en klinisk forskningsprocess kan återskapas på ett tillförlitligt sätt - Förstå innebörden av Helsingforsdeklarationen och Good Clinical Practice så att forskningspersoners autonomi och integritet alltid sätts i första rummet - Ha kännedom om nationell, europeisk och internationell lagstiftning, vilka projekt som kräver ansökan till olika myndigheter och hur detta går till Färdighet och förmåga - Ha förmåga att avgöra vilka olika ansvar som prövare, medarbetare och sponsor har i en klinisk prövning - Ha förmåga att sammanfatta ett projektförslag i en synopsis och utifrån detta göra en riskanalys över ett projekt - Visa färdighet i att använda enklare statistiska metoder för att avgöra ett projekts vetenskapliga validitet Värderingsförmåga och förhållningssätt - Kunna värdera forskningsprojektförslag utifrån patientens perspektiv med ett etiskt och vetenskapligt förhållningssätt - Visa förmåga att värdera information från olika källor framförallt databaser på internet
Contents of the course : Kursen ger kunskaper om forskningsetik och hur ansökan till olika myndigheter görs, kunskap om kliniska prövningar, utveckling av nya behandlingar och då särskilt läkemedel, säkerhetsrapportering till myndigheter, personuppgiftslagen, etik-prövningslagen, biobankslagen och patientdatalagen, arkivering, internationella register över kliniska prövningar, riskanalys och viss statistik
Teaching and learning activities : Kursen är en distansutbildning. Den omfattar två huvudspår som delvis går parallellt. Det ena utgör arbete i grupp kring olika arbetsuppgifter som redovisas. Det andra utgörs av inläsning av GCP-regler. Pedagogiken baseras flipped classroom som innebär att läsanvisningar ges tidigt och att studenten därefter individuellt och i grupp arbetar med olika problem, fall och case. Förslag på lösningar presenteras och diskuteras under lärarhandledning. Frågestunder erbjuds under kursen. Inläsningen stöds av frågor som studenten kan använda för att kontrollera sin egen inlärning. Enstaka föreläsningar som webinars kan komma att ges, beroende på den enskilda kursens behov.
Examination : Utöver ett godkänt grupparbete kommer det att ges en individuell examination med flervalsfrågor.
Compulsory elements : Varje student måste delta i godkänt grupparbete. Varje student måste visa aktivitet på kursens hemsida i form av minst fem frågor, presentationer och/eller kommentarer på andras inlägg. Frånvaro eller brist på online aktivitet kan efter examinators bedömning kompenseras med en individuellt skriven uppsats.
Number of students : 20 - 25
Selection of students : Urvalet baseras på 1) kursplanens relevans för den sökandes doktorandprojekt (enligt motivering), 2) startdatum för doktorandstudier.
More information : Kursen ger en introduktion den första dagen i Stockholm. Resten av kursen består av webbaserade studier, individuellt och i grupp. Vissa moment är obligatoriska, bland annat ett webinar under onsdag eftermiddag.

Course responsible :
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Contact person :
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Institutionen för medicin, Solna

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Title : Quality assurance of clinical research

Course number : 2873
Credits : 1.5
Date : 2020-03-02 -- 2020-03-06
Language : English
Level : Doctoral level
Responsible KI department : Department of Medicine, Solna
Specific entry requirements :
Purpose of the course : This course provides the participant with the knowledge needed to secure the quality in clinical research. It gives an understanding of what is required to act safely and in accordance with local and national legislation, ethical guidelines and international treaty's when involved in clinical research. The course is useful for those working with translational or clinical laboratory research. It is valuable for researchers working with patient quality registries, other types of health registries and in epidemiology. It gives great value to researchers concerned with interventional studies including medicinal products, surgical treatments or pharmaceutical treatments. Beyond the competence you will get, you can also take a test for an internationally recognized certificate in ICH-GCP (International Conference of Harmonisation - Good Clinical Practice). Regardless of your research area, you will after this course understand how to protect patient's safety, and how to create trustful data.
Intended learning outcomes : Knowledge and understanding Knowledge on how to document data so all moments in a clinical research process can be recreated in a secured way Understand the meaning of the Helsinki Decaration and Good Clinical Practice so that research subjects autonomy and integrity always remain the first priority Knowledge on Swedish, European and international legislations, on which projects that need to be applied for and to which authority, and how such applications are done Skills and abilities Able to decide what different responsabilities the investigator, study team members and sponsor has in the clinical trial Able to summarise a project proposal into a synopsis and based on that make a risk-benefit analysis of the project Able to use simple statistical tools to judge a project proposal's scientific validity Judgement and approach Able to judge project proposals from the patient perspective including a scientific and sound ethical approach Able to evaluate information from different internet database sources
Contents of the course : The course provides insights into research ethics, and how applications to different authorities are done, it presents how clinical trials are undertaken, and how development of new treatments, in particular medicinal products, are done, and how safety reporting to authorities is done. The following laws, regulations and sources are discussed: Act on integrity of personal data, Act on ethical review of research projects, Act on biobanking, Act on patient data in health care, Act on archiving, and international registry's on clinical research. Risk analysis and some statistics are discussed.
Teaching and learning activities : The course is based on e-learning. There are two tracks, in part parallel. One track is based on group work around cases that are presented to the course. The other track is based on individual studies of GCP regulations. Both tracks include study material and tutor support. The pedagogy is based on flipped classroom meaning that instructions and learning resources will be made available early to support the individual learning and group works. Cases and their solutions will be presented and discussed under teachers supervision. Q&A will be provided. The GCP studies will be supported by MC self tests. Webinars may be provided, pending the need from the course.
Examination : In addition to an approved group work there will be an individual multiple choice examination.
Compulsory elements : Each student must participate in a group work. Each student must show activity on the course's home page with at least five questions, presentation and/or comments on others postings. Absence or lack of online activity can after the examiner's assessment be compensated by an individually written essay.
Number of students : 20 - 25
Selection of students : Selection of students will be based the relevance of the syllabus in view of the PhD-project according to the application, and starting date för PhD-studies.
More information : The course starts with a face to face meeting in Stockholm. The rest of the course is webbased and include individual and group work. There is a mandatory webinar on Wednesday afternoon.

Course responsible :
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Contact person :
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Title : Current advances in atherosclerosis research

Course number : 2878
Credits : 1.5
Date : 2020-01-29 -- 2020-03-04
Language : English
Level : Doctoral level
Responsible KI department : Department of Medicine, Solna
Specific entry requirements : Participants should have a basic knowledge of atherosclerosis.
Purpose of the course : This course will provide an historical and contemporary overview of the major discoveries in atherosclerosis research. The course is specially planned to support the PhD students in the area of cardiovascular research by giving them an opportunity to deepen their understanding of the molecular mechanisms involved in atherosclerosis.
Intended learning outcomes : At the end of the course the participant should be able to: - Recognize the major breakthroughs that led to atherosclerosis being seen as a chronic inflammatory disease rather than a mere lipid disorder. - Present and discuss these findings in the form of a seminar. - Critically evaluate research papers in small groups. - Hypothesize new therapeutic opportunities for the treatment of cardiovascular disease.
Contents of the course : 1 Atherosclerosis as an immune disease: Major clinical and experimental findings supporting this notion. 2 Possible approaches to investigate atherosclerosis. 3 The role of the immune system in atherosclerosis. 4 Anti-inflammatory therapies for cardiovascular disease. 5 Hot topics in atherosclerosis.
Teaching and learning activities : The course consists of 10 half-day sessions: 5 sessions (study time) will be used by the students to prepare for the seminars (5). During each seminar one or several specific aspects of research in atherosclerosis will be studied. A typical structure for a seminar involves: - An introduction about the topic-of-interest by an invited expert. - Presenting, analyzing and discussing an assigned paper following a journal club style where everyone is expected to participate.
Examination : Formative assessments will be conducted throughout the seminars. All the intended learning outcomes will be assessed. To pass the course, a participant has to: - Actively participate in the discussions during the seminars. - Present a selected publication relevant to the subject (working in small groups). - Demonstrate a true understanding of research perspectives of atherosclerosis.
Compulsory elements : All group discussions are compulsory
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 activities (5 seminars) will take place at Karolinska University Hospital in Solna between January 29 and March 4.

Course responsible :
Anton Gisterå
Department of Medicine, Solna

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Contact person :
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Title : Manuscript writing in English

Course number : 2912
Credits : 1.5
Date : 2020-05-11 -- 2020-05-15
Language : English
Level : Doctoral level
Responsible KI department : Department of Clinical Science and Education, Södersjukhuset
Specific entry requirements :
Purpose of the course : The purpose of this course is to increase the competence and efficiency of the doctoral students in academic writing with a focus on writing scientific manuscripts. The ability to publish in high quality scientific journals is crucial for a successful completion of the doctoral education and pursuing a career that requires a PhD. Participation in this course is thus likely to benefit the students in both short- and long-term perspective.
Intended learning outcomes : After completing the course the students should be able to: (1) prepare for writing a manuscript and choose an approach to write the manuscript, (2) compose the first draft consisting of the standard structures, (3) choose and use tables, figures, graphs, photographs, and schematic diagrams appropriately, (4) revise the first (and subsequent) drafts for clarity, brevity, coherence and readability, (5) improve choices of words, and styles of sentence constructions, (6) write grammatically correct texts, punctuations, numbers as numbers, and numbers as words, (7) submit a manuscript, address the comments from the referees, and resubmit the manuscript.
Contents of the course : The process approach of writing; literature review; plagiarism, ethical issues, permissions, and authorship issues; choice of journals; how to write the different parts e.g. introduction, materials and methods, results, discussion, conclusion, acknowledgement, references, abstract, and title of a manuscript; tables, figures, graphs; statistics; tense, spelling and grammar; readability, clarity and brevity; abbreviations and acronyms; numbers as numbers, and numbers as words; choice of words, active and passive voices; which and that; subject verb agreement, correct placement of modifiers, punctuations, capitalizations; submission format, common mistakes in grammar and choice of words; how to reply to the comments of the referees, revise and resubmit; practical tips; how to overcome writers´ block.
Teaching and learning activities : We shall use the concepts of active learning, flipped classroom, deliberate practice, and formative and summative assessments as the main methods for teaching and learning in this course. Instead of traditional lectures, there will be small-group interactive learning sessions, interspersed with probing questions, tasks, group-works, and individual studies. Students will solve problems and perform writing tasks that are constructed by the teachers, with well-defined learning objectives. Students will receive accurate and immediate feedback from the peers and the teacher to facilitate learning. During the course, students will write part of their own manuscript under the supervision of the teacher.
Examination : Participants will write part of their own manuscript (approximately 2000 words) where they will incorporate the newly acquired knowledge from the course.
Compulsory elements : Presence in all of the scheduled sessions and participation in the writing tasks are obligatory. Absence should be compensated for in accordance with the indications of the course director.
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 held at the Department of Clinical Science and Education, Södersjukhuset (Metro Skanstull, Buss: 3 to Södersjukhuset) from 09:00 to 16:00 during the week-days, including time for "flipped classes".

Course responsible :
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Contact person :
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Title : Diabetes and cardiovascular diseases

Course number : 2916
Credits : 0.6
Date : 2020-02-05 -- 2020-03-04
Language : English
Level : Doctoral level
Responsible KI department : Department of Medicine, Solna
Specific entry requirements : Undergraduate study in medicine or biomedicine
Purpose of the course : To provide an overview of diabetes epidemiology, pathophysiology and treatment options in a cardiovascular perspective.
Intended learning outcomes : The participants should after the course 1. be able to show a good insight into the pathophysiological mechanisms linking diabetes to cardiovascular disease 2. understand the prognostic influence of diabetes on cardiovascular diseases 3. show an insight in preventive measures for diabetes and cardiovascular disease 4. know how to detect and treat diabetes from a cardiovascular perspective 5. be aware of gaps in knowledge in the relation between diabetes and cardiovascular disease
Contents of the course : Lectures/Seminars on the following topics: Diabetes and cardiovascular disease - why is this combination important? Screening and prevention of diabetes and cardiovascular disease. Glucose lowering treatment and hypoglycemia from a cardiovascular perspective. Heart failure and diabetes. Biomarkers, genetics and epigenetics in diabetes and cardiovascular disease.
Teaching and learning activities : Lectures/Seminars. Debates about clinical issues. Group work. Presentation of and discussion about assigned group work.
Examination : In collaboration with other course participants, to prepare and present a written synopsis of a study protocol on topics given by the faculty members.
Compulsory elements : The course participants should attend all course lectures and sessions of group work and presentations/discussions. The participants who have missed some of the sessions will be assigned additional reading and essay work to compensate for the absence.
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 includes three half-day lectures:
 Day 1, Feb 5, 2020; 13.00-16.00
 Day 2, Feb 12, 2020; 13.00-16.00
 Day 3, March 4, 2020; 13.00-16.00
 Preparation of group work will be assigned during week 8 and 9.

 Updated course literature:
 Cosentino F et al ;2019 ESC Guidelines on diabetes, pre-diabetes, and cardiovascular diseases developed in collaboration with the EASD.
 Eur Heart J. 2019 Aug 31. pii: ehz486. doi: 10.1093/eurheartj/ehz486. [Epub ahead of print] No abstract available. PMID: 3149785

Course responsible :
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Lars Rydén
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Title : Public Health Research - Concepts and Theories

Course number : 2928
Credits : 3.0
Date : 2020-06-01 -- 2020-06-12
Language : English
Level : Doctoral level
Responsible KI department : Department of Public Health Sciences
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 : 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 :
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Institutionen för folkhälsovetenskap

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Title : Statistics with R - from data to publication figure

Course number : 2953
Credits : 3.0
Date : 2020-03-16 -- 2020-04-03
Language : English
Level : Doctoral level
Responsible KI department : Department of Laboratory Medicine
Specific entry requirements : none
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. Campus lectures and computer work using your own computer. Individual project work. 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 : First two weeks are online-based, the third week has approximately 50% scheduled time at at Flemingsberg Campus.

