Catalogue for doctoral courses

HT17

Human biology or pathology * General science courses
1202 Human Cell Culture. Methods and Applications 2017-09-04 -- 2017-09-08 (English)
1383 Basic Course in Medical Statistics * 2017-10-09 -- 2017-10-20 (English)
1383 Basic Course in Medical Statistics * 2017-11-13 -- 2017-11-24 (English)
1391 Writing science and information literacy * 2017-12-04 -- 2017-12-15 (English)
1391 Writing science and information literacy * 2017-11-06 -- 2017-11-17 (English)
1496 Flow cytometry: from theory to application 2017-09-25 -- 2017-09-29 (English)
1559 Experimental techniques in study of metabolic and endocrine disorders 2017-11-27 -- 2017-12-01 (English)
1577 Epidemiology I: Introduction to epidemiology 2017-10-23 -- 2017-11-01 (English)
1579 Biostatistics I: Introduction for epidemiologists * 2017-09-20 -- 2017-10-12 (English)
1594 Tumor immunology and immune therapy of cancer 2017-11-20 -- 2017-11-24 (English)
1595 Molecular Immunology 2017-10-30 -- 2017-11-10 (English)
1622 Epidemiology II. Design of epidemiological studies 2017-11-23 -- 2017-12-01 (English)
1635 Basic course in tumor biology and oncology 2017-08-28 -- 2017-09-08 (English)
1974 Phenotyping of genetically engineered mice 2017-12-04 -- 2017-12-08 (English)
1999 Embryology I 2017-10-09 -- 2017-10-13 (English)
2044 Pathology # 2017-10-16 -- 2017-10-27 (English)
2074 Current Topics in Infection Biology 2017-08-23 -- 2017-12-20 (English)
2132 Forskningsetik * 2017-09-12 -- 2017-10-03 (Swedish)
2135 Infectious disease epidemiology 2017-10-16 -- 2017-10-20 (English)
2144 To communicate science in different contexts * 2017-09-05 -- 2017-09-27 (English)
2154 Cardiovascular epidemiology 2017-09-25 -- 2017-09-29 (English)
2163 Malaria 2017-11-20 -- 2017-11-24 (English)
2166 Basic tumor histopathology 2017-09-11 -- 2017-09-22 (English)
2176 Cellular and molecular infection biology 2017-11-27 -- 2017-12-08 (English)
2186 Generating genetically modified mice for immunological research 2017-09-25 -- 2017-09-29 (English)
2212 Human embryonic stem cells 2017-09-04 -- 2017-09-08 (English)
2291 Clinical achievements of reproductive medicine 2017-09-18 -- 2017-09-22 (English)
2302 Basic immunology 2017-09-26 -- 2017-10-26 (English)
2348 Functional Fluorescence Microscopy Imaging (fFMI) in biomedical research 2017-11-27 -- 2017-12-08 (English)
2363 Antigen presentation and T cell activation 2017-11-20 -- 2017-11-24 (English)
2367 Mouse models of human cancer 2017-11-27 -- 2017-12-04 (English)
2418 Methods in molecular biology and their applications in medical research 2017-09-04 -- 2017-09-15 (English)
2434 Teaching and Learning in Higher Education: educational course for doctoral students * 2017-10-02 -- 2017-11-07 (English)
2454 Public health intervention and implementation research 2017-11-06 -- 2017-12-08 (English)
2484 Thrombosis and Hemostasis, from mechanisms to therapies 2017-11-06 -- 2017-11-10 (English)
2498 Obesity - basic science, clinical and epidemiological aspects 2017-10-23 -- 2017-10-27 (English)
2522 Mass spectrometry-based proteomics: When and How. 2017-10-09 -- 2017-10-20 (English)
2523 Omics data analysis: From quantitative data to biological information 2017-11-06 -- 2017-11-17 (English)
2526 Neuropschopharmacology 2017-11-13 -- 2017-11-21 (English)
2561 Writing science and information literacy * 2017-08-28 -- 2017-10-20 (English)
2583 Non-coding RNA and cancer 2017-10-16 -- 2017-10-20 (English)
2600 Neurogenetics 2017-09-25 -- 2017-09-29 (English)
2605 Brain development and Neurodevelopmental disorders 2017-09-18 -- 2017-09-22 (English)
2608 Mechanisms of Gene Regulation in Metabolism 2017-11-09 -- 2017-11-15 (English)
2609 Basic Course in Medical Statistics - a distance course * 2017-11-27 -- 2017-12-08 (English)
2609 Basic Course in Medical Statistics - a distance course * 2017-09-18 -- 2017-09-29 (English)
2616 Frontiers in Cogntive Neuroscience 2017-09-11 -- 2017-09-15 (English)
2618 Write your research results and get them published * 2017-09-04 -- 2017-09-15 (English)
2618 Write your research results and get them published * 2017-09-25 -- 2017-10-06 (English)
2618 Write your research results and get them published * 2017-11-27 -- 2017-12-08 (English)
2618 Write your research results and get them published * 2017-11-06 -- 2017-11-17 (English)
2618 Write your research results and get them published * 2017-10-23 -- 2017-11-03 (English)
2618 Write your research results and get them published * 2017-10-09 -- 2017-10-20 (English)
2624 Brain circuits 2017-09-04 -- 2017-09-08 (English)
2629 Neurodegenerative disorders I - From molecule to treatment 2017-10-02 -- 2017-10-06 (English)
2644 Human physiology - an overview # 2017-09-04 -- 2017-09-15 (English)
2647 Surgical Techniques in Rat and Mouse 2017-10-09 -- 2017-10-13 (English)
2654 Grounded theory in health research 2017-10-16 -- 2017-10-27 (English)
2669 Nanotoxicology - potential risks of engineered nanomaterials to human health and the environment 2017-09-18 -- 2017-09-22 (English)
2671 Tumor microenvironment 2017-10-02 -- 2017-10-06 (English)
2674 Practical approaches to qualitative research - based on blended learning 2017-08-28 -- 2017-11-17 (English)
2686 Introduction to teaching at KI * 2017-08-22 -- 2017-09-12 (English)
2688 Multi-disciplinary perspectives on active ageing research 2017-09-19 -- 2017-11-28 (English)
2690 Basic Laboratory Safety * 2017-09-25 -- 2017-10-02 (English)

2693 Measuring physical activity with focus on wearable monitors - applications for clinical and epidemiological studies 2017-10-06 -- 2017-11-10 (English)
2702 Occupational Science conceptual development and application on research 2017-10-02 -- 2017-11-24 (English)
2704 Metoder för systematisk litteraturöversikt 2017-09-25 -- 2017-12-15 (Swedish)
2711 Social determinants of health 2017-12-11 -- 2017-12-22 (English)
2733 Calcium signaling 2017-09-04 -- 2017-09-08 (English)
2760 Translational medicine in the field of autoimmunity - an overview 2017-10-10 -- 2017-10-26 (English)
2772 Non-coding RNAs, microRNAs and their role in human diseases 2017-12-04 -- 2017-12-08 (English)
2780 The developing brain 2017-08-28 -- 2017-09-01 (English)
2785 Cryobiology in assisted reproductive technology 2017-11-27 -- 2017-12-01 (English)
2787 Present your research! * 2017-09-18 -- 2017-09-22 (English)
2787 Present your research! * 2017-11-20 -- 2017-11-24 (English)
2787 Present your research! * 2017-08-21 -- 2017-08-25 (English)
2787 Present your research! * 2017-12-11 -- 2017-12-15 (English)
2790 How to conduct systematic reviews and meta-analyses 2017-10-09 -- 2017-10-25 (English)
2794 Medical developmental biology 2017-08-21 -- 2017-08-25 (English)
2795 Novel methods and approaches in health risk assessment 2017-09-25 -- 2017-09-29 (English)
2796 Introduction to Stata for epidemiologists 2017-09-14 -- 2017-09-15 (English)
2797 Biostatistics II: Logistic regression for epidemiologists * 2017-10-23 -- 2017-11-02 (English)
2798 Applied longitudinal data analysis 2017-09-05 -- 2017-09-13 (English)
2827 Människans Fysiologi - en översikt # 2017-12-13 -- 2018-01-12 (Swedish)
2846 Integration of Neuroimaging and Cognition in Normal Aging and Dementia 2017-11-20 -- 2017-11-24 (English)
2858 Longitudinal data analysis - classical and modern statistical methods 2017-10-23 -- 2017-11-10 (English)
2868 Advanced course in SAS programming for health care data 2017-12-04 -- 2017-12-08 (English)
2872 In situ hybridization: theory and practice 2017-11-27 -- 2017-12-01 (English)
2873 Quality assurance of clinical research * 2017-11-13 -- 2017-11-17 (English)
2873 Kvalitetssäkring av klinisk forskning * 2017-09-18 -- 2017-09-22 (Swedish)
2893 Design and analysis of twin and family-based studies 2017-10-23 -- 2017-10-27 (English)
2894 Stem cell niches 2017-09-11 -- 2017-09-15 (English)
2898 Autophagy, metabolism and cancer 2017-11-06 -- 2017-11-10 (English)
2904 Digital photomicroscopy 2017-10-09 -- 2017-10-13 (English)
2928 Public Health Research- concepts and theories 2017-09-11 -- 2017-09-22 (English)
2929 Hospital acquired infections and antibiotic resistance in high endemic setting 2017-09-25 -- 2017-10-06 (English)
2930 Tropical medicine and infections 2017-12-04 -- 2017-12-15 (English)
2942 The epigenome: a platform for the integration of metabolic and signaling pathways in development and on the path to diseases 2017-10-09 -- 2017-10-13 (English)
2944 Sex and gender perspectives in cardiovascular research 2017-09-01 -- 2017-12-08 (English)
2954 Exploring entrepreneurial opportunities in research - Identify 2017-09-25 -- 2017-09-29 (English)
2955 Exploring entrepreneurial opportunities in research - Develop 2017-10-23 -- 2017-10-27 (English)
2956 Exploring entrepreneurial opportunities in research - Test 2017-11-27 -- 2017-12-01 (English)
2964 Medicinsk forskningsetik * 2017-10-09 -- 2017-10-13 (Swedish)
2964 Medical research ethics * 2017-11-27 -- 2017-12-01 (English)
2964 Medical research ethics * 2017-09-04 -- 2017-09-08 (English)
2964 Medical research ethics * 2017-11-06 -- 2017-11-10 (English)
2970 Applications of CRISPR/Cas9 technology: genome editing and beyond 2017-10-09 -- 2017-10-13 (English)
2971 Introduction to R - data management, analysis and graphical presentation 2017-11-08 -- 2017-12-11 (English)
2972 Basic pharmacoepidemiology in a global context 2017-11-13 -- 2017-11-24 (English)
2973 Fluorescence microscopy: High content image acquisition and analysis 2017-10-02 -- 2017-10-13 (English)
2979 The future of medicine: the role of "chance" in development, evolutionary adaptation and diseases 2017-11-13 -- 2017-11-17 (English)
2980 Study design in clinical research 2017-11-13 -- 2017-12-01 (English)
2981 Rare disease genomics 2017-12-04 -- 2017-12-08 (English)
2983 Hypertension 2017-09-21 -- 2017-10-05 (English)
2985 Functional magnetic resonance imaging: data analysis and experimental design 2017-11-07 -- 2017-11-23 (English)
2986 Adverse outcome pathways (AOPs)-principles and applications in toxicology and health risk assessment 2017-11-06 -- 2017-11-10 (English)
2987 Preclinical Imaging Techniques 2017-11-20 -- 2017-11-24 (English)
2988 For the benefit to mankind - get your research into broader use inspired by Nobel Prizes 2017-10-23 -- 2017-11-21 (English)
2989 Mechanisms in regulation of development and function of the blood- and lymph- vasculature 2017-10-23 -- 2017-10-27 (English)
2990 Multivariate prediction modelling with applications in precision medicine 2017-12-11 -- 2017-12-15 (English)
2991 Extensions to the design and analysis of case-control studies 2017-11-22 -- 2017-12-01 (English)
2992 Biostatistics III: Survival analysis for epidemiologists * 2017-11-13 -- 2017-11-21 (English)

2993 Ischemic heart disease 2017-10-16 -- 2017-10-18 (English)
2994 Functional Neuroanatomy 2017-10-09 -- 2017-10-13 (English)
2995 Systematic reviews and meta-analyses in animal research - an introduction 2017-11-22 -- 2017-11-23 (English)
2996 Anaesthesia, analgesia and surgery (mice and rats) 2017-11-28 -- 2017-11-30 (English)
2997 Brain aging 2017-08-14 -- 2017-08-25 (English)

Title : Human Cell Culture. Methods and Applications

Course number : 1202
Credits : 1.5
Date : 2017-09-04 -- 2017-09-08
Language : English
Responsible KI department : The institute of Environmental Medicine
Specific entry requirements :
Purpose of the course : The purpose of the course is to enable doctoral students to acquire state-of-the art knowledge and good understanding of human cell culture.
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 : The course is held at KI Campus Solna.

Course responsible :
Roland Grafstrom
The institute of Environmental Medicine

Roland.Grafstrom@ki.se

Contact person :
Johanna Bergman
Institutet för miljömedicin

johanna.bergman@ki.se

Nobels väg 13

17177
Stockholm

Title : Basic Course in Medical Statistics

Course number : 1383
Credits : 3.0
Date : 2017-10-09 -- 2017-10-20
Language : English
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.
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 : 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 : 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: October 9-10, 12, 16, 18 & 20.

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

Mesfin.Tessma@ki.se

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

elisabeth.lofgren@ki.se

Title : Basic Course in Medical Statistics

Course number : 1383
Credits : 3.0
Date : 2017-11-13 -- 2017-11-24
Language : English
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.
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 : 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 : 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 13-14, 16, 20, 22 & 24.

