Course catalogue for doctoral education

HT20

Human biology or pathology * General science courses

1391 Writing science and information literacy * 2020-11-02 -- 2020-11-13 (English)
2193 Introduction to Medical Education Research 2020-09-07 -- 2020-12-18 (English)
2219 Bioinformatics for cell biologists * 2020-09-14 -- 2020-09-18 (English)
2348 Functional Fluorescence Microscopy Imaging (fFMI) in biomedical research 2020-11-16 -- 2020-11-27 (English)
2520 Interview Techniques in Health and Care Research 2020-09-23 -- 2020-10-20 (English)
2522 Mass spectrometry-based proteomics: When and How. 2020-11-02 -- 2020-11-13 (English)
2600 Neurogenetics 2020-09-28 -- 2020-10-02 (English)
2609 Basic Course in Medical Statistics - a distance course * 2020-09-28 -- 2020-10-09 (English)
2609 Basic Course in Medical Statistics - a distance course * 2020-11-30 -- 2020-12-11 (English)
2616 Frontiers in Cognitive Neuroscience 2020-09-21 -- 2020-09-25 (English)
2618 Write your research results and get them published * 2020-08-31 -- 2020-09-11 (English)
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2618 Write your research results and get them published * 2020-11-02 -- 2020-11-13 (English)
2624 Brain circuits 2020-09-14 -- 2020-09-18 (English)
2629 Neurodegenerative Disorders I - From Molecule to Treatment 2020-10-05 -- 2020-10-09 (English)
2644 Human physiology - an overview # 2020-09-21 -- 2020-10-09 (English)
2674 Practical approaches to qualitative research - based on blended learning 2020-08-24 -- 2020-11-13 (English)
2690 Basic Laboratory Safety * 2020-09-28 -- 2020-10-05 (English)
2711 Social determinants of health 2020-11-30 -- 2020-12-11 (English)
2738 Intermediate Medical Statistics: Regression models * 2020-11-02 -- 2020-11-13 (English)
2780 The developing brain 2020-08-31 -- 2020-09-04 (English)
2787 Present your research! * 2020-08-24 -- 2020-08-28 (English)
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2796 Introduction to Stata for epidemiologists 2020-09-10 -- 2020-09-11 (English)
2797 Biostatistics II: Logistic regression for epidemiologists * 2020-09-14 -- 2020-09-25 (English)
2799 The psychobiology of emotions 2020-11-12 -- 2020-11-20 (English)
2827 Människans Fysiologi - en översikt # 2020-11-16 -- 2020-12-18 (Swedish)
2868 Advanced course in SAS programming for health care data 2020-11-30 -- 2020-12-04 (English)
2873 Quality Assurance of Clinical Research * 2020-09-28 -- 2020-10-02 (English)
2873 Kvalitetssäkring av klinisk forskning * 2020-09-07 -- 2020-09-11 (Swedish)
2893 Design and analysis of twin and family-based studies 2020-10-12 -- 2020-10-16 (English)
2897 Dokumentation, bearbetning och analys av språkliga data 2020-11-02 -- 2021-01-15 (Swedish)
2917 Pragmatic randomised controlled trials in healthcare 2020-09-21 -- 2020-10-30 (English)
2944 Sex and gender perspectives in cardiovascular research 2020-10-19 -- 2020-10-23 (English)
2953 Statistics with R - from data to publication figure 2020-11-02 -- 2020-11-20 (English)
2964 Medical Research Ethics * 2020-09-21 -- 2020-09-25 (English)
2964 Medical Research Ethics * 2020-10-19 -- 2020-10-23 (English)
2964 Medical Research Ethics * 2020-11-23 -- 2020-11-27 (English)
2968 Methods for Life Course Epidemiology 2020-12-07 -- 2020-12-11 (English)
2971 Introduction to R - Data Management, Analysis and Graphical Presentation 2020-09-22 -- 2020-11-03 (English)
2980 Study Design in Clinical Research 2020-11-09 -- 2020-11-26 (English)
2981 Rare Disease Genomics 2020-10-05 -- 2020-10-09 (English)
2990 Multivariate prediction modelling with applications in precision medicine 2020-11-23 -- 2020-11-27 (English)
2992 Biostatistics III: Survival analysis for epidemiologists * 2020-11-09 -- 2020-11-18 (English)
2994 Functional Neuroanatomy 2020-09-07 -- 2020-09-11 (English)
2995 Systematic reviews and meta-analyses in animal research - an introduction 2020-12-02 -- 2020-12-03 (English)
2996 Anaesthesia, analgesia and surgery (mice and rats) 2020-11-09 -- 2020-11-13 (English)
3024 Advanced cancer biology 2020-09-01 -- 2020-12-22 (English)
3026 Cell cycle, cancer and anti-cancer targets 2020-10-19 -- 2020-10-23 (English)
3028 Grundkurs i SPSS 2020-09-28 -- 2020-10-02 (Swedish)
3037 Exploring entrepreneurial opportunities in research 2020-09-07 -- 2020-10-23 (English)
3049 Cellular Signalling 2020-10-12 -- 2020-10-16 (English)
3064 Imaging in Neuroscience: with a Focus on Structural MRI Methods 2020-11-23 -- 2020-11-27 (English)
3066 Metoder för systematisk litteraturöversikt 2020-09-07 -- 2020-12-14 (Swedish)
3072 Tissue-Specific Immunology 2020-11-16 -- 2020-11-20 (English)
3073 Philosophy of science and the concept of health * 2020-11-09 -- 2020-11-20 (English)
3076 Cancer Cell Metabolism 2020-09-28 -- 2020-10-02 (English)
3077 An Introduction to Genetic and Molecular Epidemiology 2020-10-19 -- 2020-10-23 (English)
3080 Gene Regulation in the Early Human Embryo 2020-09-21 -- 2020-09-25 (English)
3081 Medical developmental biology 2020-08-24 -- 2020-09-11 (English)

3089 Cryobiology in assisted reproductive technology 2020-11-23 -- 2020-11-27 (English)
3098 Construction and validation of measurement in behavioral science 2020-10-26 -- 2020-11-13 (English)
3102 Omics data analysis: From quantitative data to biological information 2020-11-16 -- 2020-11-27 (English)
3104 The epigenome: a platform for the integration of metabolic and signaling pathways in development and on the path to diseases 2020-10-12 -- 2020-10-16 (English)
3109 Pathology # 2020-10-12 -- 2020-10-23 (English)
3110 Tumor immunology and immune therapy of cancer 2020-11-02 -- 2020-11-06 (English)
3112 Basic course in tumor biology and oncology 2020-09-14 -- 2020-09-25 (English)
3113 Endothelial Cell Function and its Relevance in Cardiovascular Disease 2020-11-09 -- 2020-11-13 (English)
3114 Molecular Immunology 2020-10-19 -- 2020-10-30 (English)
3118 Forskningsetik * 2020-09-15 -- 2020-10-06 (Swedish)
3120 Flow cytometry: from theory to application 2020-10-05 -- 2020-10-09 (English)
3121 Experimental techniques in study of metabolic and endocrine disorders 2020-11-23 -- 2020-11-27 (English)
3122 The Global Diabetes Epidemic 2020-11-09 -- 2020-11-20 (English)
3127 Human Cell Culture. Methods and Applications 2020-10-05 -- 2020-10-09 (English)
3128 Epidemiology I: Introduction to epidemiology 2020-11-23 -- 2020-12-02 (English)
3134 Basic Course in Medical Statistics * 2020-10-12 -- 2020-10-23 (English)
3137 Psychobiology of Intelligence 2020-10-20 -- 2020-11-19 (English)
3138 Epidemiology II. Design of epidemiological studies 2020-12-07 -- 2020-12-16 (English)
3147 To Communicate Science in Different Contexts with Focus on Oral and Visual Communication * 2020-11-09 -- 2020-11-24 (English)
3150 Embryology I 2020-10-19 -- 2020-10-23 (English)
3154 Biostatistics I: Introduction for epidemiologists * 2020-09-14 -- 2020-10-07 (English)
3157 Mechanisms of Gene Regulation in Metabolism 2020-10-22 -- 2020-10-28 (English)
3173 Clinical Trials in Cardiovascular Research 2020-12-10 -- 2020-12-16 (English)
3190 Nucleic Acid Chemistry and Therapy 2020-09-04 -- 2020-09-22 (English)
3192 Presentera och diskutera forskning med det omgivande samhället, med fokus på elever i låg- och mellanstadiet 2020-09-03 -- 2020-10-30 (Swedish)
3196 Global Health Economics 2020-10-19 -- 2020-10-30 (English)
3197 Basic Cardiovascular Pathology 2020-11-16 -- 2020-11-20 (English)
3201 Teaching and Learning in Higher Education: A Doctoral Course * 2020-09-14 -- 2020-12-07 (English)
3214 Function B - to Design Procedures and Projects Involving Research Animals 2020-09-01 -- 2020-10-08 (English)
3218 Gene and Cell Therapy Product (ATMP) Drug Development 2020-11-16 -- 2020-11-20 (English)
3220 Basic Human Neuroscience # 2020-09-24 -- 2020-11-05 (English)
3221 Assessing and Alleviating Pain and Distress in Laboratory Animals 2020-11-16 -- 2020-11-17 (English)
3233 Public Health Implications of an Aging Population 2020-09-28 -- 2020-10-09 (English)
3234 What is Life? The Future of Biology 2020-09-15 -- 2021-02-24 (English)
4215 Clinical and Molecular Bacteriology 2020-11-09 -- 2020-11-13 (English)
5214 Immunometabolism: Implications for Health and Disease 2020-11-30 -- 2020-12-04 (English)
5215 Cancer Drug Discovery 2020-09-07 -- 2020-09-11 (English)
5216 Stress, Sleep, and Health 2020-11-02 -- 2020-11-13 (English)
5222 Preventing Illness or Promoting Health: Concepts and Illustrations from Healthcare Science Perspectives 2020-10-05 -- 2020-10-29 (English)
5223 Artificial Intelligence and Machine Learning for Biomedical and Clinical Research 2020-09-21 -- 2020-10-02 (English)
5225 Experimental Models in Cardiovascular and Metabolism Research 2020-10-19 -- 2020-10-23 (English)
5226 The DNA Damage Response in Cancer 2020-11-23 -- 2020-11-27 (English)
5227 Advanced Scientific Writing * 2020-11-23 -- 2020-11-27 (English)
5228 Global Sexual and Reproductive Health and Rights: Methods, Concepts and Implications for Policy and Practice 2020-11-02 -- 2020-11-13 (English)
5229 Basic Immunology 2020-09-07 -- 2020-09-30 (English)
5230 Cancer Genetics: a Basis for Precision Medicine 2020-11-16 -- 2020-11-20 (English)
5231 Oral Presentation of Own Research * 2020-10-12 -- 2020-10-16 (English)
5232 Tumor Microenvironment 2020-11-09 -- 2020-11-13 (English)
5233 Network Theory and Brain Imaging 2020-11-03 -- 2020-11-26 (English)
5234 Clinical and Molecular Parasitology and Mycology 2020-11-16 -- 2020-11-20 (English)
5235 Basic Bioinformatics * 2020-11-09 -- 2020-11-17 (English)
5236 Improving Use of Medicines, Focusing on Antibiotics 2020-09-10 -- 2020-09-16 (English)
5237 Human Viral Diseases: Mechanisms and Pathogenesis 2020-11-02 -- 2020-11-06 (English)
5239 Behavioral Analysis in Rodents: Classic and Novel Approaches 2020-11-16 -- 2020-11-20 (English)
5240 Lipids and Lipid-Metabolic Driven Inflammation in Cardiovascular Disease – Basic Science and Clinical Aspects 2020-09-14 -- 2020-09-18 (English)
5241 Health Risk Assessment of Endocrine Disruptors 2020-10-12 -- 2020-10-16 (English)
5243 Lipid and Lipoprotein Metabolism: Basal Aspects and Clinical Significance 2020-10-12 -- 2020-10-16 (English)

Title : Writing science and information literacy

Course number : 1391
Credits : 3.0
Date : 2020-11-02 -- 2020-11-13
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 : Introduction to Medical Education Research

Course number : 2193
Credits : 6.0
Date : 2020-09-07 -- 2020-12-18
Language : English
Level : Doctoral level
Responsible KI department : Department of Learning, Informatics, Management and Ethics
Specific entry requirements :
Purpose of the course : The participants should develop their understanding of what kind of issues/phenomena that are researched in medical education and get familiar with qualitative and quantitative approaches and methods used in the research field.
Intended learning outcomes : After the course the student is expected to be able to: 1. Reason and argue about the significance of the Medical Education research field in relation to the Higher Educational field. 2. Identify, analyze and describe different kinds of issues and phenomena that are researched in Medical Education. 3. Reflect on and express similarities and differences of different research approaches and methods used in Medical Education Research.
Contents of the course : The course content includes studies of the Medical Education field especially: * Significance of professional educational programmes, disciplines and subjects in the medical and health care field. * Researching different areas within medical education - student learning, teaching, course/curriculum design, assessment and evaluation. * Researching learning and teaching in clinical education and the health care field - supervision, professional development and patient education. * Qualitative and quantitative approaches and methods in Medical Education research. * Characteristics of high quality Medical Education research.
Teaching and learning activities : The course is situated within the framework of blended learning with one face-to-face meeting combined with web seminars. This means that the course works well for distance learners. The course opens with introductory work conducted in the learning platform Canvas, followed by two mandatory campus days. The rest of the of the course is primarily conducted via Canvas through web seminars, individual written assignments, as well as group discussions and peer feedback. Participants need to be able to attend the campus days as well as the scheduled web seminars and group discussion through the digital learning platform Canvas. The course design is based on the student's active participation in his/her own learning process.
Examination : The examination assessment consists of two main parts: * A reflective paper based on an analysis of a self-chosen doctoral thesis within Medical Education. The analysis and reflection are expected to relate to the learning outcomes. * Written and oral self and peer assessment related to assignments and web seminars. The assessment criteria (correspondence, coherence, capacity and critical appraisal) must be fulfilled to pass the course.
Compulsory elements : Assignments, web seminars, campus days and group work are compulsory. In order to compensate for absence, students can submit a written report based on the topics discussed during the missed opportunities no later than 1 week after the course.
Number of students : 8 - 24
Selection of students : Selection will be based on 1) the relevance of the course syllabus for the applicant's doctoral project (according to written motivation), 2) start date of doctoral studies (priority given to earlier start date)
More information : This is a four week course course spread out over the term and which requires time for independent work outside of scheduled time. Face-to-face sessions on campus are: 14-15 September. Virtual webinar sessions through Zoom and Canvas are: 7 October, 21 October, 18 November and 15 December (examination seminar). The course is given in English.

Course responsible :
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Title : Bioinformatics for cell biologists

Course number : 2219
Credits : 1.5
Date : 2020-09-14 -- 2020-09-18
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 - 8
Selection of students : Selection will be based on 1) the relevance of the course syllabus for the applicant's doctoral project (according to written motivation), 2) start date of doctoral studies (priority given to earlier start date)
More information : The course is given as practical and theoretical course in basic cell biology oriented bioinformatics. The course is organized as a full time intensive summer school Monday-Friday at the Medicinska Föreningen site "Solviken" in Värmdö. <r><r> 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. Note that most course participants will be housed in shared rooms (several people per room). Participants must bring their own towels and sheets (sleeping bags not allowed). Basic campsite food will be provided breakfast, lunch and dinner. Toilets are simple campsite facilities, and there are no showers, however a sauna bath and the sea to swim in. For those who do not wish to overnight at the site, it is possible to commute on a daily basis, with buses leaving frequently from Slussen (total travel time from Slussen 40 minutes in one direction including a short walk). Indicate in your application if you are in possession of a tent, and if you are willing to stay in a tent for the four nights.

Course responsible :
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Title : Functional Fluorescence Microscopy Imaging (fFMI) in biomedical research

Course number : 2348
Credits : 3.0
Date : 2020-11-16 -- 2020-11-27
Language : English
Level : Doctoral level
Responsible KI department : Department of Clinical Neuroscience
Specific entry requirements :
Purpose of the course : This course is on advanced fluorescence microscopy imaging and spectroscopy techniques for quantitative characterization of molecular transport and interactions in cells. The purpose of the course is to give an introduction of the underlying physicochemical principles, hands-on experience and an overview of applications of these specialized techniques in biomedical research. The course is suitable for doctoral students lacking training in mathematics, physics, or optical engineering but want to apply these techniques in their research.
Intended learning outcomes : At the end of the course the student will have hands-on experience with live cell imaging and specialized fluorescence microscopy and spectroscopy techniques and is expected to be able to: 1. Use fundamental aspects of molecular structure to describe light-matter interactions and the emission of fluorescence; use this knowledge to discuss fluorescent properties of a fluorophore. 2. Understand the buildup of fluorescence imaging instrumentation, identify different optical elements and describe their function. 3. Describe the theoretical background behind specialized fluorescence based methodologies for studying molecular interactions in live cells. Discuss pros and cons in relation to the biological problem studied. 4. Specify instrumental requirements and design a fluorescence imaging assay for a biological problem of interest. 5. Apply a specific labeling strategy and perform a fluorescence imaging assay. 6. Communicate the results in written and oral form. 7. Discuss the adequateness of the methodology used in the scientific literature concerned.
Contents of the course : Fluorescence microscopy and associated techniques are indispensable research tools for investigating molecular mechanisms of biological processes. Versatility of fluorescence microscopy based techniques comes from the possibility to characterize fluorescence emission by spatial position, intensity, wavelength, lifetime and polarization. In addition, fluorescence microscopy and spectroscopy based techniques allow us to quantitatively study the cellular dynamics of molecules and the kinetics of their interaction with high spatio-temporal resolution and ultimate, single-molecule sensitivity. These techniques bring new biological insight at an unprecedented rate and are of crucial importance for the development of life sciences. The course covers the following topics: Luminescence and the nature of light (Fluorescence, Phosphorescence, Light scattering); Fluorescent markers and their photo-physical properties (Organic fluorescent dyes for covalent conjugation (Rhodamine 6G, Alexa dyes, Cyanine dyes); Quantum dots; Intrinsically Fluorescent Proteins (Aequorea victoria (GFP, YFP), Discosoma coral (DsRFP) and Montipora (Keima) families); Selectively binding dyes (DiI, DraQ 5). Instrumentation for Confocal Laser Scanning Microscopy (CLSM): Light sources, Optical Elements, Objectives, Detectors, Read-out devices); Quantization and Sensitivity in fluorescence imaging (Instrumental sensitivity, Method sensitivity, Absolute sensitivity); Factors affecting quantitative accuracy. Point Spread Function; Spatially resolved fluorescence imaging: Multi-photon excitation, Total Internal Reflection Fluorescence (TIRF) Microscopy, Super-resolution techniques (STORM, PALM and STED). Fluorescence based methods for studying molecular diffusion and interactions in live cells (FRAP, FRET, FLIM, FCS, FCCS, RICS). Image analysis techniques for quantitative characterization of cell phenotypes (CellProfiler).
Teaching and learning activities : The course includes lectures, laboratory training, demonstrations, discussion sessions and short written assignments.
Examination : The final assignment consists of a written project report (5 pages) and an oral presentation of the project report (15 min).
Compulsory elements : All sessions are compulsory. Please report any absence 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 special cases be compensated by an individually tailored additional module and a special written examination organized by the course committee.
Number of students : 8 - 12
Selection of students : Selection will be based on: 1. the relevance of the course syllabus for the applicant's doctoral project (according to written motivation); 2. date for registration as a doctoral student (priority given to earlier registration date).
More information : This is a two-week course with 10 sessions that include: lectures, laboratory practice, hands-on training, written assignments, discussions, and time for self-study. The first week focuses on underlying physicochemical principles, instrumentation and hands-on training at the microscope. During this week, specialized techniques are introduced and the details are discussed in the context of a broader body of available techniques. The second week is dedicated to expert lectures on advanced applications and hands-on image analysis. The last session is reserved for assessment. Experimental exercises are carried out in the laboratory for Functional Fluorescence Microscopy Imaging (fFMI) at the Center for Molecular Medicine (CMM), Solna, L8:01, 056. Lectures are conducted in the seminar room at the Center for Molecular Medicine (CMM), Solna, L8:01, 021.

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Contact person :
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Title : Interview Techniques in Health and Care Research

Course number : 2520
Credits : 4.0
Date : 2020-09-23 -- 2020-10-20
Language : English
Level : Doctoral level
Responsible KI department : Department of Clinical Neuroscience
Specific entry requirements :
Purpose of the course : The course aims to provide course participants with a broad understanding for a research interview; i.e. planning and conducting a research interview within a research program. In addition the participants will be enabled to gain an increased understanding and a professional attitude of the researcher as an instrument for data collection which can be applied and potentially enhance the quality of data in future research interviews.
Intended learning outcomes : After the course the student is expected to be able to (a) Identify and understand the content of a research interview. (b) Demonstrate and master necessary interview tools in order to, (c) Independently, analyze and adapt this knowledge and practical skills in order to compose a research interview; i.e. planning, designing, carrying out and critically evaluating the interview. (d) Communicate and give feedback to other students' research interviews
Contents of the course : a. different perspectives and knowledge for conducting interviews b. the role of empathy in interview communication c. the researcher´s role as an instrument in data collection d. intersubjectivity, biases and ethical considerations of research interviewing e. how to plan an interview guide f. how to formulate questions g. how to conduct an interview with respect for culture and vulnerable groups
Teaching and learning activities : The course will be offered part-time, usually full Days from 9 a.m. to 4 p.m., 1-2 days weekly including lectures, video demonstrations covering various interviews and interview techniques, interview technique training seminars in small groups, supervision seminars (interview guides) with literature discussions and self-monitored studies and practice. Since interview training is a process - which requires testing in vivo, improvements, reflection between training - the course covers approximately a 5-week period.
Examination : Examination will consist of an interview guide and of an individually taped documentation of an interview with a research subject in the own research field presented in the course group. In addition the course participant will critically analyze a fello student's video-taped interview. The presentation will furthermore be within a theoretical frame of reference including the course literature, discussing interviews, interview techniques, potential biases challenging the quality of the interview responses. The reason behind choosing this kind of examination is that it has been proven to give earlier interview student-groups valuable learning experiences which immediately can be applied in the respective research area.
Compulsory elements : The education will be compulsory scheduled all through the course. If the student is unable to be present he/she has to consult the course leader/examiner for adequate opportunities to recover missed hours (usually in the form of written assignments, except for practical training and examination with the video-taped interviews).
Number of students : 8 - 12
Selection of students : Priority is given: (a) to doctorate students in the Research School for Health and Care Research (Vårdvetenskap PUF-V) (b) KI-doctorate students (or students who are in the process to be accepted as doctorate students) who are working in areas where research interviews will be applied c) doctorate students from other universities
More information : Since several students do not have Swedish as their first language, the course will be held in English. Course days are between 9 a.m. to 4 p.m. Wednesdays and Thursdays - except for the examination days which are Monday and Tuesday. The course dates are as follows: September 23, September 24, September 30, October 8, October 19, October 20. There is one week during the course allowing the student for self-studies and conducting a recorded examination interview which will be presented in class.

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Contact person :
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Title : Mass spectrometry-based proteomics: When and How.

Course number : 2522
Credits : 3.0
Date : 2020-11-02 -- 2020-11-13
Language : English
Level : Doctoral level
Responsible KI department : Department of Oncology-Pathology
Specific entry requirements :
Purpose of the course : The aim of this course is to give an overview of mass spectrometry based proteomics for researchers who would like to be able to apply these techniques in their own research.
Intended learning outcomes : After completed the course, the student will be able to -Define and apply common proteomics terminology -Recognize the principles of the most common proteomics techniques -Understand the mass spectrometry based proteomics workflow: Experimental design, sample preparation and selection of techniques -Understand proteomics to such an extent that he/she will be able to utilize proteomics core facilities or collaborate with proteomics researchers. -Evaluate the quality of protein and peptide identifications. -Demonstrate how modern proteomics is applied to clinical research and to evaluate when proteomics research could be beneficial to incorporate in research projects. -Design their own research project by mass spectrometry based proteomics.
Contents of the course : Lectures and workshops on -Overview of proteomics -The proteomics workflow -Basic of separation sciences: Protein and peptides -Introduction to Mass spectrometry -Experimental design -Sample preparation, immunoprecipitation and enrichment strategy -Quantitative and qualitative proteomics by mass spectrometry -Global and targeted proteomics -Human protein atlas and Biological validation -Clinical applications A practical laboratory exercise using mass spectrometry based proteomics This course is focusing on proteomics technologies and applications, for proteomics data analysis we recommend our KI doctoral course ""Omics data analysis: From quantitative data to biological information""
Teaching and learning activities : The course contains lectures, seminars, and a practical laboratory exercise using proteomics techniques. The students will plan their own project as a case study as well make an oral laboratory report.
Examination : -Students shall describe a proteomics project (beneficially related to their research) including different aspects from the proteomics workflow. This is handed in as a written exam. -The students shall perform an oral laboratory report
Compulsory elements : -Attendance at lectures and the practical laboratory exercise. -Attendance at examination seminar and hand in the written examination assignment. -Extra written assignments can be used to compensate absence. The students are recommended to read literatures listed below in advance of the course.
Number of students : 16 - 24
Selection of students : Selection will be based on 1) the relevance of the course syllabus for the applicant's doctoral project (according to written motivation), 2) start date of doctoral studies (priority given to earlier start date)
More information : This course is included in the doctoral programmes Allergy, immunology and inflammation (Aii) and Biology of Infections and Global Health Programme (BIGH). See https://ki.se/en/staff/doctoral-programmes.

Course responsible :
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Mattias Vesterlund
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Title : Neurogenetics

Course number : 2600
Credits : 1.5
Date : 2020-09-28 -- 2020-10-02
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 to introduce the concepts and methodology applied in human genetic studies in general with examples from human diseases in the nervous system and to use this knowledge to prepare and present oral presentations as well as ask and answer questions. The course will also allow interaction between PhD-students with master students in their second year, both with a special interest in neuroscience. A potential purpose for students attending all 6 courses given in sequence (Frontiers Courses in Neuroscience) is also to place Neurogenetics in a greater research context.
Intended learning outcomes : I) The student will be able to understand and describe the major differences and uses of human genetic studies of neurogenetic diseases using i) Twin-studies, ii) population based studies, iii) case-control studies, iv) family studies. Students will have an in depth knowledge and understanding of selected neurologic conditions such as Alzheimer disease, trinucleotide repeat disorders, their genetic basis and an insight into the molecular pathogenesis, if known. II) The students will also be able to describe how genetic studies can be used to increase our understanding of the biological basis of neurological conditions. III) The students will be able to contribute substantially to critical evaluation and presentation of scientific articles in the field of neurogenetics. IV) The students will have an understanding of the different genetic techniques and platforms available for studies in human (neurological) conditions.V) The students will have an insight in the application/use of genetic testing for neurological diseases.
Contents of the course : I) The course will give examples of how different types of genetic studies can help us identify genes involced in the pathogenesis of neurological disease: i) Twin-studies, ii) population based studies, iii) case-control studies, iv) family studies. II) The course will give examples of different gene defects in neurological diseases such as trinucleotide repeats, point mutations, copy number variations, susceptibility genes, rearrangements, transciptional regulation and epigenetics. III) The course will provide an in depth understanding of the genetics of selected neurological diseases and how these genetic dysfunctions help us understand the molecular mechanisms of disease.
Teaching and learning activities : Daily class-room lectures. Time will be allocated for students to prepare a group presentation of a selected topic/genetic neurological disease. The presentation will be on the last day of the course and constitutes the examination.
Examination : The examination will be on the last day of the course and it will consist of i) participating in a group presentation of a selected topic/genetic neurological disease ii) participate as an active audience when other groups have their presentations. Every student will be assessed individually in accordance with the intended learning outcomes of the course.
Compulsory elements : All lectures/seminars are compulsory and in case of absence, the session can be compensated by a short written report using the literature after agreement with the course director.
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) date for registration as a doctoral student (priority given to earlier registration date)
More information :

Course responsible :
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Linn Öijerstedt
Institutionen för neurobiologi, vårdvetenskap och samhälle

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Title : Basic Course in Medical Statistics - a distance course

Course number : 2609
Credits : 3.0
Date : 2020-09-28 -- 2020-10-09
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: September 28th (mandatory) and October 9th (mandatory).

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

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

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Title : Basic Course in Medical Statistics - a distance course

Course number : 2609
Credits : 3.0
Date : 2020-11-30 -- 2020-12-11
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: November 30th (mandatory) and December 11th (mandatory).

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

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

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Title : Frontiers in Cognitive Neuroscience

Course number : 2616
Credits : 1.5
Date : 2020-09-21 -- 2020-09-25
Language : English
Level : Doctoral level
Responsible KI department : Department of Neuroscience
Specific entry requirements : 180 hp in medicine, biomedicine, biology, psychology, or cognitive science, or master degree in medical imaging engineering
Purpose of the course : Students attending this course will be exposed to exciting new research in cognitive neuroscience, and learn to evaluate and critically discuss recent findings.
Intended learning outcomes : After the course the student must be able to: (1) account for current concepts and key principles of cognitive neuroscience; (2) show an understanding of the inter-disiplinary nature of cognitive neuroscience with its roots in both psychology and neuroscience; (3) discuss and critically evaluate scientific articles in the field; (4) To show basic knowledge about the strengths and weakness of the different state-of-the-art methods used in cognitive neuroscience.
Contents of the course : (1) Series of lectures informing about the state of art knowledge about: (i) Perception and sensory mechanisms; (ii) action planning and execution (iii); (iv) sex differences in the brain; (v) higher cognitive functions including working memory and creativity; (vi) memory; and (vii) cognitive effects of aging (2) Seminars where the students will critically discuss key published papers, and group presentations where they will present their analyses and conclusions for the whole group.
Teaching and learning activities : Lectures, seminars, and group presentations.
Examination : The oral presentation and group discussions during the last days seminar count as examination. We will assess individual studentsability to discuss and reason about current issues and problems in cognitive neuroscience.
Compulsory elements : The group seminar is obligatory. In addition to that, the students are assumed to take part in the lectures. The student will be able to compensate missing attendance by submitting written reports on the missed material later.
Number of students : 12 - 30
Selection of students : The selection is based on 1) the relevance of the course in Cognitive Neuroscience to the applicant's doctoral project (according to motivation), 2) start date for doctoral studies.
More information : This is a full-time course that is held with lectures both mornings and afternoons from Monday to Friday. The obligatory group seminar is held on Friday afternoon. The specially invited international guest lecturer this year is Prof. Tamar Makin from UCL, London, UK.