Course responsible :
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Title : Introduction to R

Course number : 2958
Credits : 1.5
Date : 2020-03-30 -- 2020-04-03
Language : English
Level : Doctoral level
Responsible KI department : Department of Medical Epidemiology and Biostatistics
Specific entry requirements : Biostatistics I: Introduction for epidemiologists or corresponding courses.
Purpose of the course : The purpose of this course is to introduce students to using the R statistical software to perform basic to intermediate statistical data analysis in a replicable manner.
Intended learning outcomes : After successfully completing this course, students are expected to be able to: - explain basic concepts of the R language and environment, the online- and offline sources of documentation for R, and basic concepts of data management and workflow in a standard statistical analysis, - run a standard statistical analysis interactively within the R environment, - formalize and document such a standard analysis as a stand-alone R script, - produce graphical representations, as part of reporting their analysis, - interpret their scripts for potential simplifications via functional implementation, - find, install and compare extension packages for unfamiliar statistical applications.
Contents of the course : The course will cover the basic elements of a standard statistical workflow: reading data into R; pre-processing and quality assessment of data via numerical and graphical methods; descriptive statistics via summary measures, tabulations and graphics; basic statistical inference in terms of significance testing and confidence intervals; specification, fitting & diagnosis of regression models; exporting and reporting results from the previous steps. The course includes an introduction to the Rstudio integrated development environment to provide a common framework for interactive and scripted analysis. The extensibility of the R system will be demonstrated by example.
Teaching and learning activities : Course days will be organized around a common theme, with concepts and background covered in the mornings via presentations, demos, in-class exercises and discussions, and practical application via individual and small-group lab exercises in the afternoons. Formative assessment will be integrated via in-class quizzes and lab reviews.
Examination : Students will perform an open-book examination based on practical application of the concepts presented during the course to realistic data sets and problems. Students who do not pass the examination will be offered a second examination within two months from the end of the course (excluding academic holidays).
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 :

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Title : Fundamentals of statistical modeling

Course number : 2959
Credits : 1.5
Date : 2020-05-25 -- 2020-05-29
Language : English
Level : Doctoral level
Responsible KI department : The institute of Environmental Medicine
Specific entry requirements : Courses ""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 corresponding courses.
Purpose of the course : The purpose of this advanced course is to provide an introduction to the tools of statistical modeling.
Intended learning outcomes : After successfully completing this course the students should be able to do the following independently of others: - explain the concepts of marginal and conditional distributions, - illustrate the relationship between cumulative distribution, probability mass/density, quantile, sparsity, cumulative hazard, and hazard functions, - propose possible models for the above functions both marginally and conditionally on covariates, - identify suitable models to answer scientific research questions and motivate the choice, - estimate the parameters of the above functions, and - use standard statistical software, evaluate the fit of the model, and critically interpret the results.
Contents of the course : The students are introduced to a general framework for data analyses that hinges on creating statistical models. The course focuses on the intricacies and potentials of modeling in a number of examples and real-data applications. The range of the covered examples is broad, and some examples are worked out in greater details than others. The course will enable students to gain an advanced knowledge of (1) random variables, (2) joint and conditional probability distributions, (3) modeling tools, (4) interpretation of statistical models, (5) relations between known methods, (6) estimation tools, (7) computer programming. The students will improve the level of knowledge of the foundations for data analysis, statistical practice, and use of statistical software. They will also be prepared to pursue more advanced studies in statistics. The focus of the course is on analysis of real data and interpretation.
Teaching and learning activities : The course activities are based on lectures and computer exercises, exercises not requiring statistical software, and literature review. We will provide laptop computers to all participants, but participants are welcome to bring their laptops if they prefer.
Examination : Individual written examination based on practical application of the course content, where the student has to show that all the intended learning outcomes have been achieved. Students who do not pass the examination will be offered a second examination within two months from the end of the course.
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 individual examination will be performed as a take home examination.

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Title : Open science and reproducible research

Course number : 2963
Credits : 3.0
Date : 2020-03-23 -- 2020-04-03
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 held at Campus Solna. Materials from when the course was given in the spring of 2018 are available here: https://osf.io/9qsfr/. The course is given jointly by the doctoral programmes in Neuroscience and Cell Biology and Genetics. See: http://ki.se/medarbetare/forskarutbildningsprogram.

Course responsible :
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Contact person :
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Title : Medicinsk forskningsetik

Course number : 2964
Credits : 1.5
Date : 2020-02-03 -- 2020-02-07
Language : Swedish
Level : Forskarnivå
Responsible KI department : Department of Learning, Informatics, Management and Ethics
Specific entry requirements :
Purpose of the course : Syftet med kursen är att den forskarstuderande: - ska få förståelse för centrala forskningsetiska teorier, principer och riktlinjer och därmed få möjlighet att reflektera över etiska aspekter av den egna forskningen - ska få förståelse för vad som är god vetenskap samt var gränserna går för vad som är etiskt oacceptabel forskning både vad gäller forskning på människor och djur, samt vad som gäller för forskarens egen hederlighet - utvecklar ett forskningsetiskt förhållningssätt inom sin egen forskning, gentemot andras forskning och det omgivande samhället
Intended learning outcomes : Den forskarstuderande ska efter avslutad kurs kunna: - redogöra för forskningsetiska teorier, principer och, i viss mån, riktlinjer - kunna redogöra för vanliga forskningsetiska problemsituationer - identifiera, analysera och diskutera forskningsetiska problem och konflikter - genomföra en forskningsetisk argumentation för eller emot ett förfarande
Contents of the course : - Centrala forskningsetiska principer, teorier och argument - Centrala vetenskapsteoretiska begrepp och positioner, och dess relevans för forskningsetik - Forskning på människor, innefattande det informerade samtycket och dess komponenter - Försöksdjursetik, innefattande argument för och emot att använda djur för forskningsändamål, samt de 3 R:en - Etikprövningar och forskningsetiska riktlinjer, såsom Helsingforsdeklarationen - God vetenskaplig sed och avvikelser från god sed i forskningen, exempelvis frågor kring fabricering, förvanskning och plagiering, samt hantering av vetenskapligt författarskap - Intressekonflikter i samband med forskning, såsom jäv och sponsring
Teaching and learning activities : Föreläsningar, grupparbeten och plenumdiskussioner.
Examination : Deltagaren genomför en skriftlig forskningsetisk reflektion företrädesvis angående det egna forskningsprojektet. Ett fåtal studenter ges möjlighet att muntligt redovisa en forskningsetisk reflektion, i relation till samtliga lärandemål, angående sin forskning för samtliga deltagare.
Compulsory elements : Gruppdiskussioner och plenumdiskussioner är obligatoriska. Vid frånvaro kan studenten i viss utsträckning kompensera detta genom att lämna in skrivna svar angående de fall som diskuterats.
Number of students : 30 - 35
Selection of students : Urvalet baseras på 1) datum för doktorandregistrering (där tidigare registreringsdatum har förtur), 2) kursplanens relevans för den sökandes doktorandprojekt (enligt motivering).
More information : Denna kurs innehåller obligatoriska moment under varje kursdag och studenterna förväntas därför närvara samtliga kursdagar.

Course responsible :
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Title : Medical research ethics

Course number : 2964
Credits : 1.5
Date : 2020-03-09 -- 2020-03-13
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 honesty - 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.
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.
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 - 35
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, and the students are therefore expected to be present during each course day.

Course responsible :
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Title : Medical research ethics

Course number : 2964
Credits : 1.5
Date : 2020-03-30 -- 2020-04-03
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 honesty - 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.
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.
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 - 35
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, and the students are therefore expected to be present during each course day.

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Title : Medical research ethics

Course number : 2964
Credits : 1.5
Date : 2020-05-04 -- 2020-05-08
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 honesty - 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.
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.
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 - 35
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, and the students are therefore expected to be present during each course day.

Course responsible :
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Title : Introduction to R - data management, analysis and graphical presentation

Course number : 2971
Credits : 2.5
Date : 2020-01-15 -- 2020-02-17
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 theroretical background, underlying assumptions or the theoretical intepretation of the results.
Teaching and learning activities : Lectures and online video material, practical exercises (individual and group assignments), peer assessment of other students' solutions.
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 extention 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 held at Karolinska University Hospital Huddinge. Course dates: 15/1, 17/1, 24/1, 31/1, 7/2, 14/2, 17/2. Between these course dates, there will be deadlines for mandatory home assignments. Laptop required for programming exercises.

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Title : Extensions to the design and analysis of case-control studies

Course number : 2991
Credits : 1.5
Date : 2020-03-04 -- 2020-03-10
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 case-control data and to design case-control studies that will extend the 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 cohort from a (nested) case-control sample and recognise that two-stage designs, re-use of case-control data, and extended/extreme case-control designs 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 statistical approaches that enable researchers to design more efficient case-control studies and to exploit more efficiently the data provided by nested case-control studies conducted in well-defined cohorts (such as national registers). In particular, the course will focus 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 the application of these methods to re-use controls from a prior study or after breaking the matching in a matched case-control study, conduct more flexible and informative analysis, and make efficient use of costly data.
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 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 March 4, 5, 6 and 9, 10.

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Title : Anaesthesia, analgesia and surgery (mice and rats)

Course number : 2996
Credits : 1.5
Date : 2020-05-04 -- 2020-05-08
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 endorsed by Swedish legislation L150 (SJVFS 2017:40). 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 data 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, specifically in 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 use of euthanizing mice and rats will also be covered.
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, seminar lectures, discussions, interactive sessions and practical components. In addition to three e-learning modules on laboratory animal welfare, laboratory animal anaesthesia, and laboratory animal euthanasia, nine face-to-face seminar lectures will be given: - Introduction to anaesthesia - basic principles and definitions, anaesthesia and the 3Rs (replacement, reduction and refinement), selection of anaesthetics. - Preparation for anaesthesia, inhalational anaesthesia. - Injectable anaesthetics. - Monitoring anaesthesia and intra-operative care. - Long term anaesthesia and use of ventilators and neuromuscular blocking drugs. - Post-operative care - fluids, nutrition and nursing care. - Pain assessment and pain alleviation. - Surgery and aseptic techniques (1). - Surgery and aseptic techniques (2). The seminars incorporate video material and lecture notes will be provided. The course also includes problem solving sessions, which 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. Interactive problem based sessions will be included to facilitate discussions. Interactive sessions will be used throughout the seminars to encourage participation and engagement by the students. Laboratory practical sessions (5-6 hours) on anaesthesia and surgical skills are interspersed with the seminars and interactive sessions.
Examination : Practical skills are assessed during the laboratory session using direct observation of practical skills, and a short answer/multiple choice question final written 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 face-to-face sessions and active student participation are compulsory 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 : 8 - 16
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 criterium will be used based on the date for registration as a doctoral student (priority given to earlier registration date).
More information : This course will be held from Monday to Friday between approx. 9am and 5pm. Location: Learning Lab at Comparative Medicine (Solna). Key topics of this course include basic and advanced anaesthetic and analgesia, and basic surgical procedures on laboratory animals, with focus on anaesthesia, pain recognition and analgesia in rodent models. The main instructor of this course is internationally-recognized expert Professor Paul Flecknell, MA, VetMB, PhD, DECLAM, DLAS, DECVA, (Hon) DACLAM, (Hon) FRCVS, author of the Handbook Laboratory Animal Anaesthesia, 4th Edition, and a number of research publications and educational material in the field. Course leader is Head of Education at Comparative Medicine, Rafael Frias, DVM, MSc, PhD, Assoc. Prof (LAS),

who will also be instructing in this course.

Course responsible :
Rafael Frias
Comparative medicine
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Contact person :
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Title : Translational Paediatric Oncology in the Era of Immunotherapy and Omics

Course number : 3022
Credits : 1.5
Date : 2020-03-30 -- 2020-04-03
Language : English
Level : Doctoral level
Responsible KI department : Department of Women's and children's health
Specific entry requirements :
Purpose of the course : - To enable to obtain a comprehensive overview of the different domains within childhood cancer research and to understand the historical milestones forming the paradigms that have led to a cure of 8 out of 10 children with cancer - To give an insight into the current limitations and problems of childhood cancer treatment - To enable to get an understanding of how new methodologies in molecular biology increase our knowledge about tumourigenesis and tumour evolution. - To provide an opportunity to hypothesise and develop ideas about how to cure the remaining 2 out of 10 children with cancer.
Intended learning outcomes : At the end of the course the students should be able to: - Summarise the basic epidemiological data, tumour biology and genetics, novel therapy modalities like targeted therapies and immunotherapy, including side effects, late effects and follow up within the field of paediatric oncology. - Discuss the ethical issues around childhood cancer research. - Describe and understand the principles of treatment, existing therapies, new targeted therapies and personalized medicine. - Explain and theorize about the link between cancer cell biology, tumour microenvironment, immunology, genetics, and drug treatments - current and development of new drugs. - Understand and discuss the current experimental methodology applied to paediatric oncology research such as in vivo, in vitro and in silico models. - Critical comment on research findings regarding paediatric oncology research.
Contents of the course : Introduction to research on paediatric oncology for PhD students and junior postdocs, with research projects in this specific area or in an adjacent area. The students will be presented with and will discuss problems, possibilities, and research models that are specific for the research area of paediatric oncology. The course will provide a general introduction to the field and focus on distinct, but interconnected topics specific for paediatric oncology, namely ethics, epidemiology, tumour biology and genetics, existing and novel targeted drug treatments as well as immunotherapy, and side effects, late effects and follow up. The last day will be dedicated to a symposium with invited lecturers that are renowned expert in their fields.
Teaching and learning activities : Lectures, seminars, group exercises with supervised discussions. To promote active discussion and participation, each student will prepare a short oral presentation on their current or intended research before the course and submit a short written abstract on this no later than two weeks before the course start. The course will include a one-day mini research symposium.
Examination : To pass the course the students must show that they have reached the learning outcomes of the course. Each students should prepare a scientific poster on an actual or hypothetical childhood cancer research project, including one of the following topics: epidemiology, register research, tumour biology and genetics, novel therapy modalities like targeted therapies and immunotherapy, and give an oral presentation of the poster and answer to critical questions of the audience consisting of the course leaders and course participants. Each participant in the course needs to be able not only to answer questions in a satisfactory way but also to raise relevant questions and to be able to discuss in line with the intended learning outcomes of the course.
Compulsory elements : All course activities are compulsory. Absence can be compensated for by other activities in agreement with the course leaders.
Number of students : 16 - 28
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 starts Monday. During Tuesday, Wednesday and Thursday full days are scheduled with lectures and seminars. The course concludes with a research symposium on Friday with several known experts in the field. The course will be located at KI Solna.

Course responsible :
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Title : Advanced cancer biology

Course number : 3024
Credits : 3.0
Date : 2020-01-07 -- 2020-06-09
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) date for registration as a doctoral student (priority given to earlier registration date)
More information : The course is organized to contain approximately 20 lectures of 45 min plus 15 min discussion, held once per week on during the semester by invited national and international prominent researchers. All lectures are held in Biomedicum, Nobels väg 9, KI Campus, on Tuesdays at 1 pm, unless else stated. The rooms will be announced prior to the lectures.