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

Mesfin.Tessma@ki.se

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

elisabeth.lofgren@ki.se

Title : Writing science and information literacy

Course number : 1391
Credits : 3.0
Date : 2017-12-04 -- 2017-12-15
Language : English
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.
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 : 30 - 34
Selection of 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 :
David Herron
Karolinska Institutet University Library
08-524 841 13
David.Herron@ki.se

Berzelius 7B

17177
Stockholm

Contact person :
Katarina Amcoff
Karolinska Institutet universitetsbibliotek
08-524 840 47
katarina.amcoff@ki.se

Title : Writing science and information literacy

Course number : 1391
Credits : 3.0
Date : 2017-11-06 -- 2017-11-17
Language : English
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.
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 : 30 - 34
Selection of 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 :
David Herron
Karolinska Institutet University Library
08-524 841 13
David.Herron@ki.se

Berzelius 7B

17177
Stockholm

Contact person :
Katarina Amcoff
Karolinska Institutet universitetsbibliotek
08-524 840 47
katarina.amcoff@ki.se

Title : Flow cytometry: from theory to application

Course number : 1496
Credits : 1.5
Date : 2017-09-25 -- 2017-09-29
Language : English
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.
Learning outcomes : Through this one-week course, the participants will acquire the knowledge of flow cytometry principles. They will know flow cytometric sample preparation and analysis, protocol set-up, major flow cytometric applications, as well as data interpretation and presentation.
Contents of the course : The course covers basic knowledge and main applications of flow cytometry, and contains both lectures and laboratory/group work. Experts in different fields of flow cytometric application are invited to give the lectures. The participants will be able to learn: a) Principles of flow cytometry: working mechanisms of flow cytometer; molecular and cellular probes for flow cytometry; quality control; and safty procedures and intrument maintainance. b) Basic skills: flow cytometric protocol design; sample handling and storage; data processing and analysis, and data presentation. c) Major applications of flow cytometry in biomedical research: leukocyte phenotyping, endothelial cell analysis, stem cell analysis, apotosis, platelet measurement, cell function analysis (including membrane potential, oxidative metabolism, intracellular calcium mobilization, pH, and intracellular organelles), as well as nucleic acid analysis.
Teaching and learning activities : The course includes 28 hr lectures and 12 hr hands-on lab work.
Examination : The exam 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 : Course held during week 39 (Sept 25 -29, 2017; 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 16 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 web-based course evaluations (2014-2016).

Course responsible :
Nailin Li
Department of Medicine, Solna
08-51773996
Nailin.Li@ki.se

Clinical Pharmacology Unit
Karolinska University Hospital-Solna
17176
Stockholm

Contact person :
Nailin Li
Institutionen för medicin, Solna
08-51773996
Nailin.Li@ki.se

Clinical Pharmacology Unit
Karolinska University Hospital-Solna
17176
Stockholm

Title : Experimental techniques in study of metabolic and endocrine disorders

Course number : 1559
Credits : 1.5
Date : 2017-11-27 -- 2017-12-01
Language : English
Responsible KI department : Department of Molecular Medicine and Surgery
Specific entry requirements :
Purpose of the course :
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 be able to describe the possibilities and limitations of the above techniques.
Contents of the course : The aim of this course is to provide methodology to solve pre-clinical problems in metabolic and endocrine research. The course is laboratory based, aiming to give all participants hands on experience with isolation of pancreatic islets, skeletal muscle and adipose tissue. 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 : The laboratory notebook examination from each student, a short oral presentation of the project work and 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 - 16
Selection of students : Selection will be based on 1) the relevance of the course syllabus for the applicant's doctoral project (according to written motivation), 2) date for registration as a doctoral student (priority given to earlier registration date)
More information :

Course responsible :
Alexander Chibalin
Department of Molecular Medicine and Surgery
0852487512
Alexander.Chibalin@ki.se

Contact person :
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Title : Epidemiology I: Introduction to epidemiology

Course number : 1577
Credits : 1.5
Date : 2017-10-23 -- 2017-11-01
Language : English
Responsible KI department : The institute of Environmental Medicine
Specific entry requirements :
Purpose of the course : The aim of the course is to give an introduction to epidemiological theory and practice.
Learning outcomes : After successfully completing this course students are expected to be able to: -give examples of the contribution of epidemiology to science and discuss the importance of epidemiology as a research discipline. -estimate and in a general way interpret measures of disease occurrence and measures of association, and describe how a specific measure is governed by the study design. -explain strengths and weaknesses of common epidemiological study designs. -identify and explain possible sources of bias in epidemiological studies. -describe theoretical models for causation and discuss the principles of causal mechanisms. -apply knowledge of epidemiological concepts when critically reviewing scientific literature. Intended learning outcomes are classified according to Bloom¿s taxonomy: knowledge, comprehension, application, analysis, synthesis, and evaluation (Bloom, 1956, extended by Anderson and Krathwohl, 2001).
Contents of the course : The course gives an introduction to epidemiological theory and practice. It comprises basic principles regarding design, interpretation, and analysis of epidemiological studies. It introduces the concept of causation, concepts related to measures of disease occurrence and measures of association, common designs for epidemiological studies (with main focus on cohort studies), and the role of bias.
Teaching and learning activities : The course focuses on active learning, i.e. putting knowledge into practice and critically reflecting upon the knowledge, rather than memorising facts. Different strategies for teaching and learning will be used, such as lectures, group discussions and various forms of group exercises on selected topics.
Examination : To pass the course, the student has to show that the learning outcomes have been achieved. Assessments methods used are group assignments (formative assessments) along with an individual examination (summative assessment). The examination is viewed as contributing to the development of knowledge, rather than as a test of knowledge. Students who do not obtain a passing grade in the first examination will be offered a second chance to resubmit the examination within two months of the final day of the course. Students who do not obtain a passing grade at the first two examinations will be given top priority for admission the next time the course is offered.
Compulsory elements : The individual examination (summative assessment) is compulsory.
Number of students : 8 - 25
Selection of students : Eligible doctoral students, 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 is extended over time in order to promote reflection and reinforce learning. The course will be given the following dates: October 23, 25, 27, 30 and November 1.

Course responsible :
Karin Leander
The institute of Environmental Medicine
08-52487498
Karin.Leander@ki.se

Box 210 (Nobels väg 13), KI

171 77
Stockholm

Contact person :
Johanna Bergman
Institutet för miljömedicin

johanna.bergman@ki.se

Nobels väg 13

17177
Stockholm

Title : Biostatistics I: Introduction for epidemiologists

Course number : 1579
Credits : 3.0
Date : 2017-09-20 -- 2017-10-12
Language : English
Responsible KI department : Department of Medical Epidemiology and Biostatistics
Specific entry requirements :
Purpose of the course : The aim is to introduce classical statistical concepts and methods with emphasis on methods used in epidemiology and public health.
Learning outcomes : After successfully completing this course students should be able to: - define the concept of probability, laws of probability, and make simple probability calculations. (S2) - suggest a statistical distribution to describe a naturally occurring phenomonen and evaluate the appropriateness of the distribution given real data. (S3) - present appropriate descriptive statistics for an epidemiological study. (S2) - explain the difference between hypothesis testing and interval estimation and the relation between p-values and confidence intervals. (S3) - suggest an appropriate statistical test for a comparison of two groups, perform the hypothesis test using standard statistical software, and interpret the results. (S3) - estimate and interpret three alternative measures of association between binary exposures and binary outcomes and discuss the relative merits of each measure for a given research question. (S3) - explain the concept of confounding in epidemiological studies and demonstrate how to control/adjust for confounding using stratified analysis. (S2) - explain the basis of the linear regression model, fit a linear regression model using standard statistical software, assess the fit of the model, and interpret the results. (S2) Learning outcomes are classified according to Bigg's structure of the observed learning outcome (SOLO) taxonomy: (S1) uni-structural, (S2) multi-structural, (S3) relational, and (S4) extended abstract.
Contents of the course : The course introduces classical statistical concepts and methods with emphasis on methods used in epidemiology and public health. Topics covered include: the importance of statistical thinking; types of data (nominal, binary, discrete and continuous variables); data summary measures; contingency tables; graphical representations; notions of probability; probability models (distributions); principles of statistical inference; parameter estimation (mean, proportion (prevalence), incidence and ratios); concepts of confidence intervals and hypothesis tests; and a general introduction to correlation and linear regression models.
Teaching and learning activities : Lectures, exercises focusing on analysis of real data using statistical software, exercises not requiring statistical software, group discussions, literature review.
Examination : The course grade is based on the two written examinations. The course is divided into two parts, and each part will be examined separately. To pass the course, the student must pass both parts. Students who fail will be offered a re-examination within two months of the final day of the course. Students who fail the re-exam will be given top priority for admission the next time the course is offered. If the course is not offered during the following two academic terms then another re-examination will be scheduled within 12 months of the final day of the course.
Compulsory elements : The individual written examinations (summative assessments) are compulsory.
Number of students : 8 - 25
Selection of students : Eligible doctoral students, 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 is extended over time in order to promote reflection and reinforce learning. The course will be given the following dates: week1: September 20-September 26, Exam 1: September 28; week2: October 4-October 10, Exam 2: October 12. We strongly recommend prior knowledge in Stata software.

Course responsible :
Yudi Pawitan
Department of Medical Epidemiology and Biostatistics

Yudi.Pawitan@ki.se

Contact person :
Gunilla Nilsson Roos
Institutionen för medicinsk epidemiologi och biostatistik
08-524 822 93
gunilla.nilsson.roos@ki.se

Title : Tumor immunology and immune therapy of cancer

Course number : 1594
Credits : 1.5
Date : 2017-11-20 -- 2017-11-24
Language : English
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.
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 : 12 - 32
Selection of students : Selection will be based on 1) the relevance of the course syllabus for the applicant's doctoral project (according to written motivation), 2) date for registration as a doctoral student (priority given to earlier registration date)
More information :

Course responsible :
Rolf Kiessling
Department of Oncology-Pathology
0851776857
Rolf.Kiessling@ki.se

Contact person :
Andreas Lundqvist
Institutionen för onkologi-patologi

Andreas.Lundqvist@ki.se

Ulrika Edbäck
Institutionen för onkologi-patologi

ulrika.edback@ki.se

Yago Pico de Coaña
Institutionen för onkologi-patologi

yago.pico.de.coana@ki.se

Title : Molecular Immunology

Course number : 1595
Credits : 3.0
Date : 2017-10-30 -- 2017-11-10
Language : English
Responsible KI department : Department of Microbiology, Tumor and Cell Biologi
Specific entry requirements : Basic knowledge in immunology corresponding to course 2302 is required.
Purpose of the course :
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 have gained increased experience in preparing and presenting novel information about an immunological problem or a specific technique to their fellow students.
Contents of the course : The course is given during 2 weeks. Invited national and international lecturers give their views on selected problems, or techniques, in immunology. The seminars take off from basic facts, but the speakers are encouraged to move on to current problems, and to focus on both scientific and methodological aspects. To merit 3 full ECTS points for the course, students will be asked, in a group project work, to study an immunological method or problem deeply at the theoretical level and lecture about this method to the fellow students. At the end of the course, a written and an oral presentation is expected from all students.
Teaching and learning activities : Lectures, group work, oral and written presentations
Examination : Evaluation of oral and written presentation of project work. Specific contibution of each group participant will be investigated and evaluated. A short written exam based on the content of the course.
Compulsory elements : Oral presentations at the end of the course. Written project work and written test. 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 MTC on the Solna campus. Lectures will begin at 9 am and end on most days 2 pm. Lecturers will be invited from research institutes around Europe.

Course responsible :
Benedict Chambers
Department of Medicine, Huddinge

Benedict.Chambers@ki.se

Contact person :
Jonathan Coquet
Institutionen för mikrobiologi, tumör- och cellbiologi

jonathan.coquet@ki.se

Title : Epidemiology II. Design of epidemiological studies

Course number : 1622
Credits : 1.5
Date : 2017-11-23 -- 2017-12-01
Language : English
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.
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, 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 is extended over two weeks, but is still five full course days, in order to promote reflection and reinforce learning. Course dates are November 23, 24, 27, 29 and December 1.

Course responsible :
Karin Leander
The institute of Environmental Medicine
08-52487498
Karin.Leander@ki.se

Box 210 (Nobels väg 13), KI

171 77
Stockholm

Contact person :
Johanna Bergman
Institutet för miljömedicin

johanna.bergman@ki.se

Nobels väg 13

17177
Stockholm

Title : Basic course in tumor biology and oncology

Course number : 1635
Credits : 3.0
Date : 2017-08-28 -- 2017-09-08
Language : English
Responsible KI department : Department of Oncology-Pathology
Specific entry requirements :
Purpose of the course : The purpose of the course is to give a general overview of the molecular mechanisms that promotes the carcinogenic transformation. We aim to link the basic tumor biology concepts with the main principles of diagnosis and treatment of cancer patients in line with the modern concept of translational and personalised cancer medicine.
Learning outcomes : This is a basic course for all PhD-students in the field of tumor biology. After the course the students will have an understanding of the cancer problem, the modern view what cancer is, from a clinical and basic science point of view. You will get the basic foundations of cancer biology as well as aquire some ability to discuss and understand advanced problems in cancer biology. You will have an idea which are the current most important problems to solve in cancer, to improve diagnosis, prevention, treatment and quality of life. The over all aim of the course is to form a bridge between pre-clinical and clinical aspects of tumor biology and oncology for PhD students and to provide the students an understanding of all aspects of the cancer problem. This course is a basic introduction to modern cancer research and is recommended to all PhD students within basic and clinical cancer research.
Contents of the course : The course will describe the causes as well as the consequences of the transformation of a normal cell into its malignant counterpart, in order to create an understanding of cancer --from molecule to patient--, eventually also discussing the management and treatment of malignant diseases. The topics of the course include genetics, the cell cycle, apoptosis, immunology, diagnosis and treatment, all topics presented from the cancer perspective. There will be focus on a few malignant diseases, described in more detail serving as models for basic concepts of Tumor Biology and Oncology, including molecular genetics, curative treatment and palliative care, psychosocial aspects of cancer, ethics and epidemiology. All students will be offered a possibility to visit the inward clinical care and meet cancer patients.
Teaching and learning activities : The course consists of lectures, group seminars, group discussions and demonstrations. Full time during two consecutive weeks.
Examination : Written examination and group discussion with a focus on understanding of concepts, relations and how and how problems are dealt with in cancer research. Every doctoral student will be individually assessed
Compulsory elements : This course is full time for two weeks. All seminars and some demonstrations are compulsory, also some lectures, as well as the written examination. Single missed occasions can be compensated during the course after discussion with te course director. Single missed occasions can be compensated for during the course after discussion with the course director.
Number of students : 10 - 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 :
Svetlana Bajalica Lagercrantz
Department of Oncology-Pathology
08-51771797
Svetlana.Lagercrantz@ki.se

