Course catalogue for doctoral education

HT18
# Human biology or pathology * General science courses

1202 Human Cell Culture. Methods and Applications 2018-11-12 -- 2018-11-16 (English)
1363 Basic Course in Medical Statistics * 2018-11-12 -- 2018-11-23 (English)
1391 Writing science and information literacy * 2018-12-03 -- 2018-12-14 (English)
1472 Infections in the tropics 2018-10-17 -- 2018-12-14 (English)
1496 Flow cytometry: from theory to application 2018-09-24 -- 2018-09-28 (English)
1559 Experimental techniques in study of metabolic and endocrine disorders 2018-11-26 -- 2018-11-30 (English)
1579 Biostatistics I: Introduction for epidemiologists * 2018-09-17 -- 2018-10-08 (English)
1594 Tumor immunology and immune therapy of cancer 2018-11-19 -- 2018-11-23 (English)
1595 Molecular Immunology 2018-10-29 -- 2018-11-09 (English)
1622 Epidemiology II. Design of epidemiological studies 2018-12-03 -- 2018-12-12 (English)
1635 Basic course in tumor biology and oncology 2018-09-03 -- 2018-09-14 (English)
1678 The Global Diabetes Epidemic 2018-11-12 -- 2018-11-23 (English)
1710 Endothelial cell function and its relevance in cardiovascular disease 2018-11-05 -- 2018-11-09 (English)
1814 Metoder for kvalitativ innehålsanalys 2018-10-02 -- 2018-11-28 (Swedish)
1846 Improving drug use, especially antibiotics 2018-09-12 -- 2018-09-19 (English)
1999 Embryology I 2018-10-08 -- 2018-10-12 (English)
2001 What is life? The future of biology. 2018-09-12 -- 2018-12-18 (English)
2044 Pathology # 2018-10-15 -- 2018-10-26 (English)
2132 Forskningsetik * 2018-09-11 -- 2018-10-02 (Swedish)
2144 To communicate science in different contexts * 2018-08-20 -- 2018-09-04 (English)
2176 Cellular and molecular infection biology 2018-11-26 -- 2018-12-07 (English)
2219 Bioinformatics for cell biologists * 2018-09-24 -- 2018-09-28 (English)
2302 Basic immunology 2018-09-24 -- 2018-10-26 (English)
2348 Functional Fluorescence Microscopy Imaging (ffAMI) in biomedical research 2018-11-19 -- 2018-11-30 (English)
2363 Antigen presentation and T cell activation 2018-11-26 -- 2018-11-30 (English)
2418 Methods in molecular biology and their applications in medical research 2018-09-03 -- 2018-09-14 (English)
2434 Teaching and Learning in Higher Education: educational course for doctoral students * 2018-10-01 -- 2018-10-26 (English)
2522 Mass spectrometry-based proteomics: When and How. 2018-10-08 -- 2018-10-19 (English)
2523 Omics data analysis: From quantitative data to biological information 2018-11-05 -- 2018-11-16 (English)
2532 Multifactorial immune mediated diseases - etiology and pathogenesis 2018-10-01 -- 2018-10-05 (English)
2561 Writing science and information literacy * 2018-08-27 -- 2018-10-19 (English)
2600 Neurogenetics 2018-10-01 -- 2018-10-05 (English)
2608 Mechanisms of Gene Regulation in Metabolism 2018-10-18 -- 2018-10-24 (English)
2609 Basic Course in Medical Statistics - a distance course * 2018-10-01 -- 2018-10-12 (English)
2609 Basic Course in Medical Statistics - a distance course * 2018-11-26 -- 2018-12-07 (English)
2616 Frontiers in Cognitive Neuroscience 2018-09-24 -- 2018-09-28 (English)
2618 Write your research results and get them published * 2018-10-22 -- 2018-11-02 (English)
2618 Write your research results and get them published * 2018-10-01 -- 2018-10-12 (English)
2618 Write your research results and get them published * 2018-12-03 -- 2018-12-14 (English)
2618 Write your research results and get them published * 2018-09-10 -- 2018-09-21 (English)
2624 Brain circuits 2018-09-17 -- 2018-09-21 (English)
2629 Neurodegenerative disorders I - From molecule to treatment 2018-10-08 -- 2018-10-12 (English)
2630 Neurodegenerative disorders II - cellular and molecular mechanisms 2018-10-15 -- 2018-10-19 (English)
2671 Tumor microenvironment 2018-11-12 -- 2018-11-16 (English)
2674 Practical approaches to qualitative research - based on blended learning 2018-08-27 -- 2018-11-16 (English)
2690 Basic Laboratory Safety * 2018-10-01 -- 2018-10-08 (English)
2705 Basic inflammation 2018-09-17 -- 2018-10-10 (English)
2711 Social determinants of health 2018-12-03 -- 2018-12-14 (English)
2716 Breast Cancer: Research and treatment 2018-09-17 -- 2018-09-21 (English)
2738 Intermediate Medical Statistics: Regression models * 2018-10-15 -- 2018-10-26 (English)
2780 The developing brain 2018-09-03 -- 2018-09-07 (English)
2787 Present your research! * 2018-12-17 -- 2018-12-21 (English)
2787 Present your research! * 2018-10-15 -- 2018-10-19 (English)
2787 Present your research! * 2018-11-26 -- 2018-11-30 (English)
2787 Present your research! * 2018-09-03 -- 2018-09-07 (English)
2787 Present your research! * 2018-09-24 -- 2018-09-28 (English)
2790 How to conduct systematic reviews and meta-analyses 2018-10-01 -- 2018-10-17 (English)
2796 Introduction to Stata for epidemiologists 2018-09-13 -- 2018-09-14 (English)
2797 Biostatistics II: Logistic regression for epidemiologists * 2018-09-17 -- 2018-09-28 (English)
2798 Applied longitudinal data analysis 2018-10-02 -- 2018-10-10 (English)
2827 Människans Fysiologi - en översikt # 2018-12-12 -- 2019-01-11 (Swedish)
2861 Biomedical Ecology - The microbiota in health and disease 2018-09-17 -- 2018-09-21 (English)
2868 Advanced course in SAS programming for health care data 2018-11-26 -- 2018-11-30 (English)
2873 Kvalitetssäkring av klinisk forskning * 2018-10-08 -- 2018-10-12 (Swedish)
2873 Quality assurance of clinical research * 2018-10-22 -- 2018-10-26 (English)
2917 Pragmatic randomised controlled trials in healthcare 2018-10-22 -- 2018-12-03 (English)
2933 Health risk assessment of reproductive toxicity and endocrine disruptors 2018-09-24 -- 2018-09-28 (English)
2934 Endocrine disruptors-molecular mechanisms and adverse effects 2018-09-17 -- 2018-09-21 (English)
2942 The epigenome: a platform for the integration of metabolic and signaling pathways in development and on
the path to diseases 2018-09-24 -- 2018-09-28 (English)
2964 Medical research ethics * 2018-09-03 -- 2018-09-07 (English)
2964 Medical research ethics * 2018-12-03 -- 2018-12-07 (English)
2964 Medical research ethics * 2018-11-05 -- 2018-11-09 (English)
2964 Medicinsk forskningsetik * 2018-10-01 -- 2018-10-05 (Swedish)
2971 Introduction to R - data management, analysis and graphical presentation 2018-11-07 -- 2018-12-10
(English)
2979 The future of medicine: the role of "chance" in development, evolutionary adaptation and diseases 2018-10-
29 -- 2018-11-02 (English)
2980 Study design in clinical research 2018-11-05 -- 2018-11-23 (English)
2981 Rare disease genomics 2018-11-19 -- 2018-11-23 (English)
2983 Hypertension 2018-11-22 -- 2018-12-06 (English)
2990 Multivariate prediction modelling with applications in precision medicine 2018-11-19 -- 2018-11-23 (English)
2992 Biostatistics III: Survival analysis for epidemiologists * 2018-11-05 -- 2018-11-14 (English)
2993 Ischemic heart disease 2018-10-22 -- 2018-10-24 (English)
2994 Functional Neuroanatomy 2018-09-10 -- 2018-09-14 (English)
2996 Anaesthesia, analgesia and surgery (mice and rats) 2018-11-05 -- 2018-11-09 (English)
3024 Advanced cancer biology 2018-08-28 -- 2018-12-18 (English)
3031 Introduction to teaching * 2018-09-25 -- 2018-10-25 (English)
3061 Summer school in chronic inflammation 2018-08-19 -- 2018-08-25 (English)
3063 Register-based research - Pharmacoepidemiology: drug use and safety 2018-11-26 -- 2019-03-08 (English)
3064 Imaging in neuroscience: with a focus on structural MRI methods 2018-11-26 -- 2018-11-30 (English)
3066 Metoder för systematisk litteraturöversikt 2018-09-17 -- 2018-12-07 (Swedish)
3067 Immunogenicity: Immune responses against biological drugs 2018-12-10 -- 2018-12-14 (English)
3068 Basics of qualitative research 2018-09-24 -- 2018-10-05 (English)
3069 Global Sexual and Reproductive Health: Basic Concepts and State of the Art 2018-10-08 -- 2018-11-09
(English)
3070 Mucosal Immunology 2018-10-02 -- 2018-10-11 (English)
3071 Cardiovascular physiology and pathology 2018-11-19 -- 2018-11-30 (English)
3072 Tissue-specific immunology 2018-11-19 -- 2018-11-23 (English)
3073 Philosophy of science and the concept of health * 2018-11-12 -- 2018-11-23 (English)
3074 Behavioral phenotyping and cognitive studies in rodents 2018-10-22 -- 2018-10-26 (English)
3075 Computational toxicology - methods and applications 2018-11-19 -- 2018-11-23 (English)
3076 Cancer Cell Metabolism 2018-11-05 -- 2018-11-09 (English)
3077 An introduction to genetic and molecular epidemiology 2018-10-15 -- 2018-10-19 (English)
3078 Epidemiology I: Introduction to epidemiology 2018-10-22 -- 2018-10-31 (English)
3079 Nanoscale materials and device engineering against infections and antimicrobial resistance 2018-10-15 --
2018-10-19 (English)
3080 Gene Regulation in the Early Human Embryo 2018-09-17 -- 2018-09-21 (English)
3081 Medical developmental biology 2018-08-27 -- 2018-08-31 (English)
3082 Registry-based stroke research 2018-11-26 -- 2018-11-30 (English)
3085 Philosophy of science and research ethics, statistics, presentation techniques and information literacy *
2018-09-10 -- 2018-10-15 (English)
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) date for registration as a doctoral student (priority given to earlier registration date)

More information:

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Contact person:
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Title: Basic Course in Medical Statistics

Course number: 1383
Credits: 3.0
Date: 2018-11-12 -- 2018-11-23
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. 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 are: November 12, 13, 15, 19, 21, 23.

Course responsible:
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Title: Writing science and information literacy

Course number: 1391
Credits: 3.0
Date: 2018-12-03 -- 2018-12-14
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.
- and be able 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, Evaluating published science.

Teaching and learning activities: This is a KI CAMPUS course (there is also a 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 a grant application (including references) with popular science summary and rewriting based on peer and teacher feedback. There are also three assignments in which participants demonstrate development of their information literacy.

Compulsory elements: The course writing assignment is obligatory and has to be submitted about 10 days BEFORE course start. 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. There are three obligatory assignments in relation to information literacy development.

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) date for registration as a doctoral student (priority given to earlier registration date)

More information:

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Title: Writing science and information literacy

Course number: 1391
Credits: 3.0
Date: 2018-11-05 -- 2018-11-16
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.
- and be able 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, 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 a grant application (including references) with popular science summary and rewriting based on peer and teacher feedback. There are also three assignments in which participants demonstrate development of their information literacy.

Compulsory elements: The course writing assignment is obligatory and has to be submitted about 10 days BEFORE course start. 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. There are three obligatory assignments in relation to information literacy development.

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) date for registration as a doctoral student (priority given to earlier registration date)

More information:

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Title: Infections in the tropics

Course number: 1472
Credits: 7.5
Date: 2018-10-17 -- 2018-12-14
Language: English
Level: Doctoral level
Responsible KI department: Department of Medicine, Solna
Specific entry requirements:

Purpose of the course: The aim of the course is to observe and understand the challenges of infections to society and healthcare in tropical countries. This course will be held in Sweden and an African country (Ghana or Ethiopia) and will include lectures on infections that can be found in the tropics as well as site visits to hospitals for lectures on the problems faced by both staff and patients affected by infections. This course would benefit students in the fields of infection biology and global health.

Intended learning outcomes: To understand the conditions under which the major infectious diseases in the tropics arise and how they are prevented/treated locally. To understand the conditions for biomedical research in a low income country from within and to be able to account for some of the current local research issues. To be able to discuss these issues with health care professionals and researchers from low income countries in a satisfactory way.

Contents of the course: Field studies under local staff in low income country and Swedish supervision at the primary, secondary and tertiary health care level. Study visit to an In Depth Study Site and understand its layout and importance. Joint seminars (mutual presentations of research projects) at local research institute. Students will present their findings of elective projects at the end of the course.

Teaching and learning activities: Bedside and benchside teachings at hospitals and polyclinics/health care centers. Seminars. Elective work with oral and written presentations. Field studies will take place in a low income country.

Examination: Formative assessment of ability to discuss the specific issues encountered with health care professionals and researchers. Presentation of elective projects to Swedish faculty. Every student will be examined individually.

Compulsory elements: Field studies, joint seminars at local research institute, presentation of elective projects. Absence cannot be compensated for.

Number of students: 8 - 9
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). An active interest in the culture and living conditions of a democratic low income country in West Africa is expected.

More information: This course starts with some general lectures pertaining to Infections in the Tropics and comprising the most important vectorborne, airborne, water/food borne and bloodborne infections and the conditions favouring their spread and means available for their control. These lectures are held after office hours i.e. 1730-1900 at the Department of Infectious diseases, Karolinska University Hospital, Solna tentatively Oct 17, 24, 31, Nov 7 and 14. One concluding session is devoted to assign small elective projects to be done by 1-2 students during the field session in Ghana, which takes place 19/11-9/12. The clinical assignments in Ghana will be at the district hospital in HoHoe, Volta region and the Primary Health Station and leprosy hospital in Ankaful, Cape Coast, respectively. We will also do study visits to the mental hospital and prison in Ankaful. There will be a possibility for each student to spend one evening/night in a fisherman's house in Brenu, Cape Coast, in order to better understand the role of the living conditions for the health of the local people. There will be a one day session at the Noguchi Institute for Medical research in Accra where there will be joint presentations of Ghanaian and Swedish PhD Projects in the presence of Ghanaian and Swedish Faculty and students. During the final week back in Stockholm (week 50) the elective projects are reported and a final written/oral exam is held. The course ends latest Dec 14th, 2018. Thus, the full time part of the course is between Nov 19- Dec 14th, 2018 (i.e. weeks 47, 48, 49 and 50) whilst the initial lectures before this takes part once a week after office hours as stated above. International and local travel and basic hotel accommodation will be covered by course grants whilst food and expenses for leisure activities (National Parks etc.) will be covered by the students. Approximate costs for the latter would be around 400 USD.

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Contact person:
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Title: Flow cytometry: from theory to application

Course number: 1496
Credits: 1.5
Date: 2018-09-24 -- 2018-09-28
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 safety procedures and instrument maintenance. b) Basic skills: flow cytometric protocol design; sample handling and storage; data processing and analysis, and data presentation. c) Major applications of flow cytometry in biomedical research: leukocyte phenotyping, endothelial cell analysis, stem cell analysis, apoptosis, platelet measurement, cell function analysis (including membrane potential, oxidative metabolism, intracellular calcium mobilization, pH, and intracellular organelles), as well as nucleic acid analysis.

Teaching and learning activities: The course includes 28 hr lectures and 12 hr hands-on lab work. 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 safety procedures and instrument maintenance. b) Basic skills: flow cytometric protocol design; sample handling and storage; data processing and analysis, and data presentation. c) Major applications of flow cytometry in biomedical research: leukocyte phenotyping, endothelial cell analysis, stem cell analysis, apoptosis, platelet measurement, cell function analysis (including membrane potential, oxidative metabolism, intracellular calcium mobilization, pH, and intracellular organelles), as well as nucleic acid analysis.

Examination: The exam will consist 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: This course is organised jointly by the doctoral programmes Cardiovascular Research (CVR) and Allergy Immunology and Inflammation (AII), see: https://ki.se/en/staff/doctoral-programmes. The course held during week 39 (Sept 24 -28, 2018; 9:00-16:30). Lecture hall booked: Block salen, T4:00 at Karolinska University Hospital-Solna. Lectures will be given by 14-15 lecturers, usually half of them from institutions outside KI, with one or two 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 18 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).

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

Course number: 1559
Credits: 1.5
Date: 2018-11-26 -- 2018-11-30
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) date for registration as a doctoral student (priority given to earlier registration date).

More information: KI Solna campus.

Course responsible:
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Contact person:
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 phenomenon 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 will be 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 (priority given to earlier registration date). 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 Stata software 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 17, 19, 21, 24 and 26 (week 1) and September 28, October 1, 3, 5 and 8 (week 2). The individual examination will be performed as an in-class examination the last course day of each week. Dates for re-examination: October 17 (for week 1), October 24 (for week 2).

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

Course number: 1594  
Credits: 1.5  
Date: 2018-11-19 -- 2018-11-23  
Language: English  
Level: Doctoral level  
Responsible KI department: Department of Oncology-Pathology  
Specific entry requirements:  
Purpose of the course: The purpose of the course is to deepen the knowledge in the field of tumor immunology. More specifically, to understand how the immune system is regulated in cancer and how this knowledge can be used to treat patients with cancer.  
Intended learning outcomes: After the course is completed the students will be able to (1) explain important aspects of tumor immunology, (2) indicate advantages and disadvantages of different immune therapy strategies, (3) explain mechanisms of immune escape, 4) hypothesize how different immune-based regimens may affect clinical outcome in patients with cancer.  
Contents of the course: This course covers basic and applied immunology and a current review of experimental research and clinical application of tumor immunology. Both pre-clinical and clinical aspects of cancer vaccination, adoptive cell therapy, and antibody therapy will be discussed. Development of novel therapies through modification of immune cell subsets will be presented. Features of the tumor microenvironment, cancer-associated inflammation, immune surveillance and escape, and immunosuppression will also be discussed. Planning, performing, and monitoring of clinical trials are included in the course as well. One to two days are dedicated to lectures by invited international experts from the field.  
Teaching and learning activities: Lectures, seminars, group discussions and case-studies.  
Examination: Oral group presentation and individual assignment based on case-studies. Every student will be individually assessed.  
Compulsory elements: All lectures and teaching activities are mandatory. Absence from mandatory parts of the course will have to be compensated by other relevant activities after discussion with the course leaders.  
Number of students: 15 - 35  
Selection of students: Selection will be based on 1) the relevance of the course syllabus for the applicant's doctoral project (according to written motivation), 2) date for registration as a doctoral student (priority given to earlier registration date)  
More information:  

Course responsible:  
Rolf Kiessling  
Department of Oncology-Pathology  
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Contact person:  
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Yago Pico de Coaña  
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Title: Molecular Immunology

Course number: 1595
Credits: 3.0
Date: 2018-10-29 -- 2018-11-09
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's own research to cutting edge developments in the other areas of immunology research.

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

Number of students: 8 - 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 will be held Monday-Friday at Biomedicum Solna Campus. Lectures will begin at 9 am and end on most days at 2 pm. Lecturers will be invited from research institutes around the world.