Course responsible :
Lars-Gunnar Larsson
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Contact person :
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Title : Bioinformatics analysis of gene regulation in omics data and its applications to medical problems

Course number : 3027
Credits : 3.0
Date : 2020-02-27 -- 2020-03-11
Language : English
Level : Doctoral level
Responsible KI department : Department of Biosciences and Nutrition
Specific entry requirements :
Purpose of the course : To increase the understanding of the basic principles of bioinformatics and to gain practical skills in bioinformatics analysis of genomic sequencing data.
Intended learning outcomes : After the completed course, the participants will be able to understand the principles and perform basic bioinformatics analysis of genomics sequencing data. The participants will be able to plan experimental designs and to critically evaluate the appropriateness of the different sequencing based omics methods and technologies for genome-wide gene regulation studies.
Contents of the course : Principles of gene regulation in non-disease cases and dysregulation in diseases at individual locus level as well as on genome-wide level. Principles of sequencing based genomics technologies and corresponding bioinformatics data analysis. Concrete bioinformatics data analysis by the students of selected published projects.
Teaching and learning activities : The course consists of preparatory work, lectures, discussion, seminars and hands-on bioinformatics analysis.
Examination : The students will be examined for all learning outcomes by their performance in (a) submitted replies to tasks given for course week 1, (b) discussions and quizzes during the course week 2, and (c) individual presentations at the last course day of their bioinformatics analysis results conducted during course week 2.
Compulsory elements : The preparation is done in the first course week without the need to be present on-site. Week 2 consists of tasks, lectures, discussions, seminars and hands-on practicals. Both parts are compulsory. Absence has to be compensated for 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 : The first week of the course (2020-02-27 to 2020-03-04) is in the form of individual homework (distance course), as preparation for the second week of the course. Week 2 of the course (2020-03-05 to 2020-03-11) consists of tasks, lectures, discussions, seminars and hands-on practicals in Stockholm. The statistical language R will be used for the hands-on practical. It is recommended that participants have previous experiences with R. The course is given in collaboration with the RIKEN Center for Integrated Medical Sciences (RIKEN IMS, http://www.ims.riken.jp/english/). The course faculty consists of invited speakers from the RIKEN IMS and from Karolinska Institutet. The course takes place at Karolinska Institutet in Stockholm. The traveling and accommodation costs for participants from Japanese universities will not be covered by the course.

Course responsible :
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Contact person :
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Title : Grundkurs i SPSS

Course number : 3028
Credits : 1.5
Date : 2020-03-09 -- 2020-03-13
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, 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 ""lära känna"" olika typer av variabler. Detta inkluderar även omkodning av variabler, skapa nya variabler från befintliga och selektera ut individer som uppfyller vissa givna villkor.
Intended learning outcomes : Efter kursen skall doktoranden: - Ha grundläggande kunskaper om statistikprogrammet SPSS för att skapa strukturerade datafiler, modifiera data, samt skapa grafer och tabeller med hjälp av programmets menysystem. - Självständigt kunna skapa en datafil utifrån ett protokoll/enkät och mata in data. - Självständigt kunna definiera, sortera, modifiera och selektera data för enklare situationer. - Ha kunskap om de vanligaste syntax kommandona för att hantera statistiska data i SPSS. - Självständigt kunna skapa och modifiera enklare syntax för att bearbeta data i SPSS. - Ha ett förhållningssätt till datahantering som visar på grundläggande förståelse för vikten av dokumentation m.h.a. syntax. - Räkna med datumvariabler och hantera textvariabler. - Självständigt kunna skapa grafer och avancerade tabeller och göra enklare redigeringar. - Kunna utföra enklare analyser och tester. - Ha en grundläggande insikt om olika typer av fel som kan uppstå vid datahantering.
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 givna villkor, samt att med hjälp av syntax utföra grundläggande variabelkommandon. 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. För att erhålla så presentationsfärdiga rapporter som möjligt lär vi oss även att redigera resultatet av analysen. Ändamålet är att hjälpa dig att effektivisera ditt arbete, dokumentera dina analyser med hjälp av syntax och snabbt komma igång med SPSS
Teaching and learning activities : Denna kurs som sträcker sig över 5 dagar (2 dagar workshop + en övningsuppgift med avslutande seminarium).
Examination : Examination av kursen består av en hemuppgift som redovisas skriftligt. Doktoranden får självständigt arbeta med ett datamaterial under kursens gång som innehåller vanliga typer av problem med datahantering före en statistisk analys är möjlig. Varje doktorand lämnar enskilt in en lösning som dokumentation hur problemen har lösts som diskuteras via en peer-review. Egen tillgång till SPSS är nödvändig för att göra examinationen
Compulsory elements : Vid frånvaro från datorövningarna 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
More information : Kursen hålls aktivt måndag t.o.m. onsdag med föreläsningar på FM samt egna övningar på EM. Under torsdagen ges tillfälle för eget arbete med en examinationsuppgift. Uppgiften redovisas fredag. Kursen hålls vid KIDS Danderyds sjukhus.

Course responsible :
Fredrik Johansson
Department of Clinical Sciences, Danderyd Hospital

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Contact person :
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Title : Mixed methods: integration of qualitative and quantitative data within applied health research

Course number : 3032
Credits : 3.0
Date : 2020-04-01 -- 2020-05-01
Language : English
Level : Doctoral level
Responsible KI department : Department of Public Health Sciences
Specific entry requirements : Students must be familiar with the basics of qualitative and quantitative research before joining the course.
Purpose of the course : Health research problems are complex phenomena with multiple dimensions which are difficult to assess using quantitative or qualitative methodologies alone. Mixed-methods research is a methodology that combines both qualitative and quantitative research allowing the researcher a more comprehensive understanding of the issue under study. Mixed-methods pragmatic research designs provide strengths that offset the weakness of both quantitative and qualitative studies. This course will provide Ph.D students with the theoretical tools and practical experience to design, conduct and report mixed-methods studies in health research.
Intended learning outcomes : At the end of the course the students will: 1. Design a mixed-methods research question (s). 3. Apply different mixed-methods research designs to a health problem. 4. Write a mixed-methods research protocol. 5. Report the results of a mixed-method study. 6. Use mixed-methods to design and evaluate interventions studies. 7. Evaluate the quality of scientific manuscripts using mixed-methods designs.
Contents of the course : 1. Definitions of mixed-methods research. 2. Worldviews and mixed-methods research. 3. Writing a mixed-methods research protocol. 4. Choosing a mixed-methods design. 5. Integrating results in mixed-method studies. 6. Reporting and disseminating mixed-method studies. 7. Application of mixed-methods research in interventions studies. 8. Evaluating the quality of mixed-methods studies.
Teaching and learning activities : The course will start by discussing the quantitative and qualitative research designs and how both research paradigms can be combined to strengthen each other. The course will combine face-to-face lectures, online practical assignments/discussions, self-study and oral presentations. Face-to-face lectures and other activities will be conducted once a week for a period of five weeks. Once a week lectures will allow the students to reflect on the given material and to apply this new knowledge to the practical assignments. Practical assignments will be discussed with the group and feedback will be given.
Examination : Course assignments and take home examination. Both will be graded as fail or pass. In order to pass the course, the student need to pass the assignments and the take home examination. The course assignments will guide the students through the steps needed to design a mixed-methods protocol. Take home examination. 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 take home examination will consist on open ended questions where the students will appraise the quality of published mixed-methods studies and the structure of mixed-methods protocols among other topics. The take home exam will have to be submitted through the KI online learning platform one week after the end of the course.
Compulsory elements : Participation in the online practical assignments and discussion will be mandatory.
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 is a combination of face-to-face lectures and discussions with online pre-recorded lectures. Face-to-Face lectures are held once a week . feedback from the lecturers and from the students peers will be given.

Course responsible :
Mariano Salazar
Department of Public Health Sciences

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Contact person :
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Title : Imaging in Neuroscience: with a Focus on MEG and EEG Methods

Course number : 3035
Credits : 1.5
Date : 2020-04-14 -- 2020-04-28
Language : English
Level : Doctoral level
Responsible KI department : Department of Clinical Neuroscience
Specific entry requirements : Background in medicine, biomedicine, biology, psychology, cognitive science, medical imaging, computational biology or similar. At least basic medical statistics.
Purpose of the course : The main purpose of the course is to provide the students with a solid understanding of the tools available to analyze human brain activity data measured with magnetoencephalography (MEG) and electroencephalography (EEG). The students will 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: 1) follow the usual preprocessing steps of MEG and EEG; 2) give an overview of different methods to analyze the data and explain when to use them; 3) conduct MEG and EEG analysis using several methods; 4) describe different aspects of experimental design to have in consideration when creating a MEG and EEG study; 5) give a brief overview of the usage of MEG and EEG to study brain function; 6) give a brief overview of other techniques to study brain function non-invasively and describe their relative merits and challenges.
Contents of the course : The course focuses on experimental design and analysis of MEG and EEG data. We will briefly introduce the basis of the MEG and EEG signal at a neural level, and how it is measured by the different sensor technologies applied in MEG and EEG. The data processing steps, before statistical analysis, will be explained. The application of general linear model analysis, parametric and nonparametric tests of MEG and EEG data will be explained, including correction for multiple comparisons. We will review experimental design considerations for developing MEG and EEG paradigms. The study of functional connectivity using MEG and EEG data will be introduced.
Teaching and learning activities : The students will attend lectures, implement different steps of the data preprocessing and analysis during the hands-on sessions, present and discuss results.
Examination : The learning outcomes will be assessed throughout the course during the hands-on sessions where the students have to perform data analyses. The students will also complete a more extensive assignment based on one of the hands-on sessions. In the final day of the course the students will present and discuss their assignments with the rest of the group.
Compulsory elements : All parts of the course are mandatory. Absence can be compensated for by completion of an assignment on the material covered in the missed course instance.
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 : The course is run across five days: April 14 (Tue), 16 (Thu), 21 (Tue), 23 (Thu), and 28 (Tue). Lectures will be held in the same building as the national MEG lab (Nobels väg 9, Karolinska Institutet) and partly also in the MEG lab.

Course responsible :
Daniel Lundqvist
Department of Clinical Neuroscience

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Contact person :
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Title : Mouse necropsy

Course number : 3036
Credits : 1.0
Date : 2020-05-27 -- 2020-06-03
Language : English
Level : Doctoral level
Responsible KI department : Comparative medicine
Specific entry requirements : Students need to have completed a laboratory animal science course on how to carry out scientific procedures on mice i.e. EU Function A or equivalent course.
Purpose of the course : This two-day course will provide the students with the theoretical background of performing mouse necropsies, including procedures and methods to preserve organs and tissues for further morphological analysis. The course will primarily be practical. This should ultimately enable the students to perform complete mouse necropsies in a standardized and reproducible way.
Intended learning outcomes : After completion of this course, the participants of the course should 1) know how to carry out a necropsy in a mouse according to good veterinary and scientific practice, 2) understand the requirements needed to perform organ sampling through a standardized necropsy protocol. The practical learning outcomes based on a supervised training of mouse necropsies will provide the students with a basic knowledge to describe organ changes, how to document these and preserve the organs in such a way that further analysis can be performed on tissues that show a minimum of autolysis, thus providing optimal conditions for extracting useful information from mice.
Contents of the course : This course will provide a basic foundation to individuals who, perform research using experimental mouse models, and have to conduct a post-mortem examination to analyze morphological changes either due to experimental manipulation or due to introduced genetic changes. The course will provide a theoretical background to standardized mouse necropsies, sampling of organs, alternative ways of preserving these for further morphological analyses, as well as trimming of the organs and preparing these for sectioning for later evaluation using microscopy. A basic description of terms used to describe gross changes will be provided both in lectures and through recommended literature. The main part of the course will be devoted to practical necropsy training, where the participants will be actively supervised during the training.
Teaching and learning activities : The course will be based on pre-reading material on basic mouse anatomy and necropsy techniques, lectures on mouse necropsy, sample collection, tissue handling and fixation, practical demonstrations and individual practical training on such issues. Since the ultimate aim is to provide course participants with enough practical training to enable them to perform independent necropsies and tissue sampling this two day course will be split into 1+1 days with an intermittent period for personal training and reflection. In this way, participants will be given an intensive instruction and training during the first day, with a follow up providing feedback on an individual basis and more supervised training during the second day, which will follow after one week.
Examination : Practical assessments will be carried out by direct observation of skills and documentation of actions taken by learners during their training laboratory session. A short multiple choice question final written examination will also be held at the end of the course. A pass/fail criteria will be used as a global rate for this course.
Compulsory elements : All mouse necropsy sessions and active student participation are compulsory. 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 written assignment or in future course editions.
Number of students : 5 - 10
Selection of students : Selection will be based on the relevance of the course syllabus for the applicant's doctoral project (i.e. use of mouse models), which will be according to written motivation. If necessary, additional selection criterium will be used based on the date for registration as a doctoral student (priority given to earlier registration date).
More information : Both face-to-face teaching and hands-on exercises will be held on May 27 and June 3, 2020 between approx. 9am and 5pm. Location: Learning Lab, Comparative Medicine (Solna). Instructors of this course are Dr. Björn Rozell, DDS, PhD, DVM, Professor, and Rafael Frias, DVM, MSc, PhD, Assoc. Professor.

Course responsible :
Rafael Frias
Comparative medicine
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Contact person :
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Title : Exploring entrepreneurial opportunities in research

Course number : 3037
Credits : 4.5
Date : 2020-02-17 -- 2020-04-03
Language : English
Level : Doctoral level
Responsible KI department : Department of Learning, Informatics, Management and Ethics
Specific entry requirements :
Purpose of the course : This course lays the foundation for the awareness of the potential of innovation and entrepreneurship. It will enhance your career opportunities inside and outside academia. The course will facilitate the discovery and identification of intellectual assets in the daily work. You will increase the awareness of the potential of innovation and entrepreneurship, by identifying opportunities for entrepreneurship in connection to research. 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, - discover and identify intellectual assets in their own research project, - explore the potential of different intellectual assets, - communicate a value proposition describing the need, approach, benefit and competition for identified intellectual assets, - assess their new skills and reflect on possible future effects, from ones individual perspective. - use design tools to gain an understanding for the user experience to develop solutions to user needs, - transform ideas into prototypes of products, services or processes, - use business tools such as business modelling to develop a potential business idea stemming from research, - assess their new skills and reflect on the possible future effects, from an organisational perspective. - identify and test the potential of a developed business idea, whether in an economic or social context, - package a business idea into a complete business plan, - communicate (""pitch"") the business plan to people within the start-up world, such as potential investors, - assess their new skills and reflect on the possible future effects, from a societal perspective.
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 road map 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 : Each module runs for a week and the days to attend are as such: February 17, 19 and 21 - Identify March 9, 11 and 13 - Develop March 30, April 1 and 3 - Test Mondays from 9:00 to 17:00 Wednesdays from 9:00 to 12:00 Fridays from 13:00 to 17:00 The course takes place in Campus Solna.