Trastvägen 24

18279
Stocksund

Contact person :
Daria Glaessgen
Institutionen för onkologi-patologi
08-51773128
daria.glaessgen@ki.se

Title : Phenotyping of genetically engineered mice

Course number : 1974
Credits : 2.0
Date : 2017-12-04 -- 2017-12-08
Language : English
Responsible KI department : Comparative medicine
Specific entry requirements : Students need to have completed a laboratory animal science course on how to carry out scientific procedures on the appropriate animal species i.e. EU Function A or equivalent course.
Purpose of the course : The course is aimed at doctoral students and postdocs who are in the initial phase of setting up animal experiments using mice. Researchers are introduced to the concept of integrative, comprehensive phenotype analysis with attention to international harmonization of experimental approach and reporting. Emphasis will be focused on morphological phenotype analysis in relation to age, development and in vivo physiological and behavioral parameters. Students will need to prepare oral presentations, which encourage them 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.
Learning outcomes : After completion of the course the students should be able to: 1) describe systematic and standardized phenotype analysis of transgenic mice and mice carrying targeted mutations; 2) present and review strategies for production and breeding of genetically engineered mice, with attention to accurate selection of controls; 3) practically handle techniques for analysis of general parameters, experiment termination and organ selection and sampling; 4) select more specialized approaches for evaluation of (neuro)behavioral, physiological and pathomorphological parameters.
Contents of the course : The course provides instrumental knowledge for strategic select of endpoints and controls so as to maximize experimental outcome and rationalize the use of experimental animals. Attendees will be presented with theory on breeding, and schedules will be practiced with attention for selection of appropriate controls. Basic knowledge of mouse comparative biology and systematic evaluation of mouse phenotype will be presented during the course, and approaches for experiment termination and organ sampling (necropsy) will be discussed and practically trained. Specialized approaches for evaluation of (cardiovascular) physiology, (neuro) behavioral parameters, and non-invasive as well as post mortem morphological analysis will be presented.
Teaching and learning activities : The course will consist of lectures, demonstrations and practical necropsy training. Lectures and demonstrations will be interactive with attention to specific research areas as requested by the participants. Participants will practice with breeding schedules for complex genetic modifications and prepare a presentation overviewing application of acquired insights to their area of research. The course is 5 days full-time. Presentations/practical exercises are during office hours, time will be provided to interact with team task-group members during office hours but the necessity for some homework is expected.
Examination : To pass the course the student must actively participate in the lectures and group seminars, and pass the examinations: 1) Individual examination of multiple choice questions during the course; 2) Satisfactorily demonstrate a completed necropsy during the practical; 3) Presentation and discussion of group work summarizing the presented information as relevant for the area of research predominating in the group (3-4 participants per group). A pass/fail criteria will be used as a global rate for this course.
Compulsory elements : All scheduled sessions (lectures, demonstrations, practical training and oral presentations/discussions) 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.
Number of students : 8 - 16
Selection of students : If necessary, priority will be given to applicants using mouse models in their research project (explained according to a written motivation) and to applicants with an earlier registration date as doctoral students.
More information : The course is held from Monday to Friday between 9am and 5pm. Location: Learning Lab, von Eulers väg 4A, 2nd floor. This course is a collaboration between Laboratory Animal Science Education and Training Unit, Comparative Medicine, Karolinska Institutet, and the Department of Laboratory Medicine FENO, F52, Karolinska University Hospital Huddinge. Invited speakers include both local and international specialists in their field of animal research.

Course responsible :
Rafael Frias
Comparative medicine
085246660
rafael.frias@ki.se

Contact person :
Raoul Kuiper
Institutionen för laboratoriemedicin

raoul.kuiper@ki.se

Title : Embryology I

Course number : 1999
Credits : 1.5
Date : 2017-10-09 -- 2017-10-13
Language : English
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.
Learning outcomes : At the conclusion of this course students should show a good understanding of: Laboratory environment, input materials. Physical-chemical properties of culture system. Functional characteristics of different workstations for ART and their benefits. The influence of the laboratory and clinic environment on embryo culture. The morphology of oocytes, zygotes and cleavage stage embryos as well as morulae and blastocysts. Developmental milestones. Student should be aware of the general aspects and implication of the stem cells research and the potentiality that this represent for clinical application. Morphological aspects of the blastocysts for derivation of ICM and Derivation methods. Characterization of the embryonic stem cells and the importance of the pluripotency of these cells. The different differentiation assay on stem cells and what is ongoing in this field. The production of isogonics embryonic stem cells by somatic cell nuclei transfer or therapeutic clone (SCNT). Finally the students will improve their capacity to produce coherent, logical and concise explanations of data and concepts - both written and oral, through consideration of the course material. Students will also develop their ability to criticize scientific literature related with ART and reproduction physiology in a constructive and informed fashion.
Contents of the course : Sperm theory (lecture) 1. Anatomy of the testis, sperm production and maturation, fertilization. 2. Cryopreservation of spermatozoa. 3. Sperm preparation for IVF and ICSI, criteria for ICSI. Embryology (Lecture) 1. Follicle growth and maturation, ovulation. 2. Cell biology and oocyte genetics. 3. Embryo development in-vitro, morphological evaluation of embryos. 4 Cryopreservation of embryos, theory and practice. 5. Embryonic stem cells. 6. Selection of embryos for transfer and cryopreservation. Technical demonstrations (Lab) 1. How to work with sperm, oocytes and embryos. 2. Manipulation and training with mouse oocytes and mouse embryo handling. 3. Micro manipulation techniques, presentation. 4. Micromanipulation training. ICSI and embryo biopsy. Genetics (Lecture) 1. Genetic aspects of prenatal diagnostics and PGD. 2. Cloning techniques.
Teaching and learning activities : The course runs for one week with lectures, and practical demonstration in embryo-micro manipulation techniques (intra-cytoplasmatic sperm injection and Embryo biopsy for PGD)
Examination : Individual written exam on the last day of the course
Compulsory elements : The laboratory demonstrations are obligatory. The student should compensate for absence at a laboratory demonstration by presenting a literature report in agreement with the course leader.
Number of students : 8 - 14
Selection of students : Selection will be based on 1) the relevance of the course syllabus for the applicant's doctoral project (according to written motivation), 2) date for registration as a doctoral student (priority given to earlier registration date)
More information : The course will be held at Karolinska Institutet, Department of Biosience and Nutrition, Novum Huddinge.

Course responsible :
Jose Inzunza
Department of Biosciences and Nutrition
08-585 850 93
Jose.Inzunza@ki.se

Hälsovägen 7, Novum

141 86
Stockholm

Contact person :
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Title : Pathology

Course number : 2044
Credits : 3.0
Date : 2017-10-16 -- 2017-10-27
Language : English
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.
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 and inflammation. Methods in cellular and molecular pathology are discussed. During the other part of the course a selected group of diseases are studied both during 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 (priority given to earlier registration date).
More information :

Course responsible :
Barbro Ek-Rylander
Department of Laboratory Medicine
08-58586444
Barbro.Ek-Rylander@ki.se

Contact person :
Pia Laselle
Institutionen för laboratoriemedicin

pia.laselle@ki.se

Barbro Ek-Rylander
Institutionen för laboratoriemedicin
08-58586444
Barbro.Ek-Rylander@ki.se

Title : Current Topics in Infection Biology

Course number : 2074
Credits : 1.5
Date : 2017-08-23 -- 2017-12-20
Language : English
Responsible KI department : Department of Medicine, Huddinge
Specific entry requirements :
Purpose of the course : The primary purpose of this course is expose students to scientists who are performing cutting-edge research in the areas of infection biology and immunology. The seminars and discussions during/after the seminars will introduce the students to advanced ways of scientific thinking: - How diverse scientific approaches are used to make new discoveries in the fields of infection biology and immunology. - How new scientific concepts are generated in relation to previous knowledge in the field. - How scientific discoveries are effectively presented to other scientists.
Learning outcomes : After the course, students should have increased their knowledge of various topics within the field of infection biology such as host-pathogen interactions including viruses, bacteria, parasites etc, innate immune factors, signalling pathways, antigen presentation, generation of cellular and humoral immune responses, as well as aspects of vaccine and anti-microbial treatment development. The goal is that the students to be able to critically analyze data and concepts presented at the seminars within the course, and to discuss the data with the invited speakers. Since the lectures presented span over several subtopics all the students should also be able to gain new information on frontline research activities relevant for their own research project and PhD studies.
Contents of the course : The course is built up by a series of weekly seminars by invited speakers (international and national) presenting their current research in infection biology. The speakers will both give a basic introduction to their field and present their own research and discuss that in the context of the field as a whole. The lectures will cover host/microbe interactions, routes and mechanisms of infection, the susceptibility and the response of the host to such infections, and the molecular and physiological events leading to the clearance of microbes or a diseased state. Innate and adaptive immunity, inflammation, and the biology of membranes and receptors will also be presented and discussions.
Teaching and learning activities : The seminars are one hour long and are held weekly as part of a seminar series. A total of 15-20 seminars will be held during the semester.
Examination : To ensure that the examination is at the individual level, each student is required to read the review articles provided by each speaker and summarize and critically analyze one seminar in a written report.
Compulsory elements : Attendance at the seminars is compulsory to pass the course. If a student is unable to attend some seminars, she/he can compensate by summarizing and analyzing additional seminars in a written report to make up for the absence.
Number of students : 8 - 20
Selection of students : Selection will be based on 1) the relevance of the course syllabus for the applicant's doctoral project (according to written motivation), 2) date for registration as a doctoral student (priority given to earlier registration date)
More information : The seminars within the course are usually held at the Center for Infectious Medicine, F59, Karolinska University Hospital Huddinge. A detailed schedule for the seminars will be provided before the start of the course.

Course responsible :
Jakob Michaelsson
Department of Medicine, Huddinge

Jakob.Michaelsson@ki.se

Contact person :
Susanna Brighenti
Institutionen för medicin, Huddinge

Susanna.Brighenti@ki.se

Title : Forskningsetik

Course number : 2132
Credits : 1.5
Date : 2017-09-12 -- 2017-10-03
Language : Swedish
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.
Learning outcomes : Den forskarstuderande ska efter att ha gått kursen kunna: 1. Redogöra för forskningsetiska teorier, principer och till viss del riktlinjer, 2. Visa kunskap angående vanliga forskningsetiska problemsituationer och de etiska verktygen som kan användas för att hantera forskningsetiska konflikter Färdigheter: Den forskarstuderande ska efter att ha gått kursen kunna: 1. Analysera forskningsetiska konflikter, 2. Ge hållbara forskningsetiska argument för eller mot ett förfarande Förhållningssätt: Den forskarstuderande ska efter att ha gått kursen ha: 1. Utvecklat ett forskningsetiskt förhållningssätt till andra forskarstuderande, handledare och seniora forskare, 2. Förståelse för hur ett etiskt förhållningsätt uppfattas hos allmänheten 3. Förståelse för vilken roll forskarens egen hederlighet och integritet har
Contents of the course : Att ge en introduktion till etiken i samband med forskning och en orientering om dess tillämpning på problem inom det vetenskapliga området. Kursen behandlar bl.a. följande teman: centrala etiska principer, teorier och argument, forskningsetik/forskaretik, grundläggande värderingar och normer för god sed i forskningen, innehåll i och värdet av regelverk så som Helsingforsdeklarationen dess funktion, tillämpning, möjligheter och begränsingar, etikprövningar, avvikelser från värderingar, forskningsfusk och vetenskaplig oredlighet. Det informerade samtyckets historia och komponenter. Försöksdjursetik, innefattande argument för och emot att använda olika djur för forskningsändamål samt de 3 R:en. Hantering av vetenskapligt författarskap (medförfattarskap, författarordning) och intressekonflikter i forskningen.
Teaching and learning activities : Föreläsningar (ca 6t), gruppövningar, seminarier(ca 8t) och muntlig och skriftlig presentation
Examination : Vi bedömer att lärandemål är uppnådda genom examination som består av fyra delkomponenter: i) formativ bedömning i samband med aktivt deltagande i seminarier, ii) en muntlig presentation av etiska dilemman i egen eller aktuellt forskningsområde, iii) ett skriftligt PM där synpunkter från opponent på den muntliga presentationen inarbetats, och iv) opponering på annan students presentation av etiska dilemman i forskning. Godkänd kurs innebär således aktivt deltagande i seminarier och godkänd muntlig och skriftlig presentation av examinationsuppgiften samt opponering på annan students etiska presentation.
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)
More information : Kursen ges en eftermiddag per vecka (tisdagar) mellan kl.13:30 -17:15. Kursen hålls på Perioperativ medicin och intensivvård (PMI) konferensrum på Karolinska universitetsjukhuset Huddinge (B31/K32).

Course responsible :
Sigridur Kalman
Department for Clinical Science, Intervention and Technology
08-585 817 87
sigridur.kalman@ki.se

Contact person :
Isabel Climent-Johansson
Institutionen för klinisk vetenskap, intervention och teknik

isabel.climent-johansson@ki.se

Title : Infectious disease epidemiology

Course number : 2135
Credits : 1.5
Date : 2017-10-16 -- 2017-10-20
Language : English
Responsible KI department : Department of Medical Epidemiology and Biostatistics
Specific entry requirements : Knowledge in epidemiology and biostatistics equivalent to "Epidemiology I: Introduction to epidemiology" and "Biostatistics I: Introduction for epidemiologists", respectively, or corresponding courses.
Purpose of the course : This course is intended for students who already have good knowledge of general epidemiology, but who want to learn more about the specific concepts, methods and problems of the epidemiology of infectious diseases which can sometimes be quite different.
Learning outcomes : Participants are expected to have a basic knowledge of epidemiological tools, and the course aims to show how these tools apply to the study of infectious diseases. After successfully completing this course you as a student are expected to be able to: - explain the concepts and terms used in infectious disease epidemiology - list the steps of an outbreak investigation - describe the functions and problems of a surveillance system - design a simple model for an epidemic - explain how population mixing patterns influence epidemic spread - design a study to test the effectiveness of a vaccine - discuss the important determinants of the antimicrobial resistance problem - discuss national and EU systems to control infectious diseases Learning outcomes are classified according to Bloom's taxonomy: knowledge, comprehension, application, analysis, synthesis, and evaluation.
Contents of the course : Definitions; immunity; transmission routes; outbreaks; vaccinology; surveillance; models and mixing patterns; specific examples, such as antimicrobial resistance; control systems.
Teaching and learning activities : Lectures, group discussions, computer simulations, case studies.
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). 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 (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 responsible :
Johan Giesecke
Department of Medical Epidemiology and Biostatistics

Johan.Giesecke@ki.se

Contact person :
Gunilla Nilsson Roos
Institutionen för medicinsk epidemiologi och biostatistik
08-524 822 93
gunilla.nilsson.roos@ki.se

Title : To communicate science in different contexts

Course number : 2144
Credits : 3.0
Date : 2017-09-05 -- 2017-09-27
Language : English
Responsible KI department : Department of Learning, Informatics, Management and Ethics
Specific entry requirements :
Purpose of the course : The course aims are orally presentation of own research adapted to different groups and reflection on presentation skills and ability.
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 - 40
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: 5-6 September, 12-13 September and 26-27 September. The course is given in ENGLISH.