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 : 2020-08-31 -- 2020-09-11
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 or online daytime and in-class or online evenings (please see the respective course occasions for details)
 This course occasion will take place daytime and in-class or online (please state your choice in the application).
 The course focuses on scientific writing (manuscript, abstract and poster) and you may use your own research for the assignments (but there is no requirement to bring data of your own in order to benefit from the course) to maximize the learning experience and also to make actual progress in your studies. The course includes manuscript writing, poster design and presentation, cover letter writing, abstract writing and popular science writing. The popular science part is covering the skills you need in order to successfully write a popular science summary for e.g. a project plan or to apply for grants and is also helpful for oral presentations. No prior knowledge or experience in scientific writing is required to attend the course, and you will benefit equally from the course if you have published your research before.
 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
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Title : Write your research results and get them published

Course number : 2618
Credits : 3.0
Date : 2020-11-30 -- 2020-12-11
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 or online daytime and in-class or online evenings (please see the respective course occasions for details)
 This course occasion will take place daytime in-class and online (please state your choice in the application).
 The course focuses on scientific writing (manuscript, abstract and poster) and you may use your own research for the assignments (but there is no requirement to bring data of your own in order to benefit from the course) to maximize the learning experience and also to make actual progress in your studies. The course includes manuscript writing, poster design and presentation, cover letter writing, abstract writing and popular science writing. The popular science part is covering the skills you need in order to successfully write a popular science summary for e.g. a project plan or to apply for grants and is also helpful for oral presentations. No prior knowledge or experience in scientific writing is required to attend the course, and you will benefit equally from the course if you have published your research before.
 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
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Title : Write your research results and get them published

Course number : 2618
Credits : 3.0
Date : 2020-10-13 -- 2020-12-15
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) date for registration as a doctoral student (priority given to LATER registration date).
More information : This course is given in different formats: in-class or online daytime and in-class or online evenings (please see the respective course occasions for details)
 This course occasion will take place evenings in class and online (please state your preference in the application). The course focuses on scientific writing (manuscript, abstract and poster) and you may use your own research for the assignments (but there is no requirement to bring data of your own in order to benefit from the course) to maximize the learning experience and also to make actual progress in your studies. The course includes manuscript writing, poster design and presentation, cover letter writing, abstract writing and popular science writing. The popular science part is covering the skills you need in order to successfully write a popular science summary for e.g. a project plan or to apply for grants and is also helpful for oral presentations. No prior knowledge or experience in scientific writing is required to attend the course, and you will benefit equally from the course if you have published your research before.
 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 : 2020-09-28 -- 2020-10-09
Language : English
Level : Doctoral level
Responsible KI department : Department of Women's and children's health
Specific entry requirements : None.
Purpose of the course : The purpose of the course is to 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 or online daytime and in-class or online evenings (please see the respective course occasions for details)
 This course occasion will take place daytime in class and online (please state your preference in the application). The course focuses on scientific writing (manuscript, abstract and poster) and you may use your own research for the assignments (but there is no requirement to bring data of your own in order to benefit from the course) to maximize the learning experience and also to make actual progress in your studies. The course includes manuscript writing, poster design and presentation, cover letter writing, abstract writing and popular science writing. The popular science part is covering the skills you need in order to successfully write a popular science summary for e.g. a project plan or to apply for grants and is also helpful for oral presentations. No prior knowledge or experience in scientific writing is required to attend the course, and you will benefit equally from the course if you have published your research before.
 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 : Write your research results and get them published

Course number : 2618
Credits : 3.0
Date : 2020-11-02 -- 2020-11-13
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 or online daytime and in-class or online evenings (please see the respective course occasions for details)
 This course occasion will take place daytime in class and online (please state your preference in the application). The course focuses on scientific writing (manuscript, abstract and poster) and you may use your own research for the assignments (but there is no requirement to bring data of your own in order to benefit from the course) to maximize the learning experience and also to make actual progress in your studies. The course includes manuscript writing, poster design and presentation, cover letter writing, abstract writing and popular science writing. The popular science part is covering the skills you need in order to successfully write a popular science summary for e.g. a project plan or to apply for grants and is also helpful for oral presentations. No prior knowledge or experience in scientific writing is required to attend the course, and you will benefit equally from the course if you have published your research before.
 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 : Brain circuits

Course number : 2624
Credits : 1.5
Date : 2020-09-14 -- 2020-09-18
Language : English
Level : Doctoral level
Responsible KI department : Department of Neuroscience
Specific entry requirements :
Purpose of the course : The purpose of the course is to provide doctoral students in the field of neuroscience with an overview of current state-of-the art approaches, technologies and concepts used for understanding of the brain's circuits and functions in animal models. All invited speakers have made seminal contributions to how we currently study and understand the brain, and there will be ample opportunities for the students to interact with the speakers, and discuss aspects relevant to their own work.
Intended learning outcomes : By the end of the course the student shall be able to: - explain the structure and function of the main brain circuits, - describe the principles for excitatory and inhibitory networks, including receptors and neurotransmitters, as well as the action of different chemical neuromodulators, - describe principles, use and readout of optogenetics and recording technologies, - describe principles and methods to define the structure (neuroanatomy) of brain circuits, - explain how dysfunctions of networks can manifest as neuropsychiatric disorders, - describe animal behavior tests probing specific networks and network functions.
Contents of the course : The course will cover the organization and function of main circuits in the brain, including the interaction and participation of different cell types, the interplay between excitation and inhibition, and how circuit output results in behavior. Different techniques for recording, labeling and manipulation of neuronal circuits in animal models will be discussed, including electrophysiology, molecular targeting, optogenetics and viral tracing. The connection between deficient circuit functions and neuropsychiatric disorders will be included, as well as animal behavior tests probing specific circuits and circuit (dys)functions. Specific emphasis will be put into describing the technologies currently used in the neuroscience field.
Teaching and learning activities : Lectures by invited experts and group exercises.
Examination : The student should in discussions and a seminar presentation demonstrate the ability to critically evaluate original research papers on the topics covered and be able to show that the intended learning outcomes for the course are reached.
Compulsory elements : The seminar presentations are obligatory, and so are all lectures. Any absence has to be compensated for in accordance with the instructions of the course director.
Number of students : 12 - 24
Selection of students : We welcome highly motivated applicants from all areas of neuroscience. Knowledge of how neurons function and of brain anatomy are prerequisites. Selection will be based on 1) the relevance of the course syllabus for the applicant's doctoral project according to the written motivation in the application, 2) experience of neuroscience research as stated in the written motivation, 3) date for registration as a PhD student (priority given to earlier reg. date).
More information : The course will be given at Karolinska Institutet, campus Solna. Time: 9.00-17.00 (Monday to Friday). Lectures will be given by international and national scientists who have made significant contributions to their respective field, including development and/or application of novel technologies. We have a strong emphasis on young scientists, and rodent basic neuroscience studies. Updates regarding the course, including confirmed speakers, lecture halls etc will be continuously posted at www.carlenlab.org

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Course responsible :
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Contact person :
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Title : Neurodegenerative Disorders I - From Molecule to Treatment

Course number : 2629
Credits : 1.5
Date : 2020-10-05 -- 2020-10-09
Language : English
Level : Doctoral level
Responsible KI department : Department of Neurobiology, Care Sciences and Society
Specific entry requirements :
Purpose of the course : The purpose of the course is for participants to gain knowledge concerning clinical aspects and molecular mechanisms of neurodegenerative disorders. To gain and apply new knowledge, participants will (in addition to lectures by experts in the field) prepare and give own oral presentations as well as ask and answer questions in the group during the course week. The course will allow interaction between PhD-students and master students (in their second year), all with a special interest in neuroscience.
Intended learning outcomes : The student should after the course: 1) understand cellular processes and molecular mechanisms of neurodegeneration 2) understand mechanisms of protein turnover, degradation and aggregation 3) based on knowledge of these mechanisms critically be able to evaluate the concept of conformational disorders and its relevance to the different neurodegenerative disorders 4) have achieved basic knowledge about epidemiology, symptoms, pathology and current treatments of the most common neurodegenerative disorders such as Alzheimers disease, Parkinsons disease, amyotrophic lateral sclerosis and multiple sclerosis. 5) In addition, the student should understand how the pathology of these disorders is reflected in their symptoms. 6) Based on this understanding, the student should be able to discuss the effects of treatments, if they are (or may be) symptomatic or curative. 7) Be able to evaluate the relevance of different disease models, their advantages and limitations with respect to the clinical picture and to what is known about disease mechanisms.
Contents of the course : The course will cover topics related to the degeneration of neural cells, apoptosis and necrosis as well as the cellular and biochemical reactions to neuronal injury. During the course we will also present and discuss symptoms, diagnosis, pathology, epidemiology, genetics and treatment of the most common neurodegenerative disorders such as Alzheimers disease, Parkinsons disease, amyotrophic lateral sclerosis and multiple sclerosis. Molecular mechanisms of current and future treatment strategies, disease models and their potential will be presented and discussed. In addition, the students may within group assignments study less common neurodegenerative diseases such as frontotemporal dementia, Lewy body disease, ataxias and prion diseases.
Teaching and learning activities : The course runs day time for 1 week full-time with a mix of lectures by invited scientists, participants group assignments as well as individual studies.
Examination : The examination part includes: the group assignments, short formative examination questions at the end of some of the days during the course week, the oral presentations by the students and the following general discussion between all participants. All students are individually assessed.
Compulsory elements : The group assignments, the oral presentations by the students and the following general discussion between all participants are compulsory. Students that are absent from these parts will have to individually submit a written presentation of the subject.
Number of students : 10 - 25
Selection of students : If selection of course participants is necessary, we will prioritize 1) students for whom the course is mandatory, 2) students with an educational plan encompassing the topics of the course, and 3) PhD-students with an early registration date and close to finalizing the doctoral studies.
More information : The course will be held at Karolinska Institutet, Solna.

Course responsible :
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Contact person :
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Title : Human physiology - an overview

Course number : 2644
Credits : 3.0
Date : 2020-09-21 -- 2020-10-09
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 : 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 held at Campus Solna. Scheduled events approximately 7 out of 10 course days, some half days and some full days.

Course responsible :
Jessica Norrbom
Department of Physiology and Pharmacology

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Contact person :
-

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

Course number : 2674
Credits : 7.5
Date : 2020-08-24 -- 2020-11-13
Language : English
Level : Doctoral level
Responsible KI department : Department of Global Public Health
Specific entry requirements : None
Purpose of the course : Qualitative research is a powerful widely used methodology that allows researchers to understand why and how an event occurs in a given context. However, many health scientists are unfamiliar with theories and methods used in qualitative research. This course will contribute to fill this knowledge gap by providing the participants with practical skills to design, conduct, analyze and report qualitative studies.
Intended learning outcomes : - Design a qualitative study including selecting the appropriate sampling procedure and data collection methods. - Develop the data instruments including interview/focus groups discussions guides and observation protocols. - Conduct the fieldwork. - Analyze the data. - Write up the findings. - Critically discuss others' qualitative research, e.g. described in research proposals and manuscripts.
Contents of the course : - Background on qualitative methodology. - Theory of qualitative research. - Sampling in qualitative research. - Designing an interview/discussion guide. - Ethical considerations in qualitative research. - Writing a research protocol. - Data collection methods (in-depth interviews, focus groups discussions and observation). - Alternative methods of data collection. - Analysis of qualitative data. - Trustworthiness and validity. - Other approaches to interpretation: Phenomenology, narrative research, oral history. - Qualitative research in evaluation. - Critical review of literature. - Ongoing development as qualitative researcher.
Teaching and learning activities : The course will be taught with a blended learning approach, which will combine self-study and face-to-face practical training sessions. Students will be able to access course materials and interact with each other through a common e-learning platform. Practical sessions will be conducted face-to-face where a theoretical and practical training will be provided in the three dominant qualitative data collection methods, including discussion of examples used in studies. In addition, the students will conduct individual assignments that will allow them to improve their skills.
Examination : Four assignments are to be done during the course. The first three assignments will take the students through a full mini research project. The first assignment will be to write a qualitative research protocol, the second to conduct two individual depth interviews and transcribe these and the third to analyze the interview transcripts. The fourth assignment will be to write a critical review of a published qualitative paper. There will be a written examination at the end of the course, which will be emailed to the students to be returned within 48 hours. In order to obtain a pass for the whole course, students must obtain a pass in the four assignments and in the written examination.
Compulsory elements : Participation in practical sessions, on-line lectures and discussions is compulsory. Non-participation will result in additional assignments at the discretion of the course tutor.
Number of students : 8 - 15
Selection of students : Selection will be based on 1) the relevance of the course syllabus for the applicant's doctoral project (according to written motivation), 2) start date of doctoral studies (priority given to earlier start date)
More information : This is a blended learning course with pre-recorded lectures and one week of practical training. Week six of the course (September 28th to October 2nd) consists of mandatory face-to-face activities where we will practice different data collection methods and will start to discuss how to analyze qualitative data. The course's teaching and learning activities include several practical activities. Within those, the students must collect two in-depth qualitative interviews for practicing data collection and for later analysis within the course.

Course responsible :
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Title : Basic Laboratory Safety

Course number : 2690
Credits : 1.8
Date : 2020-09-28 -- 2020-10-05
Language : English
Level : Doctoral level
Responsible KI department : Department of Microbiology, Tumor and Cell Biology
Specific entry requirements : Experience of and/or education in laboratory work
Purpose of the course : The purpose of the course is to enable the students to obtain an understanding of risks and of principles in safety measures in the medical science laboratory, as well as a consciousness about general and individual responsibilities for the planning and execution of applicable safety measures. The purpose is also to develop skills in performing risk analyses and writing up risk assessments.
Intended learning outcomes : After successfully completing this course you as a student should be able to evaluate the risks associated with experiments in the laboratory. The hazards could originate from chemicals, microbiological agents, cell cultures and human blood/tissues. You should also be able to identify the needs for suitable personal protective equipment, routines for waste management and transport. In addition, you should be familiar with the regulatory framework that governs these topics, the basic needs of a safe laboratory, and be able to identify the chain of responsibilities.
Contents of the course : The course aims at giving theoretical and practical knowledge on chemical and biological aspects of laboratory safety. Topics will deal with writing risk assessments, chemical health risks including allergy, cancer and flammable agents, handling and storage of dangerous chemicals, handling of microorganisms and cell cultures including human blood and tissue samples, laboratory acquired infections, bio-safety measures including personal protection devices, ventilated workplaces, genetically modified microorganisms, bio-security and dual use, transport of dangerous goods and waste management.
Teaching and learning activities : The information will be given as lectures, group discussions, practical sessions, web-tutorials and computer sessions during a total of six days.
Examination : The examination is based on an individual written examination, a risk assessment and the active participation and contributions in a group presentation. One needs to pass each of these three assessments in order to pass the course.
Compulsory elements : Presence during some of the course activities, marked in the schedule, is compulsory. Students cannot compensate for absence during compulsory activities, but are referred to coming courses for these activities.
Number of students : 30 - 40
Selection of students : Selection will be based on 1) the relevance of the course syllabus for the applicant's doctoral project (according to written motivation), 2) start date of doctoral studies (priority given to earlier start date)
More information :

Course responsible :
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Title : Social determinants of health

Course number : 2711
Credits : 3.0
Date : 2020-11-30 -- 2020-12-11
Language : English
Level : Doctoral level
Responsible KI department : Department of Global Public Health
Specific entry requirements :
Purpose of the course : The course intends to enable the PhD student, especially in public health, to acquire increased knowledge and skills to reflect with a research mindset over his/her own PhD thesis from the perspective of social determinants of health and inequalites in health.
Intended learning outcomes : On completion of the course the student should be able to: 1. Reflect with a research mindset over major social determinants of health, and their relative importance in different contexts and settings 2. Compare and contrast how social factors may influence disease and ill health and how diseases also may have social consequences 3. Reflect with a research mindset over the social gradient in health 4. Discuss some principal mechanisms by which health inequalities are generated.
Contents of the course : The course aims to introduce and discuss some major social determinants of health and their relative importance in different settings and contexts. In addition the course discusses how the distribution of social determinants of health in the population may create a social gradient of disease and ill health in the population and some principal mechanisms by which inequalities in health may be generated. Different measures of socioeconomic position, advantages and disadvantages of the different measures and different data sources are discussed. As part of the course, students are expected in an individual assignment to reflect on their own PhD project from the perspective of social determinants of health and inequalities in health, with reference to the course literature.
Teaching and learning activities : Teaching methods will include lectures, seminars, group work and a written individual assignment, and will be based on the course book and selected scientific articles.
Examination : Successful examination involves - Completed individual assignment - Presentation of own written reflection, and commenting on the reflection of others - Participation in mandatory seminars and group work
Compulsory elements : Active participation in seminars and group work is mandatory. The course director assesses if, and in that case how, absence can be compensated.
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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Title : Intermediate Medical Statistics: Regression models

Course number : 2738
Credits : 3.0
Date : 2020-11-02 -- 2020-11-13
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: November 2, 3, 5, 6, 9, 10, 13.

Course responsible :
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Contact person :
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Title : The developing brain

Course number : 2780
Credits : 1.5
Date : 2020-08-31 -- 2020-09-04
Language : English
Level : Doctoral level
Responsible KI department : Department of Medical Biochemistry and Biophysics
Specific entry requirements :
Purpose of the course : Developmental biology lies at the heart of an effort to understanding complex biological systems. By studying how neural circuits are assembled we can extrapolate key aspects of their function as well as devise strategies for their repair. This course is given to deepen the understanding of how molecular and cellular mechanisms underlie neurobiological function and to widen the horizon of students within the strong Karolinska neuroscience community.
Intended learning outcomes : By the end of the course the student shall be able to describe the major steps contributing to the development of the nervous system and transfer new knowledge acquired in the course into their specific projects or fields of research.
Contents of the course : The course will cover the main steps of development from neural stem cells to mature circuits, including the patterning of the neural plate and thus the origin of cell types, the interplay between intrinsic and extrinsic factors, gene regulation including epigenetics, neuro-glia interactions and the role of network activity in shaping the final circuits. Different molecular and tracing technologies, and model organisms will be covered. An important aspect of the course regards molecular technologies for labeling, transcriptional analysis and genetic manipulation of defined neural populations. Connections between aberrant developmental processes and neurological disorders will be discussed.
Teaching and learning activities : Lectures by invited international experts, group work and seminar presentations.
Examination : The students should demonstrate their knowledge about the intended learning outcomes stated above including reflect on which aspects are relevant for their own research in a seminar presentation and in discussions.
Compulsory elements : All lectures and the seminar presentation (examination) are compulsory.
Number of students : 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) date for registration as a doctoral student (priority given to earlier registration date)
More information : This course is a full-time course and will be held at Campus Solna. The schedule with all details will be sent out after acceptance to the course.

Course responsible :
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Francois Lallemend
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Title : Present your research!

Course number : 2787
Credits : 1.5
Date : 2020-08-24 -- 2020-08-28
Language : English
Level : Doctoral level
Responsible KI department : Department of Women's and children's health
Specific entry requirements : None
Purpose of the course : The purpose of the course is to enable doctoral students to obtain knowledge and practical experience in presenting own research orally; adapted to different presentation formats, target groups, supporting media and situations, as well as to reflect on the development of own presentation skills.
Intended learning outcomes : After attending the course, the doctoral student should: 1. Be able to design an oral presentation in an 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 : 16 - 22
Selection of students : Selection will be based on 1) the relevance of the course syllabus for the applicant's doctoral project (according to written motivation), 2) start date of doctoral studies (priority given to earlier start date)
More information : The course focuses on research presentations in different contexts. You will practice presenting your own research results (or something else of your choice from your research area) as well as other topics in order to approach presentation skills from different angles. The course is highly interactive with a lot of exercises and together we will take your presentations to the next level. We will also deal with nervousness and a variety of other challenges you might be facing when presenting. 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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Contact person :
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Title : Present your research!

Course number : 2787
Credits : 1.5
Date : 2020-09-21 -- 2020-09-25
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 : The course focuses on research presentations in different contexts. You will practice presenting your own research results (or something else of your choice from your research area) as well as other topics in order to approach presentation skills from different angles. The course is highly interactive with a lot of exercises and together we will take your presentations to the next level. We will also deal with nervousness and a variety of other challenges you might be facing when presenting. 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 : Present your research!

Course number : 2787
Credits : 1.5
Date : 2020-10-19 -- 2020-10-23
Language : English
Level : Doctoral level
Responsible KI department : Department of Women's and children's health
Specific entry requirements : None
Purpose of the course : The purpose of the course is to enable doctoral students to obtain knowledge and practical experience in presenting own research orally; adapted to different presentation formats, target groups, supporting media and situations, as well as to reflect on the development of own presentation skills.
Intended learning outcomes : After attending the course, the doctoral student should: 1. Be able to design an oral presentation in an 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 : The course focuses on research presentations in different contexts. You will practice presenting your own research results (or something else of your choice from your research area) as well as other topics in order to approach presentation skills from different angles. The course is highly interactive with a lot of exercises and together we will take your presentations to the next level. We will also deal with nervousness and a variety of other challenges you might be facing when presenting. 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 : Present your research!

Course number : 2787
Credits : 1.5
Date : 2020-11-16 -- 2020-11-20
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 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 : The course focuses on research presentations in different contexts. You will practice presenting your own research results (or something else of your choice from your research area) as well as other topics in order to approach presentation skills from different angles. The course is highly interactive with a lot of exercises and together we will take your presentations to the next level. We will also deal with nervousness and a variety of other challenges you might be facing when presenting. 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 : Present your research!

Course number : 2787
Credits : 1.5
Date : 2020-12-14 -- 2020-12-18
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 : The course focuses on research presentations in different contexts. You will practice presenting your own research results (or something else of your choice from your research area) as well as other topics in order to approach presentation skills from different angles. The course is highly interactive with a lot of exercises and together we will take your presentations to the next level. We will also deal with nervousness and a variety of other challenges you might be facing when presenting. 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 : Introduction to Stata for epidemiologists

Course number : 2796
Credits : 1.0
Date : 2020-09-10 -- 2020-09-11
Language : English
Level : Doctoral level
Responsible KI department : Department of Global Public Health
Specific entry requirements :
Purpose of the course : This course aims at introducing students to the basics of the statistical software Stata. It focuses on the minimum set of commands students should know for data-management, data-reporting, graphics and basic use of do-files.
Intended learning outcomes : After successfully completing this course you as a student should independently be able to: - use Stata to open and describe a dataset - import and export datasets in different formats - produce tables of descriptive statistics - count and present table of counts - provide a graphical presentation of continuous variables - generate new variables and recode existing variables - test univariable associations for continuous and categorical data
Contents of the course : This course is designed to introduce students to the basics of Stata. It will focus on the minimum set of commands students should know to organize their own work. Specific topics include data-management, data-reporting, graphics and basic use of do-files. By the end of this course, the student should be capable of using Stata independently. As motivating and instructive examples both lectures and exercises will be based on real studies published in top scientific journals.
Teaching and learning activities : Lectures and computer exercises using Stata®.
Examination : Written examination. Students who do not obtain a passing grade in the first examination will be offered a second chance to resubmit the examination within two months of the final day of the course. Students who do not obtain a passing grade at the first two examinations will be given top priority for admission the next time the course is offered.
Compulsory elements : The individual examination (summative assessment) is compulsory.
Number of students : 8 - 25
Selection of students : Eligible doctoral students will be prioritized according to 1) the relevance of the course syllabus for the applicant’s doctoral project (according to written information), 2) date for registration as a doctoral student (priority given to earlier registration date). To be considered, submit a completed application form. Give all information requested, including a short description of current research training and motivation for attending, as well as an account of previous courses taken.
More information : The present course covers an introduction to the Stata package and basic commands for data manipulation and presentation. The content on how Stata can be used to manage and analyze epidemiological data is not covered.

Course responsible :
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Title : Biostatistics II: Logistic regression for epidemiologists

Course number : 2797
Credits : 2.0
Date : 2020-09-14 -- 2020-09-25
Language : English
Level : Doctoral level
Responsible KI department : Department of Global Public Health
Specific entry requirements : Knowledge in epidemiology and biostatistics equivalent to ""Epidemiology I: Introduction to epidemiology"" and ""Biostatistics I: Introduction for epidemiologists"" or corresponding courses
Purpose of the course : This course focuses on the application of linear and logistic regression in the analysis of epidemiological studies.
Intended learning outcomes : After successfully completing this course you as a student are expected to be able to: - choose a suitable regression model for assessing a specific research hypothesis using data collected from an epidemiological study, fit the model using standard statistical software, evaluate the fit of the model, and interpret the results. - explain the concept of confounding in epidemiological studies and demonstrate how to control/adjust for confounding using statistical models. - apply and interpret appropriate statistical models for studying effect modification. - critically evaluate the methodological aspects (design and analysis) of a scientific article reporting an epidemiological study. 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 : This course focuses on the application of linear and logistic regression in the analysis of epidemiological studies. Topics covered include a brief introduction to continuous and binary outcome data, univariable and multivariable models, interpretation of parameters for continuous and categorical predictors, flexible modeling of quantitative predictors, confounding and interaction, model fitting and model diagnostics.
Teaching and learning activities : Lectures, computer lab with exercises focusing on analysis of real data sets using statistical software, exercises not requiring statistical software, group discussions, literature review.
Examination : To pass the course, the student has to show that the learning outcomes have been achieved. The course grade is based on the individual written examination (summative assessment). The focus of the examination 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 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 : 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 September 14, 16, 18, 21, 23 and 25. The course is extended over time, but is still five full course days in order to promote reflection and reinforce learning.

Course responsible :
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Title : The psychobiology of emotions

Course number : 2799
Credits : 1.5
Date : 2020-11-12 -- 2020-11-20
Language : English
Level : Doctoral level
Responsible KI department : Department of Clinical Neuroscience
Specific entry requirements :
Purpose of the course :
Intended learning outcomes : (1) The student shall have acquired a good understanding of the concept emotion as discussed in psychology and biology. (2) The student shall be able to discuss the application of emotion research to relevant issues in clinical and healthy interpersonal contexts. (3) The student shall have developed an in-depth understanding of a selection of topics related to the forefront of research on the biology of emotions, with specific focus on the learning of fear and other aversions.
Contents of the course : The course focuses on the rapidly growing knowledge of the biological bases of emotion and related affective processes, and how this knowledge shapes our understanding of both normal and clinical aspects of human behavior and psychology. The course consists of two integrated blocks. The first block lays the ground for a good conceptual understanding of theoretical and empirical perspectives of emotion and how it can be applied to phenomena on both individual and group level. The second block provides the opportunity to gain an in-depth understanding of a selection of research topics drawn from current research of the biology of emotion (e.g. fear learning and extinction, social affects, emotion regulation, and emotion and consciousness).
Teaching and learning activities : The course is organized as a series of lectures and seminars.
Examination : The course is examined in two ways: (1) formative assessment during active participation in the lectures and seminars; (2) a short research proposal outlining an experiment related to the theme of the course.
Compulsory elements : The students are assumed to actively participate in both lectures and seminars. If the student is ill or unable to take part during lectures/seminars, he/she should discuss with the course director of how to compensate for this through writing assignements.
Number of students : 8 - 20
Selection of students : The selection will be made on the basis of (1) a research project related to the course content, (2) relevance of the course for the students individual study plan.
More information : The course will be held at the Karolinska Institutet campus at Solna.

Course responsible :
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Contact person :
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Title : Människans Fysiologi - en översikt

Course number : 2827
Credits : 3.0
Date : 2020-11-16 -- 2020-12-18
Language : Swedish
Level : Forskarnivå
Responsible KI department : Department of Physiology and Pharmacology
Specific entry requirements :
Purpose of the course : KI är ett medicinsk universitet med forskning och utbildning inom medicin och hälsa. Alla doktorander ska inhämta grundläggande kunskaper om den mänskliga kroppen i hälsa och sjukdom i de fall grundläggande medicinsk högskoleutbildning saknas. Denna kurs riktar sig till doktorander utan medicinsk bakgrund. Syftet med kursen är att ge kursdeltagarna en basal och mycket översiktlig introduktion till människokroppens organsystem, dess funktion och samverkan. Innehållet i kursen kommer att vara användbart för fortsatta studier där kunskap om människans fysiologi är av värde.
Intended learning outcomes : Studenten ska efter genomgången kurs ha översiktlig kunskap och förståelse för hur människokroppens organsystem fungerar och samverkar under normala betingelser. Kursinnehållet ska kunna användas för fortsatt fördjupning inom en forskarutbildning där vissa humanbiologiska kunskaper är av värde. Färdigheter - Skriftligt kunna redogöra för organsystemens funktion. - Sammanställa och delge information skriftligt för utvalda fördjupningsområden. Förhållningssätt och värderingsförmåga - Uppvisa ett kritiskt och vetenskapligt förhållningssätt till data som presenteras under föreläsningar och i kurslitteratur.
Contents of the course : - Nervsystemets fysiologi - Muskel - Autonoma nervsystemet och endokrinologi - Högre hjärnfunktioner - Hjärta och cirkulation - Njure och syra-bas - Respiration - Digestion Samt samspelet mellan olika organsystem.
Teaching and learning activities : Kursen innehåller föreläsningar, gruppdiskussioner i form av frågestunder samt problembaserad undervisning. Dessutom ges en frivillig dugga som ger bonuspoäng på tentamen.
Examination : För att bli godkänd i kursen måste studenten visa att lärandemålen har uppnåtts. Detta bedöms genom en skriftlig tentamen.
Compulsory elements : Moment som är obligatoriskt under kursen är tentamen. I anslutning till kursen ges ett rest-tentamenstillfälle.
Number of students : 5 - 20
Selection of students : Urvalet baseras på 1) kursplanens relevans för den sökandes doktorandprojekt (enligt motivering), 2) startdatum för doktorandstudier
More information : Kursen är en översiktskurs för dem utan tidigare grundutbildning inom biologi eller medicin. Vi ger kursen tillsammans med ett grundutbildningsprogram (logopeder) vars fysiologiundervisning har motsvarande omfång. Start och sluttiderna för kursen kan komma att ändras +/- några dagar. Kursupplägget är föreläsningar måndag och fredag. I slutet av kursen hålls ett seminarium och en examination.

Course responsible :
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Biomedicum kvarter 5C

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Contact person :
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Title : Advanced course in SAS programming for health care data

Course number : 2868
Credits : 1.5
Date : 2020-11-30 -- 2020-12-04
Language : English
Level : Doctoral level
Responsible KI department : Department of Medicine, Solna
Specific entry requirements : Introductory course in SAS programming (course 1447), Epidemiology I: Introduction to Epidemiology (course 1577) and Biostatistics I: Introduction for epidemiologists (course 1579) or corresponding courses.
Purpose of the course : The purpose of this course is to give students with prior experience in SAS the foundation needed to work independently with large data bases in SAS, performing the data management needed for observational studies from for instance a register linkage.
Intended learning outcomes : After this course the student should be able to - independently use a wide range of SAS functions and procedures for data management - manage data using Proc SQL, and in a given situation decide whether to use SQL or SAS Base - develop basic SAS macros - use core statistical procedures, and export results to other software Intended learning outcomes are classified according to Bloom¿s taxonomy: knowledge, comprehension, application, analysis, synthesis, and evaluation (Bloom, 1956, extended by Anderson and Krathwohl, 2001).
Contents of the course : Students will develop their skills in processing data using built-in functions and procedures, including loops, learn how to merge data sets and perform operations with SAS Base and SQL coding, and the benefits and tricks of transposition, where one moves between ¿long¿ and ¿wide¿ data sets. Students will also learn how to write user written functions (macros) in SAS, and work through examples of how to analyse data with core statistical techniques, and export relevant results to edited tables. Although exercises during the course will use health care data, the same skills would be useful for studies in e.g., demography, sociology, and economics.
Teaching and learning activities : Different strategies for teaching and learning, such as interactive lectures, laboratory exercises and small group discussions, will be used. Daily, formative assessments are used to support the students' learning processes.
Examination : A computerized individual take-home examination with realistic assignments, corresponding to the learning outcomes of the course. Students will be allowed to use any literature during the exam, including access to the Internet. Students who do not pass the examination will be offered a second examination within two months.
Compulsory elements : The individual examination (summative assessment) is compulsory.
Number of students : 8 - 25
Selection of students : Eligible doctoral students will be prioritized according to 1) the relevance of the course syllabus for the applicant’s doctoral project (according to written information), 2) date for registration as a doctoral student (priority given to earlier registration date). To be considered, submit a completed application form. Give all information requested, including a short description of current research training and motivation for attending, as well as an account of previous courses taken.
More information : Please note the specific entry requirements for the course.