Course responsible :
Samer Yammine
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Contact person :
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Title : Biostatistics I: Introduction for Epidemiologists

Course number : 3042
Credits : 3.0
Date : 2020-04-01 -- 2020-04-21
Language : English
Level : Doctoral level
Responsible KI department : The institute of Environmental Medicine
Specific entry requirements :
Purpose of the course : The aim is to introduce classical statistical concepts and methods with emphasis on methods for continuous outcome data.
Intended learning outcomes : After successfully completing this course, students should be able to: - define the concept of probability, laws of probability, and make simple probability calculations, - suggest a statistical distribution to describe a naturally occurring phenomenon and evaluate the appropriateness of the distribution given real data, - present appropriate tabular and graphical descriptions of study data, - explain the difference between hypothesis testing and interval estimation and the relation between p-values and confidence intervals for the mean, - explain the necessary assumptions for inference under various tests for continuous data, - fit and interpret the coefficients of linear regression, with or without adjustment, with or without an interaction, - explain and apply non-parametric tests for differences in distribution, - explain the concepts of confounding and effect modification, describe the difference between them and use models correctly to account for them.
Contents of the course : The course introduces classical statistical concepts and methods with emphasis on methods used in epidemiology and public health. Topics covered include: the importance of statistical thinking; types of data (nominal, binary, discrete and continuous variables); data summary measures; graphical representations; notions of probability; probability models (distributions); principles of statistical inference for the mean via the central limit theorem, concepts of confidence intervals and hypothesis tests; and an introduction to linear regression.
Teaching and learning activities : Lectures, exercises focusing on analysis of real data using statistical software, exercises not requiring statistical software, group discussions, literature review.
Examination : To pass the course, the student has to show that the intended learning outcomes have been fulfilled. The course grade is based on the individual written examination. Students who fail will be offered a re-examination within two months of the final day of the course. Students who fail the re-exam 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 another re-examination will be scheduled within 12 months of the final day of the course.
Compulsory elements :
Number of students : 8 - 25
Selection of students : Applicants 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). Submit a completed application form. Give a short description of current research training and motivation for attending, as well as an account of previous courses taken. Prior knowledge of statistical programmes R or Stata is recommended.
More information : The course is extended over time in order to promote reflection and reinforce learning. The course will be held the dates April 1, 2, 3 and 6, 7 (week 1) and April 15, 16, 17, 20 and 21 (week 2).

Course responsible :
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Title : Biostatistics II: Logistic Regression for Epidemiologists

Course number : 3043
Credits : 2.0
Date : 2020-01-27 -- 2020-02-04
Language : English
Level : Doctoral level
Responsible KI department : Department of Medical Epidemiology and Biostatistics
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 aim is to introduce statistical methods for categorical outcome data.
Intended learning outcomes : After successfully completing this course you as a student are expected to be able to: - estimate and explain the difference between absolute and relative effect measures, including but not limited to odds ratio, risk ratio, and risk difference, - perform tests for multiple category outcome data, - fit and interpret the results of the logistic regression model, - apply and interpret appropriate statistical models for studying effect modification and confounding. - critically evaluate the methodological aspects (design and analysis) of a scientific article reporting an epidemiological study.
Contents of the course : This course focuses on the application of methods for binary data and in particular logistic regression in the analysis of epidemiological studies. Topics covered include a brief introduction two-by-two tables and methods for estimating relative effect measures. Then moving on to univariable and multivariable models for binary outcomes to estimate relative and absolute effect measures, with the interpretation of parameters categorical predictors, flexible modeling of quantitative predictors, confounding and interaction, model fitting and model diagnostics.
Teaching and learning activities : Lectures, exercises focusing on analysis of real data using statistical softwares, exercises not requiring statistical software, group discussions, literature review.
Examination : To pass the course, the student has to show that the intended learning outcomes have been achieved. The course grade is based on the individual written examination (summative assessment). 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. 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 :
Number of students : 8 - 25
Selection of students : Applicants 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). Submit a completed application form. Give a short description of current research training and motivation for attending, as well as an account of previous courses taken. Prior knowledge of statistical programmes R or Stata is recommended.
More information : The course is extended over time in order to promote reflection and reinforce learning. The course will be held the dates January 27, 28, 30, 31 and February 3, 4.

Course responsible :
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Title : Basic Bioinformatics

Course number : 3044
Credits : 2.0
Date : 2020-05-04 -- 2020-05-12
Language : English
Level : Doctoral level
Responsible KI department : Department of Medicine, Solna
Specific entry requirements : Basic knowledge in molecular biology from undergraduate level.
Purpose of the course : This course aims to give the students who work mainly in wet lab, an opportunity to obtain a foundation in the principles of bioinformatics, so they can start to develop skills in bioinformatics. This is done by equipping and familiarising the students with several bioinformatic tools commonly used in molecular biology and genetics.
Intended learning outcomes : By the end of the course the participants should be able to: - use the command line interface (a text-based means of interacting with a computer), - download datasets from omics databases - know principles of python (a programming language) and be able to create graphs and perform cluster analysis - know how to apply the basic principles for analyzing high-throughput sequencing and genotyping data. - have the foundations to perform by themselves the taught data analysis techniques.
Contents of the course : Bash command line interface, genome browsers, python including plotting and clustering methods, high-throughput sequencing and genotyping data: RNA-seq and GWAS.
Teaching and learning activities : Each session of the course starts with an introductory interactive lecture, followed by hands-on computer exercises. Most of the course consists of hands-on exercises where the students can work in small groups (2 to 3) and interact with the teachers.
Examination : The examination is in line with the intended learning outcomes and involves practical exercises of each of the sessions taught. The exercises are solved during the last day of the course. The process and solutions of the examination can be discussed in small groups (2 to 3) and with the teachers. The answers of the exam should be handed in to the teachers individually.
Compulsory elements : The introductory lectures are compulsory since the course is designed to gradually increase in complexity. The practical sessions are also compulsory, unless stated they are not. Absence has to be compensated for in agreement with the course organizers. The examination is compulsory.
Number of students : 10 - 35
Selection of students : Wet lab students without prior bioinformatics experience are given priority, and secondarily date for registration as a doctoral student (priority given to earlier registration date).
More information : The course is held on different classrooms at Widerströmska Huset, Tomtebodavägen 18a, KI campus Solna.

Course responsible :
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Title : Causal inference: emulating a target trial to assess comparative effectiveness

Course number : 3046
Credits : 1.5
Date : 2020-03-23 -- 2020-03-25
Language : English
Level : Doctoral level
Responsible KI department : The institute of Environmental Medicine
Specific entry requirements : Courses ""Epidemiology I: Introduction to epidemiology"", ""Epidemiology II: Design of epidemiological studies"", ""Biostatistics I: Introduction for epidemiologists"", ""Biostatistics II: Logistic regression for epidemiologists"", and either ""Causal inference for epidemiological research"" (course 2416) or ""Causal Inference from observational data"" (course 2462) or corresponding courses.
Purpose of the course : This course focuses on a general framework for the assessment of comparative effectiveness and safety research, which can be applied to both observational data and randomized trials.
Intended learning outcomes : After successful completion of this course, the student should be able to: - Formulate sufficiently well-defined causal questions for comparative effectiveness research - Specify the protocol of the target trial - Design analyses of observational data that emulate the protocol of the target trial - Identify key assumptions for a correct emulation of the target trial - Decide when g-methods are required for data analysis - Critique observational studies and randomized trials for comparative effectiveness research
Contents of the course : The course introduces students to a general framework for the assessment of comparative effectiveness and safety research. The framework, which can be applied to both observational data and randomized trials with imperfect adherence to the protocol, relies on the specification of a (hypothetical) target trial. The course explores key challenges for comparative effectiveness research and critically reviews methods proposed to overcome those challenges. The methods are presented in the context of several case studies for cancer, cardiovascular, renal, and infectious diseases.
Teaching and learning activities : Lectures and group sessions. Before the course, the student is required to study the course literature.
Examination : A written individual examination will be carried out after the course. The examination will require the evaluation of a published article on comparative effectiveness or safety. 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.
Compulsory elements : The individual written examination (summative assessment).
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 : Pre-course reading is required: Chapters 1-3 of the book: Hernán MA, Robins JM (2019). Causal Inference. Boca Raton: Chapman & Hall/CRC, forthcoming. The book can be downloaded (for free) from https://www.hsph.harvard.edu/miguel-hernan/causal-inference-book/. The individual examination will be performed as a take-home examination.

Course responsible :
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Title : Cellular Signalling

Course number : 3049
Credits : 1.5
Date : 2020-03-23 -- 2020-03-27
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 give a broad view of various signalling pathways and enable to identify common themes on protein-protein and protein-lipid interactions. The students shall learn on how signal transduction occurs through a highly regulated cascade of events in side cells. The student should identify and reflect the knowledge (general methodology and theoretical concepts) gained with the benefit for own research.
Intended learning outcomes : After the course, the student: - should be able to show adaquate knowledge on current common methods and techniques, in the field of signal transduction. - should be able to hold a journal club presentation in the field of signal transduction. - should be able to apply some of the conceptual knowledge in his/her own research project(s).
Contents of the course : The course brings up current aspects in cellular signalling and the developments in understanding the function of the different signalling pathways in various cell model systems. 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. In the context of the functional genomic era, the course will cover the molecular basis of certain diseases related to the abrogation of signalling pathways.
Teaching and learning activities : Lectures, presentations and individual discussions with all participants. Students are encouraged to take up additional new topics with the course leader and lecturers. Discussions about resources to retrieve additional information about a particular issue within the field of signal transduction.
Examination : Oral Presentation is compulsory and it is essential to be an active participants in the discussions. It has to 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 - 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 will take place in Neo, room DNA 5105, at Campus Flemingsberg.

Course responsible :
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Contact person :
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Title : Immunogenicity: Immune responses against biological drugs

Course number : 3067
Credits : 1.5
Date : 2020-03-30 -- 2020-04-03
Language : English
Level : Doctoral level
Responsible KI department : Department of Clinical Neuroscience
Specific entry requirements :
Purpose of the course : Understanding of central terms and definitions in the field of immunogenicity, used in research and in clinical applications. To become familiar with the identified molecular and cellular immunological processes that trigger and increase the risk for developing anti-drug antibodies (ADA). Understanding of how immunogenicity needs to be taken into consideration all the way from choosing your biological target of treatment, to drug development, approval, clinical routine and individualized therapy and health care practice.
Intended learning outcomes : At the end of the course the student should be able to: - Understand what determines the immunogenicity of drugs and why they differ in this respect. - Give examples of different methods of how to measure drug level and ADA. - Understand the algorithms needed in clinical practice and what consequences ADA might have for treatment decision, safety and efficacy. - Integrate this knowledge in your own research project or a disease and treatment of choice.
Contents of the course : The course will give you an orientation of the clinical research fields where treatment with biopharmaceuticals are important and how the immune system can react against different biopharmaceuticals. It will include the diseases MS, RA, IBD, and SLE and biopharmaceuticals like IFNbeta, natalizumab, rituximab, TNF-blockers as well as the biosimilars for these. A range of immunoassay methodologies that can be used to measure drug levels and ADA will be presented and the clinical relevance of the test results discussed. The course will also give insights on the type of research being done to identify risk factors for ADA, and optimisation of drug design, production and administration to minimize the risk. Ways to improve treatment regiments adopted to results of drug level and ADA, as well how to monitor and store data in clinical routine will be discussed.
Teaching and learning activities : Lectures, individual essays, peer-review and oral presentation.
Examination : Essay, peer-review and oral presentation.
Compulsory elements : Lectures, essay, peer-review and oral presentation. Absence from lectures can be compensated for by writing an additional essay on the subject missed.
Number of students : 10 - 30
Selection of students : Selection will be made according to the applicant’s written motivation to take the course.
More information :

Course responsible :
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CMM

Solna

Contact person :
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Title : Philosophy of science and the concept of health

Course number : 3073
Credits : 1.5
Date : 2020-03-23 -- 2020-04-03
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 the written motivation explaining why the course would benefit the doctoral studies.
More information : The course is web-based and arranged over two weeks time.

Course responsible :
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Title : Epidemiology I: Introduction to epidemiology

Course number : 3078
Credits : 1.5
Date : 2020-01-20 -- 2020-01-29
Language : English
Level : Doctoral level
Responsible KI department : Department of Public Health Sciences
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: - discuss the contribution of epidemiology to science and give examples of the advancements in the field, - reason about classification of exposure, outcome and covariates in epidemiological studies, - 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, with a specific focus on cohort studies. - 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. 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 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 : Course dates are January 20, 22, 24, 27 and 29. The course is extended over two weeks, but still five full course days, in order to promote reflection and reinforce learning. The individual examination (i.e. the summative assessment) will be performed as a take home examination after the course.

Course responsible :
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Contact person :
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Title : Cytostatic Drugs in Research and Cancer Treatment

Course number : 3108
Credits : 1.5
Date : 2020-05-04 -- 2020-05-08
Language : English
Level : Doctoral level
Responsible KI department : Department of Laboratory Medicine
Specific entry requirements :
Purpose of the course : The present course aims to provide the participants with a comprehensive overview about cytostatic drugs and their role in modern cancer therapy. By the end of the course, the student will know how to handle cytostatic drugs in laboratory experiments, have an overview of their use in cancer treatment, their mechanism of action and their role in research. Moreover, the student will have an awareness of recent advances in cancer treatment, including drug development, target therapy and drug administration.
Intended learning outcomes : After passing the course, students - will be able explore the mechanism of action of the cytostatic and targeted drugs in order to understand cell death and drug resistance in cancer therapy. - will understand the mechanisms underlying the interaction between cytostatic drugs and other drugs in order to minimize the adverse effects. - will have an overview over new strategies for cancer treatment including the use of nanocarriers and nanoparticles. - will understand the mechanisms underlying pain caused by cytostatic and targeted drugs including chemotherapy induced peripheral neuropathy (CIPN). - will understand the effect of anticancer drugs on the immune system. - will understand safety regulations and routines according to Swedish legislation and will be able to implement these in their daily work.
Contents of the course : Cytostatic and targeted anticancer drugs Mechanism of action of cytostatic and targeted anticancer drugs Modern therapies include the use of antibodies, cellular therapy and nanocarriers in cancer treatment. Drug-drug interaction between cytostatic drugs and other simultaneously used drugs. Basic aspects of pharmacokinetics, pharmacodynamics and pharmacogenetics of cytostatic and targeted anticancer drugs Mechanisms underlying pain induced by cancer terapy. Treatment strategies using combination of cytostatic and targeted anticancer drugs Mechanisms underlying cell-death induced by cytostatic and targeted drugs. Drug resistance in cancer therapy The effect of anticancer drugs on the immune system The Swedish legislation and safety regulations ¿how to work and handle the cytotoxic drugs AFS 2005:5¿
Teaching and learning activities : The course consists of lectures, seminars and group work.
Examination : The course assignment will consist on a formative assessment based on individual presentation (10-15 minutes) as well as a written assignment (3-4 A4 pages) on the combination of cytostatic and targeted drugs in clinical use. The presentation should include the following issues: mechanisms of action, rational behind the treatment, side effects, efficacy, and interactions.
Compulsory elements : The seminar on safety regulations, group work and the examination seminar are compulsory. In case of absence, the student has to acquire appropriate knowledge from the recommended literature, may get a consultation with the course leader (if needed) and write short report.
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 will be held in Novum, Flemingsberg, level 4, conference room Cellen. The information regarding exact time will be sent to course participants along with the course schedule.
 This course has previously been given with number 1741.