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

cormac.mcgrath@ki.se

Contact person :
Margareta Krook-Brandt
Institutionen för lärande, informatik, management och etik

Margareta.Krook-Brandt@ki.se

Title : Cardiovascular epidemiology

Course number : 2154
Credits : 1.5
Date : 2017-09-25 -- 2017-09-29
Language : English
Responsible KI department : The institute of Environmental Medicine
Specific entry requirements :
Purpose of the course : This course focuses on the application of epidemiological study designs to understand and evaluate risk factors for common cardiovascular diseases.
Learning outcomes : Students having successfully completed this course should be able to: - Explain the theoretical difference between risk factors and risk indicators for cardiovascular diseases; - Explain potential mechanisms underlying the effect of risk factors in the atherosclerotic process; - Discuss the differences among the different common epidemiological study designs used within the cardiovascular epidemiology research area; - Interpret study results critically by considering the different sources of bias.
Contents of the course : The course introduces basic epidemiological concepts and common epidemiological study designs such as cohort studies, case-control studies, clinical trials and genetic association studies. During the course choice of epidemiological study design as well as potential sources of bias will be discussed using practical examples. During the course special attention will be given to discuss: -established and emerging cardiovascular risk factors; -potential mechanisms underlying atherosclerosis and its main clinical outcomes of interest in the field of cardiovascular epidemiology; -theories and concepts related to common epidemiological study designs: case control, cohort and clinical trials; -the emerging role of biomarkers in cardiovascular research; -the role of genetic- and environmental interactions. No specific background knowledge is formally required to be eligible for the course. However, before the course begins students are recommended to do a self-assessment regarding some important basic concepts (within epidemiology and cardiology). This test will be distributed to course participants about two weeks before the beginning of the course. The students may use some of the literature indicated in the course literature to fill in gaps of knowledge if needed. On the first day of the course we will go through the test and briefly discuss together the questions and the answers.
Teaching and learning activities : Apart from lectures, the course will include group work and seminars in order to facilitate learning. Group tasks will include critical discussions of research articles in order for students to practice their skills in the evaluation of study designs and results. Individually, but also in pairs, students will work on exercise questions.
Examination : Learning outcomes will be assessed using 1) a short individual written examination, and 2) oral presentations of group work.
Compulsory elements : Individual written examination, group work on day 2 and on day 4 of the course.
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 (priority given to earlier registration date)
More information :

Course responsible :
Bruna Gigante
The institute of Environmental Medicine

Bruna.Gigante@ki.se

Contact person :
Karin Leander
Institutet för miljömedicin
08-52487498
Karin.Leander@ki.se

Box 210 (Nobels väg 13), KI

171 77
Stockholm

Johanna Bergman
Institutet för miljömedicin

johanna.bergman@ki.se

Nobels väg 13

17177

Stockholm

Title : Malaria

Course number : 2163
Credits : 1.5
Date : 2017-11-20 -- 2017-11-24
Language : English
Responsible KI department : Department of Medicine, Solna
Specific entry requirements :
Purpose of the course :
Learning outcomes : At the end of the module students will be able to: - discuss current issues in malaria research, prevention and control in low and middle income countries - analyse broader context of malaria prevention and control interventions - explain the importance of the recent pathogenesis of malaria - understand the management of severe and uncomplicated malaria
Contents of the course : Malaria epidemiology, life cycle, morphology, pathogenesis, clinical aspects, diagnostic methods. Principles for therapy and prophylaxis, pharmacology and resistance to antimalarial drugs. Immunology, genetics and vaccines. Entomology and vector control. Public health and socio-economic aspects. New control policies and research strategies.
Teaching and learning activities : The course will consist of lectures, seminars and practical sessions
Examination : Written examination.
Compulsory elements : It is compulsory to attend all the lectures. The practical sessions attendance is not compulsory for students with previous knowledge on the specific skills. It will be possible to compensate absence by completing individual assignments provided by the course organizer.
Number of students : 9 - 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 will be located at Department of Infectious Diseases, Karolinska University Hospital Solna

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Course responsible :
Anna Färnert
Department of Medicine, Solna

Anna.Farnert@ki.se

Infektionsenheten

17176
Stockholm

Contact person :
Anne Rasikari
Institutionen för medicin, Solna
08-517 718 61
Anne.Rasikari@ki.se

B3:03

Title : Basic tumor histopathology

Course number : 2166
Credits : 1.5
Date : 2017-09-11 -- 2017-09-22
Language : English
Responsible KI department : Department of Oncology-Pathology
Specific entry requirements :
Purpose of the course : The core of this course is based on microscopic sessions tutored by expert pathologists. This approach gives an opportunity to the participants to learn the morphology/histology of different human cancers and the corresponding normal tissues and to get understanding of the complex histology of human cancers.
Learning outcomes : At the end of the course the participants should be able to: Distinguish normal from malignant cells in tumor tissues and be acquainted with the morphology/histology of the different tumor types, differentiation stage and tumor grade. Recognize cellular processes in the tumor tissue and its microenvironment like mitosis, cell proliferation, pleomorphism, lineage differentiation, tumor stage, necrosis, apoptosis, neural and vascular invasion, vascularisation. Understand ethical issues and legislation concerning biobanking and practical issues on tumor handling.
Contents of the course : Tumor histopathology and grading. Introduction. Endocrine tumors. Breast tumors. Prostate tumors. Gastrointestinal tumors. CNS tumors. Hematological malignancies. Sarcoma. Gynecologycal cancers. Tumor handling and biobanking.
Teaching and learning activities : The first day will include an introductory lecture covering general aspects of tumor morphology/histopathology and grading (approx 6 hrs). In the following days we will review one tumor diagnosis per day organized in 45 min introduction , followed by 2 hrs interactive microscopy sessions using a multi-headed microscope and a digital screen, guided by pathologists expert in each field. Home exercises consisting on digital images of tumors together with the clinical history are given at least twice to the students for training. For distribution of files and examination we use KI Box.
Examination : The students will get different case studies including digital images from tumors tissues and their clinical history via the KI Box account of the course. The students will then examine the cases and provide a writen description of the relevant observations leading to a correct diagnosis and answers. Images and questions have been provided by each teaching pathologist. When appropriate, anti-plagiarism tools will be used according to the guidelines from the Board of Doctoral Education at KI.
Compulsory elements : 100% attendance is recommended, due that each session is exclusive and cannot be compensated for later on. The student will be asked to review the issue presented in case of absence in a session.
Number of students : 8 - 17
Selection of 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 :
Bertha Brodin
Department of Oncology-Pathology
51775244
Bertha.Brodin@ki.se

Cancer Centrum Karolinska CCK R8:00

171 76
Stockholm

Contact person :
Bertha Brodin
Institutionen för onkologi-patologi
0851775244
Bertha.Brodin@ki.se

Title : Cellular and molecular infection biology

Course number : 2176
Credits : 3.0
Date : 2017-11-27 -- 2017-12-08
Language : English
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.
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 : Following up from feedback, 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 :
Keira Melican
Department of Neuroscience

Keira.Melican@ki.se

Contact person :
Benedict Chambers
Institutionen för medicin, Huddinge

Benedict.Chambers@ki.se

Keira Melican
Institutionen för neurovetenskap

Keira.Melican@ki.se

Title : Generating genetically modified mice for immunological research

Course number : 2186
Credits : 1.5
Date : 2017-09-25 -- 2017-09-29
Language : English
Responsible KI department : Department of Medicine, Solna
Specific entry requirements :
Purpose of the course : The purpose of this course is to give the students an in depth theoretical understanding of technologies for generating precise genetic modifications in mice. The course focuses on traditional gene targeting techniques (homologous recombination in embryonic stem cells) and on newer techniques based on RNA-guided nucleases (i.e. CRISPR/Cas9) for non-homologous end joining (NHEJ) and homology directed repair (HDR). Understanding these technologies will enable the students to design experiments to test hypotheses in vivo and generate new tools to ask complex immunological questions. These skills are becoming ever more important as science is getting more complex.
Learning outcomes : After taking the course the student should have an in depth knowledge of how to generate genetically modified mice. The students should be able to write a scientifically sound gene targeting project plan at the end of the course. The student should acquire enough practical and theoretical knowledge to allow them to independently generate genetically modified mice. Specifically, the student should know how to design and make DNA constructs for classical gene targeting and for NEHJ and HDR using CRISPR/Cas9. The students should know how to design genotyping using e.g. Southern blotting and PCR, and finally how to use the modified mice in experiments. Furthermore, after the course the students should know how to critically analyse experiments presented in the scientific literature and judge their scientific quality.
Contents of the course : 1) Gene targeting and transgenesis in general: -A short history of gene targeting, transgenesis and CRISPR/Cas9 in mice -When are these technologies suitable for immunological experiments? -Overview of the work process. 2) Designing and making constructs for classical gene targeting, and for CRISPR/Cas9-based NHEJ and HDR. -How to obtain the necessary information for designing a gene targeting construct -Different approaches to make DNA constructs for gene targeting and CRISPR/Cas9-based NHEJ and HDR. 3) Conditional gene targeting. (Cre-lox system.) 4) Common problems in gene targeting, transgenesis, and CRISPR/Cas9; and how to solve them. 5) How to use genetically modified mice in immunological research.
Teaching and learning activities : Lectures will be the main form of teaching during the course. Workshops and a take-home examination are also critical elements of the course. In groups of three, the students will design a gene targeting (or CRISPR/Cas9) project and present their research plan.
Examination : Formative assessment during active participation in the workshop and summative assessment of the quality of the take-home examination in line with the intended learning outcomes of the course. Students will have a new examination opportunity within two months after the course is finished.
Compulsory elements : The workshops and the take-home examination are compulsory.
Number of students : 12 - 16
Selection of students : Selection will be based on 1) the relevance of the course syllabus for the applicant's doctoral project (according to written motivation), 2) date for registration as a doctoral student (priority given to earlier registration date)
More information :

Course responsible :
Alexander Espinosa
Department of Medicine, Solna

Alexander.Espinosa@ki.se

Contact person :
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Title : Human embryonic stem cells

Course number : 2212
Credits : 1.5
Date : 2017-09-04 -- 2017-09-08
Language : English
Responsible KI department : Department of Biosciences and Nutrition
Specific entry requirements :
Purpose of the course :
Learning outcomes : The objectives of this course are that at the conclusion of this course students should have a good understanding of: - Folliculogenesis and Fertilization - Pre implantation Embryology - Criteria of selected or scoring the blastocysts for isolation of ICM - Derivation methods of hESCs - Culture condition of hESCs - Main components of the culture system (culture media, tissue culture plastics, gases, incubators, workstations, laboratory environment, input materials) - Physical-chemical properties of culture system (osmolarity and pH of culture media, temperature, light levels) and how they can be influenced - Nutritional requirements of the blastocyst and hESCs - Functional characteristics of different tissue culture incubators - The influence of the laboratory and clinic environment on hESCs - Developmental milestones - Students should know the prospective possibilities of having a good culture system - Students should be aware of the general aspects and implication of the stem cells research and the potentiality that these represent for clinical application - Characterization of the embryonic stem cells and the importance of the pluripotency of these cells - The different differentiations assay on stem cells and what is ongoing in this field - The immunorejection problem and the production of isogonics embryonic stem cells by somatic cell nuclear transfer or therapeutic clone (SCNT) - The pluripotence induction of somatic cell by transduction, (the iPS cells) - 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 hESC technology and reproduction physiology in a constructive and informed fashion - Be aware of potential development of hESC technology in the future.
Contents of the course : Divide in lectures and laboratory work 1. Embryology ¿theory¿ (lectures) 2.Culture system (lectures) 3.Human Embryonic Stem cells culture (lectures) 4. Characterization (lectures) 5. Laboratory demonstrations 6. Genetics (lectures) 7. Induction of different cell types (lectures) 8. Reprogramming (lectures) 9. Stem cells therapy and challenge (lecture) 10. Future in human embryonic stem cells (lecture) Course test, evaluation, discussions, examination and closing of course:
Teaching and learning activities : The course (human embryonic stem cells) runs for one week every year, with lectures and laboratory practical demonstrations.
Examination : Writing individual- examen
Compulsory elements : The laboratory parts are obligatory. If absent at laboratory activity; student should present a literature work related with the subject of the missing activity
Number of students : 8 - 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 be held at Karolinska Institutet, Department of Biosciences and Nutrition, NOVUM, Huddinge.