Course responsible :
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Title : Quality Assurance of Clinical Research

Course number : 2873
Credits : 1.5
Date : 2020-09-28 -- 2020-10-02
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 that all moments in a clinical research process can be re-created in a secured way and valid data generated. Understand the meaning of the Helsinki Declaration and Good Clinical Practice so that research subjects safety always remain the first priority. Knowledge in Swedish, European and international legislations, where a project needs to be applied and to which authority, and how such applications are done. Skills and abilities: Able to differentiate the responsibilities between the investigator, study team members and sponsor in the clinical trial. Able to summarise a project proposal into a risk analysis of the project. Able to use simple statistical tools to judge a project proposal's scientific validity. Judgement and approach: Relate to project proposals from the patient perspective including a scientific and sound ethical approach. Able to judge and critically 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 principles in clinical research and how development of new treatments like medicinal products and medical devices are done. It also explains how safety reporting to authorities is done. It covers laboratory and diagnostic research, and quality assurance in epidemiological and registry-based research. The following laws, regulations and sources are discussed: Act on integrity of personal data (GDPR), 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 : This is a blended course that starts with a mandatory face-to-face (F2F) meeting followed by digital training modules. There are two main tracks that run in parallel. The first track is a group work. The second track is based on individual reading of international guidelines in clinical research. The pedagogy is based on the flipped classroom model with readings proposed initially by the faculty, followed by individual and group-based discussions on problems and cases. Proposals for solution are discussed with faculty support. Reading and learning is supported by self-tests. After the first day with a mandatory F2F the rest of the course is provided by internet. There is a mandatory webinar during the course week.
Examination : In addition to an approved group work there will be an individual examination with short reply questions.
Compulsory elements : There is a face-to-face meeting the first day that is mandatory. Each student must participate in a group work. Each student must show activity on the course's home page with a personal introduction, and at least two questions, presentation and/or comments on other students' postings on each of the nine lectures. Absence or lack of online activity can after the examiner's assessment be compensated by an individually written essay. Webinars are mandatory. To be able to take the final exam all proceding moments must be approved and cleared.
Number of students : 20 - 25
Selection of students : Selection will be based on 1) the relevance of the course syllabus for the applicant's doctoral project (according to written motivation), 2) start date of doctoral studies (priority given to earlier start date)
More information : The course is given Monday-Friday. It is difficult to upheld other work simultaneously with the course. Certain moments at campus Solna are mandatory.

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Contact person :
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Title : Kvalitetssäkring av klinisk forskning

Course number : 2873
Credits : 1.5
Date : 2020-09-07 -- 2020-09-11
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 genomföra klinisk forskning. Kursen är användbar för dem som arbetar direkt med patienter, med medicinska data, med translationell eller klinisk laboratorieforskning. Den är också värdefull för forskare som arbetar med kvalitetsregister i vården och epidemiologisk forskning. Särskilt stort värde har kursen för de forskare som arbetar med interventioner av olika slag som medicinsk teknik eller kliniska läkemedelsprövningar. 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 och valida data genereras - Förstå innebörden av Helsingforsdeklarationen och Good Clinical Practice så att åtgärder för att skydda forskningspersoners säkerhet vidtas - Ha kännedom om nationell, europeisk och internationell lagstiftning, vilka vetenskapliga projekt som kräver ansökan till olika myndigheter och hur detta går till Färdighet och förmåga: - Ha förmåga att avgöra vilka olika ansvar som forskaren, medarbetare och sponsor har i en klinisk prövning - Ha förmåga att sammanfatta ett projektförslag och göra en riskanalys - Visa färdighet i att använda enklare statistiska metoder för att avgöra ett projekts vetenskapliga validitet Värderingsförmåga och förhållningssätt: - Förhålla sig till forskningsprojekt 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 kvalitetsprinciper för att vid klinisk forskning, utveckling av nya behandlingar med läkemedel, medicinsk teknik, nya laborativa och diagnostiska metoder, kvalitetssäkring av epidemiologisk och registerbaserad forskning, säkerhetsrapportering till myndigheter, GDPR, etikprövningslagen, biobankslagen och patientdatalagen, arkivering, internationella register över kliniska prövningar, riskanalys och viss statistik
Teaching and learning activities : Kursen inleds med ett fysiskt möte och fortsätter därefter med digital distansundervisning. 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 internationella regelverk för klinisk forskning. Pedagogiken baseras på "flipped classroom" med tidiga läsanvisningar och att studenten individuellt och i grupp arbetar med olika problem och fall. Förslag på lösningar presenteras och diskuteras under lärarhandledning. Frågestunder erbjuds under kursen. Inläsningen stöds av självstudiefrågor som studenten kan använda för att kontrollera sin egen inlärning. Efter en första obligatorisk inledande dag där deltagarna möter sina lärare face-to-face sker resten av undervisningen på distans. Enstaka föreläsningar ges som obligatoriska webbinarier under denna period.
Examination : Utöver ett godkänt grupparbete kommer det att ges en individuell examination med kortsvarsfrågor.
Compulsory elements : Den inledande dagens möte mellan studenter och kursledning sker som klassrumsundervisning och är obligatorisk. Varje student måste delta i godkänt grupparbete. Varje student måste visa aktivitet på kursens hemsida i form av en presentation av sig själv för kurskamraterna. Minst två frågor, egna presentationer eller kommentarer på andras inlägg, måste ges under var och ett av de nio kursavsnitten. Frånvaro eller brist på online aktivitet kan efter examinators bedömning kompenseras med en individuellt skriven uppsats. Webbinarier som ges är obligatoriska. För att kunna delta i slutprovet måste de föregående momenten vara godkända.
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 hålls heltid måndag till fredag. Det är svårt att hinna med annat arbete parallellt. Vissa moment kräver fysisk närvaro campus Solna.

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Contact person :
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Title : Design and analysis of twin and family-based studies

Course number : 2893
Credits : 1.5
Date : 2020-10-12 -- 2020-10-16
Language : English
Level : Doctoral level
Responsible KI department : Department of Medical Epidemiology and Biostatistics
Specific entry requirements : Epidemiology I: Introduction to Epidemiology, Biostatistics I: Introduction for epidemiologists, Epidemiology II: Design of epidemiological studies, Biostatistics II: Logistic regression for epidemiologists and Biostatistics III: Survival analysis for epidemiologists or corresponding courses
Purpose of the course : This course focuses on potential designs and analyses using twin- and family-data. Methods to estimate within-family associations and heritability are covered.
Intended learning outcomes : After successfully completing this course you as a participant are expected to be able to: - discuss the difference between a within-family analysis and a more standard (e.g. between-family) statistical analysis, - select an appropriate within-family/heritability analysis for a given dataset, based on a specific research question, - discuss how to perform within-family/heritability analyses using the statistical software R, - interpret the output from a within-family/heritability analysis, and compare with a more standard statistical analysis, - discuss assumptions made in heritability analysis, and how violations may affect the results.
Contents of the course : The aim of empirical research is often to estimate the causal effect of a particular exposure on a particular outcome. A complicating feature of observational studies is that the exposure-outcome association is typically confounded, and cannot be given a causal interpretation. The standard approach to deal with confounding is to control for confounders in the analysis, e.g. by regression modeling. However, many confounders may be difficult to measure, or unknown to the investigator. An appealing solution is to study within-family associations, which are automatically controlled for all factors that are shared within the family (e.g. socioeconomic status, genetic factors). In this course we will focus on the theory and practice of within-family analyses. In many studies, the research question is to what extent a phenotype is caused by genetic factors. Frequently though, there may be no obvious candidate gene, and financial limitations may prohibit a genome wide scan. An appealing solution is to study whether the phenotype tends to run in families; the stronger genetic influence, the larger familial heredity. A commonly used design to estimate the fraction of variation in an outcome which may be attributable to genes and environment is the classic twin methodology. In this course we will cover the concept of heritability, its underlying assumptions, and applications in the classic twin method. Within-family analysis and bivariate heritability analysis (i.e., quantitative genetic analysis of two phenotypes) complement each other. Although within-family analyses require fewer assumptions, bivariate heritability analyses may yield additional information. In this course we will compare and contrast the methods.
Teaching and learning activities : Different strategies for teaching and learning, such as interactive lectures, small group discussions and exercises on selected topics, will be used.
Examination : An individual, oral examination will take place the last day of the course. Each student will present a hypothetical study in which all the intended learning outcomes should be addressed. The examination will be performed in small groups with one examining teacher in each group. Feedback from peers will also be emphasized. 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 semesters, then a third examination will be scheduled within 12 months of the final day of the course.
Compulsory elements : The individual, oral 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 responsible :
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Title : Dokumentation, bearbetning och analys av språkliga data

Course number : 2897
Credits : 7.5
Date : 2020-11-02 -- 2021-01-15
Language : Swedish
Level : Forskarnivå
Responsible KI department : Department for Clinical Science, Intervention and Technology
Specific entry requirements : Logopedexamen eller en magisterexamen omfattande grundkurs i lingvistik eller motsvarande om minst 30 HP. Dessutom krävs Svenska B/Svenska 3 och Engelska A/Engelska 6 med lägst betyget godkänd/E.
Purpose of the course : Kursen syftar till att ge kunskaper om och färdigheter i ändamålsenlig, effektiv och kvalitetssäker hantering och analys av språkliga data, såsom ljud-/videoinspelningar och transkriptioner.
Intended learning outcomes : Efter kursen skall studenten kunna - jämföra och kritiskt granska olika metoder för dokumentation av språkliga data - resonera kring vad valet av - och vilka möjligheter och begränsningar - olika dokumentationsmetoder innebär för fortsatt analys av tal, röst och språk - självständigt använda mjukvara för annotering av språkliga data - självständigt använda automatiska metoder för att extrahera annoterade delar ur ljud- eller videoinspelningar för vidare analys - beskriva och argumentera för ett ändamålsenligt tillvägagångssätt att dokumentera, bearbeta och analysera språkliga data för att besvara en given forskningsfråga eller klinisk frågeställning - kritiskt granska beskrivningar av tillvägagångssätt för dokumentation, bearbetning och analys av språkliga data
Contents of the course : Kursen innehåller - teoretisk översikt över datorbaserade metoder för dokumentation (video- respektive ljudinspelning och annotering), bearbetning (sortering och filtrering) och analys (t ex grafisk representation) av språkliga data, med fokus på de möjligheter och begränsningar som valet av metod innebär. - praktisk tillämpning av verktyg för dokumentation, bearbetning och analys av språkliga data, såsom ljud- och videoannotering (i t ex Praat och ELAN) och metoder för bearbetning av annoterad data (med hjälp av enkla programmeringsscript). - integrering av teoretiska kunskaper och praktiska färdigheter genom tillämpning på deltagarens individuellt valda projektarbete.
Teaching and learning activities : Föreläsningar, seminarier, laborationer, handledning i grupp, samt eget projektarbete.
Examination : Muntlig och skriftlig redovisning av eget projektarbete, samt muntlig och skriftlig granskning av annan students projektarbete.
Compulsory elements : Obligatorisk närvaro vid alla undervisningsmoment förutom föreläsningar. Vid frånvaro från obligatoriskt undervisningsmoment ansvarar studenten själv för att kontakta kursansvarig lärare för kompletteringsuppgift. Kursansvarig bedömer om och i så fall hur frånvaro från obligatoriska utbildningsinslag kan tas igen.
Number of students : 5 - 10
Selection of students : Urvalet baseras på 1) kursplanens relevans för den sökandes doktorandprojekt (enligt motivering), 2) startdatum för doktorandstudier
More information : Kursen inleds med en veckas föreläsningar och övningar (under v. 45). Studenterna genomför under v. 46-51 ett eget projektarbete, med veckovisa tillfällen till handledning i grupp. Arbetet examineras genom en skriftlig rapport, vilken presenteras muntligt i seminarieform, under dagarna 14-15/1 2021.

Course responsible :
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Title : Pragmatic randomised controlled trials in healthcare

Course number : 2917
Credits : 4.5
Date : 2020-09-21 -- 2020-10-30
Language : English
Level : Doctoral level
Responsible KI department : Department of Global Public Health
Specific entry requirements : Participants should have completed an introductory course in either epidemiology, biostatistics or quantitative research methods.
Purpose of the course : This course will enable students to to learn about the key elements of a randomised controlled trial (RCT), what a pragmatic trial is, why it is relevant, how to develop a protocol for a pragmatic RCT, issues in the conduct of an RCT, from writing up the protocol to trial close out. The student will also learn about ethical issues in trials, reporting trials, and nesting relevant studies in a trial. The course is particularly useful for those students with an interest in evaluating pragmatic interventions in healthcare using a randomised trial design and those interested in trials from an epidemiological method perspective.
Intended learning outcomes : At the end of the course, the student should be able to: - Understand the continuum from Explanatory to pragmatic randomized trials - the PRECIS tool. - Understand what makes a trial pragmatic and the relevance of pragmatic trials - Know the CONSORT criteria for reporting of pragmatic randomized trials - Describe the elements of a trial protocol and demonstrate this through development of a pragmatic trial protocol - Have knowledge of PICOT to frame the research question and identify the primary and secondary outcomes - Explain the principles, methods and relevance of randomization and allocation concealment - Describe recruitment strategies, trial governance, quality assurance and control, participant retention and adherence - Dealing with serious adverse events in a pragmatic trial - Describe the data management process including data and safety monitoring plan, data analysis (predefined and post hoc analyses), different data types, measures of effect - Explain the handling of serious adverse events in a pragmatic trial - Explain the ethical principles in conducting RCTs - Know how to embed qualitative studies and economic assessments into pragmatic trials - Understand the practicalities of conducting RCTs - Explain the challenges of conducting a RCT - Demonstrate the ability to develop a protocol for a pragmatic RCT.
Contents of the course : The course is divided into six sections with the following content: Section 1 This is an introduction to different types of randomized controlled trials (RCTs) with particular emphasis on pragmatic randomized controlled trials (pRCTs). We will explain the reasons why one would do a pragmatic RCT and what makes them a special case of randomized controlled trials. We will introduce you to the frameworks for designing and reporting pRCTs, PRECIS and the CONSORT extension for pRCTS. The student will be be guided on working on the first stages of a trial protocol. Section 2:The focus of the course this section is the basic elements of the design of a trial: the research question, the population and setting included in the students study; the intervention and the comparison; the outcomes used to measure the effects of the intervention; and the study target. These basic elements of the trial are summarised in the PICOT acronym. PICOT stands for participants, intervention, comparison, outcome, and target. At the end of the section the student should be able to define their research question, using the PICOT structure; be able to clearly and precisely define the participants and study settings of your randomized controlled trial; define inclusion and exclusion criteria; select outcomes, and specify the target, superiority or non-inferiority. Section 3: The content of the course in this section is randomization and sample size. The student will learn why randomization is important, and what benefits it has for the interpretation of a trial. The student will learn to use tools, such as random number tables and online calculators for randomizing participants. The student will also be introduced to sample size and estimations for simple RCTs and for cluster RCTs. In this section we discuss post recruitment retentions, safety monitoring and data collection. At the end of the section, the student will be guided to write the the randomization and sample size part of their protocol for their planned pRCT. Section 4: The emphasis of the course in this section is data analysis and interpretation. At the end of this section, the student will be guided to write the data analysis part of their protocol for their planned pRCT. Section 5: The section has two subsections - ethics, and economic evaluations. While ethics are important to all research projects, there are particular considerations to be taken into account, particularly when the trial is cluster randomized. These issues will be discussed. Economic evaluations are useful for those conducting a trial and for those making a decision on whether an effective intervention is worth implementing widely. The student will be guided to think through and articulate the ethical issues arising in their protocol. Section 6: The content of the course in this final section is qualitative evaluation alongside pragmatic randomized trials. Qualitative evaluations are an important addition to pRCTs; this is because they can be a valuable part of a process evaluation. Process evaluations are necessary to find out how, and why an intervention works; whereas the pRCT is aimed at finding out if an intervention works; and what its effects are.
Teaching and learning activities : This course is a blended learning course i.e a combination of classroom and online teaching/learning. The course runs for 6 weeks at 50% pace (equivalent to 3 weeks of full time work). There will be one contact session at the beginning of each week for 2.5 hours. This lecture will outline the learning for the week (pace the sessions), discuss some concepts in more detail, clarify issues raised by the students and explain the assignment progress expected at the end of the week. The students will have access to a tutor on one other day of the week to discuss/ clarify any other issues the have arisen during the self learning/ assignment work up phase. The online part of the course is hosted on an Edx platform which each student will have access to. The platform contains lectures, reading material, and exercise as formative assessment. In addition students will have access to a discussion forum to interact and learn from each other - by posting questions and having discussions around topics of relevance as they work through the course. The tutor may also interact on some threads. The final

assessment will be based on a complete trial protocol developed in stages as the course progresses.
Examination : Student achievement of the learning objectives will be assessed through a written protocol that is developed in stages over the course submitted at the end of the course. This will be marked by a tutor. Grades given will be pass/not pass.
Compulsory elements : None of the lectures in the classroom or the tutor interaction sessions are mandatory. However students will be expected to develop the protocol in steps, as prescribed over the duration of the course. This protocol will be the final assessment.
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). We will prioritise those with some experience in the health sector, or who are using randomised trials in their research.
More information : This is a predominantly online course, set up over 6 weeks. Each week includes several structured sections, which should take 6-10 hours to complete each section. Each week there will be a 3-hour facilitated group discussion on Monday afternoons. The first session on the 21st September 2020 should be attended in person. The course will be run in Canvas (not EdX).

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Title : Sex and gender perspectives in cardiovascular research

Course number : 2944
Credits : 1.0
Date : 2020-10-19 -- 2020-10-23
Language : English
Level : Doctoral level
Responsible KI department : Department of Medicine, Solna
Specific entry requirements : Second cycle - Master´s level study in medicine or biomedicine
Purpose of the course : ""Every cell has sex and every person is gendered"". This course encourages students to examine the validity and implications of this statement in the field of experimental and clinical cardiovascular research, and; in particular, in relation to their PhD projects. It will focus on what the current evidence and regulations suggest in respect to implementation of sex and gender perspectives in the field of experimental medicine with further implementation in cardiovascular medicine and research.
Intended learning outcomes : After completion of both the online module and the face-to-face part of the course, students are expected to be able: I) to account for sex and gender in biomedical research involving animals, cells or tissues; II) to account for sex and gender when considering aspects of cardiovascular research in humans.
Contents of the course : This short course consists of two modules. The first module consists of a web-based course developed by Canadian Institute of Gender and Health with the title SEX AND GENDER IN BIOMEDICAL RESEARCH, as well as individual work designed by course organizers mainly including web based tools for requirement of relevant information. The face-to-face module will concentrate on cardiovascular research topics. It will include a number of in-house seminars/workshops with guest lecturers (Meet an Expert - Get Inspired) who will facilitate and enhance the learning process as it draws on team-based learning approaches, while promoting a sense of community among the students. Examples of experimental research towards reproductive cardiovascular health, sex-specific cell signaling in health and disease, will be linked with presentations of subjects of importance regarding sex/gender perspectives in cardiovascular disease development, and with presentation of symptoms, availability and feasibility of treatment regimens and outcomes.
Teaching and learning activities : The course consists of an online creative, flexible and free-accessible module that anyone can take in one's own pace (about 8 hours to complete) and a face-to-face day with seminars/workshops with guest lecturers (Meet an Expert - Get Inspired).
Examination : Exam format: I) assessment of the web-based course: pass when acquire the answer to 90% of questions. II) presentations of assigned work, either individually or in group.
Compulsory elements : The participants must have to pass and get a certificate from the web-based course SEX AND GENDER IN BIOMEDICAL RESEARCH and attend the seminars/workshop. The participants should write a reflective report (1-2 A4 pages; estimated to take about one day to complete).
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 primarily targets KI PhD students and PostDocs who are interested in implementation of gender dimension in the research content. This course is a great opportunity to endorse methods for implementation of sex and gender aspects in biomedical research as well as utilizing the international competence to follow the KI strategy to comply to implementation of sustainable development goals by 2030.

Course responsible :
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Contact person :
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Title : Statistics with R - from data to publication figure

Course number : 2953
Credits : 3.0
Date : 2020-11-02 -- 2020-11-20
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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Eric Rullman
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Title : Medical Research Ethics

Course number : 2964
Credits : 1.5
Date : 2020-09-21 -- 2020-09-25
Language : English
Level : Doctoral level
Responsible KI department : Department of Learning, Informatics, Management and Ethics
Specific entry requirements :
Purpose of the course : The objective of this course is for the doctoral student to: - understand central research ethical theories, principles and guidelines, to gain the possibility to reflect over ethical aspects of his or her own research - understand what is good research and the boundaries for what is ethically unacceptable research with regards to humans and animals, and to the researcher's own academic integrity - develop a research ethical approach within his or her own research, to others' research and to society
Intended learning outcomes : After having completed the course, the doctoral student should be able to: - give an account of research ethical theories, principles, and, to some extent, guidelines - account for common problems that arise in the area of research ethics - identify, analyze, and discuss research ethical issues and conflicts - conduct a research ethical argumentation for or against a matter
Contents of the course : - Central research ethical principles, theories and arguments - Central philosophy of science - concepts and positions, and its relevance to research ethics - Research on humans, including informed consent and its components - Animal research ethics, including arguments for and against using animals for research purposes, and the three R's. - Ethical reviews and research ethical guidelines, such as the Helsinki Declaration - Good research practice and deviations from good research practice within research, for example issues concerning fabricated data, fraud and plagiarism, and handling of authorship in scientific writing - Conflicts of interest in research, such as bias and sponsorship
Teaching and learning activities : Lectures, group work and general discussions.
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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Department of Learning, Informatics, Management and Ethics

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Contact person :
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Title : Medical Research Ethics

Course number : 2964
Credits : 1.5
Date : 2020-10-19 -- 2020-10-23
Language : English
Level : Doctoral level
Responsible KI department : Department of Learning, Informatics, Management and Ethics
Specific entry requirements :
Purpose of the course : The objective of this course is for the doctoral student to: - understand central research ethical theories, principles and guidelines, to gain the possibility to reflect over ethical aspects of his or her own research - understand what is good research and the boundaries for what is ethically unacceptable research with regards to humans and animals, and to the researcher's own academic integrity - develop a research ethical approach within his or her own research, to others' research and to society
Intended learning outcomes : After having completed the course, the doctoral student should be able to: - give an account of research ethical theories, principles, and, to some extent, guidelines - account for common problems that arise in the area of research ethics - identify, analyze, and discuss research ethical issues and conflicts - conduct a research ethical argumentation for or against a matter
Contents of the course : - Central research ethical principles, theories and arguments - Central philosophy of science - concepts and positions, and its relevance to research ethics - Research on humans, including informed consent and its components - Animal research ethics, including arguments for and against using animals for research purposes, and the three R's. - Ethical reviews and research ethical guidelines, such as the Helsinki Declaration - Good research practice and deviations from good research practice within research, for example issues concerning fabricated data, fraud and plagiarism, and handling of authorship in scientific writing - Conflicts of interest in research, such as bias and sponsorship
Teaching and learning activities : Lectures, group work and general discussions.
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 : 2020-11-23 -- 2020-11-27
Language : English
Level : Doctoral level
Responsible KI department : Department of Learning, Informatics, Management and Ethics
Specific entry requirements :
Purpose of the course : The objective of this course is for the doctoral student to: - understand central research ethical theories, principles and guidelines, to gain the possibility to reflect over ethical aspects of his or her own research - understand what is good research and the boundaries for what is ethically unacceptable research with regards to humans and animals, and to the researcher's own academic integrity - develop a research ethical approach within his or her own research, to others' research and to society
Intended learning outcomes : After having completed the course, the doctoral student should be able to: - give an account of research ethical theories, principles, and, to some extent, guidelines - account for common problems that arise in the area of research ethics - identify, analyze, and discuss research ethical issues and conflicts - conduct a research ethical argumentation for or against a matter
Contents of the course : - Central research ethical principles, theories and arguments - Central philosophy of science - concepts and positions, and its relevance to research ethics - Research on humans, including informed consent and its components - Animal research ethics, including arguments for and against using animals for research purposes, and the three R's. - Ethical reviews and research ethical guidelines, such as the Helsinki Declaration - Good research practice and deviations from good research practice within research, for example issues concerning fabricated data, fraud and plagiarism, and handling of authorship in scientific writing - Conflicts of interest in research, such as bias and sponsorship
Teaching and learning activities : Lectures, group work and general discussions.
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 : Methods for Life Course Epidemiology

Course number : 2968
Credits : 1.5
Date : 2020-12-07 -- 2020-12-11
Language : English
Level : Doctoral level
Responsible KI department : The institute of Environmental Medicine
Specific entry requirements : Knowledge equivalent to "Epidemiology I: Introduction to epidemiology", "Biostatistics I: Introduction for epidemiologists", "Epidemiology II: Design of epidemiological studies", "Biostatistics II: Logistic regression for epidemiologists" and "Biostatistics III: survival analysis for epidemiologists" or corresponding courses.
Purpose of the course : The course critically reviews life course theory and methods for analysis of longitudinal data with applications to life course epidemiology. A special focus is put on discussing and applying methods for mediation analysis.
Intended learning outcomes : After successfully completing this course, the student is expected to be able to: - Discuss the most common life course models and their implications for health policy - Evaluate strengths and limitations in using register data for research in life course epidemiology - Explain the applicability of visualization techniques for research in life course epidemiology - Identify and apply appropriate methods for mediation analysis - Perform mediation analysis, and interpret and communicate the derived results - Critically appraise evidence from life course epidemiological studies.
Contents of the course : This course focuses on an overview and critical discussion of life course theory and methods for analysis of longitudinal data with applications to life course epidemiology. We shall review, discuss and apply different approaches to addressing common challenges in register-based, life course and intergenerational research through both methodological innovations and adaptation of existing statistical methods. Examples of techniques to be discussed and applied include methods for visualizing and modeling changes in categorical variables, modeling the effects of binary exposure variables over the life course, and techniques for mediation analyses. We shall also discuss and apply concepts and methods from the field of causal inference to life course studies. The statistical software used in the lectures and computer labs is Stata.
Teaching and learning activities : Lectures, computer labs and individual and group work involving analysis of real-life research problems using longitudinal data and a statistical software (Stata).
Examination : To pass the course, the student has to show that the intended learning outcomes have been achieved. The assessment methods used in this course are individual and group assignments (formative assessment) and an individual take-home examination (summative assessment). The focus will be on application of methods to research problems and interpretation of results, rather than mathematical detail. The examination is viewed as contributing to the development of knowledge, rather than a test of that 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.
Compulsory elements : 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 responsible :
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Title : Introduction to R - Data Management, Analysis and Graphical Presentation

Course number : 2971
Credits : 2.5
Date : 2020-09-22 -- 2020-11-03
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 : 10 - 20
Selection of students : Selection will be based on 1) the relevance of the course syllabus for the applicant's doctoral project (according to written motivation), 2) start date of doctoral studies (priority given to earlier start date)
More information : The course is held at Karolinska University Hospital Huddinge. Course dates: 22/9, 25/9, 2/10, 9/10, 16/10, 23/10, 3/11. Between these course dates, there will be deadlines for mandatory home assignments. Laptop required for programming exercises.

Course responsible :
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Title : Study Design in Clinical Research

Course number : 2980
Credits : 3.0
Date : 2020-11-09 -- 2020-11-26
Language : English
Level : Doctoral level
Responsible KI department : Department of Molecular Medicine and Surgery
Specific entry requirements :
Purpose of the course : The purpose of the course is to give early stage doctoral students, that are going to conduct clinical research, an overview over the design and conduct of clinical research, including writing a study protocol and critically reflecting on its content.
Intended learning outcomes : At the end of the course the students should be able to: 1) Independently plan and produce a study protocol, including a thorough methodological evaluation and choice of appropriate study design; 2) Critically reflect on other students' individual project work in a scientifically constructive way; 3) Interpret and critically evaluate scientific studies relevant to the course content.
Contents of the course : 1) Basic terms in epidemiology and clinical study design; 2) Measures of disease occurrence; 3) Observational studies, including cohort and case-control studies; 4) Systematic and random errors; 5) Experimental studies, including randomised clinical trials; 6) Quality of life in clinical research; 7) Screening and diagnosis in relation to clinical research. Throughout the course the students will work on an individual project (examination 1) for peer-review (examination 2) and the students will critically review and discuss relevant scientific articles (examination 3).
Teaching and learning activities : Lectures, seminars, individual article review, group discussions, and homework tasks. The course focuses on active learning, i.e. putting knowledge into practice and critically reflecting upon the knowledge, rather than memorising facts. Therefore, much of the focus of the course is on the individual project where students are required to develop a full study protocol including several important aspects covered in the lectures, article reviews and group discussions. Students will also peer-review each other's projects in the examination seminar.
Examination : 1) Individual project work: To develop a written comprehensive yet concise study protocol including several important aspects of study design as discussed during the course; 2) Peer-review of other students' projects followed by oral presentation of own project and opposition of other students projects during the group examination; 3) Critically review scientific articles relevant to the course content and participate actively in the seminars. To pass the course the student has to show that all intended learning outcomes have been reached.
Compulsory elements : Compulsory attendance includes the scheduled lectures and seminars. Absence will need to be replaced by individual assignments following discussion with the course co-ordinator, e.g. article reviews, with written or oral follow-up.
Number of students : 20 - 25
Selection of students : Selection will be based on 1) the relevance of the course syllabus for the applicant's doctoral project (according to written motivation), 2) date for registration as a doctoral student (priority given to earlier registration date)
More information : The course will take place during a 3-week period, at Karolinska Institutet, Solna. The majority of lectures and seminars are scheduled during the first 3.5 days of the first course week. The oral exam will take place at the end of the third week (Thursday). The course entails 3 credits, requiring two weeks of full-time work, which in addition to the lectures and seminars includes individual work on the study protocol. The lecturers are active clinical researchers.