Course responsible:
Benedict Chambers
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Contact person:
Jonathan Coquet
Institutionen för mikrobiologi, tumör- och cellbiologi
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Title : Epidemiology II. Design of epidemiological studies

Course number : 1622
Credits : 1.5
Date : 2018-12-03 -- 2018-12-12
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 motivation), 2) date for registration as a doctoral student (priority given to earlier registration date). 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 Stata software is strongly recommended.

More information : Course dates are December 3, 5, 7, 10 and 12. The course is extended over time, but is still five full course days in order to promote reflection and reinforce learning. The individual examination will be performed as a takehome examination.

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

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

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

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

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

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

Number of students: 20 - 25

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

More information:

Course responsible:
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Contact person:
Daria Glaessgen
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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 - 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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Contact person:
Sergiu-Bogdan Catrina
Institutionen för molekylär medicin och kirurgi

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Title: Endothelial cell function and its relevance in cardiovascular disease

Course number: 1710
Credits: 1.5
Date: 2018-11-05 -- 2018-11-09
Language: English
Level: Doctoral level
Responsible KI department: Department of Medicine, Solna

Specific entry requirements:

Purpose of the course: 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) a presentation of a research project, which should be designed at least partially using the knowledge from the course lectures and experimental methods from the lab demonstration.

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 get approval of the course.

Number of students: 8 - 20
Selection of students: Selection will be based on: 1) field of study (priority given to cardiovascular, metabolic and inflammatory disease fields) 2) PhD registration date (priority given to earlier registration date) 3) written motivation to attend the course

More information:

Course responsible:
Jiangning Yang
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Contact person:
Jiangning Yang
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Title : Metoder för kvalitativ innehållsanalys

Course number : 1814
Credits : 4.5
Date : 2018-10-02 -- 2018-11-28
Language : Swedish
Level : Forskarnivå

Purpose of the course : Kursen syftar till att ge en utveckling av färdigheterna i innehållsanalys som teknik och metod samt metodens bredd och användning i kvalitativ forskning på längre sikt.


Contents of the course : Utveckling från en kvantitativ till en kvalitativ tradition av innehållsanalys Design och val av analys Olika beståndsdelar i analysen Applicering och kritisk granskning

Teaching and learning activities : Kursen innehåller föreläsningar, seminarier och individuella uppgifter. Studenterna kommer att i projektarbeten under hela kursen, med stöd från föreläsningar och individuella litteraturuppgifter, applicera innehållsanalys i sin egen forskning och kritiskt reflektera på tillämpningen.

Examination : Studenterna kommer att i sina projektarbeten, i slutet av kursen, demonstrera kunskap och förståelse av innehållsanalys genom att lämna in en skriftlig rapport innehållande praktisering av analysen i förhållande till lärandemålen.

Compulsory elements : Kursen i sin helhet kräver aktivt deltagande av studenterna genom att medverka i olika typer av lärandeformer.

Number of students : 10 - 20
Selection of students : Urvalet baseras på 1) kursplanens relevans för den sökandes doktorandprojekt (enligt motivering), 2) datum för doktorandregistrering (där tidigare registreringsdatum har förtur).

More information : Kurstillfällen 2-3 oktober, 23-24 oktober samt 27-28 november. <br>The course is given in English if necessary.

Course responsible :
Ann Rudman
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Contact person :
Maria Jirwe
Institutionen för neurobiologi, vårdvetenskap och samhälle

Maria.Jirwe@ki.se
Title: Improving drug use, especially antibiotics

Course number: 1846
Credits: 1.5
Date: 2018-09-12 -- 2018-09-19
Language: English
Level: Doctoral level
Responsible KI department: Department of Public Health Sciences

Purpose of the course: This course will help participants to understand, discuss and apply key concepts on medicine use, especially antibiotics, and antibiotic resistance from a global health perspective. In addition, participants will have opportunities to further develop their skills for communicating science and networking in multicultural and multidisciplinary contexts.

Intended learning outcomes: At the end of the course students will be able to:
- appraise that medicinal drugs are one of the main technologies used within the health care system and are also widely used for self-medication/home treatment
- analyse factors affecting antibiotic use and resistance, both on macro- and micro-level and its impact on global health
- evaluate different methods to improve use of medicines, and in particular antibiotics

Contents of the course: -Sources to describe drug utilisation will be presented, together with possibilities and difficulties to collect appropriate data to show the level of medicine use in a given population. -Methods to estimate the level of self-medication and people's beliefs and behaviour will also be shown and discussed. The use of antibiotics will be used as an example as infections are one of the leading causes of morbidity worldwide. Furthermore, the use of antibiotics carries a special problem, in that resistance affects not only previously treated persons but also previously untreated persons and may spread throughout the world. Antibiotic resistance has been recognized as a threat to public health in all countries, by both WHO and EU. -Examples of antibiotic use from countries of different income level and from different parts of the health system will be presented and discussed. In addition factors affecting medicine use, both on macro- and micro-level will be mapped out and discussed. The case of Europe will be presented, where it has been shown that antibiotic use is very different between neighbouring countries which indicates that other factors besides strict medical factors play an important role. -Decisions to use medicines are taken in homes, pharmacies or other drug outlets, within primary health care as well as in hospitals. The concept of rational use of medicines includes correct use of good quality medicines at an affordable cost. -Methods to improve use of medicines, and in particular antibiotics, will be presented, including the role of guidelines and various kinds of information or educational interventions directed to health care professionals, patients or the public. Ways of evaluating such interventions will be presented and discussed.

Teaching and learning activities: This blended-learning course will be held using the learning platforms Ping Pong and Adobe Connect. Learning activities include synchronous (i.e real-time, on campus) and asynchronous (video recorded, on-line) lectures, seminars and group work. The course is extend over 2-3 weeks but is equivalent to one week full-time.

Examination: A written individual assignment and presentation of group work. Each student will be individually assessed.

Compulsory elements: It is compulsory to attend all the synchronous lectures and to participate in online discussion forums. Absence will have to be compensated by extra individual assignments provided by the course organizers.

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 will be held September 12-14 and September 18-19, room Sterky, Widerströmska huset, Tomtebodavägen 18A, floor 4. It is a full-time course between 9-17.

Course responsible:
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Jaran Eriksen
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Title: Embryology I

Course number: 1999
Credits: 1.5
Date: 2018-10-08 -- 2018-10-12
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:

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

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


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

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

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

Number of students: 8 – 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: The course will be held at Karolinska Institutet, Department of Biosience and Nutrition, Novum Huddinge.

Course responsible:
Jose Inzunza
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Stockholm

Contact person:
Title: What is life? The future of biology.

Course number: 2001  
Credits: 2.3  
Date: 2018-09-12 -- 2018-12-18  
Language: English  
Level: Doctoral level  
Responsible KI department: Department of Microbiology, Tumor and Cell Biology  

Specific entry requirements:  

Purpose of the course: This course should be chosen by those curious of where biomedicine will take us next. What are the possibilities and challenges with new high through put technologies? How accessible to research are complex systems like cells, organisms or brains? The students will also acquire an understanding of the conceptual and technical challenges in future biomedicine and advance their ability to ask scientific questions and identify significant - and possible - areas for problem solving. You will be involved in advanced reasoning on issues at the borderline of knowledge.

Intended learning outcomes: After the course students shall be able to discuss: 1. Theories about complexity of biological systems 2. How biocomplexity can be studied. 3. The role of computational simulations in modern biology. How simulations can be done and what the predictive power is. How mathematics can be used in simulating biological phenomena. 4. How one understands the organisational principles of biological systems. If self-organisation is a field for study or just a trivial phenomenon. 5. How evolutionary theory can be formalised into mathematical models. 6. If quantum mechanical theory can have a role in molecular biology. 7. How genetic information can be converted to mechanical or electrical force in biological system.

Contents of the course: Inspired by the seminal book by Erwin Schrödinger "What is life?" published close to 75 years ago we will adress this question again, in view of the impressive development since then. There are many new concepts to consider in the future of biology, such as the consequences of the -omics era, complexity, computation and simulation, as well as the role of mathematics and physics in biological theory. The course will cover areas such as biocomplexity, quantum mechanical theory in biology, computation and simulation (in silico biology), organization of biological systems, causality in biology, how does chemistry become electric and magnetic forces and evolutionary theory in the light of molecular biology. Leading scientists with an overview perspective will be invited to discuss in the seminar form the challenges that meet us today in biology, as a result of the --omics era, the availability of large amounts of data as a result of high through-put techniques, and the possibilities provided by mathematics, simulation theory and computational biology. Young scientists in this areas are also invited to lecture from their perspective.

Teaching and learning activities: One-two seminars + workshops every month for five months. Every occasion consists of a 1-2 hour seminar with the invited expert, followed by a two hour workshop of basic concepts, i.e. 3-4 hours on each occasion. For each seminar the students will usually be given one article on the topic to read. Active participation in discussions in groups with invited speaker of high international standards is a key element. Some lectures are shown as recorded DVD-lectures. You also receive DVD-recordings of all lectures for further self studies at home.

Examination: Formatively during the workshop discussions. Summatively by a written individual home-exam (essay) covering the intended learning outcomes of the course.

Compulsory elements: The seminars and workshops are compulsory. Absence has to be compensated by an extra assignment after discussion with the course leader.

Number of students: 8 - 22  
Selection of students: Selection of participants based on 1) relevance of the course for project plan of the applicant, 2) personal motivation for taking this course and 3) date of registration (earlier date gets slot first).

More information: Lectures open to all at 15.00 usually on Mondays-Thursdays, two times/month. Lectures followed by discussion with the participants for 1-2 hours. In lecture halls of KI Campus Solna, usually Wallenberg lecture hall of Nobel Forum. Invited national or international speakers. Some lectures recorded from earlier courses only for participants, takes place in seminar room of Biomedicum. Attendance of six lectures required.

Course responsible:  
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Contact person: -
Title : Pathology

Course number : 2044
Credits : 3.0
Date : 2018-10-15 -- 2018-10-26
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 : 16 - 30
Selection of students : Selection will be based on 1) documented knowledge in areas such as human tissue biology, cell biology or physiology (this kind of knowledge is a prerequisite to be able to benefit from the course). Those who already have studied pathology earlier (for example medical doctors) are not prioritized. 2) Date of admission to doctoral studies (those who have been admitted longest time ago have priority).

More information:

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Forskningsetik

Course number : 2132
Credits : 1.5
Date : 2018-09-11 -- 2018-10-02
Language : Swedish
Level : Forskarnivå
Responsible KI department : Department for Clinical Science, Intervention and Technology

Specific entry requirements:

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


Förståelse för vilken roll forskarens egen hederlighet och integritet har


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

Examination: Vi bedömer att lärandemålen för kursen är uppnådda genom examination som består av fyra delkomponenter: i) formativ och summativ bedömning i samband med aktivt deltagande i seminarier, ii) en muntlig presentation av etiska dilemman i egen eller aktuellt forskningsområde, iii) ett skriftligt PM där synpunkter från opponer på den muntliga presentationen inarbetsats, och iv) opponering på annan students presentation av etiska dilemman i forskning. Godkänd kurs innebär att det framgått 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: 15 - 20

Selection of students: Urvalet baseras på 1) kursplanens relevans för den sökandes doktorandprojekt (enligt motivering), 2) datum för doktorandregistrering (där tidigare registreringsdatum har förtur) 


Course responsible:
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Contact person:
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To communicate science in different contexts

Course number: 2144
Credits: 3.0
Date: 2018-08-20 -- 2018-09-04
Language: English
Level: Doctoral level
Responsible KI department: Department of Learning, Informatics, Management and Ethics

Purpose of the course: The course aims are orally presentation of own research adapted to different groups and reflection on presentation skills and ability.

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. Reflect on presentation skills and 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, Overhead-projector, PowerPoint, 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 and receive feedback on content, presentation skills and adaptation towards target group.

Examination: The assessment consists of two different tasks: 1. Reflective statement based in experience, feedback and research/literature within communication and learning. 1. Oral presentation in a popular scientific context supported by PowerPoint or similar. 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 in a scientific context and observe and give feedback to an oral presentation made by a peer. Absence from the compulsory sessions or assessment seminar can be compensated through supplementary activity.

Number of students: 20 - 30
Selection of students: The selection for this basic general science course will be based on your admission date to doctoral education (priority given to earlier registration date). Please make sure that you have entered the correct registration date for doctoral education in your personal profile.

More information: This is a two-week course which requires time for independent work outside of scheduled class time. Scheduled class room sessions are on the following dates: 20-21 August, 27-28 August and 3-4 September. The course is given in ENGLISH.

Course responsible:
Cormac Mcgrath
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Contact person:
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Title: Cellular and molecular infection biology

Course number: 2176
Credits: 3.0
Date: 2018-11-26 -- 2018-12-07
Language: English
Level: Doctoral level
Responsible KI department: Department of Neuroscience

Specific entry requirements:

Purpose of the course: This course is given to show students how to take inspiration from several different disciplines and techniques and apply it to their own infection biology research. Students will be given examples of cutting edge technologies and how they are applied across a broad range of infection biology fields and encouraged to think about how these techniques can be translated to new applications. The course will also teach participants to critically appraise oral presentations and to think on the spot to ask and answer questions.

Intended learning outcomes: After the course the students will have an overview of the various aspects of microbial infections with bacteria, viruses and parasites. The students will have knowledge on the level of current understanding of the cellular and molecular mechanisms used by pathogenic microbes, since the course will provide "state-of-the-art-level" presentations in selected aspects of a host-pathogen interaction. The students will be able to give examples of interdisciplinary studies in the research field of microbe-host interactions, many lectures focus on interdisciplinary themes such as microbe-cell interactions, microbial manipulation of host inflammatory responses, pathogen transmission and novel techniques to study microbe-host interactions. Analytical and critical thinking will be encouraged by the course design. The students will also have an improved capability for scientific discussions, since the course provides the possibility to interactive discussions with invited teachers, who will attend the student presentation. After the course the students will have a more holistic picture of infection biology, and hopefully they will be encouraged to apply such new information for the benefit of their further graduate training and even get significant input for their own research.

Contents of the course: Microbial pathogenesis, the interplay between microbes and various host responses and transmission of pathogens

Teaching and learning activities: The course consists of lectures by in-house and invited speakers on various topics in the discipline of cellular and molecular infection biology. Presentations will cover basic aspects of the research topic that will provide the students with a foundation in the subject. In addition, the more advanced part of the lecture will present state-of-the-art research. Groups of students will prepare a seminar and another group will act as opponents to critically analyse the presentations. The students will subsequently participate in interactive student-driven discussions which includes the invited teacher.

Examination: The students will be assigned a series of questions based on topics that have been discussed during the course in a written examination.

Compulsory elements: The compulsory parts of the course are preparation and attendance of the lectures and the student group presentations. If the students cannot attend a lecture they should write a summary based on the course literature for this lecture. There will be a written examination at the end where the students should discuss a given problem within microbial pathogenesis and microbe-host interactions.

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 will be run this year as half-days of lectures with take-home reading and group work for the afternoons. National and international speakers from the field of Infection Biology will be invited.

Course responsible:
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Keira Melican
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Title: Bioinformatics for cell biologists

Course number: 2219  
Credits: 1.5  
Date: 2018-09-24 -- 2018-09-28  
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 exercises and discussions bridge sequence analysis to cellular function.  

Teaching and learning activities: The learning activities on the course consist of lectures and practical computer exercises. 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 exercises. Summative oral examination in conjunction with the presentation of individual student projects.  

Compulsory elements: The computer exercises are obligatory. Absence from the obligatory moments is compensated according to the instructions of the course director.  

Number of students: 12 - 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) date for registration as a doctoral student (priority given to earlier registration date)  

More information: The course is given as practical and theoretical course in basic cell biology oriented bioinformatics. The course is organized full time at Karolinska Institutet Solna campus. All course participants must bring their own laptop for the course practicalities with the following software pre-installed (or at least downloaded): Python, PyCharm, Java8, R and R studio. Links to all programs will be provided. Note that we will have very limited time to solve the installation problems. The focus will be on the following topics: Introduction to the sequencing techniques and samples preparation for the sequencing. Programming languages: VBA, Python, R with no prior knowledge of programming required. In the part 2 we will practice: alignments, variant calling, RNA-seq data analysis, making sense of gene lists. The main teachers will be Dr. Leonid Bystrykh and Dr. Victor Guryev from the University of Groningen, along with faculty from KI (Edyta Wójtowicz and Allegra Lord).  

Course responsible:  
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Stockholm
Title: Basic immunology

Course number: 2302
Credits: 3.0
Date: 2018-09-24 -- 2018-10-26
Language: English
Level: Doctoral level
Responsible KI department: Department of Medicine, Solna

Specific entry requirements:

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

Intended learning outcomes: To be able to understand basic principles of innate and adaptive immunity and how different components of the immune system cooperate. To be able to relate, compare and understand experimental aspects of immune-related diseases in a clinical perspective. To be able to apply knowledge gained on the function of the immune system to analyze and discuss an immunological/clinical case (group project). To be able to present the group project and discuss the results as well as work in pairs with clinical cases.

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: The course is given during two weeks separated into two parts. 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. Course literature (Abbas) is handed out at the course start. An immunological quiz is connected to the different chapters in the book, 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 organizers during the oral presentations of the work. At this occasion special attention is given to all students’ active participation and contributions to the discussions. The individual written assignment is evaluated by the course organizers and, with respect to proposing new research ideas related to the students´ own PhD projects, by their own supervisors.

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

Number of students: 12 - 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) 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 24th to 26th (Monday to Wednesday) and October 24th to 26th (Wednesday to Friday). 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 27th or 28th of September (Thursday or Friday, respectively), so students are expected to have time to devote to the course outside the official lecture days. The course location is at the Center for Molecular Medicine (CMM), Karolinska University Hospital, Solna.

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

Course number: 2348
Credits: 3.0
Date: 2018-11-19 -- 2018-11-30
Language: English
Level: Doctoral level
Responsible KI department: Department of Clinical Neuroscience

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 build up 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, L5:02, 020a. Lectures are conducted in the seminar room at the Center for Molecular Medicine (CMM), Solna, L8:01, 021.
Contact person:
Title: Antigen presentation and T cell activation

Course number: 2363
Credits: 1.5
Date: 2018-11-26 -- 2018-11-30
Language: English
Level: Doctoral level
Responsible KI department: Department of Oncology-Pathology
Specific entry requirements: Basic immunology course, or otherwise have attained the same level of previous knowledge.

Purpose of the course: This course will provide a cutting edge overview of antigen presentation and T cell activation. This course is suitable for PhD students with basic immunology knowledge who want to deepen their knowledge in important aspects of various lymphocyte subsets biology.

Intended learning outcomes: By completing this course the students will be able to account for different types of antigen capture and processing, antigen presentation pathways (MHC class I and II), the MR1 and CD1 system, peptide/lipid/glycolipid presentation as well as T-cell subsets and invariant lymphocytes. The students will be able to demonstrate that they have acquired the required knowledge about T lymphocyte recognition of antigen-presentation with strong focus on lymphocyte and target cell. The students will also be able to demonstrate that they have acquired the required knowledge about T-cell activation and the effects of this in steady state or disease as well as in cell therapy.