Course responsible :
Jose Inzunza
Department of Biosciences and Nutrition
08-585 850 93
Jose.Inzunza@ki.se

Hälsovägen 7, Novum

141 86
Stockholm

Contact person :
Jose Inzunza
Institutionen för biovetenskaper och näringslära
08-585 850 93
Jose.Inzunza@ki.se

Hälsovägen 7, Novum

141 86
Stockholm

Title : Clinical achievements of reproductive medicine

Course number : 2291
Credits : 1.5
Date : 2017-09-18 -- 2017-09-22
Language : English
Responsible KI department : Department for Clinical Science, Intervention and Technology
Specific entry requirements :
Purpose of the course : The purpose of the course is to enable doctoral students to obtain a basic understanding of the biological processes involved in human reproduction. Experts in the field will provide with a fresh overview of clinical and pre-clinical research aiming at development of novel treatment possibilities but also discussing their current limitations.
Learning outcomes : The learning outcomes of this course are that at the conclusion of this course students should be able to show a comprehensive view of key factors involved in reproductive biology and the processes involved in fertilization and implantation. Additionally, at the end of the course students will be able to perform a critical assessment of reported achievements on reproductive medicine and their current clinical possibilities and limitations.
Contents of the course : Contents: Biology of the gametes, fertilization and early embryo development Normal and pathological implantation, early pregnancy loss, ectopic pregnancy, repeated miscarriage In vitro spermatogenesis and oocyte maturation Clinical investigation and therapeutic approach on female and male infertility Genetics in infertility Gonadal dysgenesia Stem cells research Assisted reproduction techniques (ART) In vitro systems and cultures Cloning. Somatic cell nuclear transfer Clinical aspects of fertility preservation Cryobiology systems for fertility preservation Pre-implantation genetic diagnosis Epigenetics in assisted reproduction Experimental reproductive tissue transplantation procedures: -ovarian and testicular tissue transplantation -transplantation of the uterus
Teaching and learning activities : Lectures, seminars/discussions and laboratory demonstrations.
Examination : Written examination and general group discussion of relevant parts of the examination.
Compulsory elements : All teaching activities, including the laboratory sessions, the lectures and the assessments, are obligatory. In case of not attendance to the activities, students should produce a literature work related with the subject of the missing activity upon agreement with the course organizer.
Number of students : 8 - 12
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 : All teaching activities, the laboratory sessions and the lectures are obligatory. In case of not attendance to the activities, students should produce a literature work related with the subject of the missing activity.

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

Reproduktionsmedicin
Karolinska Universitetssjukhuset Huddinge
141 86
Stockholm

Contact person :
Kenny Rodriguez-wallberg
Institutionen för onkologi-patologi
0858580000
kenny.rodriguez-wallberg@ki.se

Reproduktionsmedicin
Karolinska Universitetssjukhuset Huddinge
141 86
Stockholm

Karolina Kublickiene
Institutionen för klinisk vetenskap, intervention och teknik
08-58583859
Karolina.Kublickiene@ki.se

Karolinska Universitetssjukhus-Huddinge campus
Kvinnokliniken K-57

14186
Stockholm

Jose Inzunza
Institutionen för biovetenskaper och näringslära
08-585 850 93
Jose.Inzunza@ki.se

Hälsovägen 7, Novum

141 86
Stockholm

Cecilia Gotherstrom
Institutionen för klinisk vetenskap, intervention och teknik
08-58581487
Cecilia.Gotherstrom@ki.se

Klinisk Immunologi F79
Karolinska Universitetssjukhuset Huddinge
14186
Stockholm

Title : Basic immunology

Course number : 2302
Credits : 3.0
Date : 2017-09-26 -- 2017-10-26
Language : English
Responsible KI department : Department of Medicine, Solna
Specific entry requirements :
Purpose of the course : The purpose is to give doctoral students lacking a solid knowledge and understanding of fundamental principles in immunology the possibility to obtain this through a high quality basic course. All other courses in the Doctoral education programme 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.
Learning outcomes : 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 disease in a clinical perspective. To adapt knowledge gained of the function of the immune system by being able to analyze and discuss an immunological/clinical case (group project). 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 defence against infection, autoimmune and allergic disease or transplantation. Part 1: Introduction An overview of the immune system T cells B cells Antigen-presenting cells Innate vs adaptive immune responses Part 2: Immune defence against bacterial and viral infections Primary immunodeficiencies Autoimmune disease Allergy Vaccination Clinical Immunology Transplantation Tumour Immunology Questions and discussions Presentation of projects.
Teaching and learning activities : The course is given full-time during a total of six days separated into two parts. The teaching is mainly in lecture/seminar form but also includes project work in small groups, as well as a written assignment. The group projects are then presented orally on the last day of the course. The project work and written assignment require studies between the two course parts, including meetings with mentors. 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 course is designed so that clinically active doctors will be better able to combine it with work in the clinic (Mondays and Fridays contain no scheduled course work) .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. Considering the substantial literature requirement plus the written assignment and project work, we estimate that an extra 32h of study is needed, which is not included in the schedule.
Examination : Evaluation by the group project mentor and oral presentations of small-group project work. At this occasion special attention is given to that all students are actively participating. The 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 supervisors.
Compulsory elements : Discussion sessions, group project work and participation at the project presentation is compulsory as well as work with the written assignment. In the case of absence a separate occasion is organized with presentation for the course organizers.
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 26-28 and Oktober 24-26 (Tuesday to Thursday). 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. Teachers include specialists in different fields of immunology including both basic and clinical researchers. We will use the Abbas "Basic Immunology" as the main course textbook, but literature also includes review papers, handouts etc. The texbook the book is free and is handed out at the course start. The course location is at the Center for Molecular Medicine (CMM), Karolinska University Hospital, Solna

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Course responsible :
Johan Öckinger
Department of Medicine, Solna
0851770663
Johan.Ockinger@ki.se

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

Course number : 2348
Credits : 3.0
Date : 2017-11-27 -- 2017-12-08
Language : English
Responsible KI department : Department of Clinical Neuroscience
Specific entry requirements :
Purpose of the course : This course is on advanced fluorescence microscopy imaging and spectroscopy techniques for quantitative characterization of molecular transport and interactions in cells. The purpose of the course is to give an introduction of the underlying physicochemical principles, hands-on experience and an overview of applications of these specialized techniques in biomedical research. The course is suitable for doctoral students lacking training in mathematics, physics, or optical engineering but want to apply these techniques in their research.
Learning outcomes : At the end of the course the student will have hands-on experience with live cell imaging and specialized fluorescence microscopy and spectroscopy techniques and is expected to be able to: 1. Use fundamental aspects of molecular structure to describe light-matter interactions and the emission of fluorescence; use this knowledge to discuss fluorescent properties of a fluorophore. 2. Understand the buildup of fluorescence imaging instrumentation, identify different optical elements and describe their function. 3. Describe the theoretical background behind specialized fluorescence based methodologies for studying molecular interactions in live cells. Discuss pros and cons in relation to the biological problem studied. 4. Specify instrumental requirements and design a fluorescence imaging assay for a biological problem of interest. 5. Apply a specific labeling strategy and perform a fluorescence imaging assay. 6. Communicate the results in written and oral form. 7. Discuss the adequateness of the methodology used in the scientific literature concerned.
Contents of the course : Fluorescence microscopy and associated techniques are indispensable research tools for investigating molecular mechanisms of biological processes. Versatility of fluorescence microscopy based techniques comes from the possibility to characterize fluorescence emission by spatial position, intensity, wavelength, lifetime and polarization. In addition, fluorescence microscopy and spectroscopy based techniques allow us to quantitatively study the cellular dynamics of molecules and the kinetics of their interaction with high spatio-temporal resolution and ultimate, single-molecule sensitivity. These techniques bring new biological insight at an unprecedented rate and are of crucial importance for the development of life sciences. The course covers the following topics: Luminescence and the nature of light (Fluorescence, Phosphorescence, Light scattering); Fluorescent markers and their photo-physical properties (Organic fluorescent dyes for covalent conjugation (Rhodamine 6G, Alexa dyes, Cyanine dyes); Quantum dots; Intrinsically Fluorescent Proteins (Aequorea victoria (GFP, YFP), Discosoma coral (DsRFP) and Montipora (Keima) families); Selectively binding dyes (DiI, DraQ 5). Instrumentation for Confocal Laser Scanning Microscopy (CLSM): Light sources, Optical Elements, Objectives, Detectors, Read-out devices); Quantization and Sensitivity in fluorescence imaging (Instrumental sensitivity, Method sensitivity, Absolute sensitivity); Factors affecting quantitative accuracy. Point Spread Function; Spatially resolved fluorescence imaging: Multi-photon excitation, Total Internal Reflection Fluorescence (TIRF) Microscopy, Super-resolution techniques (STORM, PALM and STED). Fluorescence based methods for studying molecular diffusion and interactions in live cells (FRAP, FRET, FLIM, FCS, FCCS, RICS). Image analysis techniques for quantitative characterization of cell phenotypes (CellProfiler).
Teaching and learning activities : The course includes lectures, laboratory training, demonstrations, discussion sessions and short written assignments.
Examination : The final assignment consists of a written project report (5 pages) and an oral presentation of the project report (15 min).
Compulsory elements : All sessions are compulsory. Please report any absence to the course leader in advance by e-mail. Absence from any part of the course (lectures, laboratory sessions, discussion sessions and exam) is generally not accepted but could in special cases be compensated by an individually tailored additional module and a special written examination organized by the course committee.
Number of students : 8 - 12
Selection of students : Priority will be given to applicants who can concisely (max 250 words) show in their application an urgent need to begin their independent work with these techniques.
More information : This is a two weeks course with 10 sessions that include: lectures, laboratory practice, written assignments, discussions, and time for self-study. The first week focuses on underlying physicochemical concepts, instrumentation and hands on experience. Specialized techniques are introduced and the details are discussed in the context of the broader body of available techniques. The second week is dedicated to expert lectures and advanced applications. 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 lecturing hall at the Center for Molecular Medicine (CMM), Solna, L8:01, 021.

Course responsible :
Vladana Vukojevic
Department of Clinical Neuroscience

51771797
Vladana.Vukojevic@ki.se

CMM L8:01

17176
Stockholm

Contact person :
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Title : Antigen presentation and T cell activation

Course number : 2363
Credits : 1.5
Date : 2017-11-20 -- 2017-11-24
Language : English
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. Students will also learn about new techniques such as lymphocyte visualization and functional assays that could be beneficial for their own research projects.
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. Students will also 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. 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. New techniques and assays to analyze T cell activation will be presented.
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 : 14 - 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 : The course takes place at Karolinska University hospital in Huddinge.

Course responsible :
Sarah Thunberg
Department of Oncology-Pathology

sarah.thunberg@ki.se

Contact person :
Isabelle Magalhaes
Institutionen för onkologi-patologi

Isabelle.Magalhaes@ki.se

Title : Mouse models of human cancer

Course number : 2367
Credits : 1.5
Date : 2017-11-27 -- 2017-12-04
Language : English
Responsible KI department : Department for Clinical Science, Intervention and Technology
Specific entry requirements : Knowledge of the concept of the gene, i.e. knowledge about regulatory sequences such as promoter/enhancer, intron, exon as well as DNA replication, transcription and translation are essential to understanding the course content and is therefore a prerequisite for participation in the course.
Purpose of the course : The aim of the course is to convey an enhanced knowledge about the generation and use of mouse models in cancer research, as well as to empower the student to make an informed decision of suitable models for his/her own research situation.
Learning outcomes : After completion of the course, the student should be able to: - Compare and contrast different categories of mouse models of cancer and analyze the pros and cons of models within each category - Apply state-of-the-art technology in the generation and use of mouse models of cancer - Relate the knowledge about mouse models of cancer to his/her own research - Independently be able to search for more information about mouse models of cancer
Contents of the course : The course will provide an introduction to the generation of mouse models of human cancer using transgene technology, homologous recombination as well as gene editing (CRISPR/Cas9) . A survey of the state-of-the-art technologies in the field, such as conditionality, inducibility, lineage tracing and multimodal life-imaging including a visit and live-demonstration in the imaging facility of the animal house will be provided. An expert mouse pathologist will give an eye-opener on what is possibly not related to a genetically engineered phenotype but other disease conditions of the mouse. Also, the use of mouse models in various applications related to cancer research, such as studies of metastasis or experimental therapy/preclinical testing, will be reviewed. Mouse models of particular interest will be highlighted. In parallel, literature studies of mouse models of specific indications will be performed by the students, with the aim of designing new and improved mouse models.
Teaching and learning activities : 1. Lectures will provide knowledge about the current state of the field. 2. Case in point seminars will highlight mouse models of cancer of particular importance. 3. Group assignments will be used to perform a literature review and gain insight into disease-specific mouse models of cancer.
Examination : Course examination is composed of two parts: 1. Oral exam, consisting of a powerpoint presentation and discussion of the group assignments, in which the students will present the design of a new and improved mouse model of human cancer. 2. Handing in of powerpoint presentation with corrections based on oral exam.
Compulsory elements : Attendance is compulsory during all lectures and scheduled time slots for the group assignment. Absence has to be compensated for in accordance with the course organizer.
Number of students : 8 - 16
Selection of students : Selection will be based on 1) the relevance of the course syllabus for the applicant's doctoral project (according to written motivation), 2) date for registration as a doctoral student (priority given to earlier registration date)
More information : Lectures will be held November 27 to November 30. The exam will take place on December 4. Venue: Huddinge, KI South Campus, room to be announced.

Course responsible :
Rainer Heuchel
Department for Clinical Science, Intervention and Technology
08 585 830 33
rainer.heuchel@ki.se

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

Course number : 2418
Credits : 3.0
Date : 2017-09-04 -- 2017-09-15
Language : English
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.
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 - 16
Selection of students : Selection will be based on 1) the relevance of the course syllabus for the applicant's doctoral project (according to written motivation), 2) date for registration as a doctoral student (priority given to earlier registration date)
More information :

Course responsible :
Tomas Jakobsson
Department of Laboratory Medicine

Tomas.Jakobsson@ki.se

Contact person :
Veronika Tillander
Institutionen för laboratoriemedicin

Veronika.Tillander@ki.se

Title : Teaching and Learning in Higher Education: educational course for doctoral students

Course number : 2434
Credits : 4.5
Date : 2017-10-02 -- 2017-11-07
Language : English
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.
Learning outcomes : Intended Learning Outcomes At the end of the course, students are expected to: - Be familiar with different roles of a professional university teacher and current conditions related to teaching-learning within higher education. - Be able to use educational concepts in discussions of teaching and learning situated in Higher Education. - Design teaching in regards to outcome- or competency based frameworks for curriculum design and also 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. 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 three campus based meetings on Oct 2nd, 23rd and Nov 7th. The course is given in English.