Course responsible :
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Contact person :
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Title : Rare Disease Genomics

Course number : 2981
Credits : 1.5
Date : 2020-10-05 -- 2020-10-09
Language : English
Level : Doctoral level
Responsible KI department : Department of Molecular Medicine and Surgery
Specific entry requirements :
Purpose of the course : This is a course aimed at students actively involved or planning genetic analysis of rare diseases. The course is also appropriate for those working with complex diseases and cancer whose projects involve high throughput DNA sequencing. The purpose of this course is to provide the participants with knowledge and practical experience about current research strategies and tools for analysis of DNA-sequencing data in the field of rare disease genomics. The participants will also be made aware of ethical issues in relation to rare disease genomics.
Intended learning outcomes : After the course, the participants should be able: 1. To select adequate genomic technologies and data analysis strategies to answer research questions in the field of rare disease genetics or in their field of research; 2. To evaluate candidate variants and genes using publicly available databases and tools; 3. To discuss suitable approaches for functional validation of candidate variants and genes; 4. To identify and discuss on ethical issues arising from large-scale sequencing studies.
Contents of the course : The focus of the course is the use of current DNA-sequencing methods and bioinformatics tools to understand the genetic basis of rare genetic diseases. Within the overall theme of clinical and experimental approaches to diagnostics of rare genetic diseases, particular attention will be paid to annotation and classification of different types of genetic variants (single nucleotide variants and structural variants). The course will cover the use of different in-silico pathogenicity scores, phenotype ontology terms, and population and family data for variant and gene interpretation. The course will cover selected experimental strategies to validate genetic findings. The course will also cover current clinical best practice guidelines concerning ethical issues such as report of incidental findings and acquisition of informed consent.
Teaching and learning activities : The course consists of lectures, seminars, hands-on computer-based exercises, self-studies, and group presentations. Students are required to bring their laptops with working internet connection.
Examination : It will be assessed whether each individual doctoral student has reached all the learning outcomes of the course through a take-home examination. Antiplagiarism tools will be used according to KI guidelines.
Compulsory elements : All teaching and learning activities are compulsory. Absence from compulsory parts is compensated according to the instructions from the course leader.
Number of students : 15 - 20
Selection of students : Selection will be based on 1) the relevance of the course syllabus for the applicant's doctoral project (according to written motivation), 2) start date of doctoral studies (priority given to earlier start date)
More information : The course will take place in the Bioclinicum research building of the Karolinska University Hospital Solna in the classroom J3:13 Marc Bygdeman.

Course responsible :
Anna Lindstrand
Department of Molecular Medicine and Surgery

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Contact person :
Bianca Tesi
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Title : Multivariate prediction modelling with applications in precision medicine

Course number : 2990
Credits : 1.5
Date : 2020-11-23 -- 2020-11-27
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 provide an introduction to both supervised and unsupervised methodologies for prediction modelling with a focus on biomedical applications, molecular epidemiology and personalised medicine.
Intended learning outcomes : After successfully completing this course you as a student are expected to be able to: - Perform and assess basic quality control and outlier detection - Apply unsupervised and supervised statistical learning methods to detect patterns in data - Devise cross-validation strategies for parameter estimation, model selection and prediction performance evaluation - Make informed judgement of how to apply basic principles for variable selection - Critically evaluate prediction models in real-world applications
Contents of the course : Personalised medicine is a cornerstone of tomorrows health care, and is based on the idea of stratifying patients into groups based on e.g. disease risk, prognosis or probability of treatment response and administrate the most suitable therapy for each individual. The capability to generate vast amounts of quantitative molecular data from DNA- and RNA-sequencing and other molecular profiling methods is providing unprecedented opportunity for implementation of personalized precision medicine approaches in the health care system. Molecular profiling typically generates data with tens of thousands of variables of which only a subset is relevant for treatment decisions. The promise of personalised medicine relies on our ability to turn the vast molecular datasets into clinically actionable predictive models of individualised therapy response. Application of statistical learning methods and prediction modelling is a central component in developing these models, and in developing the biomarker panels that can be used for molecular subtyping, risk stratification and prediction of treatment response. This course provides an introduction to statistical learning methods and prediction models that are relevant for personalised medicine with a focus on real-world applications. This course aims to provide an introduction to methodologies for prediction modelling with a focus on biomedical applications, molecular epidemiology and personalised medicine. The course covers basic theory and introduction to modern statistical and machine learning methods for prediction modelling in high-dimensional data, together with applied data analysis through computer-based exercises. Lectures and exercises will cover the full process going from the initial data set and through data normalisation, quality control, outlier detection, application of unsupervised learning methods, application of supervised learning methods, variable selection, cross-validation and model evaluation. The main objective of the course is to provide basic theory and practical knowledge that will enable course participants to apply covered methodologies in their own research. Topics covered include: data import and basic visualisation, data pre-processing, quality control and outlier detection, unsupervised learning, supervised learning, cross-validation for parameter estimation and estimation of prediction performance, variable selection, recently developed methods (e.g. deep learning, conformal prediction).
Teaching and learning activities : The course is based on a combination of lectures, which covers methods and theory, together with computer-based exercises in R, where real-world data are analysed and interpreted. Previous experience from practical experience applying statistical models in a computer-based environment (e.g R, SAS, Stata, Matlab, Python) is strongly recommended.
Examination : The individual examination will be performed as a take-home examination. It consists of an individually written lab-report where results from an applied data analysis mini-project should be summarised and critically evaluated. 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 individually written 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 : It is recommended to have taken an introductory course in R or to have equivalent experience prior to taking this course.

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

Course number : 2992
Credits : 1.5
Date : 2020-11-09 -- 2020-11-18
Language : English
Level : Doctoral level
Responsible KI department : Department of Medical Epidemiology and Biostatistics
Specific entry requirements : Epidemiology I, Introduction to epidemiology; Biostatistics I, Introduction for epidemiologists; Biostatistics II, Logistic regression for epidemiologists or equivalent courses.
Purpose of the course : This course focuses on the application of survival analysis methods to epidemiological studies.
Intended learning outcomes : After successfully completing this course students should be able to: - propose a suitable statistical model for assessing a specific research hypothesis using data from a cohort study, fit the model using standard statistical software, evaluate the fit of the model, and interpret the results. - explain the similarities and differences between Cox regression and Poisson regression. - discuss the concept of timescales in statistical models for time-to-event data, be able to control for different timescales using standard statistical software, and argue for an appropriate timescale for a given research hypothesis. -discuss the concept of confounding in epidemiological studies and be able to control/adjust for confounding using statistical models. - apply and interpret appropriate statistical models for studying effect modification and be able to reparameterise a statistical model to estimate appropriate contrasts. - critically evaluate the methodological aspects (design and analysis) of a scientific article reporting a cohort study.
Contents of the course : This course introduces statistical methods for survival analysis with emphasis on the application of such methods to the analysis of epidemiological cohort studies. Topics covered include methods for estimating survival (life table and Kaplan-Meier methods), comparing survival between subgroups (log-rank test), and modelling survival (primarily Poisson regression and the Cox proportional hazards model). The course addresses the concept of 'time' as a potential confounder or effect modifier and approaches to defining 'time' (e.g., time since entry, attained age, calendar time). The course will emphasise the basic concepts of statistical modelling in epidemiology, such as controlling for confounding and assessing effect modification.
Teaching and learning activities : Lectures, exercises focusing on analysis of real data using the free statistical software R, exercises not requiring statistical software, group discussions, literature review.
Examination : The course grade is based solely on a take-home examination. The focus of the exam will be on understanding concepts and their application to analysis of epidemiological studies rather than mathematical detail. The course examination will be held within two weeks of the final day of the course. Students who do not obtain a passing grade in the first examination will be offered a second examination within 2 months of the final day of the course. Students who do not obtain a passing grade at the first two examinations will be given top priority for admission the next time the course is offered. If the course is not offered during the following two academic terms then a third examination will be scheduled within 12 months of the final day of the course.
Compulsory elements : The individual examination
Number of students : 8 - 25
Selection of students : Eligible doctoral students will be prioritized according to 1) the relevance of the course syllabus for the applicant’s doctoral project (according to written information), 2) date for registration as a doctoral student (priority given to earlier registration date). To be considered, submit a completed application form. Give all information requested, including a short description of current research training and motivation for attending, as well as an account of previous courses taken.
More information : The course will be held November 9, 11, 13, 16, 18. The statistical software R will be used throughout the course. It is strongly recommended to have taken an introductory course in R or to have equivalent experience prior to taking this course. We have provided a self assessment test (http://biostat3.net) for you to confirm that you have understood the central concepts. We advise all potential applicants to take the test prior to applying to Biostatistics III. If you attempt the test under examination conditions (i.e., without referring to the answers) we would recommend: 1. if you score 70% or more then you possess the required prerequisite knowledge 2. if you score 40% to 70% you should revise the areas where you lost marks 3. if you score less than 40% you should, at minimum, undertake an extensive review of central concepts in statistical modelling and possibly consider studying intermediate level courses (e.g., Biostatistics II) before taking Biostatistics III.

Course responsible :
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Title : Functional Neuroanatomy

Course number : 2994
Credits : 1.5
Date : 2020-09-07 -- 2020-09-11
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 the student with an in-depth understanding of human functional neuroanatomy. Besides human brain the course will focus on the most common animal model, the mouse, in order to point out similarities and differences.
Intended learning outcomes : 1) Gain a foundational understanding of human neuroanatomy and be able to contrast it to mice. 2) Be able to identify and understand the macro- and micro-anatomical structures of the adult brain. 3) To understand the anatomy and connections of the main functional systems in the brain 4) To be able to find these structures on Magnetic Resonance Images.
Contents of the course : A) Anatomical dissection of the human brain to understand its macroanatomy B) Microscopy to understand the histological features of adult human nervous system and how it differs between neocortical and archicortical (hippocampus) regions. C) Main morphological features of sensory, motor, limbic and cognitive functions. D) Microscopy of chosen neocortical, archicortical and cerebellar regions and recognition of the main cellular features between different layers in the respective areas. E) Understanding the principles of afferent and efferent connections.
Teaching and learning activities : Macroscopic dissections in the anatomic theatre, double-head microscopy, practical demonstration, lectures, work in the small groups, students presentation
Examination : a) identification of neuroanatomical structures on the pictures of human brain and b) writing an essay (max one A4 page) regarding the anatomy of one of the functional systems according to the instructions of the examiner.
Compulsory elements : All parts of the course are compulsory. In case of absence, a possible compensation will be discussed with the course leader.
Number of students : 8 - 40
Selection of students : Selection will be based on 1) the relevance of the course syllabus for the applicant's doctoral project (according to written motivation), 2) start date of doctoral studies (priority given to earlier start date)
More information :

Course responsible :
Tobias Karlsson
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Contact person :
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Title : Systematic reviews and meta-analyses in animal research - an introduction

Course number : 2995
Credits : 1.0
Date : 2020-12-02 -- 2020-12-03
Language : English
Level : Doctoral level
Responsible KI department : Comparative medicine
Specific entry requirements :
Purpose of the course : Systematic reviews are routinely used for scientific purposes in clinical studies, and are also currently rapidly gaining more attention in the field of animal research. Systematic overviews of all scientific literature on a well-defined specific research question are an important tool to improve the scientific quality of animal experiments, to improve translation of data generated from animals into the clinical situation, and to avoid unnecessary duplication of animal experiments, which are both an ethical and legal obligation. The aim of systematic reviews is to provide a comprehensive, objective, evidence-based and up-to-date overview of the current knowledge, which can be quantitatively summarized by means of a meta-analysis. Therefore, systematic reviews may result in new insights without having to use new animals. Systematic reviews can actually replace and refine animal experiments by better understanding the problems and limitations in previous experiments and by reducing the number of animals needed. This course objective is to encourage the use and conduct of systematic reviews and meta-analysis in animal research in order to 1) increase scientific quality, 2) to improve translation of animal data to the clinical situation, and 3) to prevent unnecessary duplication of animal studies.
Intended learning outcomes : After completion 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 animal studies; 2) Understand the difference between a classical review (so-called narrative) and systematic reviews; 3) Identify the strengths, limitations and pitfalls of systematic reviews and meta-analysis in animal research; 4) Interpret and apply basic methods of meta-analyses in animal studies.
Contents of the course : Key contents of the course include 1) Basic concepts in systematic reviews and meta-analyses, 2) strengths, problems and limitations of systematic reviews and meta-analyses, 3) conducting a systematic literature search, 4) data-extraction and quality assessment of included studies, 5) Statistical methods used in meta-analyses and interpretation. The course consists of two parts. The first part is ""flipped-classroom"" consisting of the mandatory course literature (see below) and the e-learning module ""Introduction to systematic reviews and meta-analysis of animal studies"", developed by our collaborators in SYRCLE (Systematic Review Centre for Laboratory Animal Experimentation; Radboud University Medical Center, Nijmegen, The Netherlands). The second part will be a two-day workshop during which we will build upon the acquired knowledge - with a clear focus on practical aspects of conducting systematic searches and meta-analyses, including the systematic literature search, data-extraction and quality assessment, and the statistical analyses (introducing the free software developed by Cochrane: RevMan).
Teaching and learning activities : This is a hands-on course based on active learning. The course will cover theoretical concepts mainly through the e-learning module and reading the mandatory course literature. Discussions in group and practical sessions will be used to facilitate deeper understanding, and to acquire the necessary skills to perform the different steps in systematic reviews and meta-analyses.
Examination : To pass the course the student must 1) complete the e-learning module, 2) read the mandatory course literature before the workshop, 3) actively participate during the two-day workshop, and 4) pass the final written examination (home exam/self-reflection) to consolidate the acquired knowledge.
Compulsory elements : The e-learning module needs to be completed before the course starts (certificates of completion need to be sent to the course organizer before the face-to-face workshop), and the students need to read the mandatory course literature. The face-to-face two-day workshop is mandatory (entire days). In case of well-justified circumstances, missed parts of the workshop may be replaced by a written assignment as approved by the course director.
Number of students : 8 - 16
Selection of students : Selection will be based on 1) the relevance of the course syllabus for the applicant's doctoral project (according to written motivation), 2) start date of doctoral studies (priority given to earlier start date)
More information : Face-to-face teaching and hands-on training will take place on Wednesday and Thursday between 9 am and 5 pm. Location: Comparative Medicine, Karolinska Institutet, Nobels väg 16, 4th floor. This course is arranged by the Unit for Education and Training in Laboratory Animal Science, Comparative Medicine, in collaboration the course leaders and instructors on "How to conduct systematic reviews and meta-analysis" in clinical studies at Karolinska Institutet, and with the special collaboration of SYRCLE (Systematic Review Centre for Laboratory Animal Experimentation), Radboud University Medical Center, Nijmegen, The Netherlands.

Course responsible :
Rafael Frias
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Contact person :

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

Course number : 2996
Credits : 1.5
Date : 2020-11-09 -- 2020-11-13
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, Comparative Medicine, Karolinska Institutet, Nobels väg 16, 3rd floor, Campus Solna. 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 and instructor of this course is Rafael Frias, DVM, MSc, PhD, Assoc. Prof (LAS), Head of Education, Comparative Medicine, Karolinska

Institutet.

Course responsible :
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Contact person :
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Title : Advanced cancer biology

Course number : 3024
Credits : 3.0
Date : 2020-09-01 -- 2020-12-22
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 during the semester by invited national and international prominent researchers. All lectures are held at the Biomedicum, Solnavägen 9, in seminar rooms at the 3rd (entrance) floor, KI Solna Campus Tuesdays at 1 pm, unless else stated.

Course responsible :
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Title : Cell cycle, cancer and anti-cancer targets

Course number : 3026
Credits : 1.5
Date : 2020-10-19 -- 2020-10-23
Language : English
Level : Doctoral level
Responsible KI department : Department of Cell and Molecular Biology
Specific entry requirements :
Purpose of the course : The course aims to provide the students with an updated overview of the cutting edge research activities within the fields of cell cycle and oncology focusing on the role of cell cycle (de)regulation as a cause and possible treatment opportunity for cancer.
Intended learning outcomes : The course is organized to encourage analytical and critical thinking. At the end of this course, students should: - be able to understand, analyze and criticize current strategies towards exploiting the available information on cell cycle regulation, tumor suppressors and oncogenes for the development of novel therapeutics, - evaluate the relevance of the topics presented for their future research activities and PhD studies
Contents of the course : The course contains approximately 10 seminars/lectures, held by invited national and international prominent scientists, as well as 15 hours of discussion/problem-based learning. The speakers will be asked to give a comprehensive and pedagogical overview of the research area as well as an in depth discussion on their own research. Each seminar will be followed by a discussion led by the course organizers where the students are encouraged to interact with the invited speaker. To enable a fruitful discussion the students will have to read relevant literature in the field in advance of each seminar. The topics presented will cover the main aspects of the following themes: 1. Cell Cycle - molecular overview and biological functions 2. Oncogenes and tumor suppressors within the cell cycle 3. The connection between cell cycle and the hallmarks of cancer 4. Targeting aberrant cell cycle signaling in cancer - current therapeutics 5. Technological advances in cancer cell cycle therapeutics Each day will be dedicated to a cell-cycle phase/process and these themes will be incorporated.
Teaching and learning activities : The course is full-time. It will consist of approximately of 3 hours lectures/day. Each lecture will be followed by a discussion led by one of the course organizers. To increase the learning process and to stimulate the reflection on the seminars, the students will be required to study the most recent literature, still not present in the text books within the presented fields in advance of each seminar. Further, students will be required to individually present and discuss specific aspects of the content.
Examination : As assessment, students will be evaluated based on their contributions i) to the discussion during the problem-based learning of each topic; ii) in connection to an individual presentation on a specific topic assigned at the beginning of the course.
Compulsory elements : Students are expected to attend and participate in all lectures, presentations and discussions. In the case of absence, the student will be asked to read a relevant review and/or original research article on the topic missed, summarize it and discuss it with the organizer of the course at a convenient time by appointment.
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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Department of Cell and Molecular Biology

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Contact person :
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Title : Grundkurs i SPSS

Course number : 3028
Credits : 1.5
Date : 2020-09-28 -- 2020-10-02
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 forskningsprojekt (enligt motivering), 2) startdatum för forskarstudier (där tidigare datum har förtur).
More information : Kursen hålls mellan 9-16 måndag-onsdag samt fredag kl 13-15 i Danderyds sjukhus lokaler. Blandad genomgång och eget arbete.

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

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Contact person :
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Title : Exploring entrepreneurial opportunities in research

Course number : 3037
Credits : 4.5
Date : 2020-09-07 -- 2020-10-23
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 : This course will expand your career possibilities inside and outside academia by facilitating the identification and evaluation of entrepreneurial opportunities. Value creation tools will be introduced and used in order to assess, communicate and develop identified opportunities. You will learn how to manage a process from idea to implementation and challenge established ways of thinking in order to prepare you to manage the unexpected.The course is divided in three modules, Identify, Develop and Test. Each module runs for a week and the days to attend are as such: 7-11 September, 28 September - 2 October, and 19-23 October. Mondays 9-17, Wednesdays 9-12 and Fridays 3-17. The course takes place in Campus Solna.

Course responsible :
Samer Yammine
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Contact person :
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Title : Cellular Signalling

Course number : 3049
Credits : 1.5
Date : 2020-10-12 -- 2020-10-16
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 - 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 take place at Campus Flemingsberg, building Neo; room DNA.

Course responsible :
Anna Witasp
Department for Clinical Science, Intervention and Technology

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Contact person :
Thomas Ebert
Institutionen för klinisk vetenskap, intervention och teknik

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Title : Imaging in Neuroscience: with a Focus on Structural MRI Methods

Course number : 3064
Credits : 1.5
Date : 2020-11-23 -- 2020-11-27
Language : English
Level : Doctoral level
Responsible KI department : Department of Neurobiology, Care Sciences and Society
Specific entry requirements :
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 brain structural data measured with structural magnetic resonance imaging (sMRI). 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: - Explain how MR images are generated, what causes artifacts and how to control for them. - Describe how MRI is used today for dementia investigations. - Formulate the basics of surface-based analysis and voxel-based morphometry (differences, similarities, quality control etc.). - Formulate the basis for multivariate data analysis using structural data in combination with other type of data. - Formulate the basis for network analysis (using graph theory) using structural data in combination with other types of data. - Give an overview of different methods for analyzing diffusion tensor imaging (DTI) data as well as other imaging modalities.
Contents of the course : The course focuses on neurodegenerative disorders and in vivo measurements of brain structure. The fundamentals of image processing will be introduced together with an overview of basic MRI physics, including noise and inhomogeneities as well as optimization of pulse sequences. The course covers the methodological approach to computerized segmentation of MRI anatomy using both surface-based and voxel-based methods. We will also present how MRI is used today in clinical practice to aid the diagnosis of dementia. Further, we will discuss methods for studying the integrity of the white matter (for example, DTI). We will discuss various approaches to assess the validity and reliability of the gained results. We will also cover advanced methods (multivariate data analysis and graph theory) to analyze structural data in combination with other type of data (functional MRI, demographic, cognitive and other biomarker data).
Teaching and learning activities : Lectures, seminars and workshops for 5 full consecutive days. The students will perform group projects including a critical assessment of relevant scientific literature.
Examination : The examination takes the form of a critical, in-depth discussion of the group project works, where a topic relevant to brain morphometry has been studied via a review of the scientific literature. Students will be individually assessed regarding their ability to discuss their own and others' group work in relation to the intended learning outcomes of the course.
Compulsory elements : All parts of the course are mandatory. Absence from lectures can be compensated for by a written assignment. A missed seminar or workshop has to be compensated for at a later course occasion.
Number of students : 15 - 20
Selection of students : Selection will be based on 1) the relevance of the course syllabus for the applicant's doctoral project (according to written motivation), 2) start date of doctoral studies (priority given to earlier start date)
More information : The course will be in Campus Flemingsberg, KI, every day of the week (23/11 - 27/11 - 2020) from 9.00 to 16.00. The exact location will be announced before the course starts.

Course responsible :
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Daniel Ferreira Padilla
Institutionen för neurobiologi, vårdvetenskap och samhälle

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Title : Metoder för systematisk litteraturöversikt

Course number : 3066
Credits : 7.5
Date : 2020-09-07 -- 2020-12-14
Language : Swedish
Level : Forskarnivå
Responsible KI department : Department of Women's and children's health
Specific entry requirements :
Purpose of the course : Syftet med kursen är att ge kursdeltagaren en introduktion till systematiska litteraturöversikter (systematic reviews) som metod och att stimulera till fördjupad kunskap och förståelse inom sitt eget forskningsområde.
Intended learning outcomes : Efter avslutad kurs förväntas deltagarna: *kunna reflektera över vilket bidrag den egna forskningsöversikten tillför kunskapsfältet och identifiera frågor som kvarstår *ha utvecklat färdigheter i användandet av forskningssyntes som en vetenskaplig process *kunna kritiskt utvärdera procedurer vid systematiska litteraturöversikter
Contents of the course : Utveckla färdigheter att: *använda systematiskt tillvägagångssätt och att sammanfatta kunskap utifrån en vetenskaplig process och *reflektera över hur den valda frågeställningen inom ramen för avhandlingsarbetet bidrar till kunskapsbasen inom aktuellt forskningsområde. Centralt i kursen är att utveckla färdigheter att använda systematiskt tillvägagångssätt och att sammanfatta kunskap utifrån en vetenskaplig process. Olika syften och metoder för forskningsöversikter exemplifieras. Processen i en systematisk litteratur översikt karaktäriseras av en tydligt formulerad fråga som besvaras genom systematiska och explicita metoder för att identifiera, välja ut, kritiskt bedöma och analysera relevanta studier utifrån frågeställningen.
Teaching and learning activities : Kursen tillhandahåller en introduktion i metoder för systematisk litteraturgenomgång. Kursdeltagaren utvecklar ett protokoll för och genomför en systematisk litteraturgenomgång som fokuserar på en valfri komponent/aspekt som kommer att appliceras i deltagarens eget avhandlingsarbete. Kritiskt bedöma och diskutera svagheter och styrkor i det egna och kursdeltagarnas protokoll och översikter (reviews). Kursen är en distanskurs på deltid som omfattar tre till fyra tillfällen om 1-2 dagar varav ett är slutseminarium. Under kursen varieras arbetsformerna med t.ex. föreläsningar, eget arbete, granskning av andras arbete och gruppdiskussioner, för att kursdeltagarna utifrån denna erfarenhet ska kunna reflektera över hur kunskapen inom det egna forskningsfältet byggs upp. I kursen får deltagarna prova på att arbeta systematiskt utifrån principer om forskningssyntes och även bearbeta och kritiskt granska olika procedurer för forskningsöversikter. Vid första tillfället diskuteras frågeställningen och hur den valda komponenten inom ramen för det egna avhandlingsarbetet kan användas i studentens egna forskning. Till andra tillfället görs en individuell skriftlig plan eller protokoll för hur man implementerar en systematisk forskningsöversikt utifrån frågeställningen om den valda komponenten (2-3 sidor, 1,5 radavstånd, 12 punkter Times, Roman). Uppgiften skickas i form av ett word dokument (döpt med ditt namn).
Examination : Kursen examineras individuellt genom muntlig och skriftlig examination i form av en systematisk forskningsöversikt. För godkänd kurs krävs att lärandemålen är uppfyllda, vilket innebär godkänt resultat på den skriftliga examinationen samt aktivt deltagande i obligatoriska delar. Examinationen består av: 1) En individuell uppsats i formen av en systematisk översikt och består av en litteratur genomgång utifrån den valda frågeställningen (8-12 sidor, 1,5 radavstånd, 12 punkter Times Roman Fokus i den sista uppgiften kommer att vara på: a) hur kursdeltagaren har undersökt och sammanfattat den valda frågeställningen i den individuellt genomförda forskningssyntesen b) hur studenten, i en metoddiskussion, har kritiskt granskat procedurer i den egna systematiska genomgången 2) Aktivt deltagande i det sista seminariet, där den individuella uppgiften (punkt 1) presenteras och diskuteras. Examination för kursen kommer att tillhandahållas under ett år efter kursens slut.
Compulsory elements : Deltagandet i slutseminariet är obligatoriskt. Frånvaro från det sista seminariet ska kompenseras med en skriftlig kritisk diskussion av en annan students skriftliga rapport till det sista seminariet.
Number of students : 10 - 20
Selection of students : Urvalet baseras på 1) sökandes motivering till att gå kursen, där doktorander i Forskarskolan i vårdvetenskap har företräde framför andra sökanden, 2) datum för doktorandregistrering (där tidigare registreringsdatum har förtur)
More information : Kursen är en distanskurs på deltid med följande kursdagar förlagda på campus: 7-9 september, 22-23 oktober, 16 november, 3-4 december. Deltagande vid slutseminarium (den 3 eller 4 december) är obligatoriskt. Den 14 december är sista dag för inlämning av examinationsuppgift.

Course responsible :
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Title : Tissue-Specific Immunology

Course number : 3072
Credits : 1.5
Date : 2020-11-16 -- 2020-11-20
Language : English
Level : Doctoral level
Responsible KI department : Department of Medicine, Huddinge
Specific entry requirements : Basic knowledge in immunology corresponding to the KI doctoral education course Basic Immunology (3 hp) is required.
Purpose of the course : This course will introduce the students into the emerging field of immunology within tissues, including lung, liver, gut, skin, and secondary lymphoid organs, and will actively discuss the biological and clinical relevance of immune cells in tissues.
Intended learning outcomes : After the course, the students should be able to describe certain differences of the innate and adaptive immune system in blood and various tissues. Furthermore, the students should be able to identify and discuss specific roles of the immune system in human fetal and adult tissues in health and disease but also discuss possibilities and caveats in today’s research in tissue-specific immunology, e.g. ways to collect material and ethical considerations.
Contents of the course : Following a basic introduction to tissue-immunity, invited national and international lecturers will present their immunological research in one (or more) of the relevant tissues or tissue models, including both scientific and methodological aspects. The students will be asked to study one specific topic of tissue immunology in a group project work. The topic will be provided by the course leaders at the beginning of the course. An oral presentation is expected from all students at the end of the course.
Teaching and learning activities : The course will be given over one week (full time). The teaching is mainly through lectures/seminars by the course leaders and other scientists from Karolinska Institutet who actively work in the field of tissue-specific immunology. The lectures include introduction to the various topics as well as examples of specific research projects from the lecturer's research group. This will allow the student to become familiar with experimental approaches that are used to study the immune system in tissues. In addition, there will be seminars by 1-2 external speakers with expertise in the respective field of tissue-specific immunology. Every student will be asked to prepare at least one topic-related question for every lecture in order to ensure active participation by every participant throughout the course. Furthermore, at the end of each course day, there will be an interactive Question & Answer session to summarize the main points and to provide feedback both from the course leaders and from the course participants.
Examination : The course examination will be in the form of a group assignment that is presented orally on the last course day, with each student presenting and giving feed-back to the other students. Every student will be evaluated and assessed individually. The group presentations are peer-reviewed by the course leaders and the other students. Each student has to show that all intended learning outcomes have been reached.
Compulsory elements : Students are required to attend all course days, to actively participate during the course and in the group work, and to present a given topic in an oral presentation in order to pass the course. Absence can be compensated with an individually written report. The final examination day cannot be compensated for.
Number of students : 8 - 20
Selection of students : Selection will be based on 1) the relevance of the course syllabus for the applicant’s doctoral project (according to written motivation), (2) date of registration as a doctoral student (priority given to earlier registration date).
More information : The course will take place at Flemingsberg campus. Additionally, the course will include usage of the online-platform Canvas, where the course leaders will provide material relevant for the course, e.g. literature, slides, or additional information.

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

Course number : 3073
Credits : 1.5
Date : 2020-11-09 -- 2020-11-20
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 : Cancer Cell Metabolism

Course number : 3076
Credits : 1.5
Date : 2020-09-28 -- 2020-10-02
Language : English
Level : Doctoral level
Responsible KI department : Department of Microbiology, Tumor and Cell Biology
Specific entry requirements : Basic knowledge in Tumor Cell Biology
Purpose of the course : The course provides an introduction to cancer cell metabolism. Focus is on the roles of oncogenic signaling and tumor microenvironment as drivers of tumor development and progression. Therapeutic and diagnostic perspectives exploiting the altered cancer metabolism are discussed.
Intended learning outcomes : After the course, the student should be able to: - describe and explain the role of altered cellular metabolism in cancer development and cancer progression; - reflect upon the interaction between oncogenic signaling and tumor metabolism; - discuss how tumor metabolism may be exploited in anticancer therapies and diagnosis/prognosis.
Contents of the course : Overview about cell metabolism The major metabolic pathways The mitochondrion Signalling pathways and metabolic control Cancer cell metabolism Methods to study cell metabolism Targeting metabolism for cancer treatment
Teaching and learning activities : The course consists of lectures with invited national and international scientists with focus on Cancer cell Metabolism. The students will actively talk to the scientists in the ""Meet the Scientists"" format and discuss the topics during beehive discussions. The course is given full-time during 1 week. The teaching is mainly in lecture/seminar form and also includes project work. This project is presented orally on the last day of the course. The project work requires studies of a specific topic in Cancer Cell Metabolism.
Examination : Examination is divided into two parts: Firstly, during active participation in the ""Meet the scientists"" seminar and in connection with the beehive group discussion. Secondly, the students will be given an assignment to be presented on the last day of the course. This assignment is a short project proposal within one topic chosen from a list of 10. The proposal will contain an overview of the field which motivates a specific research question identified by the student/s and a brief work plan that explains how the question/hypothesis can be solved/investigated.
Compulsory elements : Attendance at lectures is strongly advised. Participation in the beehive and ""Meet the scientists"" session is mandatory. To compensate for absence due to e.g. illness the student may be required to write a report and/or discuss the missed subject with the course leaders.
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 : Welcome to the Cancer Cell Metabolism Course, Autumn 2020! In this one week course you will attend lectures by both national and international researchers on the fields of tumor metabolism, metabolic disorders and physiology. You will learn about different aspects of tumor metabolism, from basic knowledge to detailed information about specific pathways that are deregulated and can be targeted in cancer, and about different techniques that can be used for cancer metabolic studies. The final evaluation will be based in the ability of the students to answer questions related to the content of the lectures and to propose how the acquired knowledge could be used in their own research.