Contents of the course: The following will be covered during the course: Antigen capture (including endocytosis, phagocytosis) and some immune evasion strategies related to this. This will be followed by a thorough walk-through of the antigen presentation pathways, both MHC class I and II, and upstream and downstream TCR activation, as well as 2nd signal, and 3rd signal (cytokine) induced T cell activation. The CD1 system, presentation of lipids, glycolipids (including microbial interference, presentation to lymphocytes such as CD1 restricted T cells and NKT cells, lymphocyte mediated regulation of antigen presentation), MR1 presentation and MAIT cell activation will be discussed. Manipulation of T cell activation by checkpoint inhibitors, and practical applications such as vaccination and immunotherapy will also be covered.

Teaching and learning activities: The course will be based on lectures, as well as extra time for follow up discussions. In addition a smaller group work will enable the students to gain deeper knowledge in a small area of interest. The students are also given literature (see below) in order to prepare for the lectures and discussions.

Examination: To pass the course, the student has to show that the learning outcomes have been reached. The students will be assessed with a group project presented in a written report, along with individual oral presentations. The focus of the examination is gain of knowledge rather than test of knowledge.

Compulsory elements: All lectures and group sessions are considered mandatory. Missed events should be compensated for with a written report on the subject in accordance with the indications of the course organizer.

Number of students: 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) date for registration as a doctoral student (priority given to earlier registration date)

More information:

Course responsible:
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Contact person:
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Title: Methods in molecular biology and their applications in medical research

Course number: 2418
Credits: 3.0
Date: 2018-09-03 -- 2018-09-14
Language: English
Level: Doctoral level
Responsible KI department: Department of Laboratory Medicine

Specific entry requirements:

Purpose of the course: The aim of this course is to confer knowledge of how basic molecular biology and protein work can be applied in clinically oriented research. The course is designed for doctoral students with limited experience of molecular biology and combines a lecture program with laboratory work. The course combines theoretical knowledge with hands-on practice.

Intended learning outcomes: After the course, the students will understand the principles, from both a theoretical and practical viewpoint, of a number of basic techniques used in DNA/protein research and their application in medical research. The students should also be able to design and perform investigations with some of the discussed techniques.

Contents of the course: The lectures will include theoretical and practical aspects on basic concepts concerning techniques in molecular biology and proteomics and their application in medical research. Specified subjects will include cloning, RNA-analysis, promoter studies, DNA-sequencing, expression, bioinformatics, antibody-based protein detection and proteomics. The overall objective is to convey knowledge of possibilities and limitations with different techniques and introduce valuable methodology for the students' PhD-projects.

Teaching and learning activities: The course combines a lecture program in the morning with laboratory work in the afternoon, where course participants will be subdivided into smaller groups.

Examination: The students will be asked to solve a scientific problem using methods they learned during the course. The last day of the course, the participants will give a presentation. They should be able to defend the laboratory design, discuss methodologies applied and anticipated results. The students will work in pairs. The task will be given to the participants at the end of the first week. Every doctoral student will be individually assessed.

Compulsory elements: Laboratory work is compulsory. To compensate for absence, self-studies and a written essay on the topic(s) that they have missed must be performed.

Number of students: 8 - 20
Selection of students: Students will be selected based on their motivation. Priority will be given to the doctoral students at the beginning of their doctoral training and/or to the students with little experience in molecular biology. KI students are given priority but doctoral students from other universities are welcome to apply as well.

More information: The course meets for 2 weeks full time. The lectures will be given by invited specialist from different fields and by the course organizers. Morning lectures course will take place at Karolinska University Hospital, Huddinge. Lab work in the afternoon is held at the lab in Dentist School, Alfred Nobels allé 8, Huddinge. Laboratory work is expected to be finished on 11th of September and final examination will take place on the 14th of September.

Course responsible:
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Camilla Pramfalk
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Title: Teaching and Learning in Higher Education: educational course for doctoral students

Course number: 2434
Credits: 4.5
Date: 2018-10-01 -- 2018-10-26
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: At the end of the course, students are expected to:
- Analyse different roles of a professional university teacher and current conditions related to teaching-learning within higher education.
- Use 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.
- 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. Lectures will be in English. Students may however choose English or Swedish during group work.

Examination: Examination and assessment
1) Participants design and review one teaching occasion related to their own practice or other relevant experience of teaching. This is presented through a written essay. 2) Participants auscultate teaching and perform an interview with the teacher. This is presented orally. Students may perform their oral and written examination in English or in Swedish (optional).

Compulsory elements:
- Participation during a literature seminar.
- Participation during the auscultation seminar.
- 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: Priority will be given to students with planned teaching included in their individual study plan. Enter a brief motivation and indicate the area within which the teaching is to be given. Secondly, selection will be based on registration date as a doctoral student. Please make sure that you have entered the correct registration date for doctoral education in your personal profile.

More information: The course is a blended learning course, offering two campus based meetings on October 1st and October 26th. The course is given in English.

Course responsible:
Jonas Nordquist
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Contact person:
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Title: Mass spectrometry-based proteomics: When and How.

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 "Omnics data analysis: From quantitative data to biological information".

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

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

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

Number of students: 12 - 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: This is a full time course, please note that both lectures and practical exercises are mandatory. 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. For proteomics data analysis we also recommend course 2523.

Course responsible:
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Contact person:
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Mattias Vesterlund
Institutionen för onkologi-patologi
Mattias.Vesterlund@ki.se
Title : Omics data analysis: From quantitative data to biological information

Course number : 2523
Credits : 3.0
Date : 2018-11-05 -- 2018-11-16
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-throughput 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 : 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) date for registration as a doctoral student.

More information : Lectures will be given at Widerströmska huset, Tomtebodavägen 18a, Solna and at SciLifeLab, Tomtebodavägen 23a, Solna. Schedule and additional information will be uploaded at the course web site closer to course start. Course website: https://pingpong.ki.se/public/courseId/12933/lang-sv/publicPage.do?item=11900112. <br> The course is jointly organised by the doctoral programmes Allergy, immunology and inflammation (Aii), Biology of Infections and Global Health (BIGH), Development and Regeneration (DevReg) and Tumor biology and oncology (FoTO). See: https://ki.se/en/staff/doctoral-programmes.

Course responsible :
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Contact person :
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Title: Multifactorial immune mediated diseases - etiology and pathogenesis

Course number: 2532
Credits: 1.5
Date: 2018-10-01 -- 2018-10-05
Language: English
Level: Doctoral level

Responsible KI department: Department of Medical Biochemistry and Biophysics
Specific entry requirements: Basic knowledge in immunology corresponding to course 2302 is required

Purpose of the course: This course gives an overview of multifactorial immune mediated diseases and will take up basic clinical aspects and disease mechanisms. It will also provide opportunity for the student to synthesise their new knowledge in group discussions and with experts in the field.

Intended learning outcomes: After completion of the course the students should be able to explain the term multifactorial immune mediated diseases (e.g. allergic, autoimmune, and inflammatory) and discuss basic clinical characteristics and disease mechanisms. They should be able to discuss the role of environment and genes in the etiology of such diseases, and in particular that the diseases are genetically complex. The students should also be able to describe some genetic strategies aimed at identifying risk genes. They should be able to explain how identification of risk genes can give insight into disease pathways, and discuss how such knowledge may enable disease prevention and therapy.

Contents of the course: The course includes an overview on chronic immune mediated multifactorial diseases and the challenge they represent to medicine. It covers topics such as clinical characteristics, suggested or known disease mechanisms and genetics including experimental animal models available to study such multifactorial and polygenetic diseases. Key concepts and techniques within each topic will be introduced.

Teaching and learning activities: Each day, the course combines a set of overview lectures on clinical diseases followed by lectures on pre-clinical experimental models. Everyday afternoon a group discussion will be held based on previously provided publication (one per day), at group level to facilitate peer learning. One to two senior scientists will facilitate the discussion by providing specific questions related to the publication. The tasks generally consists of "scientific projects" that are pursued by combining knowledge acquired during lectures with information available in the literature.

Examination: Examination is based on interactive engagement during daily discussions in the afternoon sessions on all days. During the last day, each student should prepare, present and discuss questions (minimum: 3-5) based on earlier presentations and published papers given during the course with their group members (peer-learning), which will be facilitated by two senior scientists. Apart from the oral presentation to pass the course, a written assignment of two pages connecting the lectures with their own work will be asked from all the participants. Participants should send this written assignment within 5 working days after the last date of the course.

Compulsory elements: All lectures, seminars and group- or individual- tasks are compulsory. Compensation for absence can be discussed with the course director.

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

More information:

Course responsible:
Amit Saxena
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Contact person:
Liselotte Bäckdahl
Institutionen för medicinsk biokemi och biofysik
Liselotte.Backdahl@ki.se
Title : Writing science and information literacy

Course number : 2561
Credits : 3.0
Date : 2018-08-27 -- 2018-10-19
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. -and be able 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, Evaluating published science.
Teaching and learning activities : This 100% ONLINE course (there is also a KI Campus version with course code 1391) will be held using the learning management system Ping Pong. Content will be learnt with various learning objects and learning practiced by exercises. Formative feedback will be given by teachers/peer/self-assessment. Scientific writing, literature management and other IT-related skills will be developed in the context of scientific communication.
Examination : The intended learning outcomes are assessed in the summative examination. Participants will write and rewrite a grant application and popular science summary based on teacher and peer feedback. Participants will also complete a number of assignments which demonstrate their ability to use relevant IT resources in a context of scientific writing and communication.
Compulsory elements : There will be a number of obligatory assignments and assessments to be completed.
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) date for registration as a doctoral student (priority given to earlier registration date)

More information :

Course responsible :
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Title: Neurogenetics

Course number: 2600  
Credits: 1.5  
Date: 2018-10-01 -- 2018-10-05  
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 involved 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, transcriptional 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: The course will be held in Flemingsberg Campus. The course is part of the Frontiers Courses in Neuroscience, and the course participants will be a mix of second year master students and doctoral students.

Course responsible:
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Contact person:
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Title: Mechanisms of Gene Regulation in Metabolism

Course number: 2608
Credits: 1.5
Date: 2018-10-18 -- 2018-10-24
Language: English
Level: Doctoral level
Responsible KI department: Department of Medical Biochemistry and Biophysics
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) date for registration as a doctoral student (priority given to earlier registration date)

More information:

Course responsible:
Alfredo Gimenez-Cassina
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Contact person:
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Institutionen för medicinsk biokemi och biofysik
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Title: Basic Course in Medical Statistics - a distance course

Course number: 2609
Credits: 3.0
Date: 2018-10-01 -- 2018-10-12
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: October 1st (not mandatory) and October 12th (mandatory).

Course responsible:
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Contact person:
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Mesfin Tessma
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Mesfin.Tessma@ki.se
Title: Basic Course in Medical Statistics - a distance course

Course number: 2609
Credits: 3.0
Date: 2018-11-26 -- 2018-12-07
Language: English
Level: Doctoral level
Responsible KI Department: Department of Learning, Informatics, Management and Ethics

Specific Entry Requirements:

Purpose of the course: The 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: November 26th (not mandatory) and December 7th (mandatory).

Course responsible:
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Title : Frontiers in Cognitive Neuroscience

Course number : 2616
Credits : 1.5
Date : 2018-09-24 -- 2018-09-28
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-disciplinary 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 : Selection will be based on 1) the relevance of the course syllabus for the applicants 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 scheduled for five full days, running from approximately 9 am to 4.30 pm. The special international guest lecturer is Prof. Giacomo Rizzolatti (University of Parma, Italy) who will talk about mirror neurons.

Course responsible :
Henrik Ehrsson
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17177
Stockholm

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

Course number: 2618
Credits: 3.0
Date: 2018-10-22 -- 2018-11-02
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, seminars, writing exercises, group assignments and practical exercises. As part of the learning process, the PhD students will be members of in-class review groups, giving feedback to their colleagues.

Examination: 1) Written assignments reflecting the intended learning outcomes of the course: draft for scientific paper, popular science 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 feedback 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: 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) date for registration as a doctoral student (priority given to LATER registration date).

More information: Welcome to apply for the writing course Write your research results and get them published!
The course includes manuscript writing, poster design and presentation, cover letter writing, abstract writing and popular science writing. The focus is on scientific writing (manuscript, abstract and poster). The popular science writing is covering the skills you need in order to successfully write a popular science summary for a project plan or to apply for grants. The course will be given in central Stockholm, in Gamla Brogatan (close to Hötorget). Please address all questions to: anna.wachtmeister@ki.se or phone: 0707890607

Course responsible:
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Lalit Kumar
Institutionen för kvinnors och barns hälsa
Title: Write your research results and get them published

Course number: 2618
Credits: 3.0
Date: 2018-10-01 -- 2018-10-12
Language: English
Level: Doctoral level
Responsible KI department: Department of Women's and children's health

Specific entry requirements: None.

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

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

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

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

Examination: 1) Written assignments reflecting the intended learning outcomes of the course: draft for scientific paper, popular science 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 feedback 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: 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) date for registration as a doctoral student (priority given to LATER registration date).

More information: Welcome to apply for the writing course Write your research results and get them published! The course includes manuscript writing, poster design and presentation, cover letter writing, abstract writing and popular science writing. The focus is on scientific writing (manuscript, abstract and poster). The popular science writing is covering the skills you need in order to successfully write a popular science summary for a project plan or to apply for grants. The course will be given in central Stockholm, in Gamla Brogatan (close to Hötorget). Please address all questions to: anna.wachtmeister@ki.se or phone: 0707890607

Course responsible:
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Lalit Kumar
Institutionen för kvinnors och barns hälsa
Title: Write your research results and get them published

Course number: 2618
Credits: 3.0
Date: 2018-12-03 -- 2018-12-14
Language: English
Level: Doctoral level
Responsible KI department: Department of Women's and children's health

Specific entry requirements: None.

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

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

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

Teaching and learning activities: Lectures, seminars, 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 feedback 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 feedback 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: 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) date for registration as a doctoral student (priority given to LATER registration date).

More information: Welcome to apply for the writing course Write your research results and get them published! The course includes manuscript writing, poster design and presentation, cover letter writing, abstract writing and popular science writing. The focus is on scientific writing (manuscript, abstract and poster). The popular science writing is covering the skills you need in order to successfully write a popular science summary for a project plan or to apply for grants. The course will be given in central Stockholm, in Gamla Brogatan (close to Hötorget). Please address all questions to: anna.wachtmeister@ki.se or phone: 0707890607

Course responsible:
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Lalit Kumar
Institutionen för kvinnors och barns hälsa
Title: Write your research results and get them published

Course number: 2618
Credits: 3.0
Date: 2018-09-10 -- 2018-09-21
Language: English
Level: Doctoral level

Responsible KI department: Department of Women's and children's health
Specific entry requirements: None.

Purpose of the course: The purpose of the course is to 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, seminars, writing exercises, group assignments and practical exercises. As part of the learning process, the PhD students will be members of in-class review groups, giving feedback to their colleagues.

Examination: 1) Written assignments reflecting the intended learning outcomes of the course: draft for scientific paper, popular science 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 feedback 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: 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) date for registration as a doctoral student (priority given to LATER registration date).

More information: Welcome to apply for the writing course Write your research results and get them published! The course includes manuscript writing, poster design and presentation, cover letter writing, abstract writing and popular science writing. The focus is on scientific writing (manuscript, abstract and poster). The popular science writing is covering the skills you need in order to successfully write a popular science summary for a project plan or to apply for grants. The course will be given in central Stockholm, in Gamla Brogatan (close to Hötorget). Please address all questions to: anna.wachtmeister@ki.se or phone: 0707890607

Course responsible:
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Title: Brain circuits

Course number: 2624
Credits: 1.5
Date: 2018-09-17 -- 2018-09-21
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 is a prerequisite. 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) date for registration as a PhD student (priority given to earlier reg. date), 3) experience of neuroscience research as stated in the written motivation.

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 or application of novel technologies. We have a strong emphasis on young scientists, and rodent basic neuroscience studies. Confirmed teachers: Anton Sirota (University of Munich), Karl Deisseroth (Stanford University, USA), Carl Petersen (EPFL, Switzerland) Peter Magill (Oxford University), Gilad Silberberg (KI), Laura Busse (University of Munich), Daniel Huber (University of Geneva), Koen Vervaeke (Oslo University) and more.

Course responsible:
Marie Carlen
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Contact person:
Mikael Corell
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mikael.corell@ki.se
Title: Neurodegenerative disorders I - From molecule to treatment

Course number: 2629
Credits: 1.5
Date: 2018-10-08 -- 2018-10-12
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 clinical aspects and molecular mechanisms in the most common neurodegenerative disorders 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 Neurodegenerative disorders in a greater research context.

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, prion diseases as well as vascular, inflammatory or trauma related causes of neurodegeneration such as stroke, epilepsy or trauma.

Teaching and learning activities: The course runs day time for 1 week full-time with lectures by invited scientists, literature seminars as group assignments, and individual studies.

Examination: The examination part includes: the group assignments, short formative examination questions at the end of day 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 already close to or planning their thesis defence but still missing course within the topic.

More information: The course will be held at Karolinska Institutet, Huddinge and/or Karolinska Sjukhuset/Karolinska University Hospital, Huddinge.

Course Responsible:
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Maria Roos
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Maria.Roos@ki.se
Title: Neurodegenerative disorders II - cellular and molecular mechanisms

Course number: 2630  
Credits: 1.5  
Date: 2018-10-15 -- 2018-10-19  
Language: English  
Level: Doctoral level  
Responsible KI department: Department of Neurobiology, Care Sciences and Society  
Specific entry requirements: The course is a continuation of the course Neurodegenerative disorders I, From molecule to treatment, but it can also be taken as a separate course, provided the participant has in other ways achieved the learning outcomes of that course.  
Purpose of the course: The purpose of the course is to provide a deeper understanding of neurodegenerative disorders, focusing on molecular mechanisms and techniques used for studying these, as well as treatment strategies.  
Intended learning outcomes: The student should: - be able to understand and critically evaluate relevant cellular and molecular pathophysiological mechanisms of neurodegenerative disorders such as stroke, Alzheimer disease, frontotemporal dementia, Lewy body disease, Parkinson’s disease, multiple sclerosis, amyotrophic lateral sclerosis, and the mechanisms of current and/or possible future treatments. - be able to understand and to perform important methods and assays for studying mechanisms behind neurodegenerative disorders, and discuss the results, taking into account the limitations of the assays. - be able to discuss the present disease models, propose alternative models, and critically evaluate these models from the perspectives of a) clinical picture, b) disease mechanisms, and c) treatment mechanisms.  
Contents of the course: The course addresses topics in basic and clinical research on neurodegenerative disorders. The focus will be on a deeper understanding of cellular and molecular mechanisms, and the techniques to study them. To this end, the students will learn about some powerful techniques that can be used for studying neurodegeneration, subcellular localization, and elucidation of pathogenic pathways.  
Teaching and learning activities: The course runs daytime for 1 week full-time with some key lectures by invited scientists, laboratory practicals, and discussions in small groups and the entire class.  
Examination: Oral examination followed by group discussions on the examination questions, and a general discussion between all participants.  
Compulsory elements: The student is obliged to attend 80% of the lectures, all laboratory practicals, and the exam (including the group discussion after the exam). Students that are absent from the practicals and/or more than 20% of the lectures will have to submit a written presentation of the subjects missed.  
Number of students: 10 - 24  
Selection of students: Selection will be based on 1) the relevance of the course syllabus for the applicant’s doctoral project (according to written motivation), 2) date for registration as a doctoral student (priority given to earlier registration date)  
More information: The course is given at the Department of Neurobiology, Care Sciences and Society, Division of Neurogeriatrics, Bioclinicum.