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

cormac.mcgrath@ki.se

Contact person :
Margareta Krook-Brandt
Institutionen för lärande, informatik, management och etik

Margareta.Krook-Brandt@ki.se

Title : Public health intervention and implementation research

Course number : 2454
Credits : 7.5
Date : 2017-11-06 -- 2017-12-08
Language : English
Responsible KI department : The institute of Environmental Medicine
Specific entry requirements :
Purpose of the course : The purpose of the course is to train doctoral students in the latest knowledge and developments in theory, method and practice in the field of public health intervention and implementation research necessary to design and conduct trials to the highest possible standards in a given context, to build evidence-based practice.
Learning outcomes : At the end of the course, the student should be able to: 1. Define core concepts in intervention and implementation research 2. Understand the concept of evidence-based public health 3. Understand how to critically appraise published intervention and implementation studies, as well as systematic reviews in public health 4. Describe models and frameworks of intervention and implementation research 5. Design an intervention study, which includes a relevant problem theory and a programme theory, appraisal of ethical aspects as well as evaluation design 6. Design the implementation of an evidence-based programme or practice, and describe the evaluation design 7. Understand concepts of fidelity and adaptation
Contents of the course : As this course aims at giving doctoral students knowledge in theory, method and practice in the field of public health intervention and implementation research, the content focuses on the following themes: 1. Models and frameworks in intervention and implementation research 2. How to apply a theoretical perspective using relevant change theories 3. Intervention and implementation core components, barriers and facilitators 4. Appropriate study designs for process and outcome evaluation 5. Systematic and critical appraisal of published intervention and implementation studies 6. Dissemination of scientific results
Teaching and learning activities : The course is based on lectures in combination with seminars in order to promote a reflective, analytical and critical approach towards this research field. The course will also use group assignments and group discussions to promote the students active participation in their learning process, as well as the ability to accomplish tasks both individually and in groups. All teaching activities aim at enhancing the student¿s ability to apply for example core concepts and theoretical frameworks, not the least ethical aspects, in an analytical and reflective practice and to apply this on the students own research projects. All teachers in the course are active researchers in the field of intervention and implementation research.
Examination : The students' knowledge and skills in theory, method and practice in the field of public health interventions and implementation research will be assessed in relation to the expected learning outcomes through the following examinations: a. Active participation in seminars with presentations, in discussions and short seminar reports b. A written project report, oral presentation of the report and opposition
Compulsory elements : Participation in scheduled seminars and group work and examination is compulsory. Absence is compensated through a written summary of the literature for the seminar where the absence occurred.
Number of students : 12 - 20
Selection of students : Selection will be based on the relevance of the course syllabus for the applicant's doctoral project (according to written motivation)
More information : The course will be given on Mondays and Tuesdays, with home-work in the form of group/individual assignments in between meetings.

Course responsible :
Lydia Kwak
The institute of Environmental Medicine

Lydia.Kwak@ki.se

Contact person :
Johanna Bergman
Institutet för miljömedicin

johanna.bergman@ki.se

Nobels väg 13

17177
Stockholm

Title : Thrombosis and Hemostasis, from mechanisms to therapies

Course number : 2484
Credits : 1.5
Date : 2017-11-06 -- 2017-11-10
Language : English
Responsible KI department : Department of Medicine, Solna
Specific entry requirements :
Purpose of the course : The aim of the course is that doctoral students acquire in-depth knowledge of thrombosis and hemostasis, as well as to elucidate the links between molecular mechanisms and clinical disorders and to introduce current advances and future directions of thrombosis research.
Learning outcomes : The concept from bench to bed side and back will be reinforced at all levels. Therefore, at the end of the course the students should be able to: 1. Describe the molecular and cellular mechanisms of haemostasis and thrombosis, as well as the dynamic processes of primary haemostasis, secondary haemostasis, and thrombosis. 2. Explain the mechanisms underlying bleeding and thrombotic disorders. 3. Have a good understanding of current anticoagulant and antiplatelet therapies, and obtain a clear view of the challenges of future anticoagulant and antiplatelet drug developments. 4. Apply current knowledge of thrombosis and haemostasis into future research design and to formulate new treatment strategies. 5. Sharpen the sense of critical appreciation of research literature, and strengthen their ability to develop new research concepts through critical reading.
Contents of the course : The course aims to bring in in-depth knowledge of thrombosis and hemostasis, and to emphasize a translational view, from bench to bed side and back, of the hemostatic system to the students. The course is designed for the students who work in both basic and clinical aspects of hemostasis, thrombosis and cardiovascular research. The following aspects of hemostasis and thrombosis will be discussed: biochemistry of the blood clotting system; cell-cell and cell-protein interactions in the cardiovascular system in relation to thrombosis and bleeding disorders; cross-talks of the clotting system with inflammation, host defense and complement systems; diagnosis of bleeding and thrombotic disorders; therapeutic strategies to fight thrombosis and bleeding with the emphasis placed on new pharmacological concepts.
Teaching and learning activities : Lectures Seminars Group work Presentation of papers related to the key lectures
Examination : Presentation of a paper related to key lectures Short written homework. Multiple-choice test.
Compulsory elements : To participate in the lectures, group work and presentation of the group work is compulsory. The students who have missed the group work sessions can book extra session time within 4 weeks to compensate the absence. Absence in lectures should be compensated for in accordance with the course director.
Number of students : 8 - 25
Selection of students : Selection will be based on 1) the relevance of the course syllabus for the applicant's doctoral project (according to written motivation), 2) date for registration as a doctoral student (priority given to earlier registration date)
More information : Course held during week 45 (Nov 6 - 10, 2017; 9:00-16:30). Lecture hall booked: Course room 1 (the room by Japanese garden), L2:U1 at Karolinska University Hospital-Solna. The course includes 16 lectures given by the experts in corresponding subjects, group work, as well as group work presentation and discussion. The course has been organized many times at KI for more than 20 years, and has been well received by the participants.

Course responsible :
Nailin Li
Department of Medicine, Solna
08-51773996
Nailin.Li@ki.se

Clinical Pharmacology Unit
Karolinska University Hospital-Solna
17176
Stockholm

Contact person :
Angela Silveira
Institutionen för medicin, Solna
08-51773224
Angela.Silveira@ki.se

Title : Obesity - basic science, clinical and epidemiological aspects

Course number : 2498
Credits : 1.5
Date : 2017-10-23 -- 2017-10-27
Language : English
Responsible KI department : Department of Clinical Sciences, Danderyd Hospital
Specific entry requirements :
Purpose of the course : This course will enable the doctoral student to acquire the necessary knowledge to integrate clinical and research knowledge and understanding, competence and skills, judgement and approach in the field of obesity in order to facilitate a role as a future scientist and/or clinician in this field.
Learning outcomes : At the end of the course the students should be able to: 1, Discuss different hypothesis and theories concerning the pathogenesis of obesity 2, Discuss occurrence of obesity and co-morbid diseases in society 3, Discuss current treatment methods of obesity and effects of these treatments on co-morbid diseases 4, Discuss methods to prevent obesity and methods used to evaluate effects of treatment and prevention 5, To relate clinical and public health aspects of obesity to research aspects of obesity
Contents of the course : The course is to give an overview of obesity in society, pathogenesis and current treatment methods. These clinical examples will be used to demonstrate how one can design various research projects related to obesity and co-morbid disease; pre-clinical, clinical, epidemiological and preventive projects.
Teaching and learning activities : The course will be based on lectures, work in small seminar groups and demonstration of surgery of obesity.
Examination : Written examination
Compulsory elements : Presence at lectures, group work and demonstration is mandatory. Absence must be compensated by a written task.
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 will take place at Danderyds University Hospital.

Course responsible :
Erik Näslund
Department of Clinical Sciences, Danderyd Hospital
086555017
Erik.Naslund@ki.se

Contact person :
Daniel Berglind
Institutionen för folkhälsovetenskap

Daniel.Berglind@ki.se

Richard Marsk
Institutionen för kliniska vetenskaper, Danderyds sjukhus

richard.marsk@ki.se

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

Course number : 2522
Credits : 3.0
Date : 2017-10-09 -- 2017-10-20
Language : English
Responsible KI department : Department of Oncology-Pathology
Specific entry requirements :
Purpose of the course : The aim of this course is to give an overview of mass spectrometry based proteomics for researchers who would like to be able to apply these techniques in their own research.
Learning outcomes : After completed the course, the student will be able to -Define and apply common proteomics terminology -Recognize the principles of the most common proteomics techniques -Understand the mass spectrometry based proteomics workflow: Experimental design, sample preparation and selection of techniques -Understand proteomics to such an extent that he/she will be able to utilize proteomics core facilities or collaborate with proteomics researchers. -Evaluate the quality of protein and peptide identifications. -Demonstrate how modern proteomics is applied to clinical research and to evaluate when proteomics research could be beneficial to incorporate in research projects. -Design their own research project by mass spectrometry based proteomics.
Contents of the course : Lectures and workshops on -Overview of proteomics -The proteomics workflow -Basic of separation sciences: Protein and peptides -Introduction to Mass spectrometry -Experimental design -Sample preparation, immunoprecipitation and enrichment strategy -Quantitative and qualitative proteomics by mass spectrometry -Global and targeted proteomics -Human protein atlas and Biological validation -Clinical applications A practical laboratory exercise using mass spectrometry based proteomics This course is focusing on proteomics technologies and applications, for proteomics data analysis we recommend our KI doctoral course "Omics data analysis: From quantitative data to biological information"
Teaching and learning activities : The course contains lectures, seminars, and a practical laboratory exercise using proteomics techniques. The students will plan their own project as a case study as well make an oral laboratory report.
Examination : -Students shall describe a proteomics project (beneficially related to their research) including different aspects from the proteomics workflow. This is handed in as a written exam. -The students shall perform an oral laboratory report
Compulsory elements : -Attendance at lectures and the practical laboratory exercise. -Attendance at examination seminar and hand in the written examination assignment. -Extra written assignments can be used to compensate absence. The students are recommended to read literatures listed below in advance of the course.
Number of students : 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://internwebben.ki.se/en/doctoral-programmes0. For proteomics data analysis we also recommend course 2523.

Course responsible :
Jürgen Eirich
Department of Oncology-Pathology

juergen.eirich@ki.se

Tomtebodavägen 23
Alfa 1
171 65
Solna

Contact person :
Rozbeh Jafari
Institutionen för onkologi-patologi

rozbeh.jafari@ki.se

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 : 2017-11-06 -- 2017-11-17
Language : English
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 current biomedical and clinical research projects. This course aims at bridging the gap between bioinformatics and classical biomedical research. The course will give students an introduction to omics technologies and basic knowledge of omics data analysis workflows.
Learning outcomes : After completed course, the student will be able to: * Understand the principles and perform the basics of high-throughtput technologies and the omics data analysis workflow (genomics, transcriptomics, proteomics,) * Understand the principles aspects of study design, experimental planning and sample selection * Know how to do basic quality control of data by use of boxplots, PCA etc * Know what normalization, data transformation etc means and what it does to your data * Know the principles of some basic statistics such as t-test and false discovery rate * Know the principles of dimensionality reduction methods such as PCA and tSNE * Use tools for hierarchical clustering, functional enrichment and pathway analysis * Use tools for gene ontology (GO) annotation/enrichment
Contents of the course : * The omics data analysis workflow: from quantitative data to biological information (emphasis on analysis of genomics, transcriptomics, and proteomics data) * Introduction to omics technologies and data structures * Omics experimental design and sample selection * Introduction to data transformation and normalisation * Introduction to basic statistics in omics data analysis: significance test/p-values/multiple testing correction/false discovery rate * Introduction to dimensionality reduction PCA/MDS/tSNE * Introduction to Gene Ontology and enrichment analysis * Introduction to correlation analysis and hierarchical clustering * Introduction to network and pathway analysis * Introduction to online bioinformatics resources and analysis tools * Introduction to the R statistical programming language * Literature study with a critical view on how omics data is analyzed in clinical research. * Current state of the art in omics data analysis is highlighted through case studies, literature studies and demonstrations
Teaching and learning activities : The teaching activities for the course will be based on lectures, workshops and data analysis cases. The students will participate in a literature study with discussions in seminar groups as well as an independent data analysis exam project. The students will also be able to download and use some of the software in workshops during the course.
Examination : The course assessment is based on two type of assignments: a literature study with a critical view on an omics data analysis subject performed in groups and an individual written omics data analysis project illustrating the different topics covered during the course.
Compulsory elements : * Attendance on lectures and data analysis demonstrations. * Attendance to literature study discussion seminar. * Attendance to examination seminar and hand in the written examination assignments. * Extra written literature study can be used to compensate absence.
Number of students : 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 (priority given to earlier registration date)
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=11900121
 The course is jointly organized 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://internwebben.ki.se/en/doctoral-programmes-0.

Course responsible :
Lukas Orre
Department of Oncology-Pathology

Lukas.Orre@ki.se

Contact person :
Erik Fredlund
Institutionen för onkologi-patologi
0709395652
erik.fredlund@ki.se

Scilifelab, Alfa1, Proteomics, Tomtebodavägen 23A

17165
Stockholm

Title : Neuropschopharmacology

Course number : 2526
Credits : 2.0
Date : 2017-11-13 -- 2017-11-21
Language : English
Responsible KI department : Department of Clinical Neuroscience
Specific entry requirements :
Purpose of the course : We are organizing a course in neuropsychopharmacology for graduate students who are interested in clinical and preclinical research in affective disorders, schizophrenia, drug dependence, and anxiety-related disorders. The purpose of this course is to highlight these psychiatric disorders, summarize current treatment strategies, and to discuss new ideas and future research ambitions within this field.
Learning outcomes : By the end of this course the PhD students should: 1) have achieved an understanding of the etiology of psychiatric disorders and are able to account for different hypotheses in this field and how the major psychiatric diseases are treated. 2) possess skills and abilities to describe, discuss, understand as well as choosing appropriate methods and animal models for studying the effects of drugs on different symptoms of psychiatric diseases. 3) be able to evaluate data and preclinical research within the research fields of psychiatric diseases.
Contents of the course : This course will focus on pharmacological strategies in the treatment of psychiatric disorders, e.g. schizophrenia, major depression etc. The course will also discuss methods and models which are used in preclinical research concerning the mechanisms of action of different drugs in the treatment of these disorders.
Teaching and learning activities : The pedagogic framing of the course include lectures given by invited clinicians and researchers within the field of psychiatric disorders. We will also have demonstrations of key models/methods which are used in specific research projects.
Examination : Written exam
Compulsory elements : The demonstrations are mandatory. The student has to compensate absense from this part with a written description of the model/method.
Number of students : 10 - 30
Selection of students : Selection will be based on 1) the relevance of the course syllabus for the applicant's doctoral project (according to written motivation), 2) date for registration as a doctoral student (priority given to earlier registration date)
More information :

Course responsible :
Kent Jardemark
Department of Physiology and Pharmacology
0768649348
Kent.Jardemark@ki.se

Contact person :
Per Svenningsson
Institutionen för klinisk neurovetenskap
0852487926
Per.Svenningsson@ki.se