Course responsible :
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Title : An Introduction to Genetic and Molecular Epidemiology

Course number : 3077
Credits : 1.5
Date : 2020-10-19 -- 2020-10-23
Language : English
Level : Doctoral level
Responsible KI department : Department of Medical Epidemiology and Biostatistics
Specific entry requirements : Knowledge in epidemiology equivalent to the course Epidemiology I: Introduction to Epidemiology or corresponding courses
Purpose of the course : The course focuses on basic concepts, methods and study design in genetic and molecular epidemiology research.
Intended learning outcomes : After successfully completing this course you are expected to be able to: - Explain the basic organization of the human genome and the central dogma of eukaryote genetics. - Describe the concepts of meiosis, recombination, linkage and linkage disequilibrium. - Give examples of familial inheritance, discuss how twins can be used in genetic studies, and summarize the last decade´s breakthrough of genome-wide association analyses in complex diseases. - Explain the different types of molecular omics techniques (epigenomics, proteomics, transcriptomics and metabolomics etc.) and how these methods could be used in epidemiological studies. - Describe the fundamentals of study design, sample randomization, and common biases in analyses of genetic and molecular epidemiological data to draw conclusions on how new sample collections should be conducted. 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 is about concepts and methods used in studies of genetic variation influencing disease and other phenotypes. It will cover basic genetic inheritance and how it influences complex and quantitative traits, but will also cover common molecular methods applied in large-scale settings in epidemiology (epigenetics, transcriptomics, metabolomics, etc.).
Teaching and learning activities : Flipped classroom approach (blended learning approach) with reading sessions, group discussions with invited experts, lectures, and lab visits.
Examination : The student has to show that all the intended learning outcomes have been achieved. An individual assessment of the learning outcomes will be a written home essay. Students who do not obtain a passing grade in the first examination will be offered a second chance of submission of home 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 responsible :
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Title : Gene Regulation in the Early Human Embryo

Course number : 3080
Credits : 1.5
Date : 2020-09-21 -- 2020-09-25
Language : English
Level : Doctoral level
Responsible KI department : Department of Biosciences and Nutrition
Specific entry requirements : Knowledge in pre-implantation embryology corresponding to the course Embryology I.
Purpose of the course : The aim of the course is to instruct the participants in human reproductive biology with focus on gene regulation and pathways that control the early embryo formation. To provide understanding in complexity of the molecular mechanisms that involve the successfully development of the early cleavage embryo, so that the student can evaluate, troubleshoot and improve existing assisted reproductive technology (ART) systems.
Intended learning outcomes : At the conclusion of this course students should be able to: 1. Show a good understanding of the genetic and epigenetic aspects of the preimplantation period of mammalian development that is crucial for reproductive success. 2. Show a good understanding of the dynamic changes in gene expression during human early embryo development involving differentiation, survival, fragmentation, zygotic genome activation, cell determination, embryo patterning and apoptosis, gene profiling from oocyte development to blastocyst formation. 3. Explain the general epigenetic influence of the laboratory and clinical environment on embryo culture and physical-chemical properties of the specific culture systems. 4. Produce coherent, logical and concise explanations of data and concepts in the field of gene regulation in the early human embryo - both in writing and orally, through consideration of the course material. 5. Discuss scientific literature related to ART and reproduction physiology in a constructive and informed fashion.
Contents of the course : 1.Genetics in oocyte maturation and embryo development 2. Importance of epigenetics in embryo development 3. Cell-cell (blastomere) interactions and receptor signaling 4. Gamete interaction 5. Zygotic genome activation 6. Embryo morphology, euploidy, aneuploidy and mosaicism 7. Implantation and post-implantation genetics 8. Genetic aspects of prenatal diagnostics, preimplantation genetic diagnosis and preimplantation genetic screening. 9. General ethical aspects 10. Literature work and discussion in reproductive genetics
Teaching and learning activities : The course runs for one week with lectures, and literature work as part of the course examination.
Examination : The examination will consist of an individual or group oral presentation on a course topic, followed by a questions and answers session and an individual written exam.
Compulsory elements : Attendance during the lectures and active part in the literature work.
Number of students : 8 - 14
Selection of students : Selection will be based on 1) the relevance of the course syllabus for the applicant's doctoral project (according to written motivation), 2) 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 Biosience and Nutrition, NEO-Huddinge.

Course responsible :
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Title : Medical developmental biology

Course number : 3081
Credits : 1.5
Date : 2020-08-24 -- 2020-09-11
Language : English
Level : Doctoral level
Responsible KI department : Department for Clinical Science, Intervention and Technology
Specific entry requirements :
Purpose of the course : The main purpose of the course is to acquire a better understanding of issues, including ethical ones, in developmental and stem cell biology with direct implications for human development and disease. Furthermore, the course will expose the students to international collaboration and provide an opportunity to build an international network.
Intended learning outcomes : After the course the doctoral student is expected to be able: - To fully understand and review the basic biology and definitions of embryonic and fetal stem cells, - To understand and review the most fundamental genetic and epigenetic/transcriptional regulatory mechanisms guiding the development of the essential organs, - To understand and review the basic principles of regenerative medicine and perinatal physiology.
Contents of the course : To achieve a better understanding of embryonic and fetal development, and to provide better healthcare for newborns and children, it is necessary to understand the development in basic research to be able to more rapidly apply such knowledge in clinical care. In this course, world-leading scientists in the fields of developmental biology, stem cell research, and regenerative medicine, will discuss the molecular mechanisms, cell biology, genetics and epigenetics of development in general and more specifically in a wide variety of organs, with a particular bias towards human development and disease. The nature of the course is translational and provide a wide range of knowledge from transcriptional mechanisms to basic physiology, ethics and patient care.
Teaching and learning activities : The course is based on lectures from morning to lunch by prominent lecturers. There are practical workshops and clinical visits in the afternoons. The course is considered demanding and requires full-time presence and attention.
Examination : Every student needs to make either a fifteen minute individual presentation or to present their projects by poster presentation. The oral and poster presentations are examined by at least four course leaders and the participants receive immediate feedback directly from the course leaders/examiners. Further feedback is given continuously throughout the course. Every student will in addition write a report that is handed in for evaluation at the end of the course. All students are also required to peer-review another student's examination report. The individual performance of each student will be evaluated separately.
Compulsory elements : Full presence is absolutely required. Necessary absence will be regulated with the course leader and given as extra tasks.
Number of students : 8 - 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 involves full time studies during 24-28th of August at Toronto University. After this period an assignment is to be completed and evaluated by course peers. The course will therefore be completed two weeks later. Travel costs for a limited number of participating KI students will be reimbursed after completion of the course.

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Title : Cryobiology in assisted reproductive technology

Course number : 3089
Credits : 1.5
Date : 2020-11-23 -- 2020-11-27
Language : English
Level : Doctoral level
Responsible KI department : Department of Biosciences and Nutrition
Specific entry requirements :
Purpose of the course : The aim of the course is to instruct the participants in human and mouse reproductive biology with focus on cryopreservation technology and embryo banking, as well as to give them practical experience through practical demonstrations in cryopreservation of gametes and embryos in IVF technology. To provide understanding of principles of cryobiology and components of culture systems used in assisted reproduction technology (ART). Thus the student can evaluate, troubleshoot and improve existing technology.
Intended learning outcomes : The objectives of this course are that at the conclusion of this course students should have a good understanding of: Folliculogenesis and Fertilization; Preimplantation Embryology; sperm and oocytes retrieval; criteria of selected or scoring the gametes and zygotes for cryopreservation; liquid nitrogen handling; principles of cryobiology. Students should be aware of the general aspects and implication of the cryobiology research and the potentiality that this represents for clinical application; The principles of cryobiology; The Cryoprotectants additives and how they protect the cells by stabilizing intracellular proteins; The factors that affect cellular response to freezing; The different cryopreservation protocols and what is ongoing in this field; The cross-contamination of samples in liquid nitrogen; problems in achieving a good result of cryopreservation procedure; The possible epigenetic effects of the cryopreservation procedure; testicular and ovarian tissue cryopreservation procedures; Storage of the cryopreserved samples, the advantages of the cryopreservation and embryo bank. Finally the students will improve their capacity to produce coherent, logical and concise explanations of data and concepts - both written and oral, through consideration of the course material. Students will also develop their ability to criticize scientific literature related with cryopreservations technology and reproduction physiology in a constructive and informed fashion; Be aware of potential development of cryobiology and IVF in the future.
Contents of the course : Contents . Sperm-and ovogenesis and Hormonal function . Main components of the culture system . Physical-chemical properties of culture system . Functional characteristics of different tissue culture incubators . The influence of the laboratory and clinic environment on embryo culture . The morphology of oocytes, zygotes and cleavage stage embryos as well as morulae and blastocysts . Developmental milestones . Biochemical tests for predicting developmental potential . Possible effects of culture and frozen condition on epigenetics events . Clinical aspects of frozen embryo transfer . The potential of the different cryopreservation techniques in clinic application with focus on IVF . General aspects and implication of the cryobiology in research
Teaching and learning activities : Divided in lectures and laboratory demonstrations: 1. Embryology theory (lectures) 2.Culture system (lectures) 3. cryobiology (lectures) 4. Gametes and embryos quality evaluation (lectures) Lab.1. Laboratory demonstration in gametes and embryo retrieval; In-vitro fertilization and cryoprotectants additive; Handling with liquid nitrogen (lab). Lab.2. Evaluation of the quality of the fertilize oocytes and selection for freezing; performed cryopreservation on the selected samples (lab). Lab.3. Thawing frozen samples and quality assessment (lab). 6. Genetics and epigenetics aspects (lectures) 7. Introduction to the different cryopreservation procedures (lectures) 8. New trends in gametes and embryo cryopreservation (lectures) 9. Fertility preservation and challenge (lecture) 10. Future in human cryobiology and ethical aspects (lecture). Course test, evaluation, discussions, examination and closing of course.
Examination : Examination on day 5, with individual or group presentations of the literature work related to the contents of the course, discussions and feedback. Every student will be individually assessed and the students has to show that all learning outcomes have been reached.
Compulsory elements : The laboratory demonstrations are obligatory; there will be lectures combined with laboratory demo, but if the student will be absent of one laboratory section, the student should present a literature work related to the subject of the missing activity.
Number of students : 8 - 14
Selection of students : Selection will be based on 1) the relevance of the course syllabus for the applicant's doctoral project (according to written motivation), 2) 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 Huddinge.

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Title : Construction and validation of measurement in behavioral science

Course number : 3098
Credits : 4.5
Date : 2020-10-26 -- 2020-11-13
Language : English
Level : Doctoral level
Responsible KI department : Department of Clinical Neuroscience
Specific entry requirements : Knowledge of basic statistics including correlations and regression analysis.
Purpose of the course : During this course doctoral students will develop an ability to plan a process of creating a new measurement instrument and/or critically evaluating and validating an existing measurement instrument for the specific use in the student's own research.
Intended learning outcomes : After completing this course a doctoral students will be able to: - Explain the measurement process taking into account test theories (classical and latent variables) as well as a theory behind a construct that is being measured; - Carry out statistical analyses to estimate reliability and validity of a measurement instrument; - Critically evaluate validity evidence taking into account the specific purpose of a measurement instrument; - Plan a study design with an aim to develop a new measurement instrument (or validate an existing one) and test its reliability and validity.
Contents of the course : The course covers those aspects of classical test theory and modern latent variables theory that are necessary for doctoral students to successfully use a measurement instrument in their research projects. These include the following topics: test construction, item analysis, reliability, validity, validity evidence, and validation strategy. Moreover, during the course students will not only learn the basics of test theories, but will also study which methods of statistical data analyses may be used to evaluate these theoretical principles in practice. We will discuss the following statistical methods: descriptive statistics, correlation, linear regression, internal consistency analysis, and factor analysis.
Teaching and learning activities : The teaching of the course is coaching-based, and thus it will follow the needs of each individual student's research project as well as the needs and previous knowledge of the entire group of students. Students will be able to choose to what extent they want to work individually or in small groups, to what extent they would like to be supervised in their work, and whether they want to work on their own data or on an example dataset provided. The course is equivalent to three weeks of full time study. However, during those three weeks only four days are planned for lectures and group discussions. The remaining time is reserved for students' own work on three examination assignments. Two of these assignments require students to run statistical analyses following the provided tutorials. Students will be able to individually decide how advanced statistics they would like to learn and which statistical program they want to use. The course will start with short presentations of students' project work (students will be asked to prepare this before the course starts), followed by a goal setting workshop. Each student will be encouraged to set individual goals for the course that will drive his or her learning. Moreover, after the opening session the content of the lectures will be adjusted accordingly to the level of previous knowledge in the particular group of students. During the first week of the course we will discuss basics of test construction, reliability of measurement, and latent variables theory. At the end of this week students will be required to submit a report presenting reliability and item analysis of a measurement instrument. During the second week students will be required to submit a report presenting factor analyses and regression/correlation analyses of an example instrument. At the end of the second week we will discuss the concept of validity, types of validity evidence, and validation strategies. We will also analyze an example validation process. Finally, the third week will be reserved for writing and peer reviewing final reports presenting a validation study design of a measurement instrument that students want to use in their own research.
Examination : The examination consists of two parts. First, to pass a course student will have to submit on time two short but complete reports summarizing case studies analyzed as examples during the course. Second, a student will have to submit on time one longer paper presenting his or her own strategy for development and/or validation of a measurement instrument as applied to a specific use in student's own research. This paper will be graded pass or fail.
Compulsory elements : Participation in open questions seminars and feedback seminars is compulsory, but there will be a possibility to attend online. Submission of the two short reports and the final paper is obligatory.
Number of students : 8 - 20
Selection of students : Selection will be based on 1) the relevance of the course syllabus for the applicant’s doctoral project (according to written motivation), 2) start date of doctoral studies (priority given to earlier start date). Priority will be given to students who use or will use quantitative measurement methods in their projects.
More information : Lectures will be held between 9:00 and 15:00 on Monday 26/10, Tuesday 27/10, Monday 2/11 and Tuesday 3/11. Discussions and workshops will be held 9:00 to 12:00 on Friday 30/10, Friday 6/11, Wednesday 11/11, and Thursday 12/11. Own work is planned for all other days during the course. The examination date is 13/11. Please note that all lectures, discussions and workshops will be available for online participation!

Course responsible :
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Contact person :
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Title : Omics data analysis: From quantitative data to biological information

Course number : 3102
Credits : 3.0
Date : 2020-11-16 -- 2020-11-27
Language : English
Level : Doctoral level
Responsible KI department : Department of Oncology-Pathology
Specific entry requirements :
Purpose of the course : During recent years omics data has become an integral part of many biomedical and clinical research projects. This broad introductory course aims at bridging the gap between classical biomedical research, omics technologies and bioinformatics. The course will give students an introduction to omics technologies and basic knowledge of omics data analysis workflows.
Intended learning outcomes : After completed course, the student will be able to: * Understand the principles and perform the basics of high-throughtput technologies and the omics data analysis workflow (genomics, transcriptomics, proteomics,) * Understand the principles aspects of study design, experimental planning and sample selection * Know how to do basic quality control of data by use of boxplots, PCA etc * Know what normalization, data transformation etc means and what it does to your data * Know the principles of some basic statistics such as t-test and false discovery rate * Know the principles of dimensionality reduction methods such as PCA and tSNE * Use tools for hierarchical clustering, functional enrichment and pathway analysis * Use tools for gene ontology (GO) annotation/enrichment
Contents of the course : * The omics data analysis workflow: from quantitative data to biological information (emphasis on analysis of genomics, transcriptomics, and proteomics data) * Introduction to omics technologies and data structures * Omics experimental design and sample selection * Introduction to data transformation and normalisation * Introduction to basic statistics in omics data analysis: significance test/p-values/multiple testing correction/false discovery rate * Introduction to dimensionality reduction PCA/MDS/tSNE * Introduction to Gene Ontology and enrichment analysis * Introduction to correlation analysis and hierarchical clustering * Introduction to network and pathway analysis * Introduction to online bioinformatics resources and analysis tools * Introduction to the R statistical programming language * Literature study with a critical view on how omics data is analyzed in clinical research. * Current state of the art in omics data analysis is highlighted through case studies, literature studies and demonstrations
Teaching and learning activities : The teaching activities for the course will be based on lectures, workshops and data analysis cases. The students will participate in a literature study with discussions in seminar groups as well as an independent data analysis exam project. The students will also be able to download and use some of the software in workshops during the course.
Examination : The course assessment is based on two type of assignments: a literature study with a critical view on an omics data analysis subject performed in groups and an individual written omics data analysis project illustrating the different topics covered during the course.
Compulsory elements : * Attendance on lectures and data analysis demonstrations. * Attendance to literature study discussion seminar. * Attendance to examination seminar and hand in the written examination assignments. * Extra written literature study can be used to compensate absence.
Number of students : 16 - 24
Selection of students : Selection will be based on 1) the relevance of the course syllabus for the applicant's doctoral project (according to written motivation), 2) start date of doctoral studies (priority given to earlier start date)
More information : This course has previously been given with number 2523. The course is given jointly by the doctoral programmes Allergy, immunology and inflamation (Aii), Tumor Biology and Oncology (FoTO), Biology of infections and global health (BIGH) and Doctoral Programme in Development and Regeneration (DEVREG). See: https://staff.ki.se/doctoral-programmes

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Course responsible :
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Title : The epigenome: a platform for the integration of metabolic and signaling pathways in development and on the path to diseases

Course number : 3104
Credits : 1.5
Date : 2020-10-12 -- 2020-10-16
Language : English
Level : Doctoral level
Responsible KI department : Department of Oncology-Pathology
Specific entry requirements :
Purpose of the course : To increase the understanding of the interplay between epigenetic regulation, signalling and metabolic pathways in complex human diseases.
Intended learning outcomes : Following the completion of the course the students will be able to describe and discuss the basic principles of epigenetic regulation and the role of chromatin in the maintenance of cellular phenotypes. Moreover, the students will learn how various signaling and metabolic pathways alter chromatin states during ageing and in human diseases, such as cancer, diabetes and psychiatric disorders. The students will also be able to design experiments for studying chromatin marks and to critically evaluate results obtained with these techniques.
Contents of the course : The course covers the molecular mechanisms of epigenetic regulation and how chromatin based processes are linked to human diseases. Particular attention will be paid to the crosstalk between chromatin marks and cellular signaling pathways as well as metabolism. Furthermore, we will discuss the regulation of these processes during the circadian cycle and their deregulation in cancer, diabetes mellitus and psychiatric diseases.
Teaching and learning activities : The learning activities used in the course include lectures, research seminars, group discussions, problem-based learning and research article presentations by the students. Every student will present a recent publication in the form of a journal club. Students will also be encouraged to actively participate in the course. There will be substantial time for discussions after the lectures and research seminars.
Examination : Examination is based on the journal club presentation (summative assessment) and on active participation in discussions during the course (formative assessment). Every student will be at one occasion presenting a pre-selected article and at another occasion will be the opponent for the presentation of a fellow student. The student's performance at these two occasions will be the basis for the final assessment.
Compulsory elements : The lectures, seminars, group discussions and journal club presentations are compulsory.
Number of students : 8 - 10
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 director is Anita Göndör at the Department of Oncology-Pathology. Telephone 08 524 862 03, email anita.gondor@ki.se.

Course responsible :
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Contact person :
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Title : Pathology

Course number : 3109
Credits : 3.0
Date : 2020-10-12 -- 2020-10-23
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 : 8 - 25
Selection of students : Date of admission to doctoral studies (those who have been admitted longest time ago have priority).
More information :

Course responsible :
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Ulla Nordström
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Title : Tumor immunology and immune therapy of cancer

Course number : 3110
Credits : 1.5
Date : 2020-11-02 -- 2020-11-06
Language : English
Level : Doctoral level
Responsible KI department : Department of Oncology-Pathology
Specific entry requirements :
Purpose of the course : The purpose of the course is to deepen the knowledge in the field of tumor immunology. More specifically, to understand how the immune system is regulated in cancer and how this knowledge can be used to treat patients with cancer.
Intended learning outcomes : After the course is completed the students will be able to (1) explain important aspects of tumor immunology, (2) indicate advantages and disadvantages of different immune therapy strategies, (3) explain mechanisms of immune escape, 4) hypothesize how different immune-based regimens may affect clinical outcome in patients with cancer.
Contents of the course : This course covers basic and applied immunology and a current review of experimental research and clinical application of tumor immunology. Both pre-clinical and clinical aspects of cancer vaccination, adoptive cell therapy, and antibody therapy will be discussed. Development of novel therapies through modification of immune cell subsets will be presented. Features of the tumor microenvironment, cancer-associated inflammation, immune surveillance and escape, and immunosuppression will also be discussed. Planning, performing, and monitoring of clinical trials are included in the course as well. One to two days are dedicated to lectures by invited international experts from the field.
Teaching and learning activities : Lectures, seminars, group discussions and case-studies.
Examination : Oral group presentation and individual assignment based on case-studies. Every student will be individually assessed.
Compulsory elements : All lectures and teaching activities are mandatory. Absence from mandatory parts of the course will have to be compensated by other relevant activities after discussion with the course leaders.
Number of students : 18 - 36
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 : Hours are between 9am to 4pm all days. All activities will be held in Bioclinicum Solna in lecture hall J3:14

Course responsible :
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Ulrika Edbäck
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Title : Basic course in tumor biology and oncology

Course number : 3112
Credits : 3.0
Date : 2020-09-14 -- 2020-09-25
Language : English
Level : Doctoral level
Responsible KI department : Department of Oncology-Pathology
Specific entry requirements :
Purpose of the course : The purpose of the course is to give a general overview of the molecular mechanisms that promotes the carcinogenic transformation. We aim to link the basic tumor biology concepts with the main principles of diagnosis and treatment of cancer patients in line with the modern concept of translational and personalised cancer medicine.
Intended learning outcomes : This is a basic course for all PhD-students in the field of tumor biology. After the course the students will have an understanding of the cancer problem, the modern view what cancer is, from a clinical and basic science point of view. You will get the basic foundations of cancer biology as well as aquire some ability to discuss and understand advanced problems in cancer biology. You will have an idea which are the current most important problems to solve in cancer, to improve diagnosis, prevention, treatment and quality of life. The over all aim of the course is to form a bridge between pre-clinical and clinical aspects of tumor biology and oncology for PhD students and to provide the students an understanding of all aspects of the cancer problem. This course is a basic introduction to modern cancer research and is recommended to all PhD students within basic and clinical cancer research.
Contents of the course : The course will describe the causes as well as the consequences of the transformation of a normal cell into its malignant counterpart, in order to create an understanding of cancer --from molecule to patient--, eventually also discussing the management and treatment of malignant diseases. The topics of the course include genetics, the cell cycle, apoptosis, immunology, diagnosis and treatment, all topics presented from the cancer perspective. There will be focus on a few malignant diseases, described in more detail serving as models for basic concepts of Tumor Biology and Oncology, including molecular genetics, curative treatment and palliative care, psychosocial aspects of cancer, ethics and epidemiology. All students will be offered a possibility to visit the inward clinical care and meet cancer patients.
Teaching and learning activities : The course consists of lectures, group seminars, group discussions and demonstrations. Full time during two consecutive weeks.
Examination : Written examination and group discussion with a focus on understanding of concepts, relations and how and how problems are dealt with in cancer research. Every doctoral student will be individually assessed.
Compulsory elements : This course is full time for two weeks. All seminars and some demonstrations are compulsory, also some lectures, as well as the written examination. Single missed occasions can be compensated during the course after discussion with te course director. Single missed occasions can be compensated for during the course after discussion with the course director.
Number of students : 20 - 25
Selection of students : Selection will be based on 1) the relevance of the course syllabus for the applicant's doctoral project (according to written motivation), 2) start date of doctoral studies (priority given to earlier start date)
More information : The course is given at Bioclinicum, KI Solna campus.

Course responsible :
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Hanna Eriksson
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Title : Endothelial Cell Function and its Relevance in Cardiovascular Disease

Course number : 3113
Credits : 1.5
Date : 2020-11-09 -- 2020-11-13
Language : English
Level : Doctoral level
Responsible KI department : Department of Medicine, Solna
Specific entry requirements :
Purpose of the course : This course is specially planned to give the participants in the area of cardiovascular research a global perspective on endothelium pathophysiology as well as advanced cutting-edge approaches used by researchers. This course will enable the participants to obtain the required knowledge to understand and study endothelial cell function in cardiovascular disease.
Intended learning outcomes : Upon completion of the course, the students should be able to: 1. show an in depth knowledge of endothelial cell function and related molecular basis; 2. evaluate endothelial cell dysfunction and its relevance to cardiovascular disease (e.g. atherosclerotic lesion, diabetes, ischemia and infection); 3. show an insight into the application of state of the art models and technologies (in vitro, in vivo, from animal model to clinic study) for studying endothelial cell function in cardiovascular disease.
Contents of the course : Endothelial cells and endothelial cell function under various physiological and pathological conditions will be discussed from molecular, cellular, organ and clinical perspectives. Topics to be covered include the roles of endothelial cells in atherosclerosis, ischemic heart disease, inflammation, hypertension and diabetes/insulin resistance, and in mechanisms of current and future treatment. The course will include examples of in vitro and animal models for evaluation of endothelial cell function as well as examples of clinical studies.
Teaching and learning activities : The course activities include daily interactive lectures and seminars given by invited scholars in the respective fields, lab demonstrations, group learning (literature review and research planning), and a group project presentation and review on the last day of the course.
Examination : The final assessment will be held in two parts: 1) a literature review and discussion in groups; 2) an oral presentation of a research project in the field of endothelial cell function, which should be designed at least partially using the knowledge from the course lectures and experimental methods from the lab demonstration. In order to pass the course, each student needs to show that he or she reached all the learning outcomes of the course.
Compulsory elements : Students need to participate in all learning activities and to complete self learning assignments. Absence maybe compensated for by an extra task in agreement with the course organizer. The final examination must be passed in order to pass the course.
Number of students : 8 - 20
Selection of students : Selection will be based on 1) the relevance of the course syllabus for the applicant's doctoral project (according to written motivation), 2) start date of doctoral studies (priority given to earlier start date).
More information : Location: Bioclinicum KI Hospital Solna Time: 09.00-17.00 all days

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Title : Molecular Immunology

Course number : 3114
Credits : 3.0
Date : 2020-10-19 -- 2020-10-30
Language : English
Level : Doctoral level
Responsible KI department : Department of Microbiology, Tumor and Cell Biology
Specific entry requirements : Basic knowledge in immunology corresponding to course 2302 is required.
Purpose of the course : This course is an extension of the Basic Immunology course and is suitable for students who already have some background knowledge of immunology. The aim of the course is to expose students to the molecular aspects of the immune responses.
Intended learning outcomes : After the course, the student should be able to relate their own research project to the cutting-edge developments in other areas of immunology research. Furthermore, they should be able to present novel information about an immunological problem or a specific technique.
Contents of the course : The course covers topics of immune cellular interactions, immune cell signalling as well as the role of epigenetics and genetics in determining immune responses and immune cell development. Students will be asked to study an immunological method or problem deeply at the theoretical level.
Teaching and learning activities : Lectures, seminars and oral presentations. The course is given over 2 weeks. Invited national and international lecturers give their views on selected problems, or techniques, in immunology. The seminars take off from basic facts, and after that the speakers move on to current problems, and focus on both scientific and methodological aspects. During the course the students will be expected to present orally selected topics within the field of immunology focusing on molecular events important in the development or maintenance of immune responses. At the end of the course, the students will write an essay on these methods or problems.
Examination : Oral presentation of selected topics and a final written exam based upon take home essay questions. These questions cover current problems, theories in immunology or relate the student'äs own research to cutting edge developments in the other areas of immunology research.
Compulsory elements : Oral presentation of selected topics. If a student misses the presentation, a special presentation with the course leader will be arranged.
Number of students : 8 - 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 : Forskningsetik

Course number : 3118
Credits : 1.5
Date : 2020-09-15 -- 2020-10-06
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 total fyra veckor på Karolinska Universitetssjukhuset, Huddinge (B31/K32). Kursen innehåller föreläsningar, seminarier, gruppövning samt studenter muntliga och skriftliga presentationer. Mellan kurstillfällena finns material att läsa enligt ett schema som ges till antagna.

Course responsible :
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Title : Flow cytometry: from theory to application

Course number : 3120
Credits : 1.5
Date : 2020-10-05 -- 2020-10-09
Language : English
Level : Doctoral level
Responsible KI department : Department of Medicine, Solna
Specific entry requirements :
Purpose of the course : The course aims to provide doctoral students with: 1) a systematic introduction of flow cytometry, 2) an overview of flow cytometric applications in biomedical research, and 3) a hands-on opportunity of flow cytometry lab training designed for various levels of flow cytometer users.
Intended learning outcomes : Through this one-week course, the participants will acquire the knowledge of flow cytometry principles. They will know flow cytometric sample preparation and analysis, protocol set-up, major flow cytometric applications, as well as data interpretation and presentation.
Contents of the course : The course covers basic knowledge and main applications of flow cytometry, and contains both lectures and laboratory/group work. Experts in different fields of flow cytometric application are invited to give the lectures. The participants will be able to learn: a) Principles of flow cytometry: working mechanisms of flow cytometer; molecular and cellular probes for flow cytometry; quality control; and safty procedures and intrument maintainance. b) Basic skills: flow cytometric protocol design; sample handling and storage; data processing and analysis, and data presentation. c) Major applications of flow cytometry in biomedical research: leukocyte phenotyping, endothelial cell analysis, stem cell analysis, apotosis, platelet measurement, cell function analysis (including membrane potential, oxidative metabolism, intracellular calcium mobilization, pH, and intracellular organelles), as well as nucleic acid analysis.
Teaching and learning activities : The course includes 28 hr lectures and 12 hr hands-on lab work.
Examination : The exam consists of two parts: a 30 min written test on flow cytometric principles; and a 60 min hands-on lab work examining flow cytometric lab skills.
Compulsory elements : The participants must attend hands-on lab sections during two afternoons. The students who have missed these sections can book extra lab section time within 4 weeks to compensate the absence.
Number of students : 20 - 32
Selection of students : Selection will be based on: 1) The relevance of flow cytometry for the applicant’s project (according to written motivation) 2) Urgency of flow cytometry training for the applicant’s project (according to written motivation) 3) Previous application (priority given to those who have applied previously)
More information : Course held during week 41 (Oct 5-9, 2019; 9:00-16:30). Lecture hall booked: Block salen, T4:00 at Karolinska University Hospital-Solna. Lectures will be given by 14-15 lecturers, usaually half of them from institutions outside KI, with one or two lecturers from abroad. All the lecturers are well-established experts in their lecture subjects of flow cytometric applications. The course has been given 1-2 times/year at KI for 20 years. It has been highly appreciated by the participants through the years, with a median general satisfaction score never below 8 (out of 9; referred to paper-based course evaluation between 2001-2013), and highly remarked with the electronic course evaluation (since 2014).