Course responsible:  
Sophia Schedin Weiss  
Department of Neurobiology, Care Sciences and Society  
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Contact person:  
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Institutionen för neurobiologi, vårdvetenskap och samhälle  
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Lars Tjernberg  
Institutionen för neurobiologi, vårdvetenskap och samhälle  
Lars.Tjernberg@ki.se
Title: Tumor microenvironment

Course number: 2671
Credits: 1.5
Date: 2018-11-12 -- 2018-11-16
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 course will provide the students with a basic knowledge within the relatively new field of tumor microenvironment by describing the interaction between tumor cells and tumor associated cells including the extracellular matrix. The students will be enabled to develop understanding of pros and cons within in vitro co-culturing and in vivo tumor models.

Intended learning outcomes: After completion of the course, the students will be able to describe and discuss tumor microenvironment with tumor associated cells, inflammatory processes and hypoxia/angiogenesis and how they contribute to the carcinogenic process. Students will also be able to describe which tumor associated cells are known to affect the tumor progression and, in some cases, the tumor initiation. The students will develop understanding of pros and cons with in vitro coculturing and in vivo tumor models. Clinical applications within the field are presented during the course.

Contents of the course: The course is designed for PhD students with an interest in tumor biology. The course will specifically address the concepts of cancer associated fibroblasts and macrophages, hypoxia, tumor metabolism, metastasis and tumor vascular angiogenesis and lymphangiogenesis. Clinical applications within the field are presented during the course.

Teaching and learning activities: The course is designed for PhD students with an interest and personal involvement in tumor biology. It consists of lectures and group discussions based on problem based learning on topics related to the course, with the specific aim to stimulate an active participation from the course participants together with course lecturers. Students are expected to discuss the developments of the TME field and present their views on the central issues of pre-clinical versus clinical use of anti-TME therapies.

Examination: The course assignment will consist of an oral discussion of a problem-based case and the assessment will be performed on an individual basis. One or two students will be appointed as reviewer(s) to provide peer feedback for the presenter, in line with concept of formative assignment. The course organizers will lead the examination and be responsible for summative individual assessment.

Compulsory elements: Attendance to all the activities of the course and the written examination are mandatory. Absence from mandatory parts of the course will have to be compensated for by other activities after discussion with the course leaders.

Number of students: 8 - 32
Selection of students: 1) course contents relevance for the applicant doctoral project 2) the applicants date of registration for PhD education (earlier registration prioritized)

More information: Course runs all weekdays between 8 am 17 pm, course venue not decided. Course is characterized as an introductory course within the field of tumor microenvironment with a special focus on clinical translational applications. Consequently, part of the course lectures are given by clinicians with research interest in tumor microenvironment some major cancer diseases.

Course responsible:
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Contact person:
Suzanne Eghazi Brage
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Title: Practical approaches to qualitative research - based on blended learning

Course number: 2674
Credits: 7.5
Date: 2018-08-27 -- 2018-11-16
Language: English
Level: Doctoral level
Responsible KI department: Department of Public Health Sciences
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 - 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 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 the lectures and other course materials through a common e-learning platform. The students will be able to contact the course coordinator if they have any questions. 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. Five days of practical training will be conducted during the first week of October 2018 (1st-5th).
Title: Basic Laboratory Safety

Course number: 2690
Credits: 1.8
Date: 2018-10-01 -- 2018-10-08
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 give the students an understanding of risks and of principles in safety measures in the biological 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, the active participation in a group presentation and the risk assessment. 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) date for registration as a doctoral student (priority given to earlier registration date), 2) the relevance of the course syllabus for the applicants doctoral project (according to written motivation).

More information:

Course responsible:
Maria Johansson
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Contact person:
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Title: Basic inflammation

Course number: 2705
Credits: 3.0
Date: 2018-09-17 -- 2018-10-10
Language: English
Level: Doctoral level

Responsible KI department: Department of Medicine, Solna

Specific entry requirements: Documented knowledge about basic concepts of innate and adaptive immunity (e.g. immunology course during undergraduate education)

Purpose of the course: This course will give a general and broad overview knowledge in the field of inflammation. Ability to think critically will be encouraged during discussions and group work.

Intended learning outcomes: After the course, the participant will be able to: understand cellular and molecular events that underlie the initiation, progression and resolution of inflammation; to describe the principal cell types involved in inflammatory responses and their interactions, the regulation of inflammation by inflammatory mediators, and the mechanisms of resolution and tissue repair; to understand the interplay between acute and chronic inflammation in the context of chronic inflammatory diseases and describe anti-inflammatory treatment strategies.

Contents of the course: The course provides the current concept of inflammation and consists of two parts. Part 1 will cover the basic mechanisms and mediators of inflammation (host defence peptides, coagulation, complement, alarmins, lipid mediators, the acute phase proteins, inflammatory cells), non-resolving inflammation, resolution of inflammation. Part 2 will discuss the common and specific features of inflammatory diseases (sepsis, chronic inflammatory diseases), animal models of inflammation, role of genetic and environmental factors, anti-inflammatory treatment. At the end of the course the students will present projects and write web-based exam.

Teaching and learning activities: Lectures, journal clubs, small-group work with a project, discussions and the project presentation, studying the course literature. The course is full-time for six days separated into two parts and also includes the non-scheduled time (32h) between the parts for the project work including meetings with mentors and the course literature studies.

Examination: Oral presentations of the small-group projects, all students have to participate actively in the presentation and discussion. Web-based written exam on the course content.

Compulsory elements: The project work, student attendance at the project presentations and the web-based exam are mandatory.

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) date for registration as a doctoral student (priority given to earlier registration date)

More information: The course is run in two blocks. First 3 days of introduction and lectures 17-19 september 2018. Then 2.5 weeks project/group work, followed by 3 days of lectures and presentation of group work.

Course responsible:
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Mia Olsson
Institutionen för medicin, Solna

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Title: Social determinants of health

Course number: 2711
Credits: 3.0
Date: 2018-12-03 -- 2018-12-14
Language: English
Level: Doctoral level
Responsible KI department: Department of Public Health Sciences

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 inequalities 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: 12 – 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:

Course responsible:
Bo Burström
Department of Public Health Sciences
08-52480160
Bo.Burstrom@ki.se
Tomtebodavägen 18A
Widerströmska huset
17177
Stockholm

Contact person:
Title: Breast Cancer: Research and treatment

Course number: 2716
Credits: 1.5
Date: 2018-09-17 -- 2018-09-21
Language: English
Level: Doctoral level

Responsible KI department: Department of Oncology-Pathology
Specific entry requirements: Basic knowledge within the field of cancer biology is required

Purpose of the course: The course aims to provide an overview of the molecular characterization, epidemiology and current treatment of breast cancer. The overall purpose is to form a bridge between pre-clinical and clinical aspects of breast cancer biology and oncology and to enable the PhD students to obtain a deeper understanding of all aspects of the breast cancer problem.

Intended learning outcomes: At the end of the course the students need to be able to show - a thorough understanding of the basic foundations of breast cancer biology - the ability to discuss and understand advanced concepts and problems in breast cancer biology - to understand and be able to discuss important problems to solve in breast cancer in order to improve diagnosis, prevention of disease, treatment and quality of life.

Contents of the course: This course is a basic introduction to modern breast cancer research and treatment and it is recommended to all PhD students within basic, epidemiologic and clinical breast cancer research. The course will describe our current understanding of breast cancer--from molecule to patient--, eventually also discussing its management, pathology, prevention and treatment. The topics of the course include genetics, the cell cycle, apoptosis, immunology, diagnostics and treatment, and pathology. All topics will be presented from the breast cancer perspective. There will be focus on breast cancer biology and oncology, including molecular genetics, curative treatment and palliative care, psychosocial aspects of cancer, ethics and epidemiology.

Teaching and learning activities: The course consists of lectures, group seminars, group discussions and demonstrations.

Examination: To pass the course the students must show that they have reached the learning outcomes of the course. This will be assessed by a written individual examination with a focus on understanding of concepts, relations and how problems are dealt within breast cancer research and treatment.

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

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: Information about the venue of the course will be provided to the students in due time.

Course responsible:
Antroula Papakonstantinou
Department of Oncology-Pathology
antroula.papakonstantinou@ki.se

Contact person:
Antroula Papakonstantinou
Institutionen för onkologi-patologi
antroula.papakonstantinou@ki.se
Title: Intermediate Medical Statistics: Regression models

Course number: 2738  
Credits: 3.0  
Date: 2018-10-15 -- 2018-10-26  
Language: English  
Level: Doctoral level  
Responsible KI department: Department of Learning, Informatics, Management and Ethics  
Specific entry requirements: Basic Medical Statistics (or equivalent)

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

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

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

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

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

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

Number of students: 18 - 20

Selection of students: Selection will be based on 1) 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: October 15, 16, 18, 19, 22, 23 and 26.

Course responsible:
Mesfin Tessma  
Department of Learning, Informatics, Management and Ethics  
Mesfin.Tessma@ki.se

Contact person:
Margareta Krook-Brandt  
Institutionen för lärande, informatik, management och etik  
Margareta.Krook-Brandt@ki.se

Mesfin Tessma  
Institutionen för lärande, informatik, management och etik  
Mesfin.Tessma@ki.se
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-glial 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: 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 will be held at lecture hall "D1012" on the 10th floor of Biomedicum. It is a full time course and schedule will be sent out after acceptance to the course. For an in depth understanding of the connection between brain development and clinical aspects of cognitive disorders, Course 2605 is recommended.

Course responsible:
Jens Hjerling-Leffler
Department of Medical Biochemistry and Biophysics

jens.hjerling-leffler@ki.se

Contact person:
Francois Lallemend
Institutionen för neurovetenskap

francois.lallemend@ki.se

Goncalo Castelo-Branco
Institutionen för medicinsk biokemi och biofysik

Goncalo.Castelo-Branco@ki.se

Ulrika Marklund
Institutionen för medicinsk biokemi och biofysik

Ulrika.Marklund@ki.se
Title: Present your research!

Course number: 2787
Credits: 1.5
Date: 2018-12-17 -- 2018-12-21
Language: English
Level: Doctoral level
Responsible KI department: Department of Women's and children's health
Specific entry requirements: None

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

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

Contents of the course: The scope of the course is to design and give oral presentations of your research results in different contexts. The main content of the course:

1. DESIGN AND DISPOSITION OF AN ORAL PRESENTATION (e.g. poster presentation, short presentation of research results):
   - Goals and aims
   - Structure
   - Simplifications to enhance understanding
   - Choice of pictures
   - Language
   - 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)
   - f. What to avoid doing during a presentation
   - g. How to deal with questions from the audience

3. DESIGN AND USE OF SUPPORTING MEDIA FOR A PRESENTATION:
   - a. Power Point slides including introduction to power point
   - b. Scientific poster
   - c. Flipchart and other supporting media

4. INTERACTION WITH THE AUDIENCE:
   - a. Catching the audience's attention
   - b. How to address the audience
   - c. Keeping the audience's attention for a longer period of time
   - d. Communicating with the audience
   - e. How to make the audience trust you
   - f. Preparing the presentation with different audiences in mind
   - g. Different learning styles which influences the audience's attention
   - h. How to impress your audience
   - i. Attention curve of the audience
   - j. How to ease the learning of the audience

5. PRACTICAL EXERCISES:
   - a. Presenting in front of an audience
   - i. Poster presentation
   - ii. Presentation of student's choice
   - iii. Elevator Pitch
   - iv. Power point presentation
   - v. Video recording of presentation with feedback
   - b. Presentation exercises in pairs or small groups
   - c. Presenting to different audiences
   - d. Body language
   - e. Language and pace
   - f. How to use your audience as an asset
   - g. How to interact with your audience
   - h. How to remember your presentation
   - i. Give and receive feedback on presentations
   - j. Deal with nervousness and stay focused on your presentation

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

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

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

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) date for registration as a doctoral student (priority given to earlier registration date)

More information: Welcome to apply for the doctoral course Present your research! The course will be given in central Stockholm, in Gamla Brogatan (close to Hötorget). Please address all questions to:
anna.wachtmeister@ki.se or phone: 0707890607

Course responsible:
Anna Hildenbrand Wachtmeister
Department of Women's and children's health
0707890607
Anna.Hildenbrand.Wachtmeister@ki.se

Contact person:
Anna Hildenbrand Wachtmeister
Institutionen för kvinnors och barns hälsa
0707890607
Anna.Hildenbrand.Wachtmeister@ki.se
Title: Present your research!

Course number: 2787
Credits: 1.5
Date: 2018-10-15 -- 2018-10-19
Language: English
Level: Doctoral level
Responsible KI department: Department of Women’s and children’s health
Specific entry requirements: None

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

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

Contents of the course: The scope of the course is to design and give oral presentations of your research results in different contexts. The main content of the course:
1. DESIGN AND DISPOSITION OF AN ORAL PRESENTATION (e.g. poster presentation, short presentation of research results):
   a. Goals and aims
   b. Structure
   c. Simplifications to enhance understanding
   d. Choice of pictures
   e. Language
   f. Time management
2. PRESENTATION TECHNIQUES AND RHETORIC FOR ORAL PRESENTATIONS:
   a. Body language and posture
   b. Language and pace
3. 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
   h. How to impose your audience's attention curve on the audience
   i. How to ease the learning of the audience
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
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
   f. How to use your audience as an asset
   g. How to interact with your audience
   h. How to remember your presentation
6. GIVE AND RECEIVE FEEDBACK ON PRESENTATIONS
   a. Poster presentation including scientific poster
   b. Power Point presentation
   c. Elevator Pitch
   d. Giving feedback on the other students' presentations
   e. Reflecting on own learning and development during the course

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 scientific poster
   b. Power Point presentation
   c. Elevator Pitch
   d. Giving feedback on the other students' presentations

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) date for registration as a doctoral student (priority given to earlier registration date)

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Course responsible:
Anna Hildenbrand Wachtmeister
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Contact person:
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Institutionen för kvinnors och barns hälsa
0707890607
Anna.Hildenbrand.Wachtmeister@ki.se
Title: Present your research!

Course number: 2787
Credits: 1.5
Date: 2018-11-26 -- 2018-11-30
Language: English
Level: Doctoral level
Responsible KI department: Department of Women's and children's health
Specific entry requirements: None

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

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

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

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

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

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

Number of students: 16 - 22

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

More information: Welcome to apply for the doctoral course Present your research! The course will be given in central Stockholm, in Gamla Brogatan (close to Hötorget). Please address all questions to: anna.wachtmeister@ki.se or phone: 0707890607

Course responsible:
Anna Hildenbrand Wachtmeister
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Contact person:
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Institutionen för kvinners och barns hälsa
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Anna.Hildenbrand.Wachtmeister@ki.se
Title: Present your research!

Course number: 2787  
Credits: 1.5  
Date: 2018-09-03 -- 2018-09-07  
Language: English  
Level: Doctoral level  
Responsible KI department: Department of Women's and children's health  
Specific entry requirements: None

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

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

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

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

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

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

Number of students: 16 - 22

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

More information: Welcome to apply for the doctoral course Present your research! The course will be given in central Stockholm, in Gamla Brogatan (close to Hötorget). Please address all questions to:  
anija.wachtmeister@ki.se or phone: 0707890607

Course responsible:  
Anna Hildenbrand Wachtmeister  
Department of Women's and children's health  
0707890607  
Anna.Hildenbrand.Wachtmeister@ki.se

Contact person:  
Anna Hildenbrand Wachtmeister  
Institutionen för kvinnors och barns hälsa  
0707890607  
Anna.Hildenbrand.Wachtmeister@ki.se
Title: Present your research!

Course number: 2787
Credits: 1.5
Date: 2018-09-24 -- 2018-09-28
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 adequate way.
2. Be able to design and use supportive media for a successful presentation.
3. Know the basics of presentation techniques and rhetoric.
4. Have gained knowledge on how to interact with the audience.

Contents of the course: The scope of the course is to design and give oral presentations of your research results in different contexts. The main content of the course:

1. DESIGN AND DISPOSITION OF AN ORAL PRESENTATION (e.g. poster presentation, short presentation of research results):
   a. Goals and aims
   b. Structure
   c. Simplifications to enhance understanding
   d. Choice of pictures
   e. Language
   f. Time management

2. PRESENTATION TECHNIQUES AND RHETORIC FOR ORAL PRESENTATIONS:
   a. Body language and posture
   b. Language and pace

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 and pace
   e. How to use your audience as an asset
   f. How to interact with your audience
   g. 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 scientific poster
   b. Power Point presentation
   c. Elevator Pitch
   d. Giving feedback on the other students' presentations

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) date for registration as a doctoral student (priority given to earlier registration date)

More information: Welcome to apply for the doctoral course Present your research! The course will be given in central Stockholm, in Gamla Brogatan (close to Hötorget). Please address all questions to: anna.wachtmeister@ki.se or phone: 0707890607

Course responsible:
Anna Hildenbrand Wachtmeister
Department of Women's and children's health
0707890607
Anna.Hildenbrand.Wachtmeister@ki.se

Contact person:
Anna Hildenbrand Wachtmeister
Institutionen för kvinnors och barns hälsa
0707890607
Anna.Hildenbrand.Wachtmeister@ki.se
Title: How to conduct systematic reviews and meta-analyses

Course number: 2790
Credits: 3.0
Date: 2018-10-01 -- 2018-10-17
Language: English
Level: Doctoral level

Responsible KI department: Department of Microbiology, Tumor and Cell Biology
Specific entry requirements: Students need to have basic knowledge of biostatistics (corresponding to KIs Basic Course in Medical Statistics or Biostatistics I) and it is recommended to have basic knowledge in epidemiology (corresponding to Epidemiology I course).

Purpose of the course: Meta-analyses are becoming the gold standard method of reviewing and summarising the scientific literature, and they have contributed greatly to the current body of scientific knowledge. This course aims to introduce the concepts and procedures of systematic reviews and meta-analyses, and will help applicants to get started with their own study.

Intended learning outcomes: At the end of the course the students should be able to: 1) Understand and demonstrate the value, principles and the different concepts related to systematic reviews and meta-analyses, in particular compared to other types of studies (incl. narrative reviews, original research); 2) Identify the strengths, limitations and pitfalls of systematic reviews and meta-analysis; 3) Independently formulate study hypotheses, and plan and generate a study protocol to perform a systematic review and meta-analysis, justifying the selection of the eligible studies and statistical methodology; 4) Apply basic methods of meta-analyses; 5) Critically reflect on other students individual project work and provide feedback in a scientifically constructive way (peer-review); 6) Interpret and critically evaluate scientific studies relevant to the course content.

Contents of the course: The course is designed for PhD students, in particular those who are at an early stage of their research education, and those with an interest in conducting systematic reviews and meta-analysis. The content of the course is as follows: 1) Basic concepts in systematic reviews and meta-analyses, 2) strengths, problems and limitations of systematic reviews and meta-analyses, 3) How to write a study protocol for a systematic review, 4) How to perform a systematic literature search (including a practical seminar organised by Karolinska Institutet library), 5) Data-extraction and quality assessment of included studies, 6) Statistical methods used in meta-analyses and interpretation, 7) Examination. This is a hands-on course, covering theoretical concepts and discussion of strengths, limitations and problems of systematic reviews and meta-analyses. We will also discuss publication guidelines, strategies to identify eligible studies, quality assessment of research papers, how to use Endnote to facilitate the systematic search, Excel for data-management, and different statistical methods and programs.