Vasco Sousa
Institutionen för klinisk neurovetenskap

vasco.sousa@ki.se

Title : Writing science and information literacy

Course number : 2561
Credits : 3.0
Date : 2017-08-28 -- 2017-10-20
Language : English
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.
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 :
David Herron
Karolinska Institutet University Library
08-524 841 13
David.Herron@ki.se

Berzelius 7B

17177
Stockholm

Contact person :
Katarina Amcoff
Karolinska Institutet universitetsbibliotek
08-524 840 47
katarina.amcoff@ki.se

Title : Non-coding RNA and cancer

Course number : 2583
Credits : 1.5
Date : 2017-10-16 -- 2017-10-20
Language : English
Responsible KI department : Department of Oncology-Pathology
Specific entry requirements :
Purpose of the course : The course aims to develop students understanding of various methodologies used in RNA research, which is achieved via lectures and problem based learning exercise.
Learning outcomes : At the end of the course, the students are expected to be able to: - understand the diversity of non-coding RNAs and their importance in tumorigenesis and tumor progression. - describe various methodologies for non-coding RNA research, account for applications and apply relevant approaches in their own projects.
Contents of the course : Non-coding RNAs are key regulators of gene expression with important impact in many biological processes. Different classes of non-coding RNA are known to play important roles in cancer development and progression. Through short introductory lectures and in-depth discussion of key papers from the recent literature, this course will cover an up-to-date introduction to the biogenesis of diverse non-coding RNAs (including small RNAs and long non-coding RNAs) and their mechanisms of gene regulation, methodologies for non-coding RNA research, expression and function of non-coding RNAs in cancer development, and their potential clinical implications.
Teaching and learning activities : The course consists of lectures and problem-based discussions. In addition, the students are required to submit a research proposal on a topic related to non-coding RNA and cancer.
Examination : The examination of the course includes problem-based discussions, and reviewing and presenting individual research proposal related to non-coding RNA.
Compulsory elements : The students are expected to attend all lectures and problem-based discussions, as well as to complete all assignments. In the case of absence, the student will be asked to compensate by completing another written assignment given by the course organizer.
Number of students : 12 - 20
Selection of students : Selection will be based on the relevance of the course to the student's research project and the personal motivation for participation in this course.
More information : This full-time course will be held at Cancer Center Karolinska, Karolinska University Hospital-Solna.

Course responsible :
Weng-onn Lui
Department of Oncology-Pathology
08-51773930
Weng-onn.Lui@ki.se

Contact person :
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Title : Neurogenetics

Course number : 2600
Credits : 1.5
Date : 2017-09-25 -- 2017-09-29
Language : English
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.
Learning outcomes : I) The student will be able to understand and describe the major differences and uses of human genetic studies of neurogenetic diseases using i) Twin-studies, ii) population based studies, iii) case-control studies, iv) family studies. Students will have an in depth knowledge and understanding of selected neurologic conditions such as Alzheimer disease, trinucleotide repeat disorders, their genetic basis and an insight into the molecular pathogenesis, if known. II) The students will also be able to describe how genetic studies can be used to increase our understanding of the biological basis of neurological conditions. III) The students will be able to contribute substantially to critical evaluation and presentation of scientific articles in the field of neurogenetics. IV) The students will have an understanding of the different genetic techniques and platforms available for studies in human (neurological) conditions.V) The students will have an insight in the application/use of genetic testing for neurological diseases.
Contents of the course : I) The course will give examples of how different types of genetic studies can help us identify genes involced in the pathogenesis of neurological disease: i) Twin-studies, ii) population based studies, iii) case-control studies, iv) family studies. II) The course will give examples of different gene defects in neurological diseases such as trinucleotide repeats, point mutations, copy number variations, susceptibility genes, rearrangements, transciptional regulation and epigenetics. III) The course will provide an in depth understanding of the genetics of selected neurological diseases and how these genetic dysfunctions help us understand the molecular mechanisms of disease.
Teaching and learning activities : Daily class-room lectures. Time will be allocated for students to prepare a group presentation of a selected topic/genetic neurological disease. The presentation will be on the last day of the course and constitutes the examination.
Examination : The examination will be on the last day of the course and it will consist of i) participating in a group presentation of a selected topic/genetic neurological disease ii) participate as an active audience when other groups have their presentations. Every student will be assessed individually in accordance with the intended learning outcomes of the course.
Compulsory elements : All lectures/seminars are compulsory and in case of absence, the session can be compensated by a short written report using the literature after agreement with the course director.
Number of students : 8 - 20
Selection of students : Selection will be based on 1) the relevance of the course syllabus for the applicant's doctoral project (according to written motivation), 2) date for registration as a doctoral student (priority given to earlier registration date)
More information : The course is part of the Frontiers Courses in Neuroscience, and the course participants will be a mix of master studients and doctoral students. This is a full-time course (9:00-17:00) and will be held in Huddinge, Karolinska University Hospital

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Course responsible :
Caroline Graff
Department of Neurobiology, Care Sciences and Society
0858583619
Caroline.Graff@ki.se

Neurogeriatrik, Novum plan 5

141 57
Huddinge

Contact person :
Eva Kallstenius
Institutionen för neurobiologi, vårdvetenskap och samhälle
08-58580324
eva.kallstenius@ki.se

Title : Brain development and Neurodevelopmental disorders

Course number : 2605
Credits : 1.5
Date : 2017-09-18 -- 2017-09-22
Language : English
Responsible KI department : Department of Neuroscience
Specific entry requirements : Background in medicine, biomedicine, neuroscience or psychology.
Purpose of the course : The purpose of the course is to introduce the students to common neurodevelopmental disorders and current animal model systems used in this field. In particular, we will focus on cortical brain development, social-cognitive and motor development in typically developing children and children with autism spectrum disorder (ASD), attention-deficit/hyperactivity disorder (ADHD) and cerebral palsy (CP). In addition, the role of both genetic and environmental factors in the etiology and/or pathophysiology of these disorders will be discussed. During the course, students will learn to critically evaluate and explain in presentations the content of original articles.
Learning outcomes : After the course students should be able to: 1) Describe fundamental neurodevelopmental processes (e.g. neurogenesis, neuronal migration, synaptogenesis). 2) Describe genetic and molecular mechanisms controlling cortical development. 3) Describe cognitive deficits among neurodevelopmental disorders (e.g., ADHD and ASD). 4) Postulate potential genetic /molecular mechanisms underlying cognitive deficits in children with neurodevelopmental disorders
Contents of the course : Course Curriculum Part I: Fundamentals of Developmental Neurobiology 1. Early brain development, construction of neural circuits, and modification of neural circuits as a result of experience 2. Genetic control of cortical development 3. Effects of sex hormones on brain development Part II: Functional Brain development in humans 1. Age-Related Changes in executive function (e.g., working memory) 2. Working memory, and training induced plasticity 3. The molecular genetics of executive function Part III: Neurodevelopmental Aspects of Clinical Disorders 1. The neurobiology and genetics of ADHD 2. Advances in the Cognitive Neuroscience of ASD 3. Childhood psychiatric disorders as anomalies in neurodevelopmental trajectories
Teaching and learning activities : A variety of teaching and learning strategies are presented during the course to facilitate students learning. These strategies include short lectures, small group discussions, computer-based learning, and problem based learning. At the beginning of the course, students will be assigned into different working group themes e.g., ADHD and ASD. These groups will work together throughout the course and prepare for the final oral presentation.
Examination : During the course there will be formative assessments to give students immediate feedback about their learning process during the different milestones of the course and clarify any questions relating to the final assessment. The summative examination will consist of an oral group presentation focusing on cognitive deficits found in children with neurodevelopmental disorders (e.g. ADHD and ASD) and the potential genetic / molecular mechanisms underlying these deficits. To pass the course it has to be shown that all the intended learning outcomes of the course are reached.
Compulsory elements : All lectures and seminars are mandatory. In order to make up for absence of a particular lecture, the students will be required to read specific chapters from the recommended literature and write a short report.
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 : Location: Tellus Seminar Room, Retzius Lab Floor 5, Scheeles v. 1, Karolinska Institutet (Solna Campus) Full Time: Monday through Friday, 9am-4pm We plan to have several well-known clinicians and psychologists from the Astrid Lindgren Children's Hospital and KIND.

Course responsible :
Rochellys Diaz Heijtz
Department of Neuroscience
08-52487886
Rochellys.Heijtz@ki.se

Retzius Väg 8

17177
Stockholm

Contact person :
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Title : Mechanisms of Gene Regulation in Metabolism

Course number : 2608
Credits : 1.5
Date : 2017-11-09 -- 2017-11-15
Language : English
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.
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 - 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 :
Alfredo Gimenez-Cassina
Department of Medical Biochemistry and Biophysics

alfredo.gimenez-cassina@ki.se

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

Course number : 2609
Credits : 3.0
Date : 2017-11-27 -- 2017-12-08
Language : English
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.
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 27 (not mandatory) and December 8 (mandatory).

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

Mesfin.Tessma@ki.se

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

elisabeth.lofgren@ki.se

Title : Basic Course in Medical Statistics - a distance course

Course number : 2609
Credits : 3.0
Date : 2017-09-18 -- 2017-09-29
Language : English
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.
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: September 18 (not mandatory) and September 29 (mandatory).

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

Mesfin.Tessma@ki.se

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

elisabeth.lofgren@ki.se

Title : Frontiers in Cogntive Neuroscience

Course number : 2616
Credits : 1.5
Date : 2017-09-11 -- 2017-09-15
Language : English
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 :
Learning outcomes : After the course the student must be able to: (1) account for current concepts and key principles of cognitive neuroscience; (2) show an understanding of the inter-disiplinary nature of cognitive neuroscience with its roots in both psychology and neuroscience; (3) discuss and critically evaluate scientific articles in the field; (4) To show basic knowledge about the strengths and weakness of the different state-of-the-art methods used in cognitive neuroscience.
Contents of the course : (1) Series of lectures informing about the state of art knowledge about: (i) Perception and sensory mechanisms; (ii) action planning and execution (iii); (iv) sex differences in the brain; (v) higher cognitive functions including working memory and creativity; (vi) memory; and (vii) cognitive effects of aging (2) Seminars where the students will critically discuss key published papers, and group presentations where they will present their analyses and conclusions for the whole group.
Teaching and learning activities : Lectures, seminars, and group presentations.
Examination : The oral presentation and group discussions during the last day¿s seminar count as examination. We will assess individual students¿ ability 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 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 :
Henrik Ehrsson
Department of Neuroscience
0852487231
Henrik.Ehrsson@ki.se

Retzius väg 8

17177
Stockholm

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

Course number : 2618
Credits : 3.0
Date : 2017-09-04 -- 2017-09-15
Language : English
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.
Learning outcomes : AFTER ATTENDING THE COURSE, THE DOCTORAL STUDENT SHOULD BE ABLE TO: - Explain the characteristics and disposition of different written presentation media and decide which forum is the most suitable for a specific text - Understand, and apply, the terminology associated with scientific writing - Write an abstract - Use the correct structure and language to compose a scientific paper, following the editorial requirements - Revise a manuscript according to a checklist with the most common language and structure mistakes in scientific writing - Use the focus points in a scientific paper (where the readers focus their reading) - Identify the main scope and focus of the research and summarize information aligned to the target group - Apply the structure of popular science writing and use popular science as a tool for presentations - Give a poster presentation - Design a scientific poster and reflect upon structure, language and style - Understand the ethics in publication - Use the software EndNote for reference management - Search for references in databases (e.g. PubMed) and decide what sources are reliable - Respond to the reviewer's comments - Write a cover letter - Reflect on own development as a writer of different texts during the course
Contents of the course : THE MAIN SCOPE OF THE COURSE is how to write about research in different contexts and forums. THE CONTENT OF THE COURSE: 1. Terminology associated to scientific writing 2. Designing and writing a) a poster b) an abstract c) a draft for a research paper d) a cover letter e) a reply to the reviewer´s comments f) a cover letter g) a popular science paper 3. The writing process: structure, language, style 4. Editorial requirements of different journals 5. Summarizing and presenting information aiming at the target audience 6. Identifying the main scope of a research project 7. References and reference management (EndNote software) 8. Data base search 9. Basic rhetoric for poster presentations 10. References 11. Ethics in publication
Teaching and learning activities : Lectures, seminares, writing exercises, group assignments and practical exercises. As part of the learning process, the Ph.D students will be members of in-class review groups, giving feed-back to their colleagues.
Examination : 1) Written assignments reflecting the intended learning outcomes of the course: draft for scientific paper, popular science paper, poster, cover letter, and abstract. All assignments can be based on own research (if applicable). 2) Evaluation sessions, where the PhD students give each other feed back on the written assignments as a part of the learning process 3) Poster presentation, where the PhD students present their posters to a small group of course participants (there are no presentations in front of a larger group)
Compulsory elements : Lectures, workshops, evaluation sessions, and group assignments as well as all written assignments. Absence can be compensated: a) during next course occasion b) individual assignments
Number of students : 15 - 22
Selection of students : Selection will be based on 1) the relevance of the course syllabus for the applicant's doctoral project (according to written motivation), 2) 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 :
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