Course responsible :
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ECM/KFC; Novum, Lab 601; Hälsovägen 7

Title : Pathology

Course number : 3109
Credits : 3.0
Date : 2020-05-04 -- 2020-05-15
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 : 1)Documented knowledge in areas such as human tissue biology, cell biology or physiology (this kind of knowledge is a prerequisite to be able to benefit from the course). Those who already have studied pathology earlier (for example medical doctors) are not prioritized. 2)Date of admission to doctoral studies (those who have been admitted longest time ago have priority).
More information :

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Title : Quality of life as an outcome measure in care sciences

Course number : 3116
Credits : 3.0
Date : 2020-01-20 -- 2020-01-30
Language : English
Level : Doctoral level
Responsible KI department : Department of Women's and children's health
Specific entry requirements :
Purpose of the course : The course aims to give doctoral students a basic understanding of the theory behind measurement of quality of life and introduce the methods used when conducting studies with quality of life as an outcome measure. Students will get the opportunity to dig into their own research by critically reviewing the instruments they are using and to orally defend the methods they are using.
Intended learning outcomes : After the course, the students should be able to critically review research papers analyzing quality of life. This includes phrasing research questions, choosing appropriate instruments, timing of assessments and procedure as well as choosing methods for analysis. Furthermore should students be able to interpret and discuss results from studies of quality of life.
Contents of the course : The concept quality of life and health-related quality of life will be discussed to give insights into these concepts. Aditionally the criticism against these concepts and their measurement will be addressed.The course will further include phrasing research questions, choosing appropirate instruments, designing studies measuring quality of life (timing of assessments and procedure), choice of methods for analysis, and interpretation of results.
Teaching and learning activities : Learning activities include lectures, group-seminars and assignments.
Examination : Doctoral students are required to accomplish a number of assignments which will be presented the first day of the course. Assignments are typically prepared and worked through at home and thereafter followed up and discussed in class.
Compulsory elements : Assignments and seminars are compulsory. Absence from group-seminars will be made up with essay-writing on the topics that were to be discussed during the seminar.
Number of students : 10 - 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 will have four scheduled days at Campus Solna: 23-24 and 29-30 of January 2020. Please note that the course starts with three days of self-study.
 The course evaluation link has the previous course code 1873.

Course responsible :
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Title : Forskningsetik

Course number : 3118
Credits : 1.5
Date : 2020-01-14 -- 2020-02-04
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.
Intended learning outcomes : Den forskarstuderande ska efter att ha gått kursen kunna: 1. Redogöra för forskningsetiska teorier, principer och till viss del riktlinjer, 2. Visa kunskap angående vanliga forskningsetiska problemsituationer och de etiska verktygen som kan användas för att hantera forskningsetiska konflikter Färdigheter: Den forskarstuderande ska efter att ha gått kursen kunna: 1. Analysera forskningsetiska konflikter, 2. Ge hållbara forskningsetiska argument för eller mot ett förfarande Förhållningssätt: Den forskarstuderande ska efter att ha gått kursen ha: 1. Utvecklat ett forskningsetiskt förhållningssätt till andra forskarstuderande, handledare och seniora forskare, 2. Förståelse för hur ett etiskt förhållningsätt uppfattas hos allmänheten 3. Förståelse för vilken roll forskarens egen hederlighet och integritet har
Contents of the course : Att ge en introduktion till etiken i samband med forskning och en orientering om dess tillämpning på problem inom det vetenskapliga området. Kursen behandlar bl.a. följande teman: centrala etiska principer, teorier och argument, forskningsetik/forskaretik, grundläggande värderingar och normer för god sed i forskningen, innehåll i och värdet av regelverk så som Helsingforsdeklarationen dess funktion, tillämpning, möjligheter och begränsningar, etikprövningar, avvikelser från värderingar, forskningsfusk och vetenskaplig oredlighet. Det informerade samtyckets historia och komponenter. Försöksdjursetisk, innefattande argument för och emot att använda olika djur för forskningsändamål samt de 3 R:en. Hantering av vetenskapligt författarskap (medförfattarskap, författarordning) och intressekonflikter i forskningen.
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 dilemman 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 dilemman 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
More information : Kursen ges en eftermiddag per vecka (tisdagar kl.13:30-17:15) under totalt fyra veckor på Karolinska Universitetssjukhuset, Huddinge (B31/K32). Kursen innehåller föreläsningar, seminarier, gruppövningar samt studenters muntliga och skriftliga presentationer. Mellan kurstillfällena finns material att läsa enligt ett schema som ges till antagna.

Course responsible :
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Title : Vetenskapsteori

Course number : 3119
Credits : 4.5
Date : 2020-02-11 -- 2020-04-07
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 diskurser som bildar basen för vetenskaplig metod och kritik.
Intended learning outcomes : Efter kursen skall doktoranden ha kunskaper om 1. Vetenskapsteoretiska teorier, principer och grundläggande begrepp 2. Aktuella diskurser om vad som är vetenskaplighet Efter kursen skall doktoranden ha färdigheter i att 1. Analysera och beskriva forskning i vetenskapsteoretiska termer 2. Delta i vetenskapsteoretisk diskurs om forskning och argumentera för styrkor och svagheter med olika vetenskapsteoretiska ingångar till en frågeställning Efter kursen skall doktorandens förhållningssätt till vetenskaplig diskurs vara 1. Grundad i respekt för den roll som dialogen och debatten har i utvecklandet av vetenskap 2. Byggd på insikt av att vetenskaplig diskurs kräver respektfull attityd till andra forskare, forskningsområden och samhälle
Contents of the course : En introduktion till vetenskapsteorin och en förståelse för olika slag av vetenskapligt kunskapssökande. 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 : Föreläsningar (ca 12 t), gruppövningar, seminarier (ca 14 t) 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 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
More information : Kursen ges en eftermiddag per vecka (tisdagar kl.13:30-17:15) under totalt nio veckor på Karolinska Universitetssjukhuset, Huddinge (B31/K32). Kursen innehåller föreläsningar med extern föreläsaren, seminarier, gruppövningar samt studenters muntliga och skriftliga presentationer. Mellan kurstillfällena finns det material att läsa enligt ett schema som ges till de antagna.

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Title : Exploring human movement

Course number : 3123
Credits : 3.0
Date : 2020-02-03 -- 2020-02-14
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 that the participants gain the theoretical knowledge and practical experience needed to use common computerized methods for the study of human movement.
Intended learning outcomes : At the end of the course, the students should be able to: * formulate clear research questions in the field of movement science and be able to set up adequate experiments for them. * in groups, conduct a scientific experiment in the movement laboratory. * analyse kinematic, kinetic and EMG data. * clearly present the results in oral and written form (including graphs). * evaluate their results by comparing them with the litterature.
Contents of the course : * Working in the lab with computerised movement analysis systems: - Kalibrering, datainsamling och analys - Signal processing of movement trajectories from reflecting markers, of Electromyography (EMG) and force plate data. * Biomechanics * Motor control * Muscle physiology * Training in experimental skills * Training in presentation skills
Teaching and learning activities : This course has three parts. The first part is a theoretical part, in which the students learn the basics of movement science by means of lectures, group work litterature studies and individual work (3 days). The second part is laboratory work in which the students learn a) the principals of computerised movement analysis systems with calibration, marker placement, EMG, and forceplate measurements; b) learn to formulate a movement scientific research question (PM); and c) learn to accomplish an laboratory experiment - group work (5 days). The last part is the presentation part, in which the students present their laboratory results in both a written rapport and in zig-zaw group seminars (2 days).
Examination : The teachers give their judgement on the oral presentations and the written laboratory report. Moreover, student peer assessment on the oral presentations.
Compulsory elements : This course has three compulsory parts: 1. Oral presentation of the movement scientific research question (PM-presentation). 2. Active participation in the laboratory experiment. 3. Active participation in the zig-zaw group seminars. Absence at these compulsory parts, the students have to compensate this with: 1. A written presentation of the movement scientific research question (PM). 2. Participate in an other laboratory experiment. 3. A written summary of a number of laboratory reports, including reflecting comments.
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 : This course is going to be integrated in the new core facility u-Move in Solna, but some of the days are also held in Flemingsberg at the movement laboratory of the physical therapy division (NVS). This course has previously been given as 2194.

Course responsible :
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Contact person :
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Title : Epidemiology III. Analysis and interpretation of epidemiological data

Course number : 3129
Credits : 1.5
Date : 2020-05-11 -- 2020-05-20
Language : English
Level : Doctoral level
Responsible KI department : The institute of Environmental Medicine
Specific entry requirements : Knowledge equivalent to ""Epidemiology I: Introduction to epidemiology"", ""Epidemiology II: Design of epidemiological studies"", ""Biostatistics I: Introduction for epidemiologists"" or corresponding courses.
Purpose of the course : The purpose of the course is to familiarise the student with principles for epidemiological data analysis and critical interpretation of study results.
Intended learning outcomes : After successfully completing this course you as a student are expected to be able to: - analyse and interpret interactions between causes, - reason about principles of causal inference, - evaluate methodological aspects when critically reviewing individual epidemiological studies, - apply good practices for quantitative bias analysis to epidemiological data, and - demonstrate how to communicate areas of expertise to the public and to those not familiar with your research area.
Contents of the course : The course focuses on issues related to causal inference, principles of epidemiological data analysis, and interpretation of epidemiological concepts and principles of relevance when critically reviewing individual epidemiological studies.
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 all the intended learning outcomes have been achieved. Assessments methods used are group assignments (formative assessments) along with a written individual take-home examination. 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 : Individual examination task (summative assessment).
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 dates are May 11, 12, 14, 19, 20. The individual examination will be performed as a take home examination, and will be distributed the last day of the course.

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Title : Cardiovascular Research - an overview of the process of atherosclerosis

Course number : 3133
Credits : 1.5
Date : 2020-05-11 -- 2020-05-15
Language : English
Level : Doctoral level
Responsible KI department : Department of Medicine, Solna
Specific entry requirements :
Purpose of the course : Atherosclerosis will be discussed from the molecular, cellular, genetic, clinical and epidemiological viewpoints. Therefore, participants with a medical background will have the possibility to be more exposed to experimental work and, conversely, participants with a non-medical background will be enabled to obtain good knowledge of distinct clinical manifestations of atherosclerosis. This will be useful for, among others, bioinformaticians in the field. In addition, the course gives the participants the possibility to network with other students in the cardiovascular field.
Intended learning outcomes : The participant should be able to: 1. Relate risk factors with the pathology of atherosclerosis 2. Discuss the development of the atherosclerotic lesion on cellular and molecular level 3. Motivate the use of different models (in vitro-, epidemiological, animal model) to study atherosclerosis and apply them to a given project.
Contents of the course : Atherosclerosis will be discussed from the molecular, cellular, genetic, clinical and epidemiological viewpoints. Topics to be covered include discussions of the roles of the following in atherosclerosis: lipids and lipoproteins; oxLDL; thrombosis; plaque stability; inflammation; innate and adaptive immunity; proteinases; blood pressure; and diabetes/insulin resistance. Examples of in vitro and animal models as well as clinical studies will be discussed.
Teaching and learning activities : Lectures, project group, presentation by participants.
Examination : To pass the course, the participant has to: 1) Give a presentation in a seminar and to be able to discuss the different aspects of atherosclerosis with the course leader and the other participants. 2) To be able to discuss the other participants' presentations. 3) Pass a written exam recapitulating the course's content.
Compulsory elements : Examination is compulsory to pass the course.
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 has previously been given with course number 1551.

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Title : Basic Course in Medical Statistics

Course number : 3134
Credits : 3.0
Date : 2020-03-09 -- 2020-03-20
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 : 40 - 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. The course will consist of 2-3 full days per week for two weeks. Course dates at KI Campus Solna are: March 9, 10, 12, 16, 18, 20.

Course responsible :
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Title : Psychobiology of Intelligence

Course number : 3137
Credits : 1.5
Date : 2020-03-24 -- 2020-04-30
Language : English
Level : Doctoral level
Responsible KI department : Department of Neuroscience
Specific entry requirements :
Purpose of the course : In this course, you will be presented an overview of the main concepts and methods in studies of the psychobiology of intelligence. During the course, there will be open discussions with the course organiser, criticisms/evaluations of key peer-reviewed papers, and student oral presentations on the subtopics covered. Intelligence is, as will be argued for in class, one of the most important human traits. Inter-individual differences in IQ are correlated with school performance, career success, income, health, longevity, and many other outcomes. In addition, modern theories and measurements of intelligence have implications for a wide range of disciplines, from cognitive neuroscience and behavior genetics to clinical psychology, sociology and psychopharmacology. Understanding the basics about intelligence and how it is implemented in biological systems might be useful to you during your career, and will surely be important to you as an informed citizen.
Intended learning outcomes : At the end of the course the student should be able to: - Understand the basic features of methods used in intelligence research: especially methods in psychometrics, neuroscience, and genetics - Grasp modern theories of intelligence, and how intelligence is measured - Discuss and evaluate key scientific articles about the psychobiology of intelligence - Be able to distinguish what is scientifically relevant from what is not in the long-lasting controversy on the nature and nurture of intelligence
Contents of the course : Lectures and discussions about these main subtopics: 1) Definitions of intelligence and progress in intelligence test development; 2) Factor analyses and the debate of General Intelligence versus Multiple Intelligences; 3) Verbal abilities, spatial abilities, reasoning, speed of processing, and working memory; 4) Theories of intelligence; 5) Malleability of intelligence; 6) Genetics of intelligence ; 7) Intelligence and the brain: overview and evolution; 8) Neural correlates of intelligence seen in human imaging studies ; 9) The neurophysiological mechanisms of intelligence as glimpsed from animal studies. In addition, the course will include seminars where students will evaluate, criticize, and discuss key papers about the psychobiology of intelligence, as well as group presentations about one of the subtopics covered in class.
Teaching and learning activities : Lectures by the course organiser, seminars guided by students on key peer-reviewed papers, and group presentations.
Examination : The seminars and group presentations count as examination. The course organiser will assess your ability to discuss, to critical thinking and reason about each subject in relation to what will be taught during the lectures.
Compulsory elements : The seminars and group presentations are mandatory. If you miss an activity, you can compensate for it by submitting a written report related to the missed material.
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 spread over 6 weeks, with the class meeting on Tuesdays and Thursdays from 14.00 to 17.00 at Karolinska Institutet, campus Solna. Note that we will not have classes during Easter week (no classes on April 7th and 9th). The course will also have two guest lecturers who have made incredibly important contributions to the field of cognitive neuroscience: Dr. Rogier Kievit (Cambridge University) and Dr. Roberto Colom (Universidad Autónoma de Madrid). This is an exciting opportunity for all students!