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

Course number : 3121
Credits : 1.5
Date : 2020-11-23 -- 2020-11-27
Language : English
Level : Doctoral level
Responsible KI department : Department of Molecular Medicine and Surgery
Specific entry requirements :
Purpose of the course : This course will enable the doctoral student to acquire the necessary knowledge to address experimentally key points of metabolic characterization of experimental models in diabetes research.
Intended learning outcomes : After the course the students will be able i) to measure glucose transport in isolated rodent skeletal muscle; ii) to measure lipolysis in isolated adipocytes; iii) to dissect out mouse pancreatic islets and measure the insulin release; iv) to judge and analyze obtained data. The students will also be able to describe the possibilities and limitations of the above techniques.
Contents of the course : The course is laboratory based, aiming to give all participants hands on experience with isolation of pancreatic islets, skeletal muscle and adipose tissue. Techniques for measurement of glucose transport in isolated rodent skeletal muscle, of lipolysis in isolated adipocytes, and for studying insulin release from pancreatic islets will be covered. Theoretical and practical considerations will be presented and discussed.
Teaching and learning activities : The course meets for five days full time, including three full day laboratory practical sessions. The first day will consist of several lectures to give a background to the metabolic questions which will be addressed in the practical part of the course. Our aim is to provide the student with a hands on experience of each technique covered. In order to achieve this, for the laboratory work the course participants will be subdivided into smaller groups.
Examination : Summative assessment of the laboratory notebook notes from each student, of a short oral presentation of the project work, of the discussions with the course leader and the other students, and of a short summary of the project work by each group.
Compulsory elements : All three laboratory tasks are compulsory; as an exception, a written task could be given to a participant to compensate absence.
Number of students : 9 - 18
Selection of students : Selection will be based on 1) the relevance of the course syllabus for the applicant's doctoral project (according to written motivation), 2) start date of doctoral studies (priority given to earlier start date)
More information : The course will take place Monday-Friday between 9:00-16:00 at KI Campus Solna, KI Campus Huddinge and the Karolinska University Hospital in Solna.

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

Course number : 3122
Credits : 3.0
Date : 2020-11-09 -- 2020-11-20
Language : English
Level : Doctoral level
Responsible KI department : Department of Molecular Medicine and Surgery
Specific entry requirements :
Purpose of the course : This course will enable the doctoral student to acquire the necessary knowledge to integrate clinical and research knowledge and understanding, competence and skills, judgement and approach in the field of diabetes mellitus in order to facilitate a role as a future scientist, public health specialist and/or clinician in this field.
Intended learning outcomes : After the course the student should be able to show an understanding about the global burden of diabetes in the world, the complications of diabetes disease, the pathogenesis of diabetes as well as prevention and treatment of diabetes.
Contents of the course : Diabetes has now become a high public health concern, due to the escalating epidemic of diabetes in both young and older adults, and the emergence of type 2 diabetes in children. The number of people with diabetes worldwide is set to double in the next 20 years, as a result of increasing obesity, sedentary lifestyle and longevity. While some of this increase will be observed in Europe and North America, it is clear that the bulk of the epidemic will be observed in non-European origin populations, in countries undergoing rapid westernization [1, 2]. The course will provide an overview of the global epidemic of diabetes disease, classifications of diabetes, pathogenesis of type 1, LADA and type 2-diabetes, diabetes complications, prevention and treatment of diabetes and its complications [3-13].
Teaching and learning activities : The course consists of lectures, diagnostics, diabetes care and coaching, a project task and examination. Two weeks full time.
Examination : Formative assessment during carrying out of the project task and of the practical training. Summative assessment during the final seminar where the student will present the project and discuss their own and others' project with the course leaders and the other course participants.
Compulsory elements : The project task is mandatory for all students and cannot be compensated for. The practical training can only be compensated for in case students can show that it is part of their own professional work already. Missing a lecture can be compensated for by writing an essay about the subject in agreement with the organizer of the course.
Number of students : 8 - 15
Selection of students : Selection will be based on 1) the relevance of the course syllabus for the applicant's doctoral project (according to written motivation), 2) start date of doctoral studies (priority given to earlier start date)
More information : The course consists of lectures, practical moments in diagnose and diabetes care, project and examination. The course will be held at Centrum för diabetes, Akademisk Specialistcentrum, Solnavägen 1E. This course was previously given with course number 1678 (see course evaluation).

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

Course number : 3127
Credits : 1.5
Date : 2020-10-05 -- 2020-10-09
Language : English
Level : Doctoral level
Responsible KI department : The institute of Environmental Medicine
Specific entry requirements :
Purpose of the course : The purpose of the course is to enable doctoral students to acquire state-of-the art knowledge and good understanding of human cell culture.
Intended learning outcomes : After the course the students should be able to: - Describe the theory and give examples of practical applications of human cell culture. - Explain basic and state-of-the-art methods applied to cell cultures. - Discuss possibilities and challenges in cell culture work.
Contents of the course : Cell culture reflecting stem, transit amplifying, differentiated and terminally differentiated tissue states. Monolayer and organotypic culture involving one or more cell types. Applicability of cell cultures as alternatives to laboratory animal experiments. Mechanisms regulating cell growth and viability, differentiation and apoptosis. Assessment of cell transformation to immortal and malignant phenotypes. Isolation of specific cells, e.g., epithelial cells, characterisation of cultured cells. Handling and sterile techniques, choice of materials and media for cell culture, e.g., serum-dependent vs. serum-free culture conditions. Cell cloning and gene transfer. Practical handling of cultures: thawing/freezing, passage, expansion and long-term storage. Handling of normal and tumor tissue for optimizing obtainment of cultures. High-throughput screening technologies. Tissue engineering practices. Transcriptomics, proteomics and informatics methods for biomedical research with cell lines. Discussion of participants' own culture experience and problems.
Teaching and learning activities : Interactive lectures, laboratory work, computer exercises and group discussions on pitfalls and possibilities with cell cultures.
Examination : Examination is in the form of a written assignment and oral presentation.
Compulsory elements : Participation in interactive lectures, group discussions, laboratory work and oral examination is compulsory. Absence from compulsory elements can compensated by participation at the next course occasion.
Number of students : 8 - 15
Selection of students : Selection will be based on 1) the relevance of the course syllabus for the applicant's doctoral project (according to written motivation), 2) start date of doctoral studies (priority given to earlier start date)
More information :

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

Course number : 3128
Credits : 1.5
Date : 2020-11-23 -- 2020-12-02
Language : English
Level : Doctoral level
Responsible KI department : The institute of Environmental Medicine
Specific entry requirements :
Purpose of the course : The aim of the course is to give an introduction to epidemiological theory and practice.
Intended learning outcomes : After successfully completing this course students are expected to be able to: -give examples of the contribution of epidemiology to science and discuss the importance of epidemiology as a research discipline. -estimate and in a general way interpret measures of disease occurrence and measures of association, and describe how a specific measure is governed by the study design. -explain strengths and weaknesses of common epidemiological study designs. -identify and explain possible sources of bias in epidemiological studies. -describe theoretical models for causation and discuss the principles of causal mechanisms. -apply knowledge of epidemiological concepts when critically reviewing scientific literature. 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 : The course is extended over time in order to promote reflection and reinforce learning. The course will be held the dates November 23, 25, 27, 30 and December 2.

Course responsible :
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Title : Basic Course in Medical Statistics

Course number : 3134
Credits : 3.0
Date : 2020-10-12 -- 2020-10-23
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: October 12, 13, 15, 19, 21, 23.

Course responsible :
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Title : Psychobiology of Intelligence

Course number : 3137
Credits : 1.5
Date : 2020-10-20 -- 2020-11-19
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 - 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 spread over 5 weeks, with the class meeting on Tuesdays and Thursdays from 14.00 to 17.00 at Karolinska Institutet, campus Solna.

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 : 2020-12-07 -- 2020-12-16
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 December 7, 9, 11, 14 and 16. The course is extended over time, but is still five full course days in order to promote reflection and reinforce learning.

Course responsible :
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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 : 2020-11-09 -- 2020-11-24
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 three different tasks: 1. Reflective statement based in experience, feedback and research/literature within communication and learning. 2. Oral presentation in a popular scientific context 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 : Selection will be based on 1) the relevance of the course syllabus for the applicant's doctoral project (according to written motivation), 2) start date of doctoral studies (priority given to earlier start date)
More information : This course prepares PhD students for science communication in different contexts. You will explore different communication concepts, presentation designs and work on your stage and presentation techniques. You will reflect on your presentation skills and abilities to communicate science, given contextual and disciplinary differences. The course is equivalent to two-weeks full-time studies. Scheduled class room sessions are on the following dates: 9-10, 16-17 and 23-24 November 2020, 10-17 each course day. The course is given in ENGLISH.

Course responsible :
Anna Birgersdotter
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Contact person :
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Title : Embryology I

Course number : 3150
Credits : 1.5
Date : 2020-10-19 -- 2020-10-23
Language : English
Level : Doctoral level
Responsible KI department : Department of Biosciences and Nutrition
Specific entry requirements :
Purpose of the course : The aim of the course is to instruct the participants in human reproductive biology with focus on assisted reproduction technologies (ART), as well as to give them practical experience through practical demonstrations in embryological and micro-manipulation techniques. To provide understanding of the components of culture systems used in ART, so that the student can evaluate, troubleshoot and improve existing systems.
Intended learning outcomes : At the conclusion of this course students should show a good understanding of: Laboratory environment, input materials. Physical-chemical properties of culture system. Functional characteristics of different workstations for ART and their benefits. The influence of the laboratory and clinic environment on embryo culture. The morphology of oocytes, zygotes and cleavage stage embryos as well as morulae and blastocysts. Developmental milestones. Student should be aware of the general aspects and implication of the stem cells research and the potentiality that this represent for clinical application. Morphological aspects of the blastocysts for derivation of ICM and Derivation methods. Characterization of the embryonic stem cells and the importance of the pluripotency of these cells. The different differentiation assay on stem cells and what is ongoing in this field. The production of isogonics embryonic stem cells by somatic cell nuclei transfer or therapeutic clone (SCNT). Finally the students will improve their capacity to produce coherent, logical and concise explanations of data and concepts - both written and oral, through consideration of the course material. Students will also develop their ability to criticize scientific literature related with ART and reproduction physiology in a constructive and informed fashion.
Contents of the course : Sperm theory (lecture) 1. Anatomy of the testis, sperm production and maturation, fertilization. 2. Cryopreservation of spermatozoa. 3. Sperm preparation for IVF and ICSI, criteria for ICSI. Embryology (Lecture) 1. Follicle growth and maturation, ovulation. 2. Cell biology and oocyte genetics. 3. Embryo development in-vitro, morphological evaluation of embryos. 4 Cryopreservation of embryos, theory and practice. 5. Embryonic stem cells. 6. Selection of embryos for transfer and cryopreservation. Technical demonstrations (Lab) 1. How to work with sperm, oocytes and embryos. 2. Manipulation and training with mouse oocytes and mouse embryo handling. 3. Micro manipulation techniques, presentation. 4. Micromanipulation training. ICSI and embryo biopsy. Genetics (Lecture) 1. Genetic aspects of prenatal diagnostics and PGD. 2. Cloning techniques.
Teaching and learning activities : The course runs for one week with lectures, and practical demonstration in embryo-micro manipulation techniques (intra-cytoplasmatic sperm injection and Embryo biopsy for PGD).
Examination : Individual written exam on the last day of the course.
Compulsory elements : The laboratory demonstrations are obligatory. The student should compensate for absence at a laboratory demonstration by presenting a literature report in agreement with the course leader.
Number of students : 8 - 14
Selection of students : Selection will be based on 1) the relevance of the course syllabus for the applicant's doctoral project (according to written motivation), 2) 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 Biosience and Nutrition, NEO-Huddinge.

Course responsible :
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Contact person :
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Title : Biostatistics I: Introduction for epidemiologists

Course number : 3154
Credits : 3.0
Date : 2020-09-14 -- 2020-10-07
Language : English
Level : Doctoral level
Responsible KI department : Department of Medical Epidemiology and Biostatistics
Specific entry requirements :
Purpose of the course : The aim is to introduce classical statistical concepts and methods with emphasis on methods used in epidemiology and public health.
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. (S2) -suggest a statistical distribution to describe a naturally occurring phenomonen and evaluate the appropriateness of the distribution given real data. (S3) -present appropriate descriptive statistics for an epidemiological study. (S2) -explain the difference between hypothesis testing and interval estimation and the relation between p-values and confidence intervals. (S3) -suggest an appropriate statistical test for a comparison of two groups, perform the hypothesis test using standard statistical software, and interpret the results. (S3) -estimate and interpret three alternative measures of association between binary exposures and binary outcomes and discuss the relative merits of each measure for a given research question. (S3) -explain the concept of confounding in epidemiological studies and demonstrate how to control/adjust for confounding using stratified analysis. (S2) -explain the basis of the linear regression model, fit a linear regression model using standard statistical software, assess the fit of the model, and interpret the results. (S2) Learning outcomes are classified according to Bigg's structure of the observed learning outcome (SOLO) taxonomy: (S1) uni-structural, (S2) multi-structural, (S3) relational, and (S4) extended abstract.
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; contingency tables; graphical representations; notions of probability; probability models (distributions); principles of statistical inference; parameter estimation (mean, proportion (prevalence), incidence and ratios); concepts of confidence intervals and hypothesis tests; and a general introduction to correlation and linear regression models.
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 on the two written examinations. The course is divided into two parts, and each part will be examined separately. To pass the course, the student must pass both parts. 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 : The individual written examinations (summative assessments) are compulsory.
Number of students : 8 - 25
Selection of students : Eligible doctoral students is prioritized according to 1) the relevance of the course syllabus for the applicant's doctoral project (according to written motivation), 2) date for registration as a doctoral student. Give all information requested, including a short description of current research training and motivation for attending, as well as an account of previous courses taken. Prior knowledge in any software, e.g. Stata, R or SAS is strongly recommended.
More information : The course is extended over time in order to promote reflection and reinforce learning. The course will be held the dates September 14, 16, 18, 21 and 23 (week 1) and September 25, 29 and October 1, 5 and 7 (week 2).

Course responsible :
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Title : Mechanisms of Gene Regulation in Metabolism

Course number : 3157
Credits : 1.5
Date : 2020-10-22 -- 2020-10-28
Language : English
Level : Doctoral level
Responsible KI department : Department of Physiology and Pharmacology
Specific entry requirements :
Purpose of the course : The students of this course will get a broad perspective of how the regulation of gene expression is linked to metabolic and endocrine regulation in different tissues. The course will also cover molecular and physiological aspects related to inter-organ communication, and how this is essential to maintain metabolic homeostasis.
Intended learning outcomes : At the end of the course students will understand and be able to discuss the different mechanisms that regulate gene expression. They will be able to describe how these processes can affect metabolic disease and disease progression. The students will be able to choose the most appropriate methodologies to study diverse aspects of gene regulation in metabolism.
Contents of the course : This course aims at giving students an overview of the current understanding of how metabolism and metabolic dysfunction are controlled at the level of gene regulation. During one week, students will focus on the genetic and epigenetic mechanisms that affect transcriptional output in diverse organs and tissues in health and disease situations. This will include: basic mechanisms of gene transcription, transcription factors and coregulators, mRNA splicing and genetic variability, the chromatin landscape and associated DNA and histone modifications, noncoding RNAs and regulation of gene expression. Attention will be given to single gene analysis as well as global regulation of gene expression. In each module the student will be introduced to the basic concepts in the field and analyze situations in which dysregulation of the processes under examination leads to metabolic disease. Each module will include a chapter dedicated to the presentation and discussion of current experimental approaches relevant to research in that particular field of science.
Teaching and learning activities : This course will consist mainly of lectures and group discussions covering both theoretical and practical questions related to the different areas of gene regulation and metabolism. Some sessions will be dedicated to problem solving and presentation of state-of-the-art methodologies relevant to research in each field.
Examination : Examination will consist of an oral presentation in which students discuss an example of metabolic disorder caused by dysregulation of gene expression and propose a research plan to further study that problem. Students will be able to discuss each other's presentations. The research plan should include appropriate methodology learned during the course.
Compulsory elements : Presence at lectures, group work, and final presentation and discussion is mandatory. To compensate for absence a written essay on the missed topic must be performed.
Number of students : 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 is held at Biomedicum (Solna Campus). This year's International speaker will be Dr. Peter Tontonoz, UCLA, (USA).

Course responsible :
Duarte Ferreira
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Contact person :
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Title : Clinical Trials in Cardiovascular Research

Course number : 3173
Credits : 1.5
Date : 2020-12-10 -- 2020-12-16
Language : English
Level : Doctoral level
Responsible KI department : Department of Medicine, Solna
Specific entry requirements :
Purpose of the course : - Improve knowledge and skills related to clinical trial planning and design as well as successful running of different types of clinical trials (observational studies, registries, randomized trials); - Provide an overview of the most recent trials in the cardiovascular arena; - Provide Good Clinical Practice (GCP) training (certificate included for those who pass)
Intended learning outcomes : After the course, the participants will know: - important aspects about how to design, plan and run a successful clinical trial - relevant regulatory aspects involved in the process of designing and running a clinical trial - important elements about how to analyze and interpret trial data - how to critically review literature of clinical trials - important statistical issues (e.g. different types of adjustments for confounders, biases, how to perform subgroup analysis in trials, statistical methods for meta-analyses) related to different trial designs (e.g. observational studies, registries, randomized trials and meta-analyses).
Contents of the course : Lectures/Seminars/Workshops on the following topics: - Different designs of clinical trials - Requirements from regulatory agencies and post marketing surveillance - Upcoming and ongoing cardiovascular clinical trials (e.g. antithrombotics, lipidology, diabetes, heart failure) - GCP training - Statistical issues in clinical trials - How to interpret clinical trials - Things to know for junior investigators
Teaching and learning activities : - Lectures/Seminars - Debates on important clinical trials - Workshops - Group work - Presentation and discussion of an ""home-designed"" clinical trial
Examination : Home-based group assignment (design of a clinical trial on a topic of students' choice) which will be presented/discussed on the examination date. Each individual will be assessed on the basis of the intended learning outcomes of the course.
Compulsory elements : Participants should attend all the sessions and be involved in group work and presentation of the home assignment. The students who have missed course sessions will be assigned extra reading and home work to compensate for the absence.
Number of students : 8 - 50
Selection of students : Selection will be based on 1) the relevance of the course syllabus for the applicant's doctoral project (according to written motivation), 2) start date of doctoral studies (priority given to earlier start date)
More information : December 10th and 11th 2020: frontal teaching/workshops. December 14th and 15th: home study and preparation of the exam in groups of 4/5 students (home-based). December 16 th: exam. Location: Karolinska University Hospital or Karolinska Institutet, Solna. The course is run in collaboration with the European Society of Cardiology - Working Group on Cardiovascular Pharmacotherapy, which will provide well-known global trialists as speakers. National experts on cardiovascular clinical trials will also be part of the team of teachers.

Course responsible :
Gianluigi Savarese
Department of Medicine, Solna

gianluigi.savarese@ki.se

Contact person :
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Title : Nucleic Acid Chemistry and Therapy

Course number : 3190
Credits : 3.0
Date : 2020-09-04 -- 2020-09-22
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 provide participants with good and up to date knowledge of nucleic acid chemistry and oligonucleotide therapy. The intention is to increase general knowledge about nucleic acids and how these can undergo different reactions as well as how oligonucleotides are chemically synthesized and modified for therapeutic or other use. We expect that this will stimulate and inspire the students in their own research whether they work on nucleic acid biology, therapy, analyse nucleic acids or use oligonucleotides as tools for investigations. It is an intention to increase understanding of nucleic acids, how these molecules work and how they can be used in therapy. In addition, knowledge on how oligonucleotides are synthesized and how these can be modified will enhance the insight and enable the students to improve their use of oligonucleotides as tools or potential therapeutics.
Intended learning outcomes : At the end of the course the students - should be able to explain the underlying chemistry of nucleic acids and how these can react at different parts of the structure. - should be able to explain how oligonucleotides can be synthesized and modified and why currently used modifications and conjugations are done. - should be able to make selections of modifications and to design oligonucleotides, for use as potential therapeutics.
Contents of the course : Introduction to Nucleic acid chemistry and nomenclature Reactions at nucleic acid bases Reactions at ribose and deoxyribose sugars Reactions at and nomenclature of phosphates and phosphate modifications Methods for synthesis of native and modified oligonucleotides Common modifications used for oligonucleotide therapy Introduction to Oligonucleotide therapy Antisense, pre-mRNA Splice-switching, siRNA, mRNA and DNA-targeting ON therapy The problem of oligonucleotide delivery in therapy
Teaching and learning activities : The course consist of lectures by experts and seminars in the presence of experts on different aspects of nucleic acid chemistry and oligonucleotide therapy as well as workshop activity including presentations by the students. Additional home work combined with individual and group activities in the class room will be a part of the learning.
Examination : Oral presentations on workshops as well as a written account with specific course related questions.
Compulsory elements : The lectures, seminars and workshop activities with student presentations will be compulsory. Absence will be compensated by extra assignments. The student will also submit reports from a workshop in written form for review and approval, in connection to the student presentations.
Number of students : 8 - 16
Selection of students : Selection will be based on 1) the relevance of the course syllabus for the applicant’s doctoral project (according to written motivation), 2) start date of doctoral studies (priority given to earlier start date)
More information :

Course responsible :
Roger Strömberg
Department of Biosciences and Nutrition
0852481024
Roger.Stromberg@ki.se

Neo, Hälsovägen 9

14183
Huddinge

Contact person :
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Title : Presentera och diskutera forskning med det omgivande samhället, med fokus på elever i låg- och mellanstadiet

Course number : 3192
Credits : 1.0
Date : 2020-09-03 -- 2020-10-30
Language : Swedish
Level : Forskarnivå
Responsible KI department : Department of Cell and Molecular Biology
Specific entry requirements :
Purpose of the course : Kursens syfte är att ge deltagarna kunskaper och färdigheter för att kunna presentera och diskutera kring forskning och vetenskap och dess betydelse för samhället, med skolbarn som målgrupp.
Intended learning outcomes : Efter avslutad kurs kommer kursdeltagarna att visa förmåga att presentera och diskutera forskning och forskningsresultat i dialog med samhället på ett målgruppsanpassat sätt, med ett särskilt fokus på målgruppen skolelever. Kursdeltagarna kommer att ha förutsättningar att kunna bidra till samhällets utveckling och stödja andras lärande.
Contents of the course : Kursen är ett nära samarbete med Berättarministeriet samt ett antal skolor och deras lärare. Programmet handlar om att väcka nyfikenhet på naturvetenskap och forskning hos skolelever, och att sprida intresse och kunskap kring vetenskapligt arbete, samt lyfta kritiskt tänkande. Deltagarna på kursen utbildas i arbetssätt och metoder att väcka intresse, presentera och diskutera forskning för och med skolelever.
Teaching and learning activities : Inläsning av material, informationsmöten och genomgångar. Deltagarna engageras i aktiviteter där skolelever besöker Karolinska Institutet och lär sig om forskning genom presentationer, och egna aktiviteter under de deltagande doktoranderas (kursdeltagarnas) handledning. Kursdeltagarna får själva handledning och återkoppling om sina insatser innan, under och efter elevernas besök vid Karolinska Institutet.
Examination : Lärandemålen examineras med individuellt deltagande vid elevernas besök till Karolinska Institutet, samt med en individuell rapport från kursdeltagarna som innehåller en reflektion kring betydelsen och praktiken av att sprida kunskap om forskning och vetenskap i samhället, och hur detta kan bidra till utveckling av individer och samhället i stort.
Compulsory elements : Alla genomgångar, diskussionstillfällen med eleverna, samt återkopplingstillfällen är obligatoriska. Frånvaro från obligatoriska moment kompenseras enligt anvisningar från kursledningen.
Number of students : 8 - 10
Selection of students : Urvalet baseras på 1) kursplanens relevans för den sökandes doktorandprojekt (enligt motivering), 2) startdatum för doktorandstudier
More information : Kursen går på deltid med ett fåtal obligatoriska genomgångar och aktiviteter. Obligatorisk mentorsutbildning i Berättarministeriets regi antingen den 8 eller 14 september klockan 13-15. Obligatorisk deltagande i minst två diskussionstillfällen med besökande elever till KI, antingen 6, 7 8 eller 9 oktober, alla 09:30-11:30. Kursaktiviteterna sker på Biomedicum i Solna samt på Berättarministeriets lokaler (ett tillfälle, antingen i Husby eller i Hagsätra). Mer information om Berättarministeriet och deras aktiviteter finns på https://www.berattarministeriet.se

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Course responsible :
András Simon
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Contact person :
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von Eulers väg 1

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Stockholm

Title : Global Health Economics

Course number : 3196
Credits : 3.0
Date : 2020-10-19 -- 2020-10-30
Language : English
Level : Doctoral level
Responsible KI department : Department of Global Public Health
Specific entry requirements : Students should be familiar with basic concepts of health economics.
Purpose of the course : The aim of this course will be to learn how health care systems are financed around the world, the principles of Universal Health Coverage (UHC) and financial protection and how it can be measured. Different perspectives of economic evaluations and the four most common types of health economic analysis (cost analysis, cost-effectiveness analysis, cost-utility analysis and cost-benefit analysis) will be described and brief introduction to modeling in health economics will be given. It will also focus on the unique challenges found in performing economic evaluations in low- and middle-income countries (LMICs) such as validated tools to collect effectiveness/utility measurements and collecting cost data.
Intended learning outcomes : At the end of the course the students will be able to: • Describe different kinds of health care financing systems around the world • Describe and discuss the definitions, key methods, measurements and indicators of UHC, financial protection and patient costs (out-of-pocket (OOP) expenditures, opportunity costs and catastrophic costs) • Explain different perspectives for economic evaluations (health care system, government, third party payer, societal, etc) • Describe common health economic evaluation methods. • Explain advantages and disadvantages with the different methods and discuss which method that would be preferable in different low- and middle-income settings. • Critically assess different tools to collect effectiveness and utility measurements • Independently write a plan for a health economic evaluation of a specific intervention in health care. • Understand the basic principles of health economic modeling • Describe different kinds of socio-economic outcomes related to patient costs
Contents of the course : Health economics is the use of economic theory and methodology to analyze how scarce resources are used in the health sector and in relation to health. OOP spending and opportunity costs is increasingly recognized as an important barrier to accessing health care, particularly in LMICs where a large portion of health expenditure comes from OOP payments and social safety net systems are often weak. Emerging UHC policies prioritize reduction of poverty impact such as catastrophic and impoverishing healthcare costs. Poverty impact is therefore increasingly evaluated alongside and within economic evaluations to estimate the impact of specific health interventions on poverty. In addition, the course will explore and describe the main kinds of health economic perspectives and evaluations (i.e. cost analysis, cost-effectiveness analysis, cost-utility analysis and cost-benefit analysis) and the challenges that are unique to LMIC settings when it comes to conducting health economic evaluations. This course will highlight methodological challenges in collecting effectiveness/utility and cost data in LMIC contexts. For example, where routine cost data are unavailable, economic evaluations in LMICs require extensive primary cost data collection. The course will also give an introduction to how modeling techniques can be used in health economics. The course provides training in health economic analyses and presentations, both written and oral.
Teaching and learning activities : The course will have a blended learning approach with the combination of face-to-face lectures, online practical assignments/discussions, self-study and oral presentations and a final written assignment. Face-to-face lectures and other activities will be conducted over the two- week period. Practical assignments in the form of discussions and exercises will be discussed with the group (if applicable online) and peer feedback will be given.
Examination : Course assignments, oral presentation and final written assignment will be graded as fail or pass. In order to pass the course, the student need to pass the oral presentation and the written assignment. The course assignments will guide the students through the steps needed to design a health economic study. The aim of the examination is to test the students on what they have learned over the duration of the course and how well they can apply it. The written assignment will have to be submitted through the KI online learning platform one week after the end of the course.
Compulsory elements : Participation in the group work, oral presentation, and submitting a final written assignment will be mandatory. Absence can be compensated by an assignment from the course leader.
Number of students : 8 - 20
Selection of students : Eligible doctoral students, with required prerequisite knowledge, will be selected 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 student should expect two weeks full-time participation with in-person lectures and case work. The course will be held at Widerströmska Huset,Tomtebodavägen 18a, 3rd floor on the Solna campus.

Course responsible :
Kristi Sidney Annerstedt
Department of Global Public Health

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Contact person :

Kristi Sidney Annerstedt
Institutionen för global folkhälsa

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Title : Basic Cardiovascular Pathology

Course number : 3197
Credits : 1.5
Date : 2020-11-16 -- 2020-11-20
Language : English
Level : Doctoral level
Responsible KI department : Department of Medicine, Solna
Specific entry requirements :
Purpose of the course : The course is designed for doctoral students performing cardiovascular research that do not have an education in medicine and/or want to update their knowledge of cardiovascular diseases. The students will learn the basic concepts in cardiovascular physiology and pathology. The course will provide an overview of cardiovascular medicine and give the possibility to gain up to date knowledge in the field. In this way the doctoral students will be prepared for more advanced courses in the Cardiovascular Research program.
Intended learning outcomes : To understand basic principles of cardiovascular physiology and pathology and how different components of the cardiovascular system cooperate. To be able to relate, compare and understand experimental aspects of cardiovascular diseases. To be able to present and explain experimental design of cardiovascular disease models. To illustrate and discuss the challenges of future improvements in drug development related to the cardiovascular diseases. To adapt knowledge of cardiovascular physiology and relating it to cardiovascular pathologies.
Contents of the course : The course contains the following topics: cardiovascular biology and development, cardiovascular physiology, cardiovascular disease genetics, regeneration of the cardiovascular system, vascular inflammation, and implications for other inflammatory disorders.
Teaching and learning activities : The course is a full-time one week course. The teaching is mainly in lecture/seminar form but also includes project work with group discussions. Time will be dedicated for individual assignments focusing on different topics of cardiovascular pathology. Students will present their assignments at the end of the course followed by open discussions.
Examination : All the learning outcomes of the course have to be reached to pass the course. During oral presentations special attention is given to scientific correctness. At the end of the course, a short written exam will recapitulate the contents of the course.
Compulsory elements : All elements of the course, including seminars, group discussions and individual presentations, are compulsory. In case of absence from theoretical parts, extra assignments have to be completed and then approved 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 : Course location will mainly be on Karolinska University Hospital in Solna. Designated time is 9:00 to 16:00 Monday to Friday including time for individual studies and group work.