Teaching and learning activities: Interactive lectures, seminars, individual article review, group discussions, practical sessions (one on systematic literature search, one on statistical methods) and homework tasks will be used. The course focuses on active learning, i.e. putting knowledge into practice and critically reflecting upon the knowledge, rather than memorising facts. Therefore, much of the focus of the course is on the individual project where students are required to develop a full study protocol including several important aspects covered in the lectures, peer assessment, article reviews and group discussions. Students will also peer-review each other's projects and this will form the basis for the final examination seminar. Throughout the course, the students will work on an individual project and will have to peer-review the project of another student. Further, students will critically review and discuss relevant scientific articles. There will be several group discussions with other students and experienced teachers, with a focus on peer-assessment (discussing each other's projects), and the lectures are interactive allowing for critical discussions.

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

Compulsory elements: Compulsory attendance includes the scheduled lectures and seminars (i.e. full first week of the course + exam). One is required to come well prepared for each seminar (see reading list). Absence will need to be replaced by individual assignments following discussion with the course co-ordinator, e.g. article reviews, with written or oral follow-up. Attendance is also compulsory for the examination, which includes discussion of the study protocol of each student + opposition for another student.

Number of students: 18 - 25

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

More information: The course will start with one intense week (5 full days) of mandatory lectures, discussions and practical sessions (01 to 05 Oct 2018). Attendance is mandatory for all 5 full days. On Oct 10th (09-12 AM) there will be an "open house" to get direct feedback from the supervisors/teachers on your study project (attendance optional). Exam day is on Oct 17th (09-13 AM), which is again mandatory. The course also requires preparation at home before the course starts and during the course. Since a basic understanding of biostatistics is required, and a basic understanding of epidemiology is recommended, please state relevant experience. The lectures will be held at KI campus Solna.
Course responsible:
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Contact person:
-
Title : Introduction to Stata for epidemiologists

Course number : 2796
Credits : 1.0
Date : 2018-09-13 -- 2018-09-14
Language : English
Level : Doctoral level
Responsible KI department : Department of Public Health Sciences
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, with required prerequisite knowledge, will be selected based on 1) the relevance of the syllabus for the applicant's doctoral project (according to written motivation), and 2) date for registration as doctoral student (priority given to earlier registration date). To be considered, submit a completed application form. Give all information requested, including a description of current research and motivation for attending, and 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 analyse epidemiological data is not covered.

Course responsible :
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Contact person :
Anastasia Urban
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Title : Biostatistics II: Logistic regression for epidemiologists

Course number : 2797
Credits : 2.0
Date : 2018-09-17 -- 2018-09-28
Language : English
Level : Doctoral level
Responsible KI department : Department of Public Health Sciences
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 motivation), 2) date for registration as a doctoral student (priority given to earlier registration date). Submit a completed application form. Give all information requested, including a short description of current research training and motivation for attending, and 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 given the following dates: September 17, 19, 21, 24, 26, 28. The individual examination will be performed as a takehome examination. Prerequisite knowledge in epidemiology and biostatistics equivalent to "Epidemiology I: Introduction to epidemiology" and "Biostatistics I: Introduction for epidemiologists" or corresponding courses. Prior knowledge in Stata software is strongly recommended.

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

Course number: 2798  
Credits: 2.5  
Date: 2018-10-02 – 2018-10-10  
Language: English  
Level: Doctoral level  
Responsible KI department: Department of Medical Epidemiology and Biostatistics

Specific entry requirements: Knowledge in epidemiology and biostatistics equivalent to "Epidemiology I: Introduction to epidemiology", "Biostatistics I: Introduction for epidemiologists" and "Biostatistics II: Logistic regression for epidemiologists" or corresponding courses.

Purpose of the course: The course gives an introduction to modern methods for the analysis of longitudinal and repeated measures studies which are commonly used in epidemiological studies and in clinical trials.

Intended learning outcomes: After successfully completing this course you as a student are expected to be able to:  
- Describe the statistical methods utilized to analyze longitudinal data in a variety of settings and with a variety of types of outcome variables.  
- Analyze a scientific problem that requires repeated measurements, identify an appropriate design, and identify the statistical methods required to analyze the data.  
- Utilize statistical software (e.g., Stata) to perform longitudinal analyses of data generated from randomized and observational studies with repeated measures designs.  
- Apply modern methods for the analysis of longitudinal data to a range of settings encountered in biomedical and public health research.  
- Interpret and communicate the clinical/scientific meaning of the results of a longitudinal analysis.  

Intended learning outcomes are classified according to Bloom’s taxonomy: knowledge, comprehension, application, analysis, synthesis, and evaluation (Bloom, 1956, extended by Anderson and Krathwohl, 2001).

Contents of the course: The course gives an introduction to modern methods for the analysis of longitudinal and repeated measures studies which are commonly used in epidemiological studies and in clinical trials. The defining feature of a longitudinal study is that measurements of the response are taken repeatedly through time on the same individuals. The primary goal of a longitudinal study is to characterize an outcome (and potentially change in that outcome over time) and the factors that influence the outcome (and its change). A feature of longitudinal data that complicates analysis is the positive correlation (i.e., lack of independence) among repeated observations and possible heterogeneity of variability across measurement occasions. The course covers the following topics:  
Introduction to longitudinal data, notation for correlated data, modeling the mean response (analysis of response profiles, parametric and semi-parametric trends), modeling the covariance, growth curves (trajectories), fixed effects models, and mixed effects models (that include random effects). This course is focused on general regression models for longitudinal data when the response variable is either continuous (linear models) or discrete (e.g., binary or count data that require logistic and Poisson models). Topics covered in the course will include: introduction to generalized linear models (e.g., linear, logistic, and Poisson regression), extensions of generalized linear models to longitudinal data, marginal models and generalized estimating equations (GEE), random effects models for continuous and categorical data (generalized linear mixed models), and contrasting marginal and mixed effects models. The course is intended for all students interested in epidemiology, biostatistics and public health.

Teaching and learning activities: Lectures, computer lab with exercises focusing on analysis of real data sets using statistical software (Stata), group discussions, literature review.

Examination: To pass the course, the student has to show that the learning outcomes have been achieved. Assessments methods used are group assignments (formative assessments) and an individual written take-home examination (summative assessment). The focus will be on understanding concepts and their application to analysis of epidemiological studies, rather than mathematical detail. The examination is viewed as a contributing to the development of knowledge, rather than as a test of knowledge. Students who do not obtain a passing grade in the first examination will be offered a second examination within two months of the final day of the course. Students who do not obtain a passing grade at the first two examinations will be given top priority for admission the next time the course is offered. If the course is not offered during the following two academic terms, a third examination will be scheduled within 12 months of the final day of the course.

Compulsory elements: The individual written examination (summative assessment).

Number of students: 8 - 25

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

More information: Course dates are October 2, 3, 4, 5, 8, 9 and 10.
Contact person:
Gunilla Nilsson Roos
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Title: Människans Fysiologi - en översikt

Course number: 2827
Credits: 3.0
Date: 2018-12-12 -- 2019-01-11
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 basall 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: 4 - 20
Selection of students: Urvalet baseras på 1) kursplanens relevans för den sökandes doktorandprojekt (enligt motivering), 2) datum för doktorandregistrering (där tidigare registreringsdatum har förtur)

More information: Kursen ges ihop med studenter på optikerprogrammet på KI Campus i Solna. Föreläsningarna ges på dagtid.

Course responsible:
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Contact person:
Title: Biomedical Ecology - The microbiota in health and disease

Course number: 2861
Credits: 1.5
Date: 2018-09-17 -- 2018-09-21
Language: English
Level: Doctoral level
Responsible KI department: Department of Microbiology, Tumor and Cell Biology

Specific entry requirements:

Purpose of the course: To support the acquisition of a broad knowledge and systematic understanding of the composition and function of the microbiota during the life cycle, how it might be influenced by diet and disease, and of host-microbe cross-talk. To introduce tools and methodologies that will enable the participants of the course to study the intestinal microbiota.

Intended learning outcomes: After finishing the course the student should be able to show an in-depth and up-to-date specialist knowledge about: - the composition and function of the microbiota and its cross-talk with the host, - the establishment of the microbiota during different stages of life, and its impact on the development and function of the immune system and host tissues, - the role of how an altered microbial function and/or dysbiosis might occur in connection with different diseases/disturbances. The student should be able to show familiarity with, and insight in: - methods to study the intestinal microbiota as well as basic data analyses and interpretation, - the microbiota as the largest metabolic organ in the body and its physiological and pathophysiological role in health and disease, - the role of the host-microbiota cross-talk in health and disease and for the intestinal ecology/homeostasis.

Contents of the course: The course will cover the aspects of the composition and function of the microbiota from birth, during life and the ageing period, how it might be influenced by diet and disease, and host-microbe crosstalk. Sequencing techniques and principles for basic bioinformatics data analyses will be introduced and compared to biochemical methods. Novel findings will be discussed by lecturers in the research front-line on the translational topics of microbiota in relation to inflammatory bowel diseases (IBD), irritable bowel syndrome (IBS) celiac disease, and rheumatological and neurophysiological diseases. The course is suitable for clinical and pre-clinical doctoral students and researchers for which the microbiota is of significance, including areas such as allergy, asthma, systemic autoimmune diseases, cardiovascular diseases, obesity, rheumatology, neurophysiological disturbances such as autism spectrum disorders, chronic fatigue, nutrition - including effects of pre- and probiotics, diabetes, metabolic syndrome, infectious diseases and antibiotic therapy.

Teaching and learning activities: The course combines lectures, student workshops, and practical laboratory work as follows: - lectures by well established front-line researchers in their respective fields, - laboratory sessions covering analysis of the students' own intestinal E. coli microbiota, - workshops/combined with focused literature studies within defined areas which will be summarized in terms of student seminars, - peer learning using the competence of the lecturers and course attendees.

Examination: Summative examination includes laboratory work and student presentations that are evaluated by the respective tutor at the specific course module and written examination of the course content.

Compulsory elements: Laboratory work and student seminars. Participants that are absent from the laboratory part and seminars will have to present a written paper on the subject and in agreement with the indications of the course director.

Number of students: 10 - 24

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

More information:

Course responsible:
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Roland Möllby
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Title: Advanced course in SAS programming for health care data

Course number: 2868
Credits: 1.5
Date: 2018-11-26 -- 2018-11-30
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, with required prerequisite knowledge, will be selected based on 1) the relevance of the syllabus for the applicant’s doctoral project (according to written motivation), and 2) date for registration as doctoral student (priority given to earlier registration date). To be considered, submit a completed application form. Give all information requested, including a description of current research and motivation for attending, and an account of previous courses taken.

More information: Students are required to have skills in SAS corresponding to the learning outcomes of the course Introductory course in SAS programming (or corresponding courses).

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

Course number : 2873
Credits : 1.5
Date : 2018-10-08 -- 2018-10-12
Language : Swedish
Level : Forskarnivå
Responsible KI department : Department of Medicine, Solna
Specific entry requirements :


Intended learning outcomes : Kunskap och förståelse - Ha kunskap om hur man dokumenterar data så att samtliga moment i en klinisk forskningsprocess kan återskapas på ett tillförlitligt sätt. - Förstå innebörden av Helsingforsdeklarationen och Good Clinical Practice så att forskningspersoners autonomi och integritet alltid sätts i första rummet. - Ha kännedom om nationell, europeisk och internationell lagstiftning, vilka projekt som kräver ansökan till olika myndigheter och hur detta går till. - Färdighet och förmåga - Ha förmåga att avgöra vilka olika ansvar som prövare, medarbetare och sponsor har i en klinisk prövning. - Ha förmåga att sammanfatta ett projektförlag i en synopsis och utifrån detta göra en riskanalys över ett projekt. - Visa färdighet i att använda enkla statistiska metoder för att avgöra ett projekts vetenskapliga validitet och förmåga att värdera information från olika källor framförallt datorer på internet.

Contents of the course : Kursen ger kunskaper om forskningsetik och hur ansökan till olika myndigheter görs, kunskap om kliniska prövningar, utveckling av nya behandlingar och då särskilt läkemedel, säkerhetsrapportering till myndigheter, personuppgiftslagen, etik-prövningslagen, biobankslagen och patientdatalagen, arkivering, internationella register över kliniska prövningar, riskanalys och viss statistik.


Examination : Utöver ett godkänt grupparbete kommer det att ges en individuellt examination med flervarsfrågor.

Compulsory elements : Varje student måste delta i godkänt grupparbete. Varje student måste visa aktivitet på kursens hemsida i form av minst fem frågor, presentationer och/eller kommentarer på andras inlägg. Frånvaro eller brist på online aktivitet kan efter examinators bedömning kompenseras med en individuellt skrivet uppsats.

Number of students : 20 - 25
Selection of students : Kursen ger kunskaper om forskningsetik och hur ansökan till olika myndigheter görs, kunskap om kliniska prövningar, utveckling av nya behandlingar och då särskilt läkemedel, säkerhetsrapportering till myndigheter, personuppgiftslagen, etik-prövningslagen, biobankslagen och patientdatalagen, arkivering, internationella register över kliniska prövningar, riskanalys och viss statistik.

More information : Kursen ger kunskaper om forskningsetik och hur ansökan till olika myndigheter görs, kunskap om kliniska prövningar, utveckling av nya behandlingar och då särskilt läkemedel, säkerhetsrapportering till myndigheter, personuppgiftslagen, etik-prövningslagen, biobankslagen och patientdatalagen, arkivering, internationella register över kliniska prövningar, riskanalys och viss statistik.

Course responsable :
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Klinisk farmakologi
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Contact person :
Title: Quality assurance of clinical research

Course number: 2873  
Credits: 1.5  
Date: 2018-10-22 -- 2018-10-26  
Language: English  
Level: Doctoral level  
Responsible KI department: Department of Medicine, Solna  
Specific entry requirements:

Purpose of the course: This course provides the participant with the knowledge needed to secure the quality in clinical research. It gives an understanding of what is required to act safely and in accordance with local and national legislation, ethical guidelines and international treaty's when involved in clinical research. The course is useful for those working with translational or clinical laboratory research. It is valuable for researchers working with patient quality registries, other types of health registries and in epidemiology. It gives great value to researchers concerned with interventional studies including medicinal products, surgical treatments or pharmaceutical treatments. Beyond the competence you will get, you can also take a test for an internationally recognized certificate in ICH-GCP (International Conference of Harmonisation - Good Clinical Practice). Regardless of your research area, you will after this course understand how to protect patient's safety, and how to create trustful data.

Intended learning outcomes:

Knowledge and understanding
Knowledge on how to document data so all moments in a clinical research process can be recreated in a secured way  
Understand the meaning of the Helsinki Decaration and Good Clinical Practice so that research subjects autonomy and integrity always remain the first priority  
Knowledge on Swedish, European and international legislations, on which projects that need to be applied for and to which authority, and how such applications are done  
Skills and abilities
Able to decide what different responsibilities the investigator, study team members and sponsor has in the clinical trial  
Able to summarise a project proposal into a synopsis and based on that make a risk-benefit analysis of the project  
Able to use simple statistical tools to judge a project proposal's scientific validity  
Judgement and approach
Able to judge project proposals from the patient perspective including a scientific and sound ethical approach  
Able to evaluate information from different internet database sources

Contents of the course: The course provides insights into research ethics, and how applications to different authorities are done, it presents how clinical trials are undertaken, and how development of new treatments, in particular medicinal products, are done, and how safety reporting to authorities is done. The following laws, regulations and sources are discussed: Act on integrity of personal data, Act on ethical review of research projects, Act on biobanking, Act on patient data in health care, Act on archiving, and international registry's on clinical research. Risk analysis and some statistics are discussed.

Teaching and learning activities: The course is based on e-learning. There are two tracks, in part parallel. One track is based on group work around cases that are presented to the course. The other track is based on individual studies of GCP regulations. Both tracks include study material and tutor support. The pedagogy is based on flipped classroom meaning that instructions and learning resources will be made available early to support the individual learning and group works. Cases and their solutions will be presented and discussed under teachers supervision. Q&A will be provided. The GCP studies will be supported by MC self tests. Webinars may be provided, pending the need from the course.

Examination: In addition to an approved group work there will be an individual multiple choice examination.

Compulsory elements:
Each student must participate in a group work. Each student must show activity on the course's home page with at least five questions, presentation and/or comments on others postings. Absence or lack of online activity can after the examiner's assessment be compensated by an individually written essay.

Number of students: 20 - 25

Selection of students:
Selection 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 provided in English. It is a blended course, with a major part of the course done in KI's learning management system. Physical attendance is needed the first morning 9-12 at KI campus in Solna. The course starts with a group-work. There is also a live webinar late Wednesday evening. The course is flipped, meaning that a major part of the the students work is supposed to be done on your own, supported by the course materials. Mutual time will be devoted to provide feedback, and outlooks. The course is demanding in terms of activities. Beyond the course examination students will be offered a possibility to sit an examn for a GCP certificate.

Course responsible:
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Contact person:
Mari Liljefors
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Title : Pragmatic randomised controlled trials in healthcare

Course number : 2917
Credits : 4.5
Date : 2018-10-22 -- 2018-12-03
Language : English
Level : Doctoral level
Responsible KI department : Department of Public Health Sciences
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 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) date for registration as a doctoral student (priority given to earlier registration date) 

**More information** : Face-to-face seminars will be conducted each Monday afternoon (14.00-17.00) to discuss with the course leaders. Each Wednesday students will submit their week work and they will receive feedback by Friday of the same week. 

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**Course responsible** : 
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**Contact person** : 
Mariano Salazar  
Institutionen för folkhälsovetenskap  
mariano.salazar@ki.se
Title: Health risk assessment of reproductive toxicity and endocrine disruptors

Course number: 2933  
Credits: 1.5  
Date: 2018-09-24 -- 2018-09-28  
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 how to assess health risks of chemical substances that cause reproductive toxicity including endocrine disruptors.  

Intended learning outcomes: After the completion of the course the student shall be able to: 
- describe the principles for health risk assessment of reproductive toxicity  
- explain how different types of data from in vivo, epidemiological and in vitro studies are used for health risk assessment of reproductive toxicity  
- identify and discuss complexities in health risk assessment of reproductive toxicity  
- identify and discuss complexities in health risk assessment of endocrine disruptors  

Contents of the course: Reproductive toxicity describes toxic effects of a chemical substance on the reproductive ability as well as on the development of the offspring. Health risk assessment of reproductive toxicity addresses the procedures to identify and characterise the reproductive toxicity with the aim to derive health based guidance values for safe levels of the chemical substances. Endocrine disruptors are substances that alter the endocrine system and are a special concern for risk assessment of reproductive toxicity. The course introduces the concepts in reproductive toxicity as well as of endocrine disruptors. Methods for identification and assessment of reproductive toxicity are described and discussed. Regulatory aspects of reproductive toxicity and endocrine disruption will be covered. Attention will be paid to evaluation of different type of data. Specific challenges in risk assessment of reproductive toxicity and of endocrine disruptors such as non-monotone dose response curves, low-dose effects and epigenetic mechanisms will be discussed.  

Teaching and learning activities: Teaching and learning activities include lectures, exercises and group assignments.  

Examination: Examination is in the form of a written assignment and/or 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 - 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:  
Johanna Zilliacus  
The institute of Environmental Medicine  
08 52483544  
Johanna.Zilliacus@ki.se  

Contact person:   
-
Title : Endocrine disruptors-molecular mechanisms and adverse effects

Course number : 2934
Credits : 1.5
Date : 2018-09-17 -- 2018-09-21
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 such chemicals substances.