Course responsible :
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Contact person :
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Title : Epidemiology II. Design of epidemiological studies

Course number : 3138
Credits : 1.5
Date : 2020-05-25 -- 2020-06-03
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 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 dates are May 25, 27, 29 and June 1 and 3. The course is extended over time, but is still five full course days in order to promote reflection and reinforce learning. The individual examination will be performed as a take home examination.

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Title : Basic Immunology

Course number : 3139
Credits : 3.0
Date : 2020-02-24 -- 2020-03-20
Language : English
Level : Doctoral level
Responsible KI department : Department of Medicine, Solna
Specific entry requirements : Basic knowledge of cell and molecular biology (as an example - to be able to account for the basics of "translation", "G1 phase", "splicing", "endocytosis" (without necessity for molecular details)).
Purpose of the course : The student will 1) learn basic concepts in Immunology, 2) get an overview of the various immune cell types and their function and development, and 3) meet the Immunology faculty of Karolinska Institutet. This course is a good starting point for more advanced/thematically focused courses in Immunology. Nevertheless, while this course does not expect any prior education in Immunology, basic immunological concepts will be discussed in depth and detail. Therefore, the course is not only directed at immunology novices, but also at students that wish to broaden and deepen their current general immunological knowledge.
Intended learning outcomes : To understand basic principles of innate and adaptive immunity, and how different components of the immune system cooperate.
Contents of the course : The course is separated into two parts. In part 1 we discuss basic immunological concepts underlying innate and adaptive immune responses. In part 2 we revisit and discuss these concepts in the context of disease. More specifically, in part 1 we will discuss development and function of key cell types mediating immune responses, pathogen recognition by cells of the innate immune system, generation of antigen receptor repertoires, principles of self/non-self discrimination and immunological tolerance, and mechanisms of humoral and cellular immune responses. In part 2 this knowledge will be applied to more clinical contexts such as defense against infection, autoimmune diseases, allergic diseases, tumors, or transplantation.
Teaching and learning activities : This is a full-time course, which consists of 2 parts. The first part will take four full days and one half-day of lectures and work on group assignments. The second part will follow after a teaching-free period of several weeks and will take 3 full days. The purpose of dividing the course into two parts is that the participants should have time to thoroughly study the literature from part 1 (fundamental immunological mechanisms) before teaching and learning of more applied immunology in part 2 starts. Considering the substantial literature requirement plus work on the assignments, we estimate that an extra 2.5 days of self-studying is needed during the teaching free period.
Examination : The course assignments must be satisfactory completed. The students will be required at least 95% attendance, and active participation in lectures and contribution to other course activities to pass the course. A single missed day of the course can be tolerated, but the student will be asked to work on an additional individual assignment based on the topic(s) of this day.
Compulsory elements : Lecture attendance and submission of all course assignments is compulsory.
Number of students : 12 - 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) date for registration as a doctoral student (priority given to earlier registration date)
More information : This is a full-time course, which consists of 2 parts. The first will take four full days (February 24th-28th) and one half-day of lectures and work on group assignments. The second part will follow after a teaching-free period of several weeks and will take 3 full days (March 17-19). Considering the substantial literature requirement plus work on the assignments, we estimate that an extra 2.5 days of self-studying is needed during the teaching free period. Lectures will mainly take place at the Center for Molecular Medicine (CMM).

 Part 1:
 Feb 24 (Mon) - 9:00-17:00
 Feb 25 (Tue) - 9:30-17:00
 Feb 26 (Wed) - 9:00-17:00
 Feb 27 (Thu) - 9:00-17:00
 Feb 28 (Fri) - 9:00-12:00

 Part 2:
 Mar 17 (Tue) - 9:30-17:00
 Mar 18 (Wed) - 9:00-17:00
 Mar 19 (Thu) - 9:30-17:00

Course responsible :
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Title : Biostatistics III: Survival analysis for epidemiologists

Course number : 3142
Credits : 1.5
Date : 2020-02-10 -- 2020-02-19
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 and Biostatistics II: Logistic regression for epidemiologists or equivalent courses, and practical experience applying statistical models.
Purpose of the course : This course focuses on the application of survival analysis methods to epidemiological studies. The statistical software Stata will be used in the course.
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, 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 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 statistical software, exercises not requiring statistical software, group discussions, literature review.
Examination : The course grade is based solely on a written examination. The examination will contain two sections and a passing grade must be obtained for each section in order to obtain a passing grade for the course. Students who do not obtain a passing grade on both sections and wish to take the examination again must retake the entire examination (i.e., both sections) even if they previously obtained a passing grade on one of the two sections. The focus of the exam will be on understanding concepts and their application to analysis of epidemiological studies rather than mathematical detail. 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 (summative assessment).
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 February 10, 12, 14, 17 and 19.
 Participants are expected to have prerequisite knowledge equivalent to the learning outcomes of the courses Epidemiology I, Biostatistics I and Biostatistics II. We have provided a self-assessment text (http://biostat3.net/download/selfassessment.pdf) for you to confirm that you understand the central concepts. We advise all potential applicants to take the test prior to applying for 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 a minimum, undertake an extensive review of central concepts in statistical modelling and possibly consider studying inter-mediate-level courses (e.g., Biostatistics II) before taking Biostatistics III. The statistical software Stata will be used throughout the course. Participants are expected to possess basic knowledge of Stata prior to the start of the course. An introduction to Stata can be downloaded from the course webpage (www.biostat3.net).

Course responsible :
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Contact person :
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Title : Introductory course in SAS programming

Course number : 3143
Credits : 1.5
Date : 2020-05-04 -- 2020-05-08
Language : English
Level : Doctoral level
Responsible KI department : Department of Public Health Sciences
Specific entry requirements :
Purpose of the course : The aim is to introduce fundamental SAS programming language for use in database handling and preparation for analyses. Further, the aim is to introduce the student on how to use statistical procedures in SAS, with focus on descriptive statistics.
Intended learning outcomes : After successfully completing this course you as a student are expected to be able to: - apply the SAS system when importing and exporting data. - manipulate data using SAS labels and formats. - manipulate data using SAS functions and programming statements. - perform descriptive statistics using adequate SAS procedures.
Contents of the course : The course is designed to give fundamental insights in the SAS system and basic skills in the SAS programming language. The course embraces commands for definition, description, modification, selection and analysing of data, and covers: - Introduction to the SAS Windows - SAS data sets, creating, importing and exporting data - Data handling, programming statements and SAS functions - SAS procedures for descriptive statistics
Teaching and learning activities : Full-time in supervised computer lab with a mixture of interactive lectures and excercises. Every morning a quiz, recapitulating the previous days' lectures.
Examination : To pass the course, the student has to show that the learning outcomes have been achieved. The course will end with an examination consisting of both an individually written and individually computerized exam where the covered commands are used. 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 : Only the examination is compulsory.
Number of students : 8 - 20
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 : Fulltime in supervised computer lab with a mixture of interactive lectures and exercises. Every morning a quiz, recapitulating the previous day's lectures. Basic computer skills are required.

Course responsible :
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Contact person :
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Institutionen för folkhälsovetenskap

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Title : Computational modelling for cognitive neuroscience and psychiatry research

Course number : 3144
Credits : 1.5
Date : 2020-01-17 -- 2020-02-20
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. Previous experience with statistical analysis (regression, general linear model) and the R software.
Purpose of the course : The purpose of the course is to introduce doctoral students to computational techniques for modelling and analysing behavioural 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) adapt the models to new experimental paradigms for their own research. The students will be able to implement and estimate the models with the R package rstan.
Contents of the course : Bayesian modelling; introduction to reinforcement learning; classical models for decision-making tasks (drift diffusion model, intertemporal choice, two-armed bandit). Applications: psychosis, addiction, depression, anxiety.
Teaching and learning activities : Lectures. Hands-on sessions with practical exercises.
Examination : Examination consists of 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 and hands-on sessions is mandatory. Absence from a lecture may be compensated by writing an essay on the corresponding topic. The final examination is compulsory (both report and presentation).
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) date for registration as a doctoral student (priority given to earlier registration date).
More information : Course dates and times: January 17th, 24th, 31st and February 7th, 14th from 9:00 to 16:00, and February 20th (examination day) from 9:00 to 12:00.

Course responsible :
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Contact person :
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Title : To communicate science in different contexts with focus on oral and visual communication

Course number : 3147
Credits : 3.0
Date : 2020-03-02 -- 2020-03-17
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 orally and visually present ones own research that has been adapted to different target groups and to reflect on ones own as well as ones peers presentation skills and abilities.
Intended learning outcomes : After the course the student is expected to be able to: 1. Orally present own research adapted to different target groups. 2. Understand how visuals and media can support research and presentation to different target groups. 3. Be able to critique and reflect on presentation skills and the ability to adapt to different target groups.
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 - Rhetoric - Use of different media (such as posters, infographics, projection media, whiteboard)
Teaching and learning activities : 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. Each course participant will perform three oral presentations, one with an infographic, and receive feedback on content, presentation skills and adaptation towards target group.
Examination : The assessment consists of two different tasks: 1. Reflective statement based in experience, feedback and research/literature within communication and learning. 2. Oral presentation in a popular scientific context supported by PowerPoint or similar. 3. A final scientific infographic in digital form revised based upon feedback from peers. To pass the course the participant needs to show evidence that they reached the learning outcomes by fulfillment of the assessment criteria.
Compulsory elements : Compulsory sessions are: 1. Oral presentation in a popular science context (video recorded) 2. Oral presentation with infographic in a scientific context and observe and give feedback to an oral presentation and infographic made by a peer. Absence from the compulsory sessions or assessment seminar can be compensated through supplementary activity.
Number of students : 18 - 20
Selection of students : The selection for this basic general science course will be based on your admission date to doctoral education (priority given to earlier registration date). Please make sure that you have entered the correct registration date for doctoral education in your personal profile.
More information : This is a two-week course which requires time for independent work outside of scheduled class time. Obligatory scheduled class room sessions are on the following dates: 02-03, 09-10, and 16-17 March 2020. The course is given in ENGLISH.

Course responsible :
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Contact person :
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Title : Introduction to Teaching and Learning in Higher Education

Course number : 3181
Credits : 1.5
Date : 2020-03-19 -- 2020-04-16
Language : English
Level : Doctoral level
Responsible KI department : Department of Learning, Informatics, Management and Ethics
Specific entry requirements :
Purpose of the course : The purpose of this course is to introduce a variety of teaching and learning methods, and to stimulate a reflective approach to teaching in order to enhance students' meaningful learning and active involvement.
Intended learning outcomes : At the end of the course we expect you to: - Be able to explain general aspects of how to facilitate student learning in different teaching situations - Be able to reflect upon own teaching experiences and use educational concepts in a discussion about teaching and learning
Contents of the course : During the course we will discuss and elaborate on practical issues regarding teaching and learning in laboratory, seminars and lectures. We will discuss and work with ways to challenge students and what to do to facilitate their learning. Course participants will observe (auscultate) teaching and reflect upon their experiences. We will touch upon the role of the teacher and KI teaching policies.
Teaching and learning activities : The course is designed to promote active learning and a variety of teaching and learning strategies will be used during the course. Examples are lectures, small group discussion, peer teaching, group work, literature studies, auscultation of teaching and reflection in groups.
Examination : To satisfactorily complete this course you must demonstrate that you have reached the learning outcomes by orally presenting your reflections of literature studies and auscultation of teaching.
Compulsory elements : The assessment seminar the last day of the course is mandatory. If absent, the student need to present his/her knowledge at a separate occasion.
Number of students : 15 - 30
Selection of students : Priority will be given to doctoral students who have just started or soon will be involved in teaching and have no teacher training.
More information : The course is based on theories of experiential learning, a reflective approach and learning through active participation and collaboration. In order to learn as much as possible from the course, it is important that you are prepared and present at scheduled sessions.
 The scheduled sessions will take place on 19 March, 26 March, 2 April and 16 April. All these sessions are half-days. In addition, time for reading, reflecting, writing and auscultation must be planned by the course participants.
 The previous course number was 3031.

Course responsible :
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Institutionen för lärande, informatik, management och etik

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Title : The Vascular Brain

Course number : 3193
Credits : 1.5
Date : 2020-05-18 -- 2020-05-22
Language : English
Level : Doctoral level
Responsible KI department : Department of Clinical Neuroscience
Specific entry requirements : Understanding of basic cell biology and molecular biology.
Purpose of the course : Brain function depends on constant supply of glucose and oxygen from blood vessels. Efficient communication between neural cells and vessels is essential for correct brain function and relies on selective transport of nutrients across the blood-brain barrier. Brains are particularly vulnerable to dysfunction of blood flow and loss of barrier properties which can lead to dementia and neurodegenerative disease. The purpose of the course is to deepen the understanding of concepts underlying cerebrovascular development, cell signaling, imaging methods and vascular contributions to neurodegenerative diseases.
Intended learning outcomes : After the completed course, the students should be able to describe and understand the principles of molecular and cellular mechanisms responsible for neurovascular development, imaging and vascular contribution to neurological disease. The student should be able to use the acquired knowledge in their specific projects and areas of research.
Contents of the course : The course covers central aspects of neurovascular development, cerebrovascular cell biology, blood-brain barrier function, principles of cerebral blood flow and vascular contribution to dementia and neurodegenerative disease. The course will cover genetic animal models, tracer technologies and imaging methods available to study blood vessel function in rodent models and human patients. We will discuss mechanisms leading to vascular dysfunction and loss of blood brain barrier properties as well as recent therapeutic methods to cross the blood-brain barrier for treatments of neurological disease. Highlights from the neurovascular field will be presented in the frame of a minisymposium.
Teaching and learning activities : Lectures by invited Swedish and international experts, minisymposium, group and individual work, seminar presentations.
Examination : The students should demonstrate that they have reached the intended learning outcomes stated above and to reflect on which aspects are relevant for their own research in during the presentations and discussions.
Compulsory elements : All lectures and minisymposium are compulsory to attend. Absence cannot be compensated for.
Number of students : 20 - 50
Selection of students : Priority will be given to PhD students with ongoing or previous experience with vascular biology issues to help them strengthen their dissertation projects.
More information : Hours: 9:00- 16:00 - Mon-Fri

Course responsible :
Sebastian Lewandowski
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Contact person :
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Title : Key Concepts and Principles for Design and Critical Interpretation of Nordic Register-Based Studies