Course responsible :
Anton Gisterå
Department of Medicine, Solna

anton.gistera@ki.se

Contact person :
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Title : Teaching and Learning in Higher Education: A Doctoral Course

Course number : 3201
Credits : 4.5
Date : 2020-09-14 -- 2020-12-07
Language : English
Level : Doctoral level
Responsible KI department : Department of Learning, Informatics, Management and Ethics
Specific entry requirements :
Purpose of the course : The course aims to prepare students for teaching in higher education and contribute to the professional development as teacher.
Intended learning outcomes : Intended Learning Outcomes At the end of the course, students are expected to be able to: - Analyse different roles of a professional university teacher and current conditions related to teaching-learning within higher education. - Understand and be able to employ core educational concepts of teaching and learning in Higher Education. - Design teaching in regards to outcome- and competency based curriculum frameworks in relation to theories of learning or research on student learning in higher education.
Contents of the course : - Roles and conditions related to being a professional university teacher - Pedagogical core concepts - Students learning in higher education - Different forms of teaching and learning activities - Design of teaching for learning
Teaching and learning activities : This course is based on theories of experiential learning, collaboration and meaningful learning. This means that active participation during course sessions is an essential part of the course content. Students get the opportunity to experience a variety of teaching-learning activities and teaching techniques related to e.g. lectures, different forms of seminars and group work. The variety of forms is planned to facilitate learning and serve as models for own teaching.
Examination : Participants will through a written essay describe and review a teaching experience (or if needed participated as a student) within higher education, reason about the experience based on pedagogical theories/principles. The essay maybe written in English or Swedish and will be presented orally.
Compulsory elements : - Participation during two webinars. The webinars, scheduled for 1.5 hours each, are used to follow up two of the assignments and will be held in Zoom. - Provide feedback based on peer-review of one written essay. Absence from compulsory sessions can be compensated through written tasks.
Number of students : 12 - 18
Selection of students : Selection will be based on 1) the relevance of the course syllabus for the applicant's doctoral project (according to written motivation), 2) start date of doctoral studies (priority given to earlier start date)
More information : This is a three week course spread out over the term and which requires time for independent work outside of scheduled class time. Scheduled sessions are on the following dates: 16 September (Campus day), 15 October (Webinar), 5 November (Webinar) and 3 December (Campus day). The course is given in English.

Course responsible :
Per Palmgren
Department of Learning, Informatics, Management and Ethics

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Contact person :
Karin Wrangö
Institutionen för lärande, informatik, management och etik

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

Course number : 3214
Credits : 3.0
Date : 2020-09-01 -- 2020-10-08
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 : 8 - 16
Selection of students : This course is primarily aimed at experienced researchers, but postdocs and selected doctoral students at the last stage of their studies will be accepted. Preference will be given to doctoral students working with animal models in the last stage of their projects.
More information : Face-to-face lectures will be held in 8 separate days between approx. 9 am and 5 pm. The course includes international, national and local experts in the field of laboratory animal science. This course is FELASA-accredited and follows the specific learning outcomes for Function B modules in accordance with the EC Education and Training Framework, recently endorsed by the new Swedish L150 (SJVFS 2019:9).

Course responsible :
Rafael Frias
Comparative medicine
085246660
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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 : 2020-11-16 -- 2020-11-20
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 - 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 :
Heather Main
Department for Clinical Science, Intervention and Technology

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Contact person :
Heather Main
Institutionen för klinisk vetenskap, intervention och teknik

heather.main@ki.se

Title : Basic Human Neuroscience

Course number : 3220
Credits : 10.0
Date : 2020-09-24 -- 2020-11-05
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 - 8
Selection of students : Doctoral students that work in a neuroscience-related project but lack a basic education in biomedicine/medicine will get priority. The start date of doctoral studies will also be considered.
More information : The course is given in parallel with the neuroscience course in the 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 meet the requirement for a course providing the grounding in human biology/physiology and/or pathology, but cannot be counted as a project specific course.

Course responsible :
Lennart Brodin
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Contact person :
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Title : Assessing and Alleviating Pain and Distress in Laboratory Animals

Course number : 3221
Credits : 1.0
Date : 2020-11-16 -- 2020-11-17
Language : English
Level : Doctoral level
Responsible KI department : Comparative medicine
Specific entry requirements : Completed the "Function A" laboratory animal science course ("to carry out scientific procedures on animals"), or completed an equivalent training.
Purpose of the course : The course provides advanced training in the recognition, prevention and alleviation of pain and distress in laboratory species. The main purpose of the course is to enable participants to apply and assess the value of improvements to the methods used in research projects that involve the use of live animals. Implementing such improvements is a key element in Refining animal research – a legal and ethical requirement of Swedish and European legislation.
Intended learning outcomes : After completion of this course, the students should be able to apply refinements effectively. They will also be able to evaluate protocols to determine what additional modifications could be made to improve animal welfare. They should also appreciate the ethical, scientific and practical issues involved in assessing and preventing pain and distress.
Contents of the course : The course provides a broad understanding of the physiology of pain and distress, concepts of consciousness in animals, and means of assessing pain and distress in animals. Key details on the pharmacology of analgesic agents is provided to underpin selection of appropriate treatment regimens in laboratory species. The potential confounding effects of pain, distress, and analgesic use on research protocols will be described, together with means of avoiding these confounding effects.
Teaching and learning activities : The course will adopt a blended learning approach that combines e-learning, seminar lectures, discussions and interactive sessions. Four e-learning modules on assessment of pain and distress and management of perioperative pain will be included in the course. In addition, seminars will provide information on: • What we know about pain and distress in people and animals, and an introduction to the physiology of pain and nociception. • How methods of assessing pain and distress have evolved, and provide an up-to-date summary of the methods that can be used in a range of different species. • How we can assess distress and the general welfare state of animals, and how the use of score sheets can provide more structured and reliable assessments. • How different types of analgesic act to reduce or eliminate pain, and the practicalities of managing pain in a research setting. • Methods of reducing, avoiding or alleviating pain and distress by improving periprocedural care, and by refinement of research procedures. • Why analgesics may be withheld in some research protocols, and explain how some of these barriers to effective pain relief can be overcome. The seminars incorporate video material and interactive tuition in assessing pain and distress. 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.
Examination : Formative assessment during the face-to-face sessions, summative quizzes in the e-modules and a summative short answer/multiple choice question final written examination is held following conclusion of the course.
Compulsory elements : All face-to-face sessions and active contribution to the course are compulsory if the student is to be provided with certification of the successful completion of the course. Completion of all e-learning modules is also a requirement. 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 - 50
Selection of students : Selection will be based on 1) the relevance of the course syllabus for the applicant's doctoral project (according to written motivation), 2) start date of doctoral studies (priority given to earlier start date)
More information : This course will be held from Monday to Tuesday between approx. 9am and 5pm. The main instructors of this course are internationally-recognized experts Professor Paul Flecknell, MA, VetMB, PhD, DECLAM, DLAS, DECVA, (Hon) DACLAM, (Hon) FRCVS, author of the Handbook Laboratory Animal Anaesthesia, 4th Edition, and Matthew Leach, Ph.D., Lecturer, School of Natural and Environmental Sciences, Newcastle University, Newcastle upon Tyne, UK. https://www.nc3rs.org.uk/grimacescales

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Course responsible :
Rafael Frias
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Contact person :
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Title : Public Health Implications of an Aging Population

Course number : 3233
Credits : 3.0
Date : 2020-09-28 -- 2020-10-09
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 : Lectures will be given Monday through Friday the first week (September 28 to October 2). The examination takes place on Thursday, October 8. This course has previously been given with course number 3040.

Course responsible :
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Contact person :
Charlotta Nilsen
Institutionen för neurobiologi, vårdvetenskap och samhälle

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Title : What is Life? The Future of Biology

Course number : 3234
Credits : 2.5
Date : 2020-09-15 -- 2021-02-24
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 : 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 : Lectures, seminars and interactive sessions are usually taking place every 3rd Tuesday 14.30 -17.00 in lecture room at Biomedicum, KI Campus Solna.

Course responsible :
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17177
Stockholm

Contact person :
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Title : Clinical and Molecular Bacteriology

Course number : 4215
Credits : 1.5
Date : 2020-11-09 -- 2020-11-13
Language : English
Level : Doctoral level
Responsible KI department : Department of Neuroscience
Specific entry requirements :
Purpose of the course : The purpose of this course is to introduce students to a variety of topics relating to both clinical and molecular bacteriology and the interaction between clinical and basic research.
Intended learning outcomes : At the end of the course the students should have a good overview of: The forefront of research in Antibiotic Resistance and Bacterial Pathogenesis Ongoing clinical and molecular bacteriology research at Karolinska Institutet/Hospital A range of different experimental techniques and approaches used in bacteriology research
Contents of the course : Topics of the course will include: Molecular pathogenesis of bacteria Clinically important bacterial infections The role of the bacterial microbiota in health and disease Innovation and emerging technologies and techniques in bacteriology
Teaching and learning activities : This one week course will consist of lectures/ seminars by leading researchers/clinicians in the field of Bacteriology as well as group and individual assignments. Lectures will be held from 9-12 each day followed by assignment work in the afternoons. Active participation is expected in lectures, seminars and group assignments.
Examination : The learning outcomes will be assessed through the group and individual written assignments. Each student will need to show that all the learning outcomes of the course are reached.
Compulsory elements : Lectures/seminars have compulsory attendance which may be compensated by a given written assignment in exceptional circumstances. Each student will need to show that all the learning outcomes of the course are reached.
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 active lecture parts of the course will only be from 9-12 each day. The aim is to hold the course at either Biomedicum or Widerström buildings, campus Solna.

Course responsible :
Keira Melican
Department of Neuroscience

Keira.Melican@ki.se

Contact person :
-

Title : Immunometabolism: Implications for Health and Disease

Course number : 5214
Credits : 1.5
Date : 2020-11-30 -- 2020-12-04
Language : English
Level : Doctoral level
Responsible KI department : Department of Medicine, Solna
Specific entry requirements : Basic knowledge of immunology (corresponding to the KI doctoral education course Basic Immunology (3 hp) molecular biology, biochemistry and cardiovascular physiology is required.
Purpose of the course : This course is intended to provide doctoral students in-depth knowledge on the new scientific advances about the interplay between immunological and metabolic processes, and provide an extra dimension to our understanding of the immune system in health and disease.
Intended learning outcomes : After successful completion of this course students are expected to be able to: - understand the concept of immunometabolism. - demonstrate detailed understanding of the molecular mechanisms underlying energy metabolism in immune cells and their contribution to the development of metabolic and inflammatory diseases. - discuss mechanisms that modulate metabolism and can control the immune response.
Contents of the course : Our understanding of molecular pathways that govern metabolism and immunology has evolved largely in parallel. However, current evidence points to a close interplay between immunological and metabolic processes. It is now clear that the behavior of cells of our immune system including monocytes, macrophages and lymphocytes is largely determined by the status of their intracellular energy metabolism. This course will provide an in-depth knowledge about immunometabolism. The course will specifically focus on the molecular mechanisms governed by metabolism that underlie immune cell functioning including oxidative phosphorylation and glycolysis. Furthermore, the concept of immunometabolism will be applied to various pathological conditions ranging from host defense against infections, cancer and cardiometabolic diseases and related complications. Of note, during the course it will be discussed how targeting of metabolism in immune cells can lead to tangible therapeutic advancements to promote health.
Teaching and learning activities : Lectures, project group work, presentation by participants
Examination : To pass the course, the participant has to: 1) Give a satisfactory presentation in a seminar and to be able to discuss the different aspects of immunometabolism 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 :

Course responsible :
Maria Forteza de los Reyes
Department of Medicine, Solna
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Akademiska stråket, 1

17164
Solna

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Title : Cancer Drug Discovery

Course number : 5215
Credits : 1.5
Date : 2020-09-07 -- 2020-09-11
Language : English
Level : Doctoral level
Responsible KI department : Department of Medical Biochemistry and Biophysics
Specific entry requirements : Students must have acquired basic knowledge (BSc level) in cell biology, systems biology or chemistry.
Purpose of the course : This course describes the steps, processes and approaches needed for drug discovery with a focus on oncology. Through lectures and interactive workshops, the students will learn about current drug discovery techniques, from screening for hit discovery to the synthesis of the final drug candidate through lead optimization. Aspects of clinical testing and precision medicine will also be addressed. In this 5 day course, students will attend lectures by prominent scientists from academic and industry active in the fields of drug screening, drug library design and logistics, disease models, drug development, medicinal chemistry, image analysis, chemoinformatics, precision medicine, and clinical trials. The students will also participate in a group-based learning project to design their own screening strategy, and site-visits to drug discovery companies based in Stockholm, as well as the screening platform at SciLifeLab Chemical Biology Consortium Sweden. At the end of the course, the students should have a good overview and understanding of the drug discovery workflow in cancer research, allowing them to pinpoint potential career directions for their own scientific paths.
Intended learning outcomes : At the end of the course the student is expected to be able to: Knowledge and understanding: -Describe, define and understand the different drug discovery approaches used in both academia and industry. -Familiarity with the drug discovery process through to a clinical implementation. Competence and skills -Ability to describe the concepts and terminology of drug discovery in cancer. -Understanding the different screening strategies and the associated benefits and shortcomings. -Ability to describe and understand how a compound can become a drug and its clinical implications. Judgement and approach -Demonstrate the ability to understand the concepts of drug discovery both written and orally in the workshop. -Evaluate how a drug discovery campaign can be used to discover new anti-cancer drugs. -Evaluate how drug discovery techniques can be currently used in a clinical setting for precision medicine.
Contents of the course : The main blocks of the course include: Drug discovery in pharma and academia: a perspective -Chemoinformatics -Drug Library design -Model systems Drug discovery strategies: -Target-based in vitro screens -Cell-based phenotypic screens -Virtual screens -High-throughput phenotypic screening -High content imaging -Image analysis -Multi-parametric analysis Target identification: -Thermal Shift (CETSA and others) -CRISPR -Transcriptomics (cMap) -PISA Lead optimization and Medicinal chemistry -Journey from compound to drug -ADME and toxicity Clinical trials and patient stratification -Diagnostics -Drug repurposing in personalised cancer medicine Workshop: design your screening strategy to target one of the hallmarks of cancer
Teaching and learning activities : -Lectures -Workshops -Site-visits
Examination : The examinations will consist of a written report of max. 2 pages, and a short oral presentation of a mock drug discovery project. The project should be well motivated in background of the current state of knowledge, or lack thereof, in the cancer research area of choice, or the student's own scientific path. Each student should ask questions or comment on the other student's presentations at the final session of the course. One needs to show that all intended learning outcomes are reached for a pass.
Compulsory elements : Attendance to all lectures and workshops are compulsory.
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 : -List of speakers/lecturers:
 Brinton Seashore-Ludlow (KI)
 Jordi Carreras-Puigvert (KI)
 Päivi Östling (KI)
 Ulrika Warpman Berglund (KI)
 Krister Wennerberg (BRIC-Copenhagen)
 Oskar Fernandez-Capetillo (KI)
 Per Arvidsson (KI)
 Martin Haraldsson (LCBKI)
 Thomas Lundbäck (AstraZeneca Göteborg and KI)
 Kirsten Tschapalda (AstraZeneca Manchester)
 Sean Rudd (KI)
 Wei Ouyang (KTH)
 Johan Ledin (UU)
 Jens Carlsson (UU)
 Ola Spjuth (UU)
 Carolina Wählby (UU)
 Bernhard Schmierer (KI)
 Rozbeh Jafari (KI)
 Daniel Martinez Molina (Pelago)
 Anja Reithmeier (LCBKI)

 -Workshop by:

 Brinton Seashore-Ludlow (KI)
 Jordi Carreras-Puigvert (KI)

 -On-site visits to:
 Pelago
 Sprint Bioscience
 Affibody
 CBCS

Course responsible :
Jordi Carreras Puigvert
Department of Medical Biochemistry and Biophysics

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Contact person :
Brinton Seashore-Ludlow
Institutionen för onkologi-patologi

brinton.seashore-ludlow@ki.se

Title : Stress, Sleep, and Health

Course number : 5216
Credits : 3.0
Date : 2020-11-02 -- 2020-11-13
Language : English
Level : Doctoral level
Responsible KI department : Department of Clinical Neuroscience
Specific entry requirements :
Purpose of the course : Stress and sleep disturbances has become almost unavoidable in our modern societies, but can significantly impact one's wellbeing. The purpose of the course is to provide an overview of how stress and sleep affect mental and physical health. The course will also offer an opportunity to develop critical thinking about research findings, and to apply a cross-disciplinary mechanistic perspective across physiological and pathological conditions. The students will be given good opportunities to network and to interact with leading national and international researchers in this area of research.
Intended learning outcomes : At the end of the course, the doctoral student shall have obtained a good knowledge in how stress and sleep affect health, and the basic mechanisms by which this association occurs. They shall also be able to critically comment on the literature in the corresponding fields, and choose an adequate design for research of the effects of stress and sleep on health. We also wish this course to be an opportunity to interact with other PhD students with overlapping research interests.
Contents of the course : The course will consist of lectures that will provide an overview of the essential concepts and the research on stress, sleep, and health. In particular, how acute stress, chronic stress, circadian rhythms, and sleep disturbances affect physiological systems such as the immune system and metabolism, and mental health and cognition, will be discussed. Lectures will also describe neuronal underpinnings of such effects, and possible treatments to improve stress- and sleep-related disorders. Models/tasks to study the effect of stress and sleep will also be the subject of a lecture. The course will additionally include journal clubs where specific papers will be discussed, and time to prepare the written and oral presentations of a mock research project. The oral presentations will take place during a seminar in the end of the course.
Teaching and learning activities : - Lectures, which will provide an overview of the essential concepts and the research in the different areas of relevance for the use of the doctoral student in the preparation of the examination assignment (written and oral presentations). - Journal clubs - Meet-the-experts session, where the students will have the opportunity to meet and interact with leading national and international researchers in the area of research of relevant - The doctoral student has access to supervision in the preparation of the written examination
Examination : The examination will consist of a written (2 pages) and an oral presentation of a mock research project that is well motivated in background of the current state of knowledge/lack of knowledge in the research area of relevance.
Compulsory elements : - Participation in the lectures. Absence of max 25 % can be compensated for by additional tasks in agreement with the course leader. - Written and oral examination - Participation in the examination seminar. In case of absence from the scheduled examination seminar, another occasion for examination can be arranged as agreed upon with the course leader.
Number of students : 8 - 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 : Hours 9-16 or 9-17, with fika included but not lunch (except last day). There will be lectures from national and international experts as well as one "meet-the-expert" session, which will give opportunity to meet the lecturers from the course face-to-face.

Course responsible :
Julie Lasselin
Department of Clinical Neuroscience

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Contact person :
Mats Lekander
Institutionen för klinisk neurovetenskap

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Julie Lasselin
Institutionen för klinisk neurovetenskap

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Title : Preventing Illness or Promoting Health: Concepts and Illustrations from Healthcare Science Perspectives

Course number : 5222
Credits : 1.5
Date : 2020-10-05 -- 2020-10-29
Language : English
Level : Doctoral level
Responsible KI department : Department of Neurobiology, Care Sciences and Society
Specific entry requirements :
Purpose of the course : Facilitating a critical dialogue about concepts of prevention and promotion along a knowledge continuum within health care sciences research.
Intended learning outcomes : Based on relevant conceptual resources, upon completion of the course the learner is expected to be able to: 1) critically appraise and reflect on the rationale for conceptual foundations on which to build research addressing illness prevention in healthcare science. 2) critically appraise and reflect on the rationale for conceptual foundations on which to build research addressing health promotion in healthcare science. 3) compare as well as analyze differences and similarities in research addressing health promotion and illness prevention in healthcare sciences. 4) demonstrate reflective reasoning about ethical issues concerning design, data gathering, analysis, intervention, and implementation of projects along a prevention/promotion continuum in healthcare sciences.
Contents of the course : The course builds on a coordinated series of lectures, panel discussions, and debates comprising topics of health promotion and illness prevention grounded in current research conducted across departments at Karolinska Institutet and in collaboration with partner universities. The course commences with an introduction to concepts of illness prevention/health promotion relating to healthcare sciences, followed by illustrations intended to generate discussion about research methods as well as clinical and social implications. The course will build on historically relevant topics as well as ongoing research. Illustrations can come from i.e. public health, family medicine and primary care, and health sciences such as nutrition, nursing, occupational science, physiotherapy, psychology, and social work.
Teaching and learning activities : This course is designed to constitute a series of short expert lectures, panel discussions from current projects, and ethics debates, which will culminate in the foundations for an oral examination. The learning experience builds on a mix of active reading and reflection in combination with dialogue in tandem with taking part of lectures, panels, and debates. The course requires active involvement of the learner through active participation in the scheduled learning activities.
Examination : The examination will consist of an individual oral presentation in a group format, through which all participants can learn from each other in a scholarly exchange of ideas and perspectives. Each participant has to show that all the ILOs are reached. Results will be assessed as Pass/not pass
Compulsory elements : All course activities are mandatory. Absence of max 20% can be compensated for by additional tasks in agreement with the course organiser. At least 80% attendance and passing the final examination is mandatory for a grade of "pass" in the course.
Number of students : 8 - 16
Selection of students : Admission to course is based on: 1) course plans relevance for the applicants doctoral student project (based on application), and 2) start date for doctoral student studies.
More information : Course week 1: October 5-6 (Mon-Tue). Course week 2: October 15-16 (Thu-Fri). Course week 3: October 29 (Thu).
 Campus Flemingsberg, ANA23 is available for all campus activities. However we can also consider including Solna if relevant.
 According to plan, the course will have lecturers, workshop leaders, and panelists from several different departments at Karolinska Institutet as well as tentatively from other universities. This is still being planned as this will be the first time the course is given.

Course responsible :
Eric Asaba
Department of Neurobiology, Care Sciences and Society
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Contact person :
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Title : Artificial Intelligence and Machine Learning for Biomedical and Clinical Research

Course number : 5223
Credits : 3.0
Date : 2020-09-21 -- 2020-10-02
Language : English
Level : Doctoral level
Responsible KI department : Department of Microbiology, Tumor and Cell Biology
Specific entry requirements : At least 1,5 credits from a course in basic statistics.
Purpose of the course : To increase knowledge about Machine Learning (ML) and Artificial Intelligence (AI) applications in biological and medical research, introduce first-hand experience and skills with different frameworks. The course requires no preliminary programming skills as well as no preliminary expertise in ML and AI. This course is given at a basic/novice level with no expertise in ML/AI and preliminary programming skills required, though experience in data analysis using RStudio/MatLab or similar analytic environment is an advantage.
Intended learning outcomes : After the completed course, the participants will be able to describe and discuss general aspects of ML and AI in a biomedical or medical context including ethical dilemmas and challenges. Practically, they should be able to prepare and analyse different data types related to own research, such as texts, omics, genomic sequences, images etc. using a range of ML and AI exploration and classification techniques as well critically analyse the outcome and estimate performance.
Contents of the course : Basic information about AI and ML, multivariate dataset preparation, classic methods of univariate and multi-dimensional analysis (Principal Component Analysis, Linear Discrimination Analysis, Factor Analysis), variable selection and sparse regression models (lasso regression, ridge regression, elastic net), supervised and unsupervised learning with neural networks, federated learning, performance estimation methods.
Teaching and learning activities : The course consists of lectures, group discussions, and hands-on labs. Previous experience from practical experience applying modelling in a computer-based environment (e.g. in R, SAS, STAT, Matlab or Python), is strongly recommended.
Examination : The student will be examined by their (a) labs accomplishment (b) final project report and (c) written reviews of projects of 2 other students.
Compulsory elements : All planned activities including lab and group works are mandatory. Absence has to be compensated with a report on the lab work, which student will have to do.
Number of students : 8 - 8
Selection of students : Selection will be based on 1) the relevance of the course syllabus for the applicant's doctoral project (according to written motivation), 2) start date of doctoral studies (priority given to earlier start date)
More information : The course takes place at Campus Solna. It is full time and intensive. For any questions about course contents and practicals, email iurii.petrov@scilifelab.se who is the main teacher of the course.

Course responsible :
Andrey Alexeyenko
Department of Microbiology, Tumor and Cell Biology

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Contact person :
Matti Nikkola
Institutionen för cell- och molekylärbiologi

Matti.Nikkola@ki.se

Title : Experimental Models in Cardiovascular and Metabolism Research

Course number : 5225
Credits : 1.5
Date : 2020-10-19 -- 2020-10-23
Language : English
Level : Doctoral level
Responsible KI department : Department of Molecular Medicine and Surgery
Specific entry requirements : No prerequisite animal study knowledge is required because the teaching and practicing will be carried out on euthanatized animals and silicone pads.
Purpose of the course : The purpose of the course is to enable the participants to obtain practical experience in ex vivo and in vivo models of cardiovascular and metabolism research as well as to discuss with fellow students and experts in the field the theory of the models and ethical aspects of translation research.
Intended learning outcomes : At the end of the course the participant should be able to: - Show an understanding of the main cardiovascular and metabolic disease models and their applications - Comprehend the benefits and limitations of these models - Learn how to breed and apply genetically modified animal models, as well as achieve and analyze data in the most optimal fashion - Practically perform experiments using common current models for cardiovascular and metabolic diseases
Contents of the course : The course is aimed at participants who are starting or have just started to use animal models in cardiovascular and metabolism research. The course will give theoretical knowledge about 1) Why and how to choose animal models to investigate relevant cardiovascular and metabolic diseases. 2) Current strategies on genetically modified animals including mice, rats and mini pigs. 3) How to collect in vivo and ex vivo data and analyze. There is also a practical component where students will get hands-on experience in the most common models used, as well as basic surgical technique practice on euthanatized mice and silicone pads instructed by experienced animal study surgeons.
Teaching and learning activities : The course is partly theoretical, partly practical, where lectures/group discussions and laboratory demonstrations are integrated. Time is also allocated for discussing of laboratory results and lectures.
Examination : All the learning outcomes of the course have to be reached to pass the course. The final grade (pass or fail) will be based on: - formative and summative assessment of the contributions during the discussions that are part of the course - individual presentation at a seminar where different aspects of an animal model will be discussed, i.e. disease aspect to be investigated, which model would suit best, and how are the results analyzed and interpreted
Compulsory elements : Lectures/group discussions and laboratory demonstrations, as well as the examination, are compulsory. Absence of up to 10 percent in lectures, discussions and laboratory demonstrations can be compensated for in agreement with 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 :

Course responsible :
Hong Jin
Department of Molecular Medicine and Surgery

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Contact person :
Jiangning Yang
Institutionen för medicin, Solna

Jiangning.Yang@ki.se

Title : The DNA Damage Response in Cancer

Course number : 5226
Credits : 1.5
Date : 2020-11-23 -- 2020-11-27
Language : English
Level : Doctoral level
Responsible KI department : Department of Oncology-Pathology
Specific entry requirements :
Purpose of the course : The course aims to provide the participants with a comprehensive overview about the DNA damage response and its role in cancer development, progression and anti-cancer treatment both with regards to DNA damaging chemo- and radiotherapy as well as emerging treatments targeting key players in the DNA damage response (targeted therapies).
Intended learning outcomes : After passing the course, students will - have gained a comprehensive overview of the DNA damage response - discuss and explain the main mechanistic aspects in different DNA repair pathways and how this and can be exploited in anti-cancer treatment - understand the mechanism of action of DNA damaging inducing anti-cancer treatments and drugs targeting the DNA damage response - describe and understand state-of-the-art strategies for targeting the DNA damage response in cancer - have gained knowledge about different molecular biology assays to study DNA repair and replication in cells and how this can be applied in their own research - understand and theorize about how the DNA damage response connects to different cellular responses such as cell cycle progression and apoptosis and apply this knowledge in their own research projects
Contents of the course : The course will cover the following topics: -Overview of the DNA damage response -The DNA damage checkpoints across the cell cycle -DNA damaging anti-cancer treatment such as chemotherapeutics and radiotherapy -State-of-the-art strategies for targeting the DNA damage response in cancer -DNA damage tolerance -Double-strand break repair -DNA replication stress, fork stalling and interstrand crosslink repair -DNA damage response and human disease -Defective DNA damage responses and cancer -Assays studying DNA repair and replication
Teaching and learning activities : The course consists of lectures and seminary by experts in their fields and group exercises. To promote active learning, lectures and seminars are followed by discussions between the students and the speakers and the students will apply knowledge from the course in their own research projects in the examination.
Examination : To pass the course the students must show that they have reached the learning outcomes of the course. The course assignment will consist of: 1) an individual oral presentation about integrating topics from the course in the students' own research projects in line with the intended learning outcomes of the course. 2) the students are expected to ask questions on each others presentations and be able to discuss and answer questions from fellow students and course leader in line with the intended learning outcomes of the course.
Compulsory elements : Attending the lectures, seminars group exercises and the examination seminar are compulsory. Absence can be compensated by other activities after discussion with the course leader.
Number of students : 8 - 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 at Karolinska Institutet Solna and Scilifelab Solna. The information regarding exact time will be sent to course participants along with the course schedule.

Course responsible :
Nina Gustafsson
Department of Oncology-Pathology

Nina.Gustafsson@ki.se

Contact person :
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Title : Advanced Scientific Writing

Course number : 5227
Credits : 1.5
Date : 2020-11-23 -- 2020-11-27
Language : English
Level : Doctoral level
Responsible KI department : Department of Women's and children's health
Specific entry requirements : Knowledge corresponding to basic doctoral courses in scientific writing at KI and some experience of scientific writing.
Purpose of the course : This is an advanced course in scientific writing, specifically designed for post docs and PhD students in the later part of their education. The aim is to improve the participants´ ability to write, revise and review original scientific articles.
Intended learning outcomes : After passing the course, the participant will: - have a better understanding of how to write an original scientific article, including use of the proper structure and language - be aware of and, thereby, able to avoid the common mistakes involved in writing scientific articles - have the ability to offer constructive criticism regarding these matters to other scientists (e.g., co-workers, as peer reviewers for journals) - be able to assess constructive criticism of their manuscripts from other scientists and revise accordingly
Contents of the course : This is an advanced course in scientific writing that requires prior knowledge and experience in writing research articles. The participant will be writing and revising manuscripts based on their own research (written, at least in part, before the course begins) as well as peer reviewing the manuscripts of other course participants. The teachers will focus on giving feedback in great detail on the scientific articles of the students and also guiding the revision of the manuscripts after the review sessions.
Teaching and learning activities : Lectures, individual writing and revising of manuscript, individual and group peer reviewing of the manuscripts of other course participants, group discussions including feedback from the teachers.
Examination : Writing and rewriting a manuscript based on the comments and feedback from the other course participants and teachers, thoughtful peer reviewing of the manuscripts of other course participants, active participation in group exercises.
Compulsory elements : All scheduled teaching, unless stated otherwise or the participant informs the teachers in advance of an acceptable reason for not being present. Absence can be compensated for by individual work specified by the teachers or in connection with the next time the course is taught.
Number of students : 8 - 12
Selection of students : Selection will be based on 1) 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 an advanced course on scientific writing for PostDocs and PhD students in the later part of their education. Focus will be on writing and revising a manuscript based on your own research results with a lot of individual coaching.