Lalit Kumar
Institutionen för kvinnors och barns hälsa

Lalit.Kumar@ki.se

Title : Write your research results and get them published

Course number : 2618
Credits : 3.0
Date : 2017-09-25 -- 2017-10-06
Language : English
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.
Learning outcomes : AFTER ATTENDING THE COURSE, THE DOCTORAL STUDENT SHOULD BE ABLE TO: - Explain the characteristics and disposition of different written presentation media and decide which forum is the most suitable for a specific text - Understand, and apply, the terminology associated with scientific writing - Write an abstract - Use the correct structure and language to compose a scientific paper, following the editorial requirements - Revise a manuscript according to a checklist with the most common language and structure mistakes in scientific writing - Use the focus points in a scientific paper (where the readers focus their reading) - Identify the main scope and focus of the research and summarize information aligned to the target group - Apply the structure of popular science writing and use popular science as a tool for presentations - Give a poster presentation - Design a scientific poster and reflect upon structure, language and style - Understand the ethics in publication - Use the software EndNote for reference management - Search for references in databases (e.g. PubMed) and decide what sources are reliable - Respond to the reviewer's comments - Write a cover letter - Reflect on own development as a writer of different texts during the course
Contents of the course : THE MAIN SCOPE OF THE COURSE is how to write about research in different contexts and forums. THE CONTENT OF THE COURSE: 1. Terminology associated to scientific writing 2. Designing and writing a) a poster b) an abstract c) a draft for a research paper d) a cover letter e) a reply to the reviewer´s comments f) a cover letter g) a popular science paper 3. The writing process: structure, language, style 4. Editorial requirements of different journals 5. Summarizing and presenting information aiming at the target audience 6. Identifying the main scope of a research project 7. References and reference management (EndNote software) 8. Data base search 9. Basic rhetoric for poster presentations 10. References 11. Ethics in publication
Teaching and learning activities : Lectures, seminares, writing exercises, group assignments and practical exercises. As part of the learning process, the Ph.D students will be members of in-class review groups, giving feed-back to their colleagues.
Examination : 1) Written assignments reflecting the intended learning outcomes of the course: draft for scientific paper, popular science paper, poster, cover letter, and abstract. All assignments can be based on own research (if applicable). 2) Evaluation sessions, where the PhD students give each other feed back on the written assignments as a part of the learning process 3) Poster presentation, where the PhD students present their posters to a small group of course participants (there are no presentations in front of a larger group)
Compulsory elements : Lectures, workshops, evaluation sessions, and group assignments as well as all written assignments. Absence can be compensated: a) during next course occasion b) individual assignments
Number of students : 15 - 22
Selection of students : Selection will be based on 1) the relevance of the course syllabus for the applicant's doctoral project (according to written motivation), 2) 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 :
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

Lalit Kumar
Institutionen för kvinnors och barns hälsa

Lalit.Kumar@ki.se

Title : Write your research results and get them published

Course number : 2618
Credits : 3.0
Date : 2017-11-27 -- 2017-12-08
Language : English
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.
Learning outcomes : AFTER ATTENDING THE COURSE, THE DOCTORAL STUDENT SHOULD BE ABLE TO: - Explain the characteristics and disposition of different written presentation media and decide which forum is the most suitable for a specific text - Understand, and apply, the terminology associated with scientific writing - Write an abstract - Use the correct structure and language to compose a scientific paper, following the editorial requirements - Revise a manuscript according to a checklist with the most common language and structure mistakes in scientific writing - Use the focus points in a scientific paper (where the readers focus their reading) - Identify the main scope and focus of the research and summarize information aligned to the target group - Apply the structure of popular science writing and use popular science as a tool for presentations - Give a poster presentation - Design a scientific poster and reflect upon structure, language and style - Understand the ethics in publication - Use the software EndNote for reference management - Search for references in databases (e.g. PubMed) and decide what sources are reliable - Respond to the reviewer's comments - Write a cover letter - Reflect on own development as a writer of different texts during the course
Contents of the course : THE MAIN SCOPE OF THE COURSE is how to write about research in different contexts and forums. THE CONTENT OF THE COURSE: 1. Terminology associated to scientific writing 2. Designing and writing a) a poster b) an abstract c) a draft for a research paper d) a cover letter e) a reply to the reviewer´s comments f) a cover letter g) a popular science paper 3. The writing process: structure, language, style 4. Editorial requirements of different journals 5. Summarizing and presenting information aiming at the target audience 6. Identifying the main scope of a research project 7. References and reference management (EndNote software) 8. Data base search 9. Basic rhetoric for poster presentations 10. References 11. Ethics in publication
Teaching and learning activities : Lectures, seminares, writing exercises, group assignments and practical exercises. As part of the learning process, the Ph.D students will be members of in-class review groups, giving feed-back to their colleagues.
Examination : 1) Written assignments reflecting the intended learning outcomes of the course: draft for scientific paper, popular science paper, poster, cover letter, and abstract. All assignments can be based on own research (if applicable). 2) Evaluation sessions, where the PhD students give each other feed back on the written assignments as a part of the learning process 3) Poster presentation, where the PhD students present their posters to a small group of course participants (there are no presentations in front of a larger group)
Compulsory elements : Lectures, workshops, evaluation sessions, and group assignments as well as all written assignments. Absence can be compensated: a) during next course occasion b) individual assignments
Number of students : 15 - 22
Selection of students : Selection will be based on 1) the relevance of the course syllabus for the applicant's doctoral project (according to written motivation), 2) 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 :
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

Lalit Kumar
Institutionen för kvinnors och barns hälsa

Lalit.Kumar@ki.se

Title : Write your research results and get them published

Course number : 2618
Credits : 3.0
Date : 2017-11-06 -- 2017-11-17
Language : English
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.
Learning outcomes : AFTER ATTENDING THE COURSE, THE DOCTORAL STUDENT SHOULD BE ABLE TO: - Explain the characteristics and disposition of different written presentation media and decide which forum is the most suitable for a specific text - Understand, and apply, the terminology associated with scientific writing - Write an abstract - Use the correct structure and language to compose a scientific paper, following the editorial requirements - Revise a manuscript according to a checklist with the most common language and structure mistakes in scientific writing - Use the focus points in a scientific paper (where the readers focus their reading) - Identify the main scope and focus of the research and summarize information aligned to the target group - Apply the structure of popular science writing and use popular science as a tool for presentations - Give a poster presentation - Design a scientific poster and reflect upon structure, language and style - Understand the ethics in publication - Use the software EndNote for reference management - Search for references in databases (e.g. PubMed) and decide what sources are reliable - Respond to the reviewer's comments - Write a cover letter - Reflect on own development as a writer of different texts during the course
Contents of the course : THE MAIN SCOPE OF THE COURSE is how to write about research in different contexts and forums. THE CONTENT OF THE COURSE: 1. Terminology associated to scientific writing 2. Designing and writing a) a poster b) an abstract c) a draft for a research paper d) a cover letter e) a reply to the reviewer´s comments f) a cover letter g) a popular science paper 3. The writing process: structure, language, style 4. Editorial requirements of different journals 5. Summarizing and presenting information aiming at the target audience 6. Identifying the main scope of a research project 7. References and reference management (EndNote software) 8. Data base search 9. Basic rhetoric for poster presentations 10. References 11. Ethics in publication
Teaching and learning activities : Lectures, seminares, writing exercises, group assignments and practical exercises. As part of the learning process, the Ph.D students will be members of in-class review groups, giving feed-back to their colleagues.
Examination : 1) Written assignments reflecting the intended learning outcomes of the course: draft for scientific paper, popular science paper, poster, cover letter, and abstract. All assignments can be based on own research (if applicable). 2) Evaluation sessions, where the PhD students give each other feed back on the written assignments as a part of the learning process 3) Poster presentation, where the PhD students present their posters to a small group of course participants (there are no presentations in front of a larger group)
Compulsory elements : Lectures, workshops, evaluation sessions, and group assignments as well as all written assignments. Absence can be compensated: a) during next course occasion b) individual assignments
Number of students : 15 - 22
Selection of students : Selection will be based on 1) the relevance of the course syllabus for the applicant's doctoral project (according to written motivation), 2) 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 :
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

Lalit Kumar
Institutionen för kvinnors och barns hälsa

Lalit.Kumar@ki.se

Title : Write your research results and get them published

Course number : 2618
Credits : 3.0
Date : 2017-10-23 -- 2017-11-03
Language : English
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.
Learning outcomes : AFTER ATTENDING THE COURSE, THE DOCTORAL STUDENT SHOULD BE ABLE TO: - Explain the characteristics and disposition of different written presentation media and decide which forum is the most suitable for a specific text - Understand, and apply, the terminology associated with scientific writing - Write an abstract - Use the correct structure and language to compose a scientific paper, following the editorial requirements - Revise a manuscript according to a checklist with the most common language and structure mistakes in scientific writing - Use the focus points in a scientific paper (where the readers focus their reading) - Identify the main scope and focus of the research and summarize information aligned to the target group - Apply the structure of popular science writing and use popular science as a tool for presentations - Give a poster presentation - Design a scientific poster and reflect upon structure, language and style - Understand the ethics in publication - Use the software EndNote for reference management - Search for references in databases (e.g. PubMed) and decide what sources are reliable - Respond to the reviewer's comments - Write a cover letter - Reflect on own development as a writer of different texts during the course
Contents of the course : THE MAIN SCOPE OF THE COURSE is how to write about research in different contexts and forums. THE CONTENT OF THE COURSE: 1. Terminology associated to scientific writing 2. Designing and writing a) a poster b) an abstract c) a draft for a research paper d) a cover letter e) a reply to the reviewer´s comments f) a cover letter g) a popular science paper 3. The writing process: structure, language, style 4. Editorial requirements of different journals 5. Summarizing and presenting information aiming at the target audience 6. Identifying the main scope of a research project 7. References and reference management (EndNote software) 8. Data base search 9. Basic rhetoric for poster presentations 10. References 11. Ethics in publication
Teaching and learning activities : Lectures, seminares, writing exercises, group assignments and practical exercises. As part of the learning process, the Ph.D students will be members of in-class review groups, giving feed-back to their colleagues.
Examination : 1) Written assignments reflecting the intended learning outcomes of the course: draft for scientific paper, popular science paper, poster, cover letter, and abstract. All assignments can be based on own research (if applicable). 2) Evaluation sessions, where the PhD students give each other feed back on the written assignments as a part of the learning process 3) Poster presentation, where the PhD students present their posters to a small group of course participants (there are no presentations in front of a larger group)
Compulsory elements : Lectures, workshops, evaluation sessions, and group assignments as well as all written assignments. Absence can be compensated: a) during next course occasion b) individual assignments
Number of students : 18 - 22
Selection of students : Selection will be based on 1) the relevance of the course syllabus for the applicant's doctoral project (according to written motivation), 2) date for registration as a doctoral student (priority given to LATER registration date).
More information : 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 :
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

Lalit Kumar
Institutionen för kvinnors och barns hälsa

Lalit.Kumar@ki.se

Title : Write your research results and get them published

Course number : 2618
Credits : 3.0
Date : 2017-10-09 -- 2017-10-20
Language : English
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.
Learning outcomes : AFTER ATTENDING THE COURSE, THE DOCTORAL STUDENT SHOULD BE ABLE TO: - Explain the characteristics and disposition of different written presentation media and decide which forum is the most suitable for a specific text - Understand, and apply, the terminology associated with scientific writing - Write an abstract - Use the correct structure and language to compose a scientific paper, following the editorial requirements - Revise a manuscript according to a checklist with the most common language and structure mistakes in scientific writing - Use the focus points in a scientific paper (where the readers focus their reading) - Identify the main scope and focus of the research and summarize information aligned to the target group - Apply the structure of popular science writing and use popular science as a tool for presentations - Give a poster presentation - Design a scientific poster and reflect upon structure, language and style - Understand the ethics in publication - Use the software EndNote for reference management - Search for references in databases (e.g. PubMed) and decide what sources are reliable - Respond to the reviewer's comments - Write a cover letter - Reflect on own development as a writer of different texts during the course
Contents of the course : THE MAIN SCOPE OF THE COURSE is how to write about research in different contexts and forums. THE CONTENT OF THE COURSE: 1. Terminology associated to scientific writing 2. Designing and writing a) a poster b) an abstract c) a draft for a research paper d) a cover letter e) a reply to the reviewer´s comments f) a cover letter g) a popular science paper 3. The writing process: structure, language, style 4. Editorial requirements of different journals 5. Summarizing and presenting information aiming at the target audience 6. Identifying the main scope of a research project 7. References and reference management (EndNote software) 8. Data base search 9. Basic rhetoric for poster presentations 10. References 11. Ethics in publication
Teaching and learning activities : Lectures, seminares, writing exercises, group assignments and practical exercises. As part of the learning process, the Ph.D students will be members of in-class review groups, giving feed-back to their colleagues.
Examination : 1) Written assignments reflecting the intended learning outcomes of the course: draft for scientific paper, popular science paper, poster, cover letter, and abstract. All assignments can be based on own research (if applicable). 2) Evaluation sessions, where the PhD students give each other feed back on the written assignments as a part of the learning process 3) Poster presentation, where the PhD students present their posters to a small group of course participants (there are no presentations in front of a larger group)
Compulsory elements : Lectures, workshops, evaluation sessions, and group assignments as well as all written assignments. Absence can be compensated: a) during next course occasion b) individual assignments
Number of students : 15 - 22
Selection of students : Selection will be based on 1) the relevance of the course syllabus for the applicant's doctoral project (according to written motivation), 2) 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 :
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

Lalit Kumar
Institutionen för kvinnors och barns hälsa

Lalit.Kumar@ki.se

Title : Brain circuits

Course number : 2624
Credits : 1.5
Date : 2017-09-04 -- 2017-09-08
Language : English
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.
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 : 8 - 25
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 as evident from 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 in lecture hall Tellus, Department of Neuroscience, Scheeles väg 1, Karolinska Institutet, Solna. Time: 9.00-17.00 (Monday to Friday). Lectures will be given by international scientists who have contributed to important advances in their respective field, often including development or application of novel technologies. We have a strong emphasis on young successful scientists. Confirmed teachers: Karl Deisseroth (Stanford University, USA), Carl Petersen (EPFL, Switzerland), Peter Magill (Oxford University, UK), Gilad Silberberg (Karolinska Institutet, Sweden), Laura Busse (University of Münich, Germany), Daniel Huber (University of Geneva, Switzerland), Yexica (Yeka) Aponte (National Institute of Drug Abuse, USA), Marie Carlén (Karolinska Institutet, Sweden), Seung-Hee Lee (KAIST, Korea) and more.

Course responsible :
Marie Carlen
Department of Neuroscience
08-52483043
Marie.Carlen@ki.se

Contact person :
-

Title : Neurodegenerative disorders I - From molecule to treatment

Course number : 2629
Credits : 1.5
Date : 2017-10-02 -- 2017-10-06
Language : English
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.
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, 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 on the topic.
More information : The course will be held at Karolinska Institutet, Huddinge and/or Karolinska Sjukhuset, Huddinge.

Course responsible :
Elisabet Åkesson
Department of Neurobiology, Care Sciences and Society
08-585 838 92
Elisabet.Akesson@ki.se

Contact person :
Helena Karlström
Institutionen för neurobiologi, vårdvetenskap och samhälle
08-585 837 77
Helena.Karlstrom@ki.se

Maria Roos
Institutionen för neurobiologi, vårdvetenskap och samhälle
0858585417
Maria.Roos@ki.se

Title : Human physiology - an overview