Intended learning outcomes : After the completion of the course the student shall be able to: - Describe molecular mechanisms and potential adverse effects of endocrine disruptors - Explain methodologies to study the mechanisms of endocrine disruptors - Identify and discuss challenges in identification and study of endocrine disruptors - Discuss implications of endocrine disruption for human health

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. Current and emerging methodologies for identification and analysis of the endocrine disruptors will be addressed. Attention will be given to future challenges in endocrine disruptor research.

Teaching and learning activities : Teaching and learning activities include lectures, exercises and group assignments.

Examination : Examination is in the form of a written assignment and/or 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 - 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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Contact person :
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Nobels väg 13
17177
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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: 2942
Credits: 1.5
Date: 2018-09-24 -- 2018-09-28
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: 10 - 18
Selection of students: Selection will be based on 1) the relevance of the course syllabus for the applicant's doctoral project (according to written motivation), 2) date for registration as a doctoral student (priority given to earlier registration date)
More information: The course director is Anita Göndör at the Department of Oncology-Pathology.

Course responsible:
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Contact person:
Matti Nikkola
Institutionen för cell- och molekylärsbiologi

Matti.Nikkola@ki.se
Title: Medical research ethics

Course number: 2964
Credits: 1.5
Date: 2018-09-03 -- 2018-09-07
Language: English
Level: Doctoral level
Responsible KI department: Department of Learning, Informatics, Management and Ethics

Specific entry requirements:

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

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

Contents of the course: - Central research ethical principles, theories and arguments - Central philosophy of science - concepts and positions, and its relevance to research ethics - Research on humans, including informed consent and its components - Animal research ethics, including arguments for and against using animals for research purposes, and the three Rs. - 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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Contact person:
Annelie Jonsson
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annelie.jonsson@ki.se
Title: Medical research ethics

Course number: 2964
Credits: 1.5
Date: 2018-12-03 -- 2018-12-07
Language: English
Level: Doctoral level

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

Specific entry requirements:

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

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

Contents of the course:
- Central research ethical principles, theories and arguments
- Central philosophy of science - concepts and positions, and its relevance to research ethics
- Research on humans, including informed consent and its components
- Animal research ethics, including arguments for and against using animals for research purposes, and the three Rs.
- 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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Contact person:
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Title: Medical research ethics

Course number: 2964
Credits: 1.5
Date: 2018-11-05 -- 2018-11-09
Language: English
Level: Doctoral level
Responsible KI department: Department of Learning, Informatics, Management and Ethics

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

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

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

Teaching and learning activities: Lectures, group work and general discussions.
Examination: The doctoral student writes an essay on a research ethical theme, in relation to all intended learning outcomes, preferably related to his or her own research. A small number of students get the opportunity to orally present an ethical reflection concerning their research in front of the whole group.

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

Number of students: 30 - 35

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

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

Course responsible:
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Contact person:
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Title: Medicinsk forskningsetik

Course number: 2964
Credits: 1.5
Date: 2018-10-01 -- 2018-10-05
Language: Swedish
Level: Forskarnivå
Responsible KI department: Department of Learning, Informatics, Management and Ethics
Specific entry requirements:

Purpose of the course: Syftet med kursen är att den forskarstuderande:
- ska få förståelse för centrala forskningsetiska teorier, principer och riktlinjer och därmed få möjlighet att reflektera över etiska aspekter av den egna forskningen.
- ska få förståelse för vad som är god vetenskap samt var gränserna går för vad som är etiskt oacceptabel forskning både vad gäller forskning på människor och djur, samt vad som gäller forskarens egen hederlighet.
- utvecklar ett forskningsetiskt förhållningssätt inom sin egen forskning, gentemot andras forskning och det omgivande samhället.

Intended learning outcomes: Den forskarstuderande ska efter avslutad kurs kunna:
- redogöra för forskningsetiska teorier, principer och, i viss mån, riktlinjer.

Contents of the course: - Centrala forskningsetiska principer, teorier och argument
- Centrala vetenskapsteoretiska begrepp och positioner, och dess relevans för forskningsetik.
- Försöksdjursetik, innefattande argument för och emot att använda djur för forskningsändamål, samt de 3 R:en.
- Etikprövningar och forskningsetiska riktlinjer, såsom Helsingforsdeklarationen.
- God vetenskaplig sed och avvikelsen från god sed i forskningen, exempelvis frågor kring fabriken, förvanskning och plagiering, samt hantering av vetenskapligt författarskap.
- Intressekonflikter i samband med forskning, såsom jäm och sponsring.

Teaching and learning activities: Föreläsningar, gruppvarbeten och plenumdiskussioner.

Examination: Deltagaren genomför en skriftlig forskningsetisk reflektion företrädesvis angående det egna forskningsprojektet. Ett fåtal studenter ges möjlighet att muntligt redovisa en forskningsetisk reflektion, i relation till samtliga lärandemål, angående sin forskning för samtliga deltagare.

Compulsory elements: Gruppdiskussioner och plenumdiskussioner är obligatoriska. Vid frånvaro kan studenten i viss utsträckning kompensera detta genom att lämna in skrivna svar angående de fall som diskuterats.

Number of students: 30 - 35

Selection of students: Urvalet baseras på 1) datum för doktorandregistrering (där tidigare registreringsdatum har förrut), 2) kursplanens relevans för den sökandes doktorandprojekt (enligt motivering).

More information: Denna kurs innehåller obligatoriska moment under varje kursdag och studenterna förväntas därför närvara samtliga kursdagar.

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

Course number: 2971
Credits: 2.5
Date: 2018-11-07 -- 2018-12-10
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 interpretation 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 extension 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) date for registration as a doctoral student (priority given to earlier registration date)

More information: The course is held at Karolinska University Hospital Huddinge. Course dates: 7/11, 9/11, 16/11, 22/11, 30/11, 7/12, 10/12. Between these course dates, there will be deadlines for mandatory home assignments. Laptop required for programming exercises.

Course responsible:
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Contact person:
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Title: The future of medicine: the role of "chance" in development, evolutionary adaptation and diseases

Course number: 2979
Credits: 1.5
Date: 2018-10-29 -- 2018-11-02
Language: English
Level: Doctoral level
Responsible KI department: Department of Microbiology, Tumor and Cell Biology

Specific entry requirements:
Purpose of the course: This course is suitable for doctoral students who want to deepen their understanding on the interaction between chromatin structure and the environment in human health and disease.

Intended learning outcomes: Following the completion of the course, the students will be able to describe the basic principles of stochastic developmental variation, its role in functional diversity, such as differences in cell types within an organism, physiological and morphological differences among tissues and organs, differences in performance, and changes in behaviour. Moreover, the students will be able to describe the underlying mechanisms that contribute to molecular variation between single cells, with a focus on chromatin-based processes. They will thus get a deeper understanding about the dynamics of chromatin states and how deregulation of such states contributes to ageing and human diseases, such as viral infections, cancer, metabolic, neurological and psychiatric disorders. The students will also be able to design experiments for studying the transcriptome and chromatin marks in single cells and to critically evaluate results obtained with single-cell techniques.

Contents of the course: The course covers chromatin-based mechanisms of transcriptome variation, and how this feature relates to cell-to-cell variation in phenotypes. Particular attention will be paid to the function of stochastic epigenetic variation during viral infection, and the deregulation of these processes in cancer, metabolic, neurological and psychiatric diseases.

Teaching and learning activities: The learning activities used in the course include lectures by the course organisers and several internationally well-known scientists in the field of chromatin research, research seminars, group discussions, problem-based learning activities and research article presentations by the students. Every student will present a recent publication in the form of a journal club. To encourage active participation, substantial time will be dedicated for discussions after the lectures and research seminars in the form of group discussions and problem-based learning activities.

Examination: Examination is based on the journal club presentations, and on active participation in discussions and problem-based learning activities during the course.

Compulsory elements: The lectures, seminars, group discussions, problem-based learning activities and journal club presentations are compulsory. Absence has to be compensated for in agreement with the course organisers.

Number of students: 10 - 18

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

More information:

Course responsible:
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Contact person:
Matti Nikkola
Institutionen för cell- och molekylärbiologi

Matti.Nikkola@ki.se
Title: Study design in clinical research

Course number: 2980
Credits: 3.0
Date: 2018-11-05 -- 2018-11-23
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 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: 18 - 25
Selection of students: Selection will be based on 1) the relevance of the course syllabus for the applicant's doctoral project (according to written motivation), 2) 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:
Shaohua Xie
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Contact person:
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Shaohua Xie
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Title: Rare disease genomics

Course number: 2981
Credits: 1.5
Date: 2018-11-19 -- 2018-11-23
Language: English
Level: Doctoral level
Responsible KI department: Department of Molecular Medicine and Surgery
Specific entry requirements:
Purpose of the course: The course is aimed primarily at doctoral students in biomedical and human genetic research, and provides interactive training in the latest massive parallel sequencing techniques and data-analysis tools.
Intended learning outcomes: After the course, the participants will be familiar with high throughput genomic technologies and their application to the study of rare genetic diseases. The students will be able to use publicly available bioinformatics tools and databases to perform downstream bioinformatics analysis and evaluate candidate variants. The students will also become familiar with design of experimental follow-up of genetic variants and genotype-phenotype correlation studies as well as ethical issues arising from large-scale sequencing studies.
Contents of the course: This is a course aimed at students actively involved or planning genetic analysis of rare (Mendelian) diseases. The course is also appropriate for those working with complex diseases and cancer whose projects involve high throughput DNA sequencing. The focus of the course is the use of DNA-sequencing 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. The course will cover the use of different in-silico pathogenicity scores, phenotype ontology terms, and population and family data for variant interpretation. The course will cover 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, discussions, and hands-on computer-based bioinformatics analysis. A journal-club seminar held by the student will take place at the end of the course. Students are required to bring their laptops.
Examination: It will be assessed whether each individual doctoral student has reached all the learning outcomes of the course during active participation in the bioinformatics tutorials as well as during the journal-club seminars.
Compulsory elements: The lectures, discussions, seminars and hands-on bioinformatics tutorials 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) date for registration as a doctoral student (priority given to earlier registration date)
More information:

Course responsible:
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Contact person:
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Ann Nordgren
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Title: Hypertension

Course number: 2983
Credits: 1.0
Date: 2018-11-22 -- 2018-12-06
Language: English
Level: Doctoral level
Responsible KI department: Department of Clinical Sciences, Danderyd Hospital
Specific entry requirements: Undergraduate study in medicine or biomedicine

Purpose of the course: To understand the key role of vascular function in cardiovascular physiology and pathophysiology, and why uncontrolled blood pressure is the most important cause of premature death.

Intended learning outcomes: This course module will focus on clinical hypertension research and the importance of translational medicine, including experimental studies and clinical trials. At the end of the course the participants should be able to show 1) good understanding of the physiology of blood pressure control and the pathophysiology of hypertension; 2) good knowledge of current clinical management of hypertension; 3) knowledge of the current challenges and potential improvements in clinical care and drug developments in hypertension; and 4) critical reading of publications on hypertension research.

Contents of the course: Physiology and pathophysiology of hypertension, including neurohormonal regulatory mechanisms. Interactions between the CNS, heart, vessels, and kidneys. How to measure blood pressure, and to assess vascular and endothelial function, and hypertensive heart disease. Antihypertensive drug treatment, target blood pressure, and effects on outcome. How to assess target organ damage. Use of registers in hypertension research.

Teaching and learning activities: Lectures, seminars, and discussions in groups. Journal club sessions. Presentation and discussion of assigned group work.

Examination: All participants will give individual presentations of assigned group work at the end of the course module; and each student will be accordingly assessed on the intended learning outcomes.

Compulsory elements: The participants must attend the sections of presentations and discussion of the assigned group work.

Number of students: 5 - 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 activities will be at Danderyd University Hospital (lecture rooms located in building 18, floor 5) on November 22 and 29, and December 6, on all occasions at 13:00-17:00; and assigned group work to be done between these three dates. Total course module length is 3 days.

Course responsible:
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Nailin Li
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Clinical Pharmacology Unit
Karolinska University Hospital-Solna
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Stockholm
Title: Multivariate prediction modelling with applications in precision medicine

Course number: 2990
Credits: 1.5
Date: 2018-11-19 -- 2018-11-23
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 tomorrow's 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 administer 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, with required prerequisite knowledge, are selected 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 (priority given to earlier registration date). Submit a completed application form. Give all information requested, including a description of current research and motivation for attending, and 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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Contact person:
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Title: Biostatistics III: Survival analysis for epidemiologists

Course number: 2992
Credits: 1.5
Date: 2018-11-05 -- 2018-11-14
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: 1) 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. 2) 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. 3) discuss the concept of confounding in epidemiological studies and be able to control/adjust for confounding using statistical models. 4) apply and interpret appropriate statistical models for studying effect modification and be able to reparameterise a statistical model to estimate appropriate contrasts. 5) 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, with required prerequisite knowledge, will be selected based on 1) the relevance of the syllabus for the applicant's doctoral project (according to written motivation), and 2) date for registration as doctoral student (priority given to earlier registration date). To be considered, submit a completed application form. Give all information requested, including a description of current research and motivation for attending, and an account of previous courses taken.

More information: The course will be held November 5, 7, 9, 12 and 14. The course is extended over two weeks, but is still five full course days, to promote reflection and active learning. 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 selfassessment test (http://biostat3.net) for you to confirm that you understand the central concepts. We advise all potential applicants to take the test prior to applying for Biostatistics III. If you attempt the test under examination conditions (i.e., without referring to the answers) we would recommend: 1. if you score 70% or more then you possess the required prerequisite knowledge. 2. if you score 40% to 70% you should revise the areas where you lost marks. 3. if you score less than 40% you should, at a minimum, undertake an extensive review of central concepts in statistical modelling and possibly consider studying intermediate level courses (e.g., Biostatistics II) before taking Biostatistics III.

Course responsible:
Mark Clements
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Contact person:
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Title: Ischemic heart disease

Course number: 2993
Credits: 1.0
Date: 2018-10-22 -- 2018-10-24
Language: English
Level: Doctoral level
Responsible KI department: The institute of Environmental Medicine

Specific entry requirements:

Purpose of the course: The course aims to give the student an overview of the state of art of research on ischemic heart diseases and focuses on the areas where implementation is needed to answer relevant research questions.

Intended learning outcomes: The participants should after the course 1. have a good knowledge of the epidemiology of ischemic heart disease 2. understand the pathophysiology of ischemic heart disease 3. know the cardinal clinical signs of cardiac ischemia 4. discuss ischemic heart disease in the connection to other common cardiovascular diseases 5. be able to identify the areas of lack of knowledge

Contents of the course: The course is divided in three days: day 1 gives an overview of ischemic heart disease with lectures in the morning and a practical session in the cardioimaging lab at Danderyds Hospital day 2 is organized as a study and group work day day 3 gives an overview of ischemic heart disease in the pathogenesis of other common cardiovascular diseases.

Teaching and learning activities: Lectures/Seminars Individual study Group work Presentation and discussion of assigned group work

Examination: Written exam

Compulsory elements: The course participants should attend all the course lectures and the sessions of group work and presentation/discussion. The participants who have missed some of the sessions will be assigned additional reading and essay work to compensate the absence.

Number of students: 8 - 20

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

More information: Course will be hold at Danderyd Hospital

Course responsible:
Bruna Gigante
The institute of Environmental Medicine

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Contact person:
Title: Functional Neuroanatomy

Course number: 2994
Credits: 1.5
Date: 2018-09-10 -- 2018-09-14
Language: English
Level: Doctoral level
Responsible KI department: Department of Neuroscience

Specific entry requirements:
Purpose of the course: The purpose of this course is to 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: 10 - 28

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

More information: We will organize an introductory workshop on how to use a microscope for those who are not used to it. Therefore, let us know if you do not have good understanding of how to handle a light microscope and we will make sure to schedule some training for you.

Course responsible:
Tobias Karlsson
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Contact person: -
Title: Anaesthesia, analgesia and surgery (mice and rats)

Course number: 2996  
Credits: 1.5  
Date: 2018-11-05 -- 2018-11-09  
Language: English  
Level: Doctoral level  
Responsible KI department: Comparative medicine

Specific entry requirements: Students need to complete a laboratory animal science course on how to carry out scientific procedures on the appropriate animal species i.e. EU Function A or equivalent course.

Purpose of the course: 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 techniques to in vivo studies enhances outcomes from research studies, reduces data variability, and is perceived as ethically acceptable. The course 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.

Intended learning outcomes: The course is designed to meet the learning outcomes specified by the training recommendations supplied as an annex to EU Directive 2010/63/EU. Swedish legislation was amended to meet the requirements of this Directive in 2013. After completion of this course, the students should be able to meet the defined learning outcomes as set out in the EU 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 the endorsed 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.

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 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 module 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, and using appropriate non-animal models.

Teaching and learning activities: The course will adopt a blended learning approach that combines seminars, discussions, interactive sessions and practical components. Nine seminars 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). Two interactive problem based sessions will be included, including Audience response systems to facilitate discussions. An audience response system will also be used throughout the seminars to encourage participation and engagement by the students. The seminars incorporate video material and supplemental material is provided via on-line e-learning components. 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 DOPS (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 at a global rate for this course, a level of supervision for the prospective work on animals will be assigned, as suggested in the EU guidelines endorsed by the Swedish competent authority for the protection of animals used in science.

Compulsory elements: All 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 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: An e-learning module and home study of pre-reading material must be completed prior the face-to-face teaching that will be held between Tuesday and Friday. A final written examination will take place on Friday. Location: Learning Lab, von Eulers väg 4A, 2nd floor.
Course responsible:
Rafael Frias
Comparative medicine
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Contact person:
Title: Advanced cancer biology

Course number: 3024
Credits: 3.0
Date: 2018-08-28 -- 2018-12-18
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 textbooks, 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 textbooks within the presented fields, prior to each seminar. Throughout the course period, the course organizers 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.

Course responsible:
Lars-gunnar Larsson
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Contact person:
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Jonas Fuxe
Institutionen för medicinsk biokemi och biofysik
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Purpose of the course: The purpose of this course is to introduce a variety of teaching and learning methods, and to stimulate a reflective approach to teaching in order to enhance students' meaningful learning and active involvement.

Intended learning outcomes: At the end of the course we expect you to:
- Be able to explain general aspects of how to facilitate student learning in different teaching situations
- Be able to reflect upon own teaching experiences and use educational concepts in a discussion about teaching and learning

Contents of the course: During the course we will discuss and elaborate on practical issues regarding teaching and learning in laboratory, seminars and lectures. We will discuss and work with ways to challenge students and what to do to facilitate their learning. Course participants will observe (auscultate) teaching and reflect upon their experiences. We will touch upon the role of the teacher and KI teaching policies as well as strategies for coping with stress.

Teaching and learning activities: The course is designed to promote active learning and a variety of teaching and learning strategies will be used during the course. Examples are lectures, small group discussion, peer teaching, group work, literature studies, auscultation of teaching and reflection in groups.

Examination: To satisfactorily complete this course you must demonstrate that you have reached the learning outcomes by orally presenting your reflections of literature studies and auscultation of teaching.

Compulsory elements: The assessment seminar the last day of the course is mandatory. If absent, the student need to present his/her knowledge at a separate occasion.

Number of students: 15 - 30
Selection of students: Priority will be given to doctoral students who have just started or soon will be involved in teaching and that have no teacher training.