Course number : 3199
Credits : 3.0
Date : 2020-03-30 -- 2020-10-02
Language : English
Level : Doctoral level
Responsible KI department : The institute of Environmental Medicine
Specific entry requirements :
Purpose of the course : Nordic registers constitute individual-level data in registers and databases, so-called microdata, covering vital events, health aspects, demographic and socioeconomic indicators for the entire populations in the Nordic countries over a period of decades. These features make the combination of Nordic register data an indispensable and powerful resource for answering a multitude of research questions, in a time- and cost-effective manner, and can ultimately provide policy-makers and key actors with new knowledge. The purpose of this two-week course is to provide participants with knowledge on how registers can and should be used for research purposes. This course will cover central concepts and principles for design and critical interpretation of Nordic register-based studies, taking ethical aspects and legal principles into consideration, and be divided into three aligned modules. The third module will be integrated in the two other modules.
Intended learning outcomes : At the end, the student should be able to: Module 1: - describe theoretical models for causation and discuss the principles of causal mechanisms, - recognise and formulate well-defined research questions and explain how these are related to the choice of study design, - explain and contrast central concepts in epidemiological and sociological life-course research, - explain strengths and weaknesses in common methods and study designs used in register-based research, - apply knowledge, skills and scientific approach when critically reviewing register-based studies as well as when designing studies in this field. Module 2: - reason about how to identify register data to answer the research question under study, - reflect upon different quality aspects, comparability and discrepancies between data sources when combining register data from different countries, - identify and explain possible sources and structures of bias, - evaluate how different sources of bias may influence the findings arising in studies and steps to prevent these, - apply the knowledge attained to identify and reason about potential biases in own research. Module 3: - discuss legal principles and laws that apply to research on personal data, - reason about legal systems that protect individual privacy with respect to how personal data are used and distributed to others, - reason about ethical principles that apply, with specific focus on personal privacy, informed consent and the concept of benefit/harm, - give adequate consideration of ethical aspects and legal principles when handling personal data in relation to own and others´ research projects.
Contents of the course : The perspective is Nordic by default, as the course will focus on methodological, practical, ethical and legal aspects of utilising register data from different Nordic countries for research purposes. Module 1: Central concepts, designs and methods in epidemiological and sociological life-course research. The module focuses on formulation of research questions, central concepts and general principles for study designs and methods commonly used when utilising register data. Designs and methods will be presented in the context of several case studies. Module 2: Identification of data and analysis of bias in registers. The module focuses on major steps in identifying relevant data from different Nordic countries, and comparability and discrepancies between data sources when combining data. We will cover how to identify and prevent different sources of bias, and aspects that should be kept in mind to gain a deeper understanding of when and how bias can occur, as well as the magnitude and possible direction of bias. Issues related to data quality, such as different variable definitions, data collection methods, reporting procedures, completeness and coverage, and how these aspects can vary, for instance over time and between geographic regions, will be highlighted. Module 3: Ethical and legal aspects of using personal information in register-based research. The research community is entrusted with their professional responsibility when utilising register data for research purposes. As register data is not primarily collected for research, it is critical to protect and guarantee individual privacy with respect to how personal data are used and distributed to others. This module will be integrated in the above modules and address legal aspects and laws that apply to register-based research, and ethical principles that should be emphasised in this context.
Teaching and learning activities : The course will be divided into three aligned modules. The third module will be integrated in the two other modules. The emphasis is on analysis, synthesis and the ability to make critical and independent interpretations, so-called higher order thinking skills. Different strategies, such as interactive lectures and various forms of group assignments will be used. All activities are designed to stimulate active learning, and communication between peers and teachers. Diverse perspectives and a broad, cross-border approach for various problem areas will be promoted, and cross-fertilisation between different disciplines will be stimulated. The collaborative-learning nature of assignments is also highlighted and peer learning emphasised
Examination : Learning outcomes, teaching and learning activities, and assessment methods will be constructed so that they harmonise, so-called constructive alignment. Assessment and learning are seen as linked and not separate processes. The examination tasks contain formative and summative features. Different methods for feedback on assignments are used, both so-called peer assessment and teacher-to-student. The individual examination (summative assessment) constitutes of a take-home examination.
Compulsory elements :
Number of students : 12 - 20
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 : This two-week course is divided into two separate course weeks. The dates are March 30-April 3, 2020 (week 1) and September 28-October 2, 2020 (week 2). The course will be arranged as a retreat somewhere in Sweden. Travel costs and accommodation will be covered in relation to the educational activities. </BR> </BR> The target group is doctoral students (and those who have recently completed their doctoral education) involved in register-based research within their research training. Eligible applicants are registered doctoral students at a Nordic higher education institution. Given availability, also applicants (doctoral students and those who have recently completed their doctoral education) not at a Nordic higher education institution can be considered. Eligible doctoral students (and those who have recently completed their doctoral education) will be selected based on aspects regarding the project and the applicant (see below), and if the syllabus seems to be of relevance for the applicant's project. Date for registration as doctoral student will be taken into account, and priority will be given to earlier registration date. A letter of motivation (not exceeding one A4 sized page) from the main supervisor is required, which should state that the student is recommended and permitted to take part in the course (with the exception of emergencies). This letter should be emailed to johanna.bergman@ki.se </BR> </BR> 1. Aspects that are considered regarding the project: </BR> - The project’s relevance for the area of Nordic register-based research. </BR> - The project’s potential novelty, originality, design and relation to research forefront. </BR> - The project's potential to create new knowledge, new ideas and approaches. </BR> - If the project seems to be ethically and legally acceptable. </BR> - If presented project seems to be relevant for the research question under study. </BR> - If the general design, including time schedule seems to be optimal for the project. </BR> - The project´s potential strengths and limitations as well as alternative approaches. </BR> </BR> 2. Aspects that are considered regarding the applicant: </BR> - The applicant´s motivation for attending the course. The supervisor´s motivation is also considered. Time since admission as a doctoral student (to be early in their education is an advantage). </BR> - The applicant´s ability to describe the project. </BR> Link to the webpage: https://ki.se/en/imm/nordforsk-graduate-education-courses

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Course responsible :
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Title : Function B - to Design Procedures and Projects Involving Research Animals

Course number : 3214
Credits : 3.0
Date : 2020-03-03 -- 2020-04-02
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 : 5 - 10
Selection of students : This course is primarily intended for principal investigators, but selected doctoral students at the last stage of their studies will be accepted. Thus, preference will be given to doctoral students working with animal models in the last stage of their projects. If necessary, a selection criterium will be used based on the date for registration as a doctoral student (priority given to earlier registration date) and on the relevance of the course syllabus for the applicant's doctoral project.
More information : Face-to-face lectures will be held in 8 separate days between approx. 9 am and 5 pm. 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 2017:40).

Course responsible :
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Comparative medicine
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Contact person :
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Title : Gene and Cell Therapy Product (ATMP) Drug Development

Course number : 3218
Credits : 1.5
Date : 2020-03-30 -- 2020-04-03
Language : English
Level : Doctoral level
Responsible KI department : Department for Clinical Science, Intervention and Technology
Specific entry requirements :
Purpose of the course : In this course, the students acquire an understanding of how to develop a gene or cell therapy product (ATMP), including Good Manufacturing Practice (GMP) production and proving efficacy through clinical trials. The course provides a broad understanding of ATMP development from a research idea to registration as an approved form of therapy where the cost of treatment is covered by the state. Students will learn about the European Medicines Agency (EMA) regulations for ATMP and requirements for commercial models and health economy considerations. This broad scope gives students access to information and contacts for a plethora of future career opportunities in ATMP development and provides an opportunity to build both national and international networks.
Intended learning outcomes : After the completed course, the doctoral student can: - fully understand and review the classification of ATMPs and the regulations associated with different stages of the ATMP development pipeline. - understand and critically review the research, development, manufacture, clinical, and commercial aspects of ATMP. - understand and review the need for multi-disciplinary expertise and interactions for translation of research with commercial and clinical considerations.
Contents of the course : To achieve a better understanding of ATMP development, and to construct systems and organisations for bringing ATMP options to patients, it is necessary to understand the specific needs in terms of research, commercial and clinical aspects. In this course, leading experts in the fields of ATMP drug development will discuss different aspects of intellectual property, regulation, manufacture, clinical trials, health economy, business models and marketing approval strategy in general and more specifically using various ATMPs as examples. The nature of the course is translational and provides a wide range of knowledge from pre-clinical to GxP to patient delivery and market approval.
Teaching and learning activities : The course is a combination of theoretical knowledge and practical skills. Some of the lecture parts of the course are based around a sandwiched conference on the same theme. There are additional lectures on basic knowledge of the field as well as practical activities and demonstrations such as some basic GMP philisophy and procedures. The course is demanding and requires full-time presence and attention.
Examination : The students are examined with an individual written report according to the course learning outcomes. The participants receive written feedback for their reports from the examiner. All students are also required to peer-review another student's examination report.
Compulsory elements : Full presence in all parts of the course is required. Necessary absence will be regulated with the course leader and compensated as extra tasks.
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 is full time. This course represents a national cooperation in ATMP education in large part through co-operation with the Centre for Advanced Medical Products (CAMP) and Swelife-ATMP. It is given jointly by the doctoral programmes Cell Biology and Genetics (CBG) and Development and Regeneration (DEVREG). See: https://ki.se/en/staff/doctoral-programmes.

Course responsible :
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Title : Basic Electron Microscopy for Cell Biologists

Course number : 3219
Credits : 1.5
Date : 2020-05-04 -- 2020-05-08
Language : English
Level : Doctoral level
Responsible KI department : Department of Cell and Molecular Biology
Specific entry requirements :
Purpose of the course : The students take this course in order to learn about the ways electron microscopy methods are used in the study of biological problems, and to gain knowledge in the theoretical basis of electron microscopy and some practical starting skills in electron microscopy methods.
Intended learning outcomes : After the completed course, the students understand and can explain the theoretical basis of electron microscopy techniques, and explain how different kinds of biological research problems are studied using electron microscopy techniques. The students have basic knowledge on the application of different preparation methods, and can critically analyse and relate them to cell biological research questions. The students have basic (novice level) practical knowledge on the different practical preparation techniques.
Contents of the course : The course introduces students to electron microscopy and the kind of biological problems such as different biological functions and structures that are studied using electron microscopy. The course includes training in basic methods used to do research on biological material such as subcellular structures. The course includes theoretical lectures, discussions and practical sessions on specimen preparation for conventional and cryo-transmission electron microscopy. Most important tissue processing methods for electron microscopy: fixation, dehydration, resin embedding, sectioning, negative staining of ultrathin sections. There are demonstrations on preprative methods in electron microscopy. Some Cryo-EM techniques will be demonstrated.
Teaching and learning activities : The learning and teaching activities include talks (lectures), discussions, laboratory activities and demonstrations.
Examination : The outcomes are examined through an individual quiz with multiple choice questions, and a short individual written report/reflection on how the participants can employ EM techniques in their own research.
Compulsory elements : The practical laboratories and demonstrations are obligatory. Absence from obligatory moments is regulated by instructions of the course leader.
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) start date of doctoral studies (priority given to earlier start date)
More information : The course will be held on the Karolinska Institutet's Solna campus. Lectures and final exam will be held in Biomedicum while practicals and demonstrations will be held in the KI 3D-EM facility (Nobels v. 12E). Designated time is 9:00 to 17:00 Monday to Friday including time for individual studies and group work. Assembly on the first day is in Biomedicum B0317 at 0900. The days typically consist of lectures before lunch and practicals/demonstrations in the afternoons.

Course responsible :
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Title : Basic Human Neuroscience

Course number : 3220
Credits : 10.0
Date : 2020-02-13 -- 2020-04-01
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 will follow the curriculum of the neuroscience course in the medicine 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 satisfy the requirement for a course providing the grounding in human biology/physiology and/or pathology, but can not be counted as a project-specific course.

Course responsible :
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Contact person :
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Title : Psychiatric Genetics

Course number : 3222
Credits : 1.5
Date : 2020-03-23 -- 2020-03-27
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 that the participants acquire basic knowledge in genetic epidemiology, molecular genetics and epigenetics, as well as to provide an overview of the current knowledge of genetics and epigenetics in psychiatric illness including also the study tools, and aspects of ethics and law.
Intended learning outcomes : After completing the course, the participants should be able to explain basic genetic and epigenetic concepts and mechanisms, and to some extent be able to describe genetic and epigenetic research methodology and give examples of current understanding about genetic and epigenetic influences on psychiatric health, and briefly explain the legislation on biobanks.
Contents of the course : The course provides an introduction to the field of genetics and epigenetics including molecular genetics, genetic epidemiology, molecular epigenetics and the use of nerve cells generated from skin cells. An overview of current knowledge in psychiatric genetics is provided for several of the major diagnostic groups. Visit a laboratory for large-scale sequencing is also included.
Teaching and learning activities : The course is given as a full-time course for one week. Lectures, film, exercises and demonstrations are included.
Examination : Examination assignment carried out in groups. Presentation for other course participants as well as active contribution to the discussions. Each participant is examined individually.
Compulsory elements : Participation in the teaching, as well as in the examination assignment. Any absence of compulsory parts must be compensated by reading and summarizing overview articles in addition to regular course literature. This should be aligned with the course management. Observe that it is not possible to compensate for more than 50% of the teaching.
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 : Genomics for Biomedical Scientists: Handle Your Gene Expression Data

Course number : 3230
Credits : 3.0
Date : 2020-02-03 -- 2020-02-14
Language : English
Level : Doctoral level
Responsible KI department : Department of Microbiology, Tumor and Cell Biology
Specific entry requirements :
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 : 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) date for registration as a doctoral student (priority given to earlier registration date)
More information : The course most likely takes place at the SciLifeLab in Solna (alternatively at the Biomedicum in Solna). The course will provide theoretical training combined with hand-on practical training. Part of the practical training can be performed remotely. Students are encouraged (but it is not obligatory) to work on their own RNA- and ChIPseq data during the course.
 This course was previously given with course number 3062.