Course responsible :
Anna Hildenbrand Wachtmeister
Department of Women's and children's health
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Contact person :
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Title : Global Sexual and Reproductive Health and Rights: Methods, Concepts and Implications for Policy and Practice

Course number : 5228
Credits : 3.0
Date : 2020-11-02 -- 2020-11-13
Language : English
Level : Doctoral level
Responsible KI department : Department of Women's and children's health
Specific entry requirements :
Purpose of the course : Understanding of how sexual and reproductive health and rights (SRHR) are shaped, and its effects on future generations is crucial for all researchers involved in global health, maternal health and many other areas related to health. This course will provide participants with practical and theoretical tools as well as background to review and carry out research in SRHR.
Intended learning outcomes : At the end of the course the student should be able to: 1. Understand the state of the art in SRHR, including global trends, progress, challenges and gaps in research 2. Examine SRHR Policies and understand their relation to SRHR outcomes, as well as translate research into policy 3. Explain how structural factors – including social, political, economic and ethical factors - influence SRHR 4. Utilize, analyse and interpret qualitative and quantitative data and measurements in SRHR 5. Demonstrate skills in scientific writing, and reviewing and critiquing scientific papers 6. Apply skills for successful interdisciplinary collaboration
Contents of the course : 1. Introduction to core concepts and state of the art in SRHR in a global context 2. Underlying causes of (in)equities in SRHR 3. SDGs and other policy initiatives and their relation to SRHR globally 4. Qualitative and quantitative research methods 5. Critiquing the literature in SRHR
Teaching and learning activities : The course will be given at four ANSER institutions (https://www.ugent.be/anser/en) at the same time and collaboration over sites will happen in terms of online lectures, discussions, seminars, etc. This course will benefit and make use of the fact that it is provided by four institutions from different parts of the world. Learning activities are online lectures, readings, on-campus interactive lectures, seminars, practical exercises and student projects.
Examination : - In preparation of the course, students will bring a revised version of a research protocol or paper that they are writing on/related to their research topic. The evaluation will consist of a revised version of the protocol/paper - Peer review of other students' protocol/paper - The students will be divided in groups and given a specific SRHR topic to write a debate article/commentary on - Seminar participation - Assignments will be graded pass/fail
Compulsory elements : Hand in the assignments, participate in discussions.
Number of students : 8 - 10
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 provided at four ANSER institutions (https://www.ugent.be/anser/en):
 1. Ghent University, Belgium
 2. NOVA National School of Public Health, Universidade Nova de Lisboa, Portugal
 3. Technical University of Kenya, Kenya
 4. Karolinska Institutet, Sweden
 The course will be given at all four institutions at the same time. Collaboration over sites will happen in terms of lectures, discussions, seminars, etc. This course will benefit and make use of the fact that it is provided by four institutions from different parts of the world.
 Maximum number of students: 10 per institution.

Course responsible :
Elin Larsson
Department of Women's and children's health

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Contact person :
Anna Kågesten
Institutionen för global folkhälsa

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Title : Basic Immunology

Course number : 5229
Credits : 3.0
Date : 2020-09-07 -- 2020-09-30
Language : English
Level : Doctoral level
Responsible KI department : Department of Medicine, Solna
Specific entry requirements : Knowledge in basic cell biology.
Purpose of the course : To give doctoral students the possibility to acquire a solid knowledge and understanding of fundamental principles in immunology. All other courses in the doctoral education program Aii (Allergy, immunology and inflammation) assume that students have taken the Basic Immunology course, or otherwise have previously attained the same level of knowledge and understanding.
Intended learning outcomes : To be able to: - Explain the basic principles of innate and adaptive immunity and how different components of the immune system cooperate - Describe and compare experimental aspects of immune-related diseases in a clinical perspective. - Apply knowledge gained on the function of the immune system to write a research project proposal in immunology that will be discussed in pairs - Review a chosen immunological/clinical topic, which will be presented as a group project
Contents of the course : The course is separated into two parts. In part 1 we discuss basic immunological mechanisms within the innate and adaptive immune response. In part 2 we apply the knowledge in clinical settings such as defense against infection, autoimmune and allergic diseases or transplantation. Part 1: An overview of the immune system, T cells, B cells, Antigen presenting cells, Innate lymphoid cells, Innate vs adaptive immune responses. Part 2: Immune defense against bacterial and viral infections, Primary immunodeficiencies, Autoimmune disease, Allergy, Vaccination, Clinical Immunology, Transplantation, Tumor Immunology. Questions and discussions. Presentation of projects.
Teaching and learning activities : Lectures and seminars are given three days per week and remaining days are assigned for project work, a written assignment as well as reading. The project work and written assignment require studies between the two course parts, including meetings with mentors. On the last day of the course, the project work will be presented orally. An immunological quiz is connected to the different topics of the course, so that the student will be able to digest the relatively big material. 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 of the applied immunology in part 2 starts.
Examination : The student will be examined on both the project work and the written assignment. The project work will be evaluated by the group project mentor and by the course organisers during the oral presentations of the work. At this occasion special attention is given to all student´s active participation and contributions to the discussions. The individual written assignment is evaluated by the course organisers.
Compulsory elements : All activities included in the course are compulsory. Absence needs to be compensated for in agreement with the course director.
Number of students : 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) date for registration as a doctoral student (priority given to earlier registration date).
More information : The course is divided into two sessions with 3 days of lectures each, September 7th to 9th (Monday to Wednesday) and September 28th to 30th (Monday to Wednesday). In between these days of lectures, the students work on both a group project and an individual written assignment, including meetings with mentors and literature studies. The first meeting with mentors should ideally take place on either the 10th or 11th of September (Thursday or Friday, respectively), so students are expected to have time to devote to the course outside the official lecture days. Teachers include specialists in different fields of immunology including both basic and clinical researchers. The course location is at the Center for Molecular Medicine (CMM), Karolinska University Hospital, Solna. The course has previously been given with number 3187 (see linked course evaluation).

Course responsible :
Karine Chemin
Department of Medicine, Solna

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Contact person :
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Title : Cancer Genetics: a Basis for Precision Medicine

Course number : 5230
Credits : 1.5
Date : 2020-11-16 -- 2020-11-20
Language : English
Level : Doctoral level
Responsible KI department : Department of Molecular Medicine and Surgery
Specific entry requirements :
Purpose of the course : Thanks to the introduction of next-generation sequencing technologies, the genomic landscape of many cancer types, including both solid tumors and haematological malignancies, have been rapidly unraveled. This has provided essential information about recurrent genetic events and identified key pathways and processes deregulated in each cancer type. Based on this knowledge, an array of genetic markers have been identified with diagnostic, prognostic and predictive impact, that also has paved the way for the development of new targeted therapies. Today, cancer genetics provides an important basis for precision cancer diagnostics, which in turn enables individually adapted therapies and follow-up strategies. The purpose of this course is to bring the students to an advanced level in the rapidly developing field of cancer genetics and precision medicine, and to provide knowledge that can be applied for basic, translational as well as clinical research.
Intended learning outcomes : After the course, the participants should have knowledge on the biological and clinical impact of cancer genetics as a basis for precision diagnostics/medicine in solid tumors and haematological malignancies. They should be able to select adequate genomic technologies and data analysis strategies for cancer research projects and clinical diagnostics. They should be able to evaluate different categories of gene mutations using publicly available databases and tools. Finally, they should be able to identify and discuss ethical issues arising from large-scale next-generation sequencing studies.
Contents of the course : The latest research in cancer genetics including i) currently available technologies and technology development, ii) the impact of cancer genomics in solid tumors and haematological malignancies and iii) the strong potential of precision diagnostics as one of the two pillars of precision medicine will be presented and discussed. The course is primarily aimed at students actively involved or planning genetic analysis for basic, translational and clinical cancer projects.
Teaching and learning activities : The course consists of lectures, seminars, hands-on computer-based exercises, self-studies, and group presentations.
Examination : The course assessment will consist of a written single best answer (SBA) exam, including some open-end questions covering ethical issues, to assess whether each individual doctoral student has reached the learning outcomes of the course.
Compulsory elements : The course seminar as well as the examination are compulsory. Absence from compulsory parts is compensated according to the instructions from the course leader.
Number of students : 10 - 20
Selection of students : Selection will be based on 1) the relevance of the course syllabus for the applicant's doctoral project (according to written motivation), 2) start date of doctoral studies (priority given to earlier start date)
More information :

Course responsible :
Richard Rosenquist Brandell
Department of Molecular Medicine and Surgery

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Contact person :
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Title : Oral Presentation of Own Research

Course number : 5231
Credits : 1.5
Date : 2020-10-12 -- 2020-10-16
Language : English
Level : Doctoral level
Responsible KI department : Department of Women's and children's health
Specific entry requirements : Having research results to present outside the research group.
Purpose of the course : The purpose of the course is to build skills and increase the participant's confidence in presenting own research results.
Intended learning outcomes : After passing the course, the participant will: - be able to structure and build compelling presentations based on own research results - have skills in how to consistently deliver in an engaging manner - be capable of building instant rapport and get an audience on their side every time - understand the best use of voice, body language and posture - be able to make their mark and be remembered - understand how to deal with challenges during presentations, e.g. hostile audience members, difficult questions, technology problems, nervousness and blacking out - have knowledge of a broad variety of presentations styles in order to find their own - be able to use supportive media - be able to design presentation slides that support the message
Contents of the course : This is an advanced course in presentation skills requiring prior experience of presenting your research specifically targeting post docs and PhD students in the later part of their education. The course is highly personalized, tailored to the specific needs of the individual participants. A variety of techniques will be presented and tried out to enable the participants to develop in their own way to become more professional at presenting, yet remaining authentic. The course includes: - presentation structure - presentation techniques - dealing with the audience - overcoming challenges, e.g. hostile audience members, questions, nervousness, technology issues - body language, voice and presence on stage - filming of an elevator pitch, which the participants get to keep after the course to use e.g. on a webpage - how to design successful power point presentation slides - how to use supporting media
Teaching and learning activities : Lectures, group work, exercises, filming.
Examination : Presentations and participating in exercises during the course.
Compulsory elements : All scheduled teaching and group work is compulsory. Absence can be compensated for during individual assignments or during the next course occasion.
Number of students : 8 - 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 : Welcome to apply for PhD course 5231 Oral presentation of your own research! This is a presentation techniques course for PhD students, who have some previous experience of presenting their research results and want to further improve their skills. Focus will be on presenting your own results in different formats and individual coaching.

Course responsible :
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Contact person :
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Title : Tumor Microenvironment

Course number : 5232
Credits : 1.5
Date : 2020-11-09 -- 2020-11-13
Language : English
Level : Doctoral level
Responsible KI department : Department of Oncology-Pathology
Specific entry requirements : Basic course in tumor biology and oncology or corresponding knowledge
Purpose of the course : The purpose of the course is to provide: -A systematic overview on the cellular, structural and chemical composition of the tumor microenvironment (TME) -A platform for scientific discussions on how differences in the tumor microenvironment can influence tumor progression and therapy response -Practice in what to consider when selecting a relevant TME model system and how to analyze the tumor microenvironment ex vivo and in vivo -A context for reflection on advances and challenges with existing and future TME-targeting therapies
Intended learning outcomes : After completion of the course, the students should be able to: - Describe the main cellular and acellular components of the TME - Discuss principal mechanisms of TME communication - Systematically identify and compare properties of different TMEs and their clinical impact - Critically evaluate different methods and model systems for TME studies and motivate their use from a context-dependent perspective (level of complexity, ethics, clinical relevance, etc)
Contents of the course : The course content is structured as follows: -Components of the TME are introduced (cancer-associated fibroblasts, endothelial cells, pericytes, immune cells, ECM and associated factors etc). Processes like angiogenesis and lymphangiogenesis are discussed together with conditions like hypoxia and acidosis. -TME properties are related to malignant growth, invasion, metastasis, and response to therapy from a clinical perspective. The specific TME of selected tumor types will be further studied in depth according to the participants´ interest. -Model systems and tools for TME studies are presented (organoids, digital image analysis etc.).
Teaching and learning activities : The course consists of lectures, group work and discussions, literature search, and a hands-on demonstration of digital image analysis using clinical tissue samples. TME characteristics of different tumor types will be explored by problem-based learning (starting from a clinical case). The course is designed to stimulate interactive learning where all course participants are active, for example by summarizing the key topics of the day in groups.
Examination : The course assignments consist of: (1) Short written summary of key topics of the day in groups, to be discussed and peer-reviewed (formative assessment) (2) Oral group presentation (assessment of PBL assignment) (3) Essay, 1 page (summative assessment)
Compulsory elements : All parts of the course are mandatory and require full attendance. Absence must be compensated for by other activities (after discussion with the course organizer).
Number of students : 10 - 20
Selection of students : Selection will be based on 1) the relevance of the course syllabus for the applicant's doctoral project (according to written motivation), 2) start date of doctoral studies (priority given to earlier start date)
More information : The course is between 9 am and 4 pm. All activities will be on the Solna Campus (BioMedicum and BioClinicum).

Course responsible :
Monika Ehnman
Department of Oncology-Pathology

Monika.Ehnman@ki.se

Contact person :
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Title : Network Theory and Brain Imaging

Course number : 5233
Credits : 1.5
Date : 2020-11-03 -- 2020-11-26
Language : English
Level : Doctoral level
Responsible KI department : Department of Clinical Neuroscience
Specific entry requirements : No advanced mathematical knowledge is required. However, being comfortable with reading linear equations (once they are explained) is highly recommended.
Purpose of the course : Network theory is an interdisciplinary subject of how networks are organized and function. On multiple different spatial scales (from neurons to brain regions) the brain is organized as a network of connected components. For several decades network theory has been applied to study the brain's structure and function revealing new knowledge about the brain. The purpose of this course is to provide students with the foundations of network theory. This course will cover all aspects of creating network models from neuroimaging data (theory, assumptions, visualization, and quantifying models).
Intended learning outcomes : After the course, the doctoral student shall have obtained a thorough knowledge about core concepts about network neuroscience. This includes: 1) be able to create network models; 2) be able to apply and interpret network measures calculated from models (centrality measures, shortest paths, community detection etc); 3) implement a network analysis and visualize the results using python, R or graphical interfaces; 4) gain knowledge about how network models have been applied within the neurosciences; 5) understand how network models relate to theory; 6) gain an overview of recent developments within network neuroscience.
Contents of the course : The content consists of lectures, seminars and demonstrations to provide the students with knowledge about network neuroscience. This will include the basics of network models, measures to quantify networks, history of network science and applications of network models in neuroscience, programming exercises in how to construct network models (R, python, and graphical software packages – students can choose one), and recent developments in network neuroscience. Each student will also do an individual research project applying elements from the course onto real data.
Teaching and learning activities : Lectures, seminars, laboratory exercises (that will require using R, Python or graphical software (Gephi)), oral presentation.
Examination : Individual mini research project. This can be carried out on the student’s own data or open data provided. The analysis should be presented in a 10 minute presentation. The students will also submit their analysis (e.g. Jupyter notebook of analysis or 1-2 pages describing/motivating analysis steps).
Compulsory elements : Mandatory attendance to lectures and presentation. Absence during lectures will require completing supplementary written tasks.
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 : 3rd, 5th, 10th, 12th November. kl 10-15. Presentations on 26th November, 10-16.

Course responsible :
William Thompson
Department of Clinical Neuroscience

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Contact person :
William Thompson
Institutionen för klinisk neurovetenskap

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Title : Clinical and Molecular Parasitology and Mycology

Course number : 5234
Credits : 1.5
Date : 2020-11-16 -- 2020-11-20
Language : English
Level : Doctoral level
Responsible KI department : Department of Microbiology, Tumor and Cell Biology
Specific entry requirements :
Purpose of the course : The purpose of this course is to expose students to advanced aspects of clinical and molecular parasitology and mycology. Students will be presented to cutting-edge technologies and approaches used in research on these fascinating eukaryotic pathogens, to stimulate their curiosity and inspire them to translate and apply it to their own research.
Intended learning outcomes : After the course, the students will have acquired knowledge on the current understanding of the cellular and molecular interplay between parasites, parasitic fungi and their hosts. The students will be able to give examples of interdisciplinary studies in host-parasite interaction and should be able to relate their own research project to the forefront developments in other areas of parasitological and mycological research. Thus, after the course the students will have a more holistic picture of infection biology, and hopefully be encouraged to apply new information for the benefit of their further graduate training and research.
Contents of the course : The course covers topics on microbial virulence, transmission and evolution, the cellular and molecular interplay between eukaryotic pathogens and their hosts and how this related to disease pathogenesis.
Teaching and learning activities : The course consists of lectures by invited national and international experts on parasitological and mycological research. Lectures will cover basic aspects of parasite and host biology and disease pathogenesis to provide the students with a foundation in the subject. In addition, the lectures will contain a more advanced part where state-of-the-art research is presented. The students will be encouraged to actively interact in discussions with the lecturers and to think on the spot to ask questions. The students will also be presented to selected scientific and/or methodological conundrums and are expected to choose and write an essay on one of these, containing suggestions on research approaches on how to solve the scientific mystery.
Examination : The students will be presented a number of current scientific problems related to the parasitological and mycological research topics discussed during the course. The students are expected to choose and write an essay on one of these. The essay should contain a summary of the research field, suggestions on research approaches aimed to solve the scientific conundrum and relate it to their own research. This essay assignment serves as course examination, where students will be individually assessed.
Compulsory elements : Attendance of the lectures is compulsory. If the students are unable to attend lectures they should write a summary based on the course literature provided for that lecture. Obligatory is also a written essay assignment where students will present and discuss a chosen scientific and/or methodological problem.
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) date for registration as a doctoral student (priority given to earlier registration date).
More information : The course is held at Karolinska Institutet, campus Solna.

Course responsible :
Ulf Ribacke
Department of Microbiology, Tumor and Cell Biology

ulf.ribacke@ki.se

Tomtebodavägen 16

17165
Solna

Contact person :
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Title : Basic Bioinformatics

Course number : 5235
Credits : 2.5
Date : 2020-11-09 -- 2020-11-17
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 familiarizing the students with several bioinformatic tools commonly used in molecular biology.
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), - know principles of python (a programming language) and be able to manage data sets and create graphs, - know the basic principles for analyzing high-throughput sequencing data, - have the foundations to critically assess the main steps of the taught data analysis techniques.
Contents of the course : Bash command line interface, genome browsers, python including plotting, high-throughput sequencing in the form of RNA-seq.
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 and moderators. An online session of introductory exercises will be included in the course before the face to face sessions start.
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 : Both the introductory lectures and the practical sessions are compulsory, unless stated they are not. This is because the course is designed to gradually increase in complexity. 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 :
Daniel Ramsköld
Department of Cell and Molecular Biology

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Contact person :
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Title : Improving Use of Medicines, Focusing on Antibiotics

Course number : 5236
Credits : 1.5
Date : 2020-09-10 -- 2020-09-16
Language : English
Level : Doctoral level
Responsible KI department : Department of Global Public Health
Specific entry requirements :
Purpose of the course : This course will help participants to understand, discuss and apply key concepts of medicines in health systems and use of medicines across countries on different income levels. The special focus will be on the global antibiotic use and growing threat of antibiotic resistance. Participants will have opportunities to exchange knowledge and experience throughout the lectures in the course. Further opportunities for networking will be provided during group assignments with other participants in multicultural and multidisciplinary context.
Intended learning outcomes : At the end of the course students will be able to: - Recognise the role of medicines in health systems as well as understand and discuss the importance of systems approach in medicines use. -Identify, analyse and discuss factors influencing antibiotic use and resistance in various contexts and its impact on global health - Propose and evaluate different methods to improve use of medicines, and in particular antibiotics considering various contexts.
Contents of the course : The following content will be covered during the course: • The tools used in drug utilisation research such as ATC/DDD, together with methods to collect appropriate data to show the level of medicine use in a given population. • Access to essential medicines as one of the six building blocks of well-functioning health systems and the role of essential medicines in universal health coverage. • Examples of antibiotic use from countries on different income levels and from different parts of the health system. • Factors affecting antibiotic use, both on macro- and micro-level. • The methods to monitor global, national and local antibiotic consumption and resistance. • The burden of antibiotic resistance and economic consequences. • Lectures on introduction to changing behaviour, methods to improve use of medicines (in particular antibiotics) including the role of guidelines and various kinds of information or educational interventions directed to health care professionals, general public or policy makers. • Methods to evaluate such interventions • One Health approach: use of antibiotics in livestock, antibiotic residues and resistance in the environment
Teaching and learning activities : This is a blended-learning course i.e. a combination of classroom and online activities. During the course learning platforms and e-meeting tools e.g. Canvas and Zoom are used. Learning activities include synchronous (i.e. real-time, on campus) and asynchronous (video recorded, on-line) lectures, seminars and group work. The course is extended over 1-2 weeks but is equivalent to one- week full-time work.
Examination : To pass the course the participants need to demonstrate that the intended learning outcomes have been achieved. A written individual assignment and presentation of group work constitute the examination of the course. Each student will be individually assessed.
Compulsory elements : It is compulsory to attend all the synchronous lectures and to participate in the group work concluded with the presentation. Absence in the mandatory lectures has to be communicated with the course organizers and if needed compensated by extra individual assignments.
Number of students : 8 - 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 has previously been given with number 1846 (see course evaluation). The course will be held at Widerströmska huset, Tomtebodavägen 18A, campus Solna.

Course responsible :
Cecilia Stålsby Lundborg
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Contact person :
Anna Machowska
Institutionen för global folkhälsa

anna.machowska@ki.se

Title : Human Viral Diseases: Mechanisms and Pathogenesis

Course number : 5237
Credits : 1.5
Date : 2020-11-02 -- 2020-11-06
Language : English
Level : Doctoral level
Responsible KI department : Department of Medicine, Huddinge
Specific entry requirements : Ingen
Purpose of the course : The aim of the course is to enable students to acquire a good knowledge on mechanisms and pathogenesis related to viral infection in humans.
Intended learning outcomes : The course should give knowledge of molecular virology with special consideration to the role of virology within medicine. On completion of the course the student is expected to: - Be able to account for taxonomic subdivision of viruses. - Be able to account for the most important human pathogenetic viruses. - Be able to account for the molecular mechanisms of the virus life cycle - Be able to account for emerging viruses and pandemics - Be able to account for viral pathogenesis - Be able to account for virological methods in research - Be able to account for viral immunology, antiviral therapy and vaccination.
Contents of the course : Virus taxonomy, important human pathogenic viruses, virus structure, infection process at cell level and organism level, pathogenesis, epidemiology, molecular interactions between viruses and host cells, genetic stability of viruses, influence on host cell growth control, immune response against viruses, virus vaccines, antiviral drugs, virus vectors for gene therapy
Teaching and learning activities : The course will be given over one week (full time). The teaching is mainly through lectures/seminars. The lectures include introduction to the various topics (described above).
Examination : Written exam containing open questions.
Compulsory elements : All seminars and lectures. Absence needs to be compensated for in agreement with the course leader. More than one day of absence cannot be compensated for.
Number of students : 8 - 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 : Von Behring lecture hall, ANA Futura, level 9

Course responsible :
Kim Blom
Department of Medicine, Huddinge

kim.blom@ki.se

Contact person :
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Title : Behavioral Analysis in Rodents: Classic and Novel Approaches

Course number : 5239
Credits : 1.5
Date : 2020-11-16 -- 2020-11-20
Language : English
Level : Doctoral level
Responsible KI department : Department of Neuroscience
Specific entry requirements :
Purpose of the course : The course is aimed at students working with or interested in behavioral analyses in rodents. The purpose of the course is (1) to give the students a solid understanding of basic behavioral tests to use for the phenotypic characterization of rodents, with special emphasis on neurodegenerative and psychiatric diseases, and (2) allow the students to acquaint themselves with modern, advanced technical procedures for behavioral analysis.
Intended learning outcomes : At the end of the course the participants should be able to (1) know how to choose appropriate rodent behavioral models to best address their specific research question, (2) interpret the results of previous studies, critically evaluate protocols and adapt them to their own research, and (3) understand the advantage offered by recent methodological breakthroughs to the analysis of behavior.
Contents of the course : The course will provide the knowledge necessary to apply advanced methodologies to the study of behavioral paradigms utilized for the phenotypic characterization of rodent models of neurodegenerative and psychiatric diseases, as well as for the evaluation of novel drugs. During the course, the students will learn how to analyze classic behavioral paradigms using state-of-the-art approaches including deep learning image analysis, optogenetics end point measurements and automated analysis of multiple behavioral outputs using the IntelliCage system. The course will include a practical part, where students will visit the Animal Behavior Core Facility at KM-B and get hands-on-experience on the equipment and the most common protocols used. The students will also learn how to design experiments, interpret and analyze data.
Teaching and learning activities : The course is partly theoretical, partly practical, with integrated lectures, laboratory demonstrations and practical sessions. During the practical sessions, the students will be divided in groups, which will be asked to design a behavioral study in a particular rodent model of disease, with data collection and final analysis.
Examination : A short answer and multiple-choice examination will be used to evaluate if the students have reached the required knowledge to successfully pass the course.
Compulsory elements : All sessions and activities are necessary for the students to successfully complete the course. When absences are justified, missed parts of the course may be compensated in agreement 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 will be held at Campus Solna, from 9:00 to 17:00 during the week-days. There will be a practical part, where students will visit the Animal Behavior Core Facility at KM-B.

Course responsible :
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Title : Lipids and Lipid-Metabolic Driven Inflammation in Cardiovascular Disease – Basic Science and Clinical Aspects

Course number : 5240
Credits : 1.5
Date : 2020-09-14 -- 2020-09-18
Language : English
Level : Doctoral level
Responsible KI department : Department of Medicine, Solna
Specific entry requirements :
Purpose of the course : This course provides the participants with the up-to-date knowledge on lipids and lipid metabolism in cardiovascular diseases, importance of lipid mediators of inflammation- resolution, analytical methods and metabolomics, emphasizing both pre-clinical research work and clinical aspects of cardiovascular diseases.
Intended learning outcomes : At the end of the course, the participant should show: - a general understanding of lipid and lipoprotein metabolism, lipid mediators of inflammation-resolution in cardiovascular diseases, the research and analytical methods used in the field and clinical aspects. - a good understanding of the pathophysiological importance of lipid metabolism and lipid mediators in cardiovascular diseases. - a clear view of potential and currently available approaches targeting lipid metabolism for preventing or treating cardiovascular diseases - an ability to apply established knowledge to discuss challenges and developments in cardiovascular research and therapeutics targeting lipid metabolism
Contents of the course : The course module will provide course participants with in-depth knowledge of specific areas of lipid metabolism, metabolomics and inflammation-resolution in cardiovascular diseases, as well as an overview of the state of the art in the area of both pre-clinical research and clinical aspects. Topics to be covered include discussion on lipids and lipoproteins, lipid metabolism, lipid mediator biosynthesis, receptors, omega-3 fatty acids, analytical methods (e.g. GC-MS and LC-MS-MS), inflammation and its resolution, therapeutics and clinical studies. Also, the participants will be encouraged and have the possibility during the course to apply these perspectives on their own projects. Critical review of contemporary key papers in the field will be performed in adjunct to lectures and seminars.
Teaching and learning activities : The course is a full-time one week course. The teaching is partly in lecture/seminar form but also includes project work with group discussions. Time will be dedicated for an individual task focusing on different aspects covered in the lectures/seminars. The task will be presented at the end of the course followed by open discussions. • Lectures • Seminars • Individual work • Debates of clinical issues • Presentation and discussion of assigned individual work
Examination : Presentation of a project selected from assigned topics based on the course seminars. Critical evaluation and discussion of the other participants presentations.
Compulsory elements : The participants must attend the seminars, critical reviews of papers and the oral exam (presentation). Absence has to be compensated for by a written assignment in agreement with the course leader within 4 weeks.
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 Monday to Friday from 9:00 – 16:00 at DNA lecture room NEO building, Flemingsberg Campus.

Course responsible :
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Title : Health Risk Assessment of Endocrine Disruptors

Course number : 5241
Credits : 1.5
Date : 2020-10-12 -- 2020-10-16
Language : English
Level : Doctoral level
Responsible KI department : The institute of Environmental Medicine
Specific entry requirements :
Purpose of the course : The purpose of the course is to give the student knowledge and understanding of molecular mechanisms and adverse effects of endocrine disruptors as well as of methodologies to study and identify such substances and to assess the health risks.
Intended learning outcomes : After the end of the course the student should be able to: - Describe molecular mechanisms and potential adverse effects of endocrine disruptors - Explain methodologies to study endocrine disruptors - Apply methodology for identification of endocrine disruptors according to EU scientific criteria and guidance - Identify and discuss challenges in health risk assessment of endocrine disruptors
Contents of the course : Endocrine disruptors are defined as an exogenous substance or mixture that alters function(s) of the endocrine system and consequently causes adverse health effects in an intact organism, or its progeny, or (sub)populations. Endocrine disruptors act via hormone receptors and by altering hormone levels and have been implicated in several endocrine-related diseases. The course will include molecular mechanisms of endocrine disruptors, from molecular initiating events to adverse effects. Methodologies for identification and analysis of the endocrine disruptors will be addressed. Identification of endocrine disruptors based on EU scientific criteria and guidance will be addressed. Attention will be given to future challenges in health risk assessment of endocrine disruptors.
Teaching and learning activities : Teaching and learning activities include lectures, exercises and group assignments.
Examination : Examination is in the form of a written examination and an oral presentation.
Compulsory elements : Participation in the exercises and group assignments is compulsory. Absence can be compensated with an individual task.
Number of students : 8 - 15
Selection of students : Selection will be based on 1) the relevance of the course syllabus for the applicant's doctoral project (according to written motivation), 2) start date of doctoral studies (priority given to earlier start date)
More information : The course will be at KI Solna campus.

Course responsible :
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Nobels väg 13

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Title : Lipid and Lipoprotein Metabolism: Basal Aspects and Clinical Significance

Course number : 5243
Credits : 1.5
Date : 2020-10-12 -- 2020-10-16
Language : English
Level : Doctoral level
Responsible KI department : Department of Medicine, Huddinge
Specific entry requirements :
Purpose of the course : The course constitutes an opportunity for the students to gradually increase their understanding of basic and clinical research in lipid metabolism during the course of a week. The purpose of the course is to provide comprehensive as well as in depth knowledge in order for the students to be able to apply established models and methods used in this field in his/her own research.
Intended learning outcomes : After the course the students will be able to describe: 1. lipid and lipoprotein metabolism 2. diseases associated with lipid metabolism and their characteristics 3. approaches available and under development for preventing or treating lipid disorders 4. models and laboratory methods used in lipid metabolism in in vivo studies
Contents of the course : Overview and new developments within the field of basic and clinical research in lipid and lipoprotein metabolism. Emphasis will be laid on cholesterol metabolism, lipoproteins, lipoprotein receptors and on the regulation of enzymes involved in metabolism of cholesterol, bile acids, fatty acids and triglycerides. Genetic diseases and effects of diet on clinical conditions such as atherosclerosis, obesity, diabetes, and gallstone disease will also be highlighted.
Teaching and learning activities : The course is comprised by lectures, group discussions and case studies.
Examination : The intended learning outcomes of the course will be assessed by a written examination on the last day of the course.
Compulsory elements : The lectures are mandatory. All information presented at the lectures is compulsory and will be a significant basis for the written examination. A missed lecture has to be compensated for by completing an essay in accordance with instructions of the organizers.
Number of students : 10 - 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 is held at the Karolinska University Hospital in Huddinge with the exact location to be announced two weeks before the course begins. The course is 40 hours in total and includes lectures, case studies, group discussions and self study during one week. The invited speakers are professors or assistant professors at KI or at universities within Sweden. The course is given in collaboration with the Master's programme in Biomedicine (the elective track of Metabolic and Cardiovascular Diseases). This course was previously given with course number 2433 (see course evaluation).

Course responsible :
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