More information: The course is based on theories of experiential learning, a reflective approach and learning through active participation and collaboration. In order to learn as much as possible from the course it is important to be present at scheduled meetings and, where appropriate, be prepared for them. The course is scheduled 25 September, 4 October and 25 October. In addition, time for reading and auscultation must be planned by the course participants. The course is given in English. The course is equal with the previous course number 2686 - Introduction to teaching at KI.

Course responsible:
Jayne Alfredsson
Department of Learning, Informatics, Management and Ethics
jayne.alfredsson@ki.se

Contact person:
Jayne Alfredsson
Institutionen för lärande, informatik, management och etik
jayne.alfredsson@ki.se
Title: Summer school in chronic inflammation

Course number: 3061
Credits: 1.5
Date: 2018-08-19 -- 2018-08-25
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 chronic inflammation and its cellular and molecular mechanisms, including tools and technologies applied.

Intended learning outcomes: Upon completion of the course, the doctoral students can describe important concepts in the cellular and molecular mechanisms relating to chronic inflammation, and critically evaluate important methods and technologies applied in chronic inflammation research.

Contents of the course: Chronic inflammation and its cellular and molecular mechanisms. Methods and technologies used in the study of chronic inflammation.

Teaching and learning activities: The course is organized as a summer school, which encompasses lectures, small group discussions, student presentations, and site visits to research laboratories.

Examination: The students are examined with individual and group presentations on the course themes.

Compulsory elements: Participation in the group discussions and student presentations is mandatory. Compensation is according to the instructions of the course director.

Number of students: 5 - 5

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 summer school course is jointly organized by Peking University Health Science Center, King's College London, Keio University and Karolinska Institutet. It is part of a rotating program where the participating universities take turn to organize the summer school. In 2018, the summer school course takes place in Beijing, China. Participants should plan for arrival on August 18 and departure for August 26. The summer school organizes the accommodation for days August 18-26, in shared rooms. The five doctoral students admitted from Karolinska Institute will receive travel grants (10000 Swedish crowns including INDI) that must be used to cover travel expenses for this summer school according to the KI travel regulations. All travel such as flights, visas and vaccinations must be organized by the participants.

Course responsible:
Matti Nikkola
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Contact person:
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_institutionen för cell- och molekylärobologi
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von Eulers väg 1
171 77
Stockholm
Title: Register-based research - Pharmacoepidemiology: drug use and safety

Course number: 3063
Credits: 3.0
Date: 2018-11-26 -- 2019-03-08
Language: English
Level: Doctoral level
Responsible KI department: Department of Medicine, Solna
Specific entry requirements: All applicants must have basic and documented skills in using statistical software (SAS, Stata, or R) for data management and analysis, and have - at a minimum - basic level knowledge in epidemiology and biostatistics.

Purpose of the course: The purpose of the course is to gain knowledge and hands on experience in conducting Nordic register-based research using health data and socioeconomic data with a special focus on pharmacoepidemiological methodology and data sources.

Intended learning outcomes: At the end of the course the student should be able to: - Demonstrate knowledge of basic concepts in pharmacoepidemiology and its relevance for public health - Demonstrate knowledge of sources of health and socioeconomic register data in the Nordic countries - Demonstrate knowledge of legal issues and sharing of data within and across Nordic countries - Independently plan and produce a study protocol to perform a pharmacoepidemiologic study including description of data sources - Independently analyze register data using statistical software

Contents of the course: The course will cover Nordic register-based research with a special focus on pharmacoepidemiology. In pharmacoepidemiological studies, a broad range of data sources are available for use, such as nationwide health registers (e.g. hospital contacts, births, deaths, and cancer), medical quality registers, medical records, biological data (biobanks), and socioeconomic data. The course will cover the available data sources in the Nordic countries, and the legal issues and issues related to data access and data sharing across countries. Special emphasis will be on the nationwide prescription registers and other registers used for pharmacoepidemiologic research. The participants will be introduced to epidemiologic study design and sources of errors in pharmacoepidemiologic studies and methods to correct such errors. Through group work the participants will independently develop a study protocol for a register-based study. The participants will become familiar with Nordic register data and challenges when performing register studies. They will strengthen their analytic skills through computer labs by working on simulated Nordic register data.

Teaching and learning activities: Lectures, group work, and computer labs (individual and group work).

Examination: Oral and written presentation of group work. Each student will be assessed individually. It has to be shown that all the intended learning outcomes are reached.

Compulsory elements: It is compulsory to participate in the individual work and group work. Any absence will have to be compensated by extra individual assignments outside the course periods and provided by the course organizers.

Number of students: 8 - 20

Selection of students: Applicants will be prioritized as follows: 1) PhD-students within pharmacoepidemiology or related area 2) Postdocs with focus on pharmacoepidemiology 3) Others that have passed the postdoctoral level and have ongoing research activity in pharmacoepidemiology. Selection will be based on: 1) The relevance of the course syllabus for the applicant's project according to written motivation 2) Date for registration as a doctoral student (priority given to earlier registration date)

More information: VENUE: Eugeniahemmet T3, Karolinska University Hospital Solna FORMAT: The format will be a two-week course divided into two separate parts of five full working days each (in total 10 full working days/3 HEC, equivalent to 3 ECTS). All students must complete both parts of the course. Part 1 will be held during the autumn term 2018 (week 48), and Part 2 will be held during the spring term 2019 (week 10). During Part 1 of the course the students will work in groups and develop a study protocol for a pharmacoepidemiological study. The final examination assignment of Part 1 will be a written study protocol and an oral presentation of the protocol by each study group in a final plenary session. During Part 2 of the course the students will strengthen their analytic skills through computer labs. Students will get hands-on experience performing basic epidemiologic analyses in a simulated Nordic register data set under the supervision of the faculty. The exercises will be cross-platform exercises, i.e. it will be possible for the participants to use different statistical software (Stata, SAS, or R). Group assignments will be given during each computer lab session. The final examination assignment of Part 2 will be oral presentation of the group assignments, including the results of analyses, in a final plenary session. Two distinguished international researchers and lecturers will be part of the teaching faculty during Part 2 of the course. Professor Sonia Hernandez-Diaz from the Harvard T.H. Chan School of Public Health, USA is an expert in drug safety studies in pregnancy, and Professor K. Arnold Chan, Director of the National Taiwan University Health Data Research Center, Taiwan has comprehensive experience in pharmacoepidemiology from both academia and the private sector, and as advisor for regulatory authorities. REIMBURSEMENT OF TRAVEL AND ACCOMODATION EXPENSES: Participants living outside commuting distance from Stockholm can apply for a maximum of 6000 SEK per course occasion to cover travel expenses, and a maximum of 1200 SEK/night (max 5 nights per course occasion) to cover accommodation expenses. The participants must follow the travel regulations of their respective institutions. 10 seats are reserved for PhD students. 12 seats are reserved for students from other Nordic countries than Sweden. WHEN APPLYING APPLICANTS SHOULD: 1) State their current position and level of training (e.g., doctoral student and date of registration, post doc) and current institution 2) List their previous
courses in epidemiology/biostatistics and the institution where they were completed. 3) Describe previous experience with studies in pharmacoepidemiology or another epidemiologic field (if any). 4) Motivate their interest in this course with respect to their current and future research plans and how they expect to benefit from the course.

Course responsible:
Helle Kieler
Department of Medicine, Solna

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Contact person:
Ingvild Odsbu
Institutionen för medicin, Solna

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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 graduate student should be able to:

- explain how MR images are generated, what causes artifacts and how to control for them
- understand how MRI is used today for dementia investigations
- formulate the basics of surface-based analysis and voxel-based morphometry (differences, similarities and 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 DTI as well as other imaging modalities

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

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) date for registration as a doctoral student (priority given to earlier registration date)

More information: The course will be in Campus Flemingsberg, KI, every day of the week (26/11-30/11-2018) 9.00-16.00. The exact location will be announced before the course starts.
**Title :** Metoder för systematisk litteraturöversikt

**Course number :** 3066
**Credits :** 7.5
**Date :** 2018-09-17 -- 2018-12-07
**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 förvändas 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 utför 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 utför en vetenskaplig process. Olika syften och metoder för forskningsöversikter exemplifieras. Processen i en systematisk litteraturöversikt karaktäriseras av en tydligt formulerad fråga som besvaras genom systematiska och explikta metod för att identifiera, välja ut, kritiskt bedöma och analysera relevanta studier utför frågeställningen.

**Teaching and learning activities :** Kursen tillhandahåller en introduktion i metoder för systematisk litteraturöversikten. Kursdeltagare utvecklar ett protokoll för och genomför en systematisk litteraturöversikten som fokuserar på en välfri 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, granskningsarbete och gruppdiskussioner, för att konsolidera kunskapen i deltagarnas projekt. Centralt i kursen är att utveckla färdigheter att använda systematiskt tillvägagångssätt och att sammanfatta kunskap utifrån en vetenskaplig process.

**Examining the course :** Kursen examineras individuellt genom muntlig och skriftlig examination i form av en systematisk litteraturöversikt. För godkänd kurs krävs att lärandemålen är uppfyllda, vilket innebär godkänd 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 ett arbetsskott och en litteraturöversikt utför en vald frågeställning (1-2 sidor, 1,5 radavstånd, 12 punkter Times, Roman). Uppgiften skickas i form av ett Word dokument (döpt med ditt namn).

**Teaching and learning activities :** Kursen tillhandahåller en introduktion i metoder för systematisk litteraturöversikt. Uppgiften skickas i form av ett Word dokument (döpt med ditt namn).

**Course number :** 3066
**Credits :** 7.5
**Date :** 2018-09-17 -- 2018-12-07
**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 förvändas 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 utför 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 utför en vetenskaplig process. Olika syften och metoder för forskningsöversikter exemplifieras. Processen i en systematisk litteraturöversikt karaktäriseras av en tydligt formulerad fråga som besvaras genom systematiska och explikta metod för att identifiera, välja ut, kritiskt bedöma och analysera relevanta studier utför frågeställningen.

**Teaching and learning activities :** Kursen tillhandahåller en introduktion i metoder för systematisk litteraturöversikt. Kursdeltagare utvecklar ett protokoll för och genomför en systematisk litteraturöversikten som fokuserar på en välfri 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, granskningsarbete och gruppdiskussioner, för att konsolidera kunskapen i deltagarnas projekt. Centralt i kursen är att utveckla färdigheter att använda systematiskt tillvägagångssätt och att sammanfatta kunskap utifrån en vetenskaplig process.

**Examining the course :** Kursen examineras individuellt genom muntlig och skriftlig examination i form av en systematisk litteraturöversikt. För godkänd kurs krävs att lärandemålen är uppfyllda, vilket innebär godkänd 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 ett arbetsskott och en litteraturöversikt utför en vald frågeställning (1-2 sidor, 1,5 radavstånd, 12 punkter Times, Roman). Uppgiften skickas i form av ett Word dokument (döpt med ditt namn).

**Teaching and learning activities :** Kursen tillhandahåller en introduktion i metoder för systematisk litteraturöversikt. Uppgiften skickas i form av ett Word dokument (döpt med ditt namn).

**Number of students :** 10 - 20

**Selection of students :** Urval görs utför kriterier som utgör motivering till att gå kursen, där doktorander i Forskarskolan i vårdvetenskap har företräde framför andra sökanden.

**More information :** Kursen är en distanskurs på deltid som omfattar sex till sju tillfällen på Campus om 1-3 dagar varav ett är slutseminarium. Tider och lokal: Tillfälle 1-3: 17-19 september, 9.00-16.00 (föreläsningar och workshop/seminarium) Tillfälle 4: 4 oktober, 13.00-16.00 (frivillig workshop) Tillfälle 5: 12 oktober 9.00-16.00 (detta sker i halvklass och ni kommer att närvara antingen fm eller em). Tillfälle 6: 9 november, 9.00-16.00 (frivillig handledning. OBS detta datum kan komma att ändras i samråd med er) Tillfälle 7: 6 eller 7 december, 9.00-16.00 (detta sker i halvklass och ni kommer att närvara en av de två dagarna). Samtliga tillfällen är på Solna campus, Tomtebodavägen 18A eller Berzelius väg 7B.

**Course responsible :**
Claudia Lampic
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Claudia.Lampic@ki.se

**Contact person :**
Title: Immunogenicity: Immune responses against biological drugs

Course number: 3067
Credits: 1.5
Date: 2018-12-10 -- 2018-12-14
Language: English
Level: Doctoral level
Responsible KI department: Department of Clinical Neuroscience

Specific entry requirements:

Purpose of the course: Understanding of central terms and definitions in the field of immunogenicity, used in research and in clinical applications. To become familiar with the identified molecular and cellular immunological processes that trigger and increase the risk for developing anti-drug antibodies (ADA). Understanding of how immunogenicity needs to be taken into consideration all the way from choosing your biological target of treatment, to drug development, approval, clinical routine and individualized therapy and health care practice.

Intended learning outcomes: At the end of the course the student should be able to: - Understand what determines the immunogenicity of drugs and why they differ in this respect. - Give examples of different methods of how to measure drug level and ADA. - Understand the algorithms needed in clinical practice and what consequences ADA might have for treatment decision, safety and efficacy. - Integrate this knowledge in your own research project or a disease and treatment of choice.

Contents of the course: The course will give you an orientation of the clinical research fields where treatment with biopharmaceuticals are important and how the immune system can react against different biopharmaceuticals. It will include the diseases MS, RA, IBD, and SLE and biopharmaceuticals like IFNbeta, natalizumab, rituximab, TNF-blockers as well as the biosimilars for these. A range of immunoassay methodologies that can be used to measure drug levels and ADA will be presented and the clinical relevance of the test results discussed. The course will also give insights on the type of research being done to identify risk factors for ADA, and optimisation of drug design, production and administration to minimize the risk. Ways to improve treatment regiments adopted to results of drug level and ADA, as well how to monitor and store data in clinical routine will be discussed.

Teaching and learning activities: Lectures, individual essays, peer-review and oral presentation.

Examination: Essay, peer-review and oral presentation.

Compulsory elements: Lectures, essay, peer-review and oral presentation. Absence from lectures can be compensated for by writing an additional essay on the subject missed.

Number of students: 10 - 50

Selection of students: Selection will be based on the relevance of the course syllabus for the applicants doctoral project (according to written motivation).

More information: Full time week course (40 h). This course is part of both the doctoral programme of Aii (allergy, immunology and inflammation) and Neuroscience.

Course responsible:
Anna Fogdell-Hahn
Department of Clinical Neuroscience

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CMM

Solna

Contact person:
Title: Basics of qualitative research

Course number: 3068
Credits: 3.0
Date: 2018-09-24 -- 2018-10-05
Language: English
Level: Doctoral level
Responsible KI department: Department of Clinical Science and Education, Södersjukhuset

Specific entry requirements:

Purpose of the course: The purpose of the course is to teach participants how to identify different theoretical and philosophical starting points for qualitative inquiry and how to select the most appropriate qualitative methodology for a research question. Furthermore, to enable participants to write an academic qualitative proposal in the participant's field of interest from research question to ethical consideration, to critically appraise a qualitative paper and compare with quantitative ones in different aspects and finally to evaluate the ethical considerations in a qualitative study.

Intended learning outcomes: At the end of the course the participants will be able: 1. To describe different theoretical starting points for qualitative inquiry 2. To apply knowledge of qualitative research methods for discussing rationales for the design of the qualitative inquiry 3. To critically compare of qualitative and quantitative research (basic assumptions of the qualitative research paradigm as it compares to the quantitative paradigm) 4. To describe the common essential elements of qualitative research including; How to select the appropriate: qualitative research methods based on phenomenon of interest setting for data collection, study participants, data generation strategies (including individual interviews, focus group discussion, written narratives, participants observation and field notes) and data analysis method 5. To critically comment on/evaluate the weaknesses and strengths of the studies (published papers) using qualitative research in terms of research question, aim and method 6. To design a qualitative research proposal in the field of health

Contents of the course: The course will provide some of the most important information which students need to understand and implement successful qualitative research methods (including the common essential elements of qualitative research). In addition the course will provide step by step guidance to examine and apply current qualitative methodologies as a way to generate, manage, analyse qualitative data and moreover, ethical considerations. The course will start with the definition of qualitative research, basic assumptions and characteristics of qualitative research in comparison to quantitative research. Following that will be the notion of some common essential elements in qualitative methods such as: selecting the methods based on phenomenon of interest, using the literature review, choosing the setting for data collection, selecting participants, generating data and content analysis. After that, practical principle to do qualitative inquiry will be addressed. Finally ethical considerations in qualitative research will be explained.

Teaching and learning activities: The learning activities on the course are a mix of lectures, discussions, individual and group work, interviews, seminars, field observation and individual presentations.

Examination: Formative assessment (feedback and coaching) during Peer learning activity, critique of a qualitative paper, individual and group presentation. Summative assessment in connection to oral presentations (50%) and of a written examination and individual qualitative study proposal (50%).

Compulsory elements: Active participation in the class discussions, individual and group assignment (individual and group interview and field observation), written assignment (an abstract of a qualitative proposal) and student presentations is mandatory. Compensation according to the instructions of the course director, which means absence in less than 2 lectures is acceptable and should be compensated for by an individual project related to that particular session.

Number of students: 15 - 30
Selection of students: Selection will be based on 1) the relevance of the course syllabus for the applicant's doctoral project (according to written motivation), 2) date for registration as a doctoral student (priority given to earlier registration date)

More information: The course will be held with lectures at the hospital and group work at optional places

Course responsible:
Hamid Khankeh
Department of Clinical Science and Education, Södersjukhuset

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Sjukhusbacken 10
118 83
Stockholm

Contact person:
Jeanette Öhrman
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Title: Global Sexual and Reproductive Health: Basic Concepts and State of the Art

Course number: 3069
Credits: 3.0
Date: 2018-10-08 -- 2018-11-09
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 (SRH) is 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 the theoretical tools to review and carry out research in SRH. Online lectures and readings will take place before the on-campus week and an assignment given to all students at the beginning of the course and submitted at the end of the course.

Intended learning outcomes: At the end of the course the student should be able to:
1. Describe core concepts of reproduction, maternal mortality and morbidity and sexual health in a global context.
2. Understand sexuality and reproduction in a public health- and global perspective.
3. Show advanced knowledge of how socio-, political-, economic- and ethical factors relate and influence SRH.
4. Utilise, analyse and interpret data and measurements in SRH.
5. Have knowledge regarding state of the art in SRH - where are the current gaps in research.

Contents of the course: This course covers:
1. Introduction to general and core concepts in reproductive and sexual health in a global context.
2. Underlying causes of (in)equities in SRH.
3. SDGs and other policy initiatives and their relation to SRH globally.
4. Designing research projects aiming to study relevant research questions in SRH.

Teaching and learning activities: Online lectures and readings will take place before the on-campus week and an assignment given to all students at the beginning of the course and submitted at the end of the course. The course will use interactive lectures, seminars, practical exercises and projects.

Examination: Essay that will be graded as fail or pass. Create a poster. It has to be shown that all the intended learning outcomes of the course are achieved.

Compulsory elements: Hand in the assignments, participate in discussions, create a poster.

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) date for registration as a doctoral student (priority given to earlier registration date).

More information: The course will start and end with 1.5 ECT self-studies in terms of online activities and readings. The on-campus teaching (in Solna and in Uppsala) will take place 22-26 October.

Course responsible:
Elin Larsson
Department of Women's and children's health
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Contact person:
Kristina Gemzell Danielsson
Institutionen för kvinnor och barns hälsa
0851772128
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Title : Mucosal Immunology

Course number : 3070
Credits : 2.5
Date : 2018-10-02 -- 2018-10-11
Language : English
Level : Doctoral level

Responsible KI department : Department of Medicine, Huddinge
Specific entry requirements : Basic knowledge in immunology corresponding to the course 2302.