Course responsible :
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Title : Translational Molecular Brain Imaging in Neurodegenerative Disorders

Course number : 3231
Credits : 1.5
Date : 2020-03-09 -- 2020-03-13
Language : English
Level : Doctoral level
Responsible KI department : Department of Neurobiology, Care Sciences and Society
Specific entry requirements : No
Purpose of the course : The aim of the course is to provide theoretical and practical knowledge about molecular brain imaging techniques applied to neurodegenerative diseases. The course has a translational perspective, incorporating techniques used to visualize brain pathology in vivo by positron emission tomography (PET), and in vitro by autoradiography in post-mortem brain tissues.
Intended learning outcomes : At the end of the course the students should be able to demonstrate the ability to: 1) Understand the main brain pathophysiological features of neurodegenerative diseases. 2) Obtain an overview of the latest research findings regarding the evolution of brain pathophysiological changes across different stages of neurodegenerative diseases in relation to cognition, clinical presentation and fluid biomarkers, with a special focus on Alzheimer's disease. 3) Understand how to process, analyze and interpret data from key in vivo and in vitro molecular imaging techniques. 4) Understand how to perform translational research on the relationships between in vivo and in vitro brain pathophysiological findings in neurodegenerative diseases. 5) Apply the knowledge from this course to their own research work.
Contents of the course : This course will focus on experimental techniques used in translational molecular brain imaging of neurodegenerative diseases. It will first give the theoretical background for PET/microPET imaging, autoradiography and binding assay, and how they are used to quantify brain pathophysiological processes in neurodegenerative diseases. Then, the course will provide practical knowledge about how the in vivo and in vitro images are collected, processed and analyzed. The in vivo workshops will include practical exercises using brain imaging software for the analysis of PET images in humans, microPET images in transgenic mice, and demonstrations of brain MRI techniques as related to the analysis of PET images. For the in vitro aspect, the students will have demonstrations of radioligand binding assay and autoradiography on human brain tissue used to characterize the binding properties of the PET tracers in order to correlate these with other pathological changes in the brain.
Teaching and learning activities : The course is one week full-time and it will be organized as an integration of lectures, practical demonstrations and workshops.
Examination : All the intended learning outcomes will be assessed by a combination of written examination, written reports for the practical workshops, and oral presentation.
Compulsory elements : All parts of the course are mandatory. Absence from any of these will be compensated for by extra individual assignments provided by the course organizers.
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 to 16:00. All lectures and workshops will take place in NEO building, Flemingsberg campus. Final course evaluation will be based on an individual written report related to the practical workshops, and the report will be due approximately one week after the last day of the course.

Course responsible :
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Laetitia Lemoine
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Title : Developing and Evaluating Complex Interventions: Effective implementation

Course number : 3232
Credits : 3.0
Date : 2020-05-20 -- 2020-06-04
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 aim of this course is to introduce the theory and practice of developing and evaluating complex interventions, or interventions in complex systems to facilitate effective implementation. This will include different implementation research methods used for developing new interventions, how to develop an intervention 'logic model', and examples how to work with policy-makers, health professionals and the public to co-produce interventions. It will also provide a working knowledge of the key implementation frameworks and methodologies currently used to evaluate complex interventions, including feasibility studies, process evaluations and a range of outcome evaluation designs.
Intended learning outcomes : After the course, the participants should be able to: • Critically compare the strengths and limitations of different methodologies for intervention development and implementation • Identify appropriate methods for co-producing interventions involving policy makers, practitioners and the public • Understand the value of feasibility studies prior to effectiveness evaluation and considerations for using these to decide if and how to proceed to full evaluation • Understand a range of different approaches for effective implementation that is evaluating complex interventions, in terms of process and outcomes, and the types of interventions they are suited to
Contents of the course : The course will address the central aspects of complex intervention development and evaluation, including: • The intervention development process, including frameworks for intervention development and the role of existing evidence in intervention development • Issues to think about when planning a feasibility study and consideration of progression from feasibility testing to effectiveness testing • An introduction to Randomised Controlled Trials (RCT), challenges and limitations of large-scale RCTs and how they can sometimes be addressed • Evaluation options when randomisation isn't possible, including examples of natural experimental methods for evaluating policy interventions • Understanding intervention process, including key issues to think about when planning a process evaluation
Teaching and learning activities : The course will include a mix of web-based and in-person taught sessions, and group work activities in which knowledge from the taught sessions can be applied to real-life examples of the participants' work. Taught sessions include various examples of studies that have been carried out from a public health perspective, while group work activities will support students in applying their methodological principles to other health research contexts.
Examination : Examination will involve an oral presentation and a written assignment. The oral presentation will focus on the development of an intervention logic model and its rationale. The written assignment will then focus on developing a plan for evaluating this hypothetical intervention, including assessment of effectiveness and process.
Compulsory elements : The participants are expected to participate in all course sessions. Absence will be compensated in agreement with the course director.
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 : About the international lecturers: Jemma Hawkins and Graham Moore at the Centre for the Development and Evaluation of Complex Interventions for Public Health Improvement (DECIPHer) https://www.cardiff.ac.uk

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Course responsible :
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Title : Public Health Implications of an Aging Population

Course number : 3233
Credits : 3.0
Date : 2020-03-23 -- 2020-04-03
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) date for registration as doctoral student (priority given to earlier registration date), and 2) the relevance of the syllabus for the applicant's doctoral project. To be considered, include a short description of current research.
More information : This course has previously been given with course number 3040.

Course responsible :
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Title : What is Life? The Future of Biology

Course number : 3234
Credits : 2.5
Date : 2020-01-28 -- 2020-05-12
Language : English
Level : Doctoral level
Responsible KI department : Department of Microbiology, Tumor and Cell Biology
Specific entry requirements :
Purpose of the course : The understanding of life and of fundamental life procedures is to be found in the cross-section between basic physics, chemistry, biochemistry and Darwinian evolution. The problems and questions were formulated already 75 years ago by the Nobel prize winner in physics Erwin Schrödinger with his book "What is life?". During the subsequent decades dramatic advances have been made depending on the discovery of DNA and the unveiling of metabolic processes. However, the fundamental issues about origin of life and the ultimate driving forces remain largely unanswered. This broad introductory course aims at providing an understanding of the fundamental problems of life from a biology point of view, how they can be approached and studied, and how new tools and technologies expands these possibilities. Further, the course will give students an introduction to complex systems (biocomplexity) and network theory.
Intended learning outcomes : After completing the course, the student will be able to: - Understand the dominating theories for origin of life - Understand the components of evolutionary theory and its explanatory power - Know about Schrödingers historical theory on "What is life" - Present definitions of Life - Describe the residing principles for organization of biological systems - Understand how complex systems and network theory relate to the cell's biology - Know about self-organizing systems - Discuss the fundamental role of water in cellular molecular biology - Know about the role of computer simulations in modern biology - Know about the role of quantum physics and thermodynamics in molecular and cellular biology - Discuss how genetic information can be converted to mechanical or electric force in biological systems
Contents of the course : - Definitions of Life - Origin of life, residing theories - The components of Darwins evolutionary theory, and what it can explain - Prebiotic, chemical evolution - Fundamental organization of biological systems - Self organizing systems - Theories of complex systems and networks, applications to cell biology - Water in cellular biology - Quantum physics and thermodynamics in biology - The use of computer simulations in biological systems
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 leading international invited speakers are mixed with those of local experts. The students receive recordings of all invited lectures for further self-studies at home. 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 with essay questions mostly focused on understanding and discussing problem solutions.
Compulsory elements : Lectures, workshops and the literature study presentation seminars are mandatory. Some activities can be compensated for with an extra written literature study in agreement with the course organiser. The student cannot participate in the final assessment when more than 20% of the activities are missed.

Number of students : 10 - 20
Selection of students : Selection criteria: 1) the relevance of the course to the participating student's project according to motivation, 2) start date of doctoral studies (priority given to earlier start date)
More information : The course will be held as weekly lectures or workshops ususally on Tuesdays 14.30 - 17.00, i.e. three teaching hours on 10 occasions (30h) and in addition a written examination(2h). The exact dates will be communicated in connection to the admission offer. There will be seven lecture occassions and three workshops/literature discussions, led by the course organizer. The lectures will be held by invited international speakers or national experts from KI; Uppsala, KTH and Chalmers in Gothenburg.The lectures will be held in lecture hall/rooms of the KI Solna campus, and the workshops in meeting rooms at Biomedicum, Solnavägen 9. Invited speakers are going to include (if available and accepting invitation) Albert Laszlo-Barabasi, Harvard (networks), Greg Winter (Nobel prize 2018) and Nick Lane, UK (origin of life), Svante Pääbo, Leipzig (evolution), Ulf Danielsson, Uppsala University (physics and life), Lennart Pettersson (water) and Åsa Wikforss (theories of life), Stockholm University (SU), Göran Wendin and Göran Johansson, Chalmers (quantum physics).
 This course has previously been given with course number 2001.

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Contact person :
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Title : Thrombosis and Hemostasis, from Mechanisms to Therapies

Course number : 3238
Credits : 3.0
Date : 2020-02-17 -- 2020-02-27
Language : English
Level : Doctoral level
Responsible KI department : Department of Medicine, Solna
Specific entry requirements :
Purpose of the course : The course aims to bring doctoral students in-depth knowledge of thrombosis and hemostasis, to elucidate the links between molecular mechanisms and clinical disorders, to introduce current advances and future directions of thrombosis research, as well as to enhance the abilities for research question identifying and research design. The course is designed for the students who work with basic and clinical aspects of hemostasis, thrombosis and cardiovascular research.
Intended learning outcomes : The concept from bench to bed side and back will be reinforced at all levels. Therefore, at the end of the course the students should be able to: 1. Describe the molecular and cellular mechanisms of hemostasis and thrombosis, as well as the dynamic processes of primary hemostasis, secondary hemostasis, and thrombosis. 2. Explain the mechanisms underlying bleeding and thrombotic disorders. 3. Have a good understanding of current anticoagulant and antiplatelet therapies, and obtain a clear view of the challenges of future anticoagulant and antiplatelet drug developments. 4. Apply current knowledge of thrombosis and hemostasis into future research design and to formulate new treatment strategies. 5. Sharpen the sense of critical appreciation of research literature, and strengthen their ability to develop new research concepts through critical reading and reflecting.
Contents of the course : The following aspects of hemostasis and thrombosis will be discussed: biochemistry of the blood clotting system; cell-cell and cell-protein interactions in the cardiovascular system in relation to thrombosis and bleeding disorders; cross-talks of the clotting system with inflammation, host defense and complement systems; diagnosis of bleeding and thrombotic disorders; therapeutic strategies to fight thrombosis and bleeding with the emphasis placed on new pharmacological concepts. In light of the new knowledge conveyed in the course, the emphasis will be laid on critical review of the literature, research question identification, and independent research design.
Teaching and learning activities : Seminars Group work Online learning and group work on research design Presentation of papers related to the key lectures
Examination : Presentation of a paper related to key lectures Research project design and reciprocal review between the work groups. Multiple-choice test.
Compulsory elements : To participate in the lectures, group work and presentation of the group work is compulsory. The students who have missed the group work sessions can book extra session time within 4 weeks to compensate the absence. Absence in lectures should be compensated for in accordance with the course director.
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 was previously given with the course number 2484. The revised course syllabus has extended the course from one-week to two-week full time. The extension allows the course to reinforce, apart from in-depth understanding of coagulation, thrombosis and haemostasis and their links to multiple clinical settings through course lectures (40%), the training on research competence and independence through online learning and individual/group work (60%). The latter includes critical review and presentation of research literature, research question identification, research design, as well as reciprocal review and criticism of project design. The course was well appreciated by previous course participants as indicated by the course evaluation report (link below).

Course responsible :
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Contact person :
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Title : Biopsykosocialt perspektiv på beroendetillstånd

Course number : 3239
Credits : 3.0
Date : 2020-05-18 -- 2020-05-29
Language : Swedish
Level : Forskarnivå
Responsible KI department : Department of Clinical Neuroscience
Specific entry requirements : Doktorand vid svenskt universitet.
Purpose of the course : Syftet är att ge en fördjupad kunskap inom beroendefältet samt ge kunskap för att kritiskt kunna granska forskning inom området.
Intended learning outcomes : Efter kursen förväntas studenten: Kunskap • kunna definiera nyckelbegrepp inom beroendeområdet • kunna redogöra för teoretiska modeller för beroendeutveckling • kunna redogöra för olika metoder för att studera beroende samt aktivt kunna redogöra för och reflektera över fördelar och nackdelar med dessa metoder • ha kännedom om prevalens och epidemiologi för beroenderelaterade problem • kunna redogöra för olika behandlingsformer inom beroendeområdet • kunna redogöra för beroendets inverkan på individen och omgivning Färdighet och förmåga • kritiskt och konstruktivt opponera på andra studenters arbeten • delta i diskussioner, argumentera kring för kursen relevanta frågeställningar • kritiskt och konstruktivt kunna reflektera över centrala beroendeteorier, behandlingsformer samt modeller för att studera beroendetillstånd. Värderingsförmåga och förhållningssätt • kritiskt värdera vetenskapliga artiklar och argument inom för kursen relevanta ämnesområden • identifiera sitt behov av ytterligare kunskap och att utveckla sin kompetens inom kursens områden
Contents of the course : SAD's forskarkurs syftar till att studenterna ska få en ökad förståelse för och kunna redogöra för följande områden: • Beroende utifrån följande perspektiv: Epidemiologi, neurobiologi, psykologi och socialmedicin • Modeller och metoder för att studera beroende, från cell till människa • Prevention, psykologisk och farmakologisk behandling • Skadeverkningar på individ och omgivning
Teaching and learning activities : Kursen består av en veckas förberedande självständigt arbete och en vecka i internatform. Kursen inleds med att studenterna under den inledande veckan skriver en sammanfattning av sin forskningsplan för forskarutbildningen, förbereder en presentation av sin egen forskningsplan, genomför en granskning av två andra studenters presentationer av forskningsplaner samt läser in kurslitteratur. Utöver detta ska studenterna svara på fem grundläggande kunskapsfrågor inom för kursen centrala områden. Allt kursmaterial och inläsningsmaterial finns tillgängligt på KI lärarplattform. Arbetsformerna under internatet (vecka två) består av aktivt deltagande vid föreläsningar, grupparbete, diskussioner och debatt.
Examination : Aktivt deltagande i alla ovan beskrivna obligatoriska moment samt skriftligt genomförande och muntlig presentation av gruppuppgift som innebär att applicera alternativa modeller/teorier på den en befintlig forskningsplan.
Compulsory elements : Alla föreläsningar, självständigt arbete, grupparbete, debatter och diskussioner är obligatoriska. Sammanfattning av avhandlingsarbetet, kamratgranskning med presentation är också obligatoriska. Kursansvarig bedömer om och i så fall hur frånvaro från obligatoriska utbildningsinslag kan tas igen. Innan studenten deltagit i de obligatoriska utbildningsinslagen eller tagit igen frånvaro i enlighet med kursansvarigs anvisningar kan inte studieresultaten slutrapporteras. Frånvaro från ett obligatoriskt utbildningsinslag kan innebära att den studerande inte kan ta igen tillfället förrän nästa gång kursen ges.
Number of students : 10 - 18
Selection of students : Urvalet baseras på 1) kursplanens relevans för den sökandes doktorandprojekt (enligt motivering), 2) startdatum för doktorandstudier
More information : Kursen anordnas av SAD (Svenska Föreningen för Alkohol- och Drogforskning) i samarbete med KI. Kursen består av en veckas förberedande självständigt arbete på distans (18/5 - 22/5) och en vecka i internatform (25/5 - 29/5) på Skarpö (lärcenter Skarpö). Boende och mat ingår på internatet. Kursen ges på svenska.

Course responsible :
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