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

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

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

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

Examination : The course examination will be in the form of individual assignments and oral presentations. Students will be given a scientific question related to mucosal immunology. Each student then has to design an experimental approach to answer the question. The answer is presented by each student individually as short talk presentation. The presentation is peer-reviewed by the course leaders and the other students. Each student has to show that all intended learning outcomes have been reached.

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

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

More information : The course is given full-time on-site at the KI Solna campus during 2 x three days (October 2-4 and October 9-11). Students have to reserve at least one additional day for work on assignments.

Course responsible :
Tim Willinger
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Contact person :
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Title: Cardiovascular physiology and pathology

Course number: 3071
Credits: 3.0
Date: 2018-11-19 -- 2018-11-30
Language: English
Level: Doctoral level
Responsible KI department: Department of Medicine, Solna

Specific entry requirements:

Purpose of the course: The students will learn basic concepts in cardiovascular physiology and pathology. This course is designed to build up good background knowledge in cardiovascular medicine and prepare the doctoral students 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 vascular system cooperate. To be able to relate, compare and understand experimental aspects of Cardiovascular diseases in a clinical perspective. To account for current clinical management of cardiovascular disorders. To illustrate and discuss the challenges of future improvements in diagnosis, clinical care, and drug developments related to the cardiovascular disorders addressed. To adapt knowledge of cardiovascular physiology by analyzing and discussing a clinical case and relating it to cardiovascular pathologies (group project).

Contents of the course: The course contains the following topics: cardiovascular biology and development, cardiovascular physiology with focus on cardiac and smooth muscle cell contraction, cardiovascular disease genetics, regeneration of the cardiovascular system, lipid mediators and vascular inflammation, ischemic heart disease, hypertension, heart failure, and implications of diabetes and systemic inflammatory disorders on cardiovascular diseases. The course will be organized in 1-day modules to cover all above-mentioned topics.

Teaching and learning activities: The course is given full-time during a total of two weeks. The teaching is mainly in lecture/seminar form but also includes project work and practical parts, where lectures/group discussions and laboratory demonstrations are integrated. The group project is carried out in small groups focusing on different topics with a group presentation 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 of the small-group project work special attention is given to that all students are actively participating. At the very end of the course, a short written exam will recapitulate the contents of the course.

Compulsory elements: Project work and attendance at the project presentation is compulsory as well as practical parts. In case of absence from theoretical parts, individual assignments have to be completed and then approved by the course organizers.

Number of students: 12 - 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: Course location will mainly be in Bioclinicum, Karolinska University Hospital Solna. Designated time is 9:00 to 16:00 Monday to Friday including time for individual studies and group work.

Course responsible:
Anton Gisterå
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Contact person:
Title: Tissue-specific immunology

Course number: 3072
Credits: 1.5
Date: 2018-11-19 -- 2018-11-23
Language: English
Level: Doctoral level
Responsible KI department: Department of Medicine, Huddinge

Specific entry requirements: Basic knowledge in immunology corresponding to the course 2302 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 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: The course will be given over one week (full time). 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 and a written report is expected from all students at the end of the course.

Teaching and learning activities: Lectures, group work, oral presentation and written report. Deadline for submission of the written report will be one week after finishing the course.

Examination: - Short oral presentation of small-group project work on the last day of the course, with all students actively participating. - Short written report based on the content of the course (1 page, due 1 week after finishing the course). - Every student will be evaluated and assessed individually.

Compulsory elements: - Oral presentation - Short written report The students are required to attend all lectures and seminars. Absence can be compensated by an individually written report.

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 given full-time on-site at the KI Flemingsberg campus. Time for working on the assignments (report and presentation) will be provided during the course. The written report should be handed in at latest 1 week after finishing the course.

Course responsible:
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Contact person:
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Nicole Marquardt
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Title: Philosophy of science and the concept of health

Course number: 3073
Credits: 1.5
Date: 2018-11-12 -- 2018-11-23
Language: English
Level: Doctoral level

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

Specific entry requirements: 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: 15 - 15

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 given over two weeks time, with 1.5 credits for the whole course.

Course responsible:
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Contact person:
Annelie Jonsson
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Title: Behavioral phenotyping and cognitive studies in rodents

Course number: 3074
Credits: 1.5
Date: 2018-10-22 -- 2018-10-26
Language: English
Level: Doctoral level

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

Specific entry requirements: Students need to have completed a laboratory animal science course equivalent to FELASA B or FELASA C level (Directive Function A, D - EU Directive 2010/63 art. 23-26).

Purpose of the course: The course is aimed at students who are starting or have already started to use rodents for their research. The purpose of the course is to allow doctoral students to obtain theoretical and practical experience in an integrative manner in the most important behavioral tests used in behavioral phenotyping and in cognitive characterization of wild-type and transgenic mice. In particular the doctoral student will get the opportunity to obtain a solid understanding of the novel automated behavioral system IntelliCage (IC). IC allows simultaneous measurement of cognitive parameters including memory and learning, anxiety, ability to wait for ones turn, responses to natural reward, reversal learning, etc of >10 animals per IC in home cage setting. The ability of IC to measure >10 animals in home cage setting makes it an important future tool superior to classical single animal based tests.

Intended learning outcomes: At the end of the course the participant should be able to - know how to choose and understand the main rodent behavioral models and how to use them depending on the research question. - critically evaluate protocols, interpret the results of previous studies and adapt behavioral protocols to their own research.

Contents of the course: The course will give to the course participants the knowledge necessary to characterize rodent behavior using different paradigms such as Morris Water Maze, Y-maze, Open field and Fear conditioning, for basic characterisation of genetically modified rodents, for evaluation of novel drugs and for studying the effect of the environment. During the course the students will learn how to use IntelliCage to study mouse behavior including memory and learning in wild-type and transgenic mice. There is also a practical component where students will get hands-on-experience in the most common IC protocols used.

Teaching and learning activities: The course is partly theoretical, partly practical, where lectures, laboratory demonstrations and practical sessions are integrated. During the practical sessions the student will design a behavioral study using the IntelliCage, with data collection and final analysis.

Examination: A short answer and multiple-choice questioner or oral 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 pass the course. Missed parts of the course for justified absence will be compensated in agreement with the course director.

Number of students: 8 - 15

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

More information: The course is given in Huddinge campus, Monday to Friday. The inventor of the IntelliCage system Dr Vootele has been invited to the course.

Course responsible:
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Simone Tambaro
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Title: Computational toxicology - methods and applications

Course number: 3075
Credits: 1.5
Date: 2018-11-19 -- 2018-11-23
Language: English
Level: Doctoral level
Responsible KI department: The institute of Environmental Medicine
Specific entry requirements: Basic knowledge in statistics.
Purpose of the course: The purpose of the course is to build knowledge and understanding on how computational methods and tools can be used for modelling and/or prediction in toxicology and risk assessment of chemical substances.

Intended learning outcomes: After the course, the students should:
- be able to describe what computational methods and tools are available and their proper areas of use,
- have some basic practical skills in using selected software,
- be able to describe how computational methods are applied within some relevant regulations, and
- be able to reflect on the strengths and limitations of using computational toxicology in research and regulatory risk assessment.

Contents of the course: Computational, or in silico, toxicology, is a discipline that is focused on developing and using computer-based models to better understand and predict adverse effects caused by substances such as e.g. pharmaceuticals, chemicals and environmental contaminants. During the course, students will learn about concepts such as read-across, quantitative structure-activity relationships, quantitative structure-property relationships, machine learning, molecular modeling. How to use computational methods for exposure and kinetics modelling will also be covered, as will regulatory guidelines relevant for this discipline. The utility of computational toxicology in various settings (such as in the REACH regulation, and in drug discovery and development) will be discussed. The students will get familiar with selected (mostly freely available) software that are used in computational toxicology.

Teaching and learning activities: The course includes lectures, computer demonstrations and group assignments with computer exercises.

Examination: Examination is in the form of an oral presentation in groups and a written exam.

Compulsory elements: Participation in demonstrations and group assignments are compulsory. Absence can be compensated by individual task(s).

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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Charlotte Nilsson
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Title: Cancer Cell Metabolism

Course number: 3076
Credits: 1.5
Date: 2018-11-05 -- 2018-11-09
Language: English
Level: Doctoral level
Responsible KI department: Department of Microbiology, Tumor and 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: 12 - 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 be given full-time during five days. During four days, the students will have two lectures in the morning with a small break in between. After lunch, the students will be presented with some cases or small problems related to the topic of cancer metabolism, that they will need to think about and solve. The rest of the time they will work on the preparation of their final presentation individually or in groups of two people. The last day of the course, the students will attend a mini-symposium with invited international speakers outstanding in the area of cancer metabolism. After the talks, they will have the opportunity to discuss with the speakers about their topics of research. In the afternoon, the students will present their own final work.

Course responsible:
Marie Arsenian-Henriksson
Department of Microbiology, Tumor and Cell Biology

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Contact person:
María Ruiz Pérez
Institutionen för mikrobiologi, tumör- och cellbiologi

maria.ruiz.perez@ki.se
Title: An introduction to genetic and molecular epidemiology

Course number: 3077
Credits: 1.5
Date: 2018-10-15 -- 2018-10-19
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, group seminars, 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, with required prerequisite knowledge, will be selected based on
1) the relevance of the syllabus for the applicant's doctoral project (according to written motivation), and
2) date for registration as doctoral student (priority given to earlier registration date). To be considered, submit a completed application form. Give all information requested, including a description of current research and motivation for attending, and an account of previous courses taken.

More information: A flipped approach will be used as part of the course, where students will acquire knowledge before class sessions by reading scientific papers available on a learning platform. Classroom time will be used to deepen knowledge through discussions with peers and teachers. The learning platform will open the week before course start.

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

Course number: 3078
Credits: 1.5
Date: 2018-10-22 -- 2018-10-31
Language: English
Level: Doctoral level
Responsible KI department: Department of Public Health Sciences

Specific entry requirements:

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

Intended learning outcomes: After successfully completing this course students are expected to be able to: - discuss the contribution of epidemiology to science and give examples of the advancements in the field, - reason about classification of exposure, outcome and covariates in epidemiological studies, - estimate and in a general way interpret measures of disease occurrence and measures of association, and describe how a specific measure is governed by the study design, - explain strengths and weaknesses of common epidemiological study designs, with a specific focus on cohort studies, - identify and explain possible sources of bias in epidemiological studies, - describe theoretical models for causation and discuss the principles of causal mechanisms, - apply knowledge of epidemiological concepts when critically reviewing scientific literature. Intended learning outcomes are classified according to Bloom's taxonomy: knowledge, comprehension, application, analysis, synthesis, and evaluation (Bloom, 1956, extended by Anderson and Krathwohl, 2001).

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

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

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

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

Number of students: 8 - 25

Selection of students: Eligible doctoral students will be prioritized according to 1) the relevance of the course syllabus for the applicant's doctoral project (according to written motivation), 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 October 22, 24, 26, 29, 31. The course is extended over two weeks, but still five full course days, in order to promote reflection and reinforce learning. The individual examination (i.e. the summative assessment) will be performed as a take-home examination after the course.

Course responsible:
Renee Gardner
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Contact person:
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Title: Nanoscale materials and device engineering against infections and antimicrobial resistance

Course number: 3079
Credits: 1.5
Date: 2018-10-15 -- 2018-10-19
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 the interdisciplinary research of nanotechnology and its great potential in medicine and specifically against infections and antimicrobial resistance. Throughout the course, the basic principles and historical development of bionanotechnology (materials and devices) will be described and specific examples from current state-of-the-art research will be presented aiming to motivate students to employ such diagnostic and therapeutic nano-tools in their own infection biology research. Furthermore, the course aims to further train students in important academic skills such as effective communication by performing oral presentations and contributing to constructive criticism.

Intended learning outcomes: After the completed course, the students will be able to:
- Describe on a professional level the advantages and challenges of nanoscale materials in medicine
- Be up to date with current developments in nanomedicine against infections
- Understand the various in vitro and in vivo nano-based diagnostic tools
- Understand the different categories of smart nanostructured multifunctional materials and devices and their employment in nanomedicine.
- Be able to suggest the employment of novel diagnostic and therapeutic nano-tools in their own research
- Perform extensive literature research using relevant databases (Web of Science, PubMed)
- Practice important academic skills such as effective communication and presentation of research

Contents of the course: The course will cover the basic principles of nanomedicine as a field starting from the first nano-agent used in the 70's (liposomes) and expanding till today with sophisticated nano-diagnostic agents as well as multi-functional smart nano-drugs. Specific emphasis will be placed in the current state-of-the-art examples of how nanoscale materials may be utilised against infections and antimicrobial resistance. Additionally, we will place special attention to potential adverse toxicological outcomes as well as the regulatory framework surrounding nanomedicine.

Teaching and learning activities: The course will consist of lectures on each of the intended learning outcomes, including on how to perform comprehensive literature research and tips on effective communication of research, both as a report as well as oral presentation. At least one internationally-recognized expert will give a guest lecture covering one of the above topics. Visits to nanomaterial-relevant laboratories in KI, as well as microbiology research will be arranged and conducted. Each student will choose a mini-project that will be a literature research project of a topic relevant to nanomedicine and infections. General lectures and demonstrations of how to perform extensive literature research in databases such as Web of Science and how to compile a final report and scientific presentation are included. At the end of the course, each student will give an oral presentation of the mini-project with peer based feedback.

Examination: The examination will consist of two parts: 1. The written assignment of the chosen mini-project (literature research of a nanomedicine-infection topic), and 2. The oral presentation of the mini-project with both peer-based and course master feedback.

Compulsory elements: Attendance at the lectures and oral presentations are compulsory. Absence from these can be compensated by extra assignment(s), however depending on the number of missed compulsory teaching activities, the possibility of compensating these will be decided in agreement with the course master.

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) date for registration as a doctoral student (priority given to earlier registration date)

More information: 09:00 - 14:00, Mon-Frid, classroom to be decided

Course responsible:
Georgios Sotiriou
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Contact person:
Title: Gene Regulation in the Early Human Embryo

Course number: 3080
Credits: 1.5
Date: 2018-09-17 -- 2018-09-21
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
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 - 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: The course will be held at Karolinska Institutet, Department of Biosciences and Nutrition, NEO Huddinge.

Course responsible:
Jose Inzunza
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Contact person:
Virpi Töhönen
Institutionen för biovetenskaper och näringslära

Virpi.Tohonenn@ki.se
Title: Medical developmental biology

Course number: 3081
Credits: 1.5
Date: 2018-08-27 -- 2018-08-31
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) date for registration as a doctoral student (priority given to earlier registration date).

More information: This is an international exchange course in Medical Developmental Biology, a.k.a. Developmental and perinatal biology, with University of Toronto (U of T) that has been running since 1996. This year the course will be held in Toronto with numerous distinguished speakers and advanced workshops. The course covers everything from basic research on stem cells and early embryonic development to clinical aspects of pregnancy, early childhood, epigenetic and ethics. The course is a full time course with an extensive program, in addition to lectures, also interactive, practical workshops, special lectures, social networking, poster and oral research presentations by students and written report.

Course responsible:
Fredrik Lanner
Department for Clinical Science, Intervention and Technology
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Contact person:
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Fredrik Lanner
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Purpose of the course: Registry-based research can provide excellent "Real Life" data and with the Swedish personal identity code and linkage of different registries it can be a gold mine of information. The aim of the course is to provide course participants with an orientation to registry-based stroke research and registers to be used in stroke research. Understanding the possibilities but also the limitations is important, as ethical issues that are coupled to this form of research.

Intended learning outcomes: - Knowledge of the various large registries and the strengths and weaknesses of these, - Knowledge of commonly used statistical methods used in registry based research, - Ability to, from a specific research question, select relevant variables in relevant register, - Ability to identify suitable statistical method to address the research question, - Ability to discuss strengths and limitations of registry based research in general and in relation to their own research question, - Ability to discuss ethical problems in connection to registry based research.

Contents of the course: The course will provide course participants with an introduction to registry based stroke research, provide an overview of registries available in Sweden (quality registers, health data registries held by the Board of Health and Welfare, as well as regional administrative data sources), how linkage is done, what permits are needed and what laws and regulations that govern this area. Furthermore, variables in the most commonly used registries and how these have changed over time, different statistical methods and approaches will be discussed as well as ethical aspects of registry based research and how to evaluate the results from observational registry based studies.

Teaching and learning activities: The first part of the course is internet based (web lectures, reading material, preparing seminars) Lectures: on campus and on the web Seminars will be held during the on campus part of the course Individual work: Presentation and discussion of assigned individual work

Examination: Written examination and oral presentation of a registry based study (designed to answer a research question given by the examiner).

Compulsory elements: The participants must attend the seminars and the oral exam. The students who have missed these sessions can book extra session time within 4 weeks to compensate the absence.

Number of students: 8 - 20

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

More information: The first two days of the course is based on individual work of the student, watching filmed lectures, preparing seminars and study the literature. Wednesday to Friday of the course is on site on Karolinska, Solna.
Title: Philosophy of science and research ethics, statistics, presentation techniques and information literacy

Course number: 3085
Credits: 7.5
Date: 2018-09-10 -- 2018-10-15
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 at providing students with basic knowledge of statistics, information retrieval, research communication, science theory and research ethics in order to conduct their own research projects.

Intended learning outcomes: Intended learning outcomes After the course the student is expected to be able to: With respects to Information Literacy describe how search strategies are created and adjusted to a specific information source/database and be able to compare, evaluate and manage the outcome of different search strategies With respects to Research Communication -- communicate own research well adjusted to different contexts by using various means of communication -- based on theories of communication and learning assess the quality of peers' oral communication of own research and give constructive feedback accordingly With respects to Research Ethics (in accordance with https://ki.se/en/staff/purpose-and-requirements-for-doctoral-courses-in-research-ethics) -- account for theories, principles and, to a certain extent, guidelines of research ethics -- account for common problems that arise in the area of research ethics -- identify, analyse and discuss problems and conflicts that arise in the area of research ethics -- be able to carry out a research ethical argumentation for or against a particular procedure With respects to Statistics -- be able to perform basic summaries, analyses and presentation of data, as well as have enhanced their ability to recognise, understand and critically view the statistics being presented in medical articles

Contents of the course: The course provides general scientific knowledge in a coherent block as an introductory basis for further doctoral education. The main content of the course: Philosophy of science and research ethics 2 hp (Research ethics 1.5, philosophy of science 0.5) Oral presentation techniques 2 hp Statistics 2 hp Information literacy 1.5 hp

Teaching and learning activities: The pedagogic framing is based on student activity with interactive lectures, seminars and workshops. The scheduled face-to-face activities in the course will be mixed with individual work and feedback from teachers and peers via the web based platform PingPong (or similar).

Examination: The knowledge, skills and attitudes acquired in the course will be assessed through written assignments and oral presentations. For a pass grade, an approved exam in all subjects is required.

Compulsory elements: Assignments, seminar and group activities. Absence from seminar and group activities can be compensated by replacement activities.

Number of students: 12 - 24

Selection of students: Selection will be based on the applicants written motivation to attend the course, where doctoral students in the Research School in Family Medicine will be prioritised.

More information: This is a two-week course which requires time for independent work outside of scheduled class time. The course will be given in either Swedish or English. The course has previously been offered with the course number 2507. The syllabus has since been slightly modified.

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

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Contact person: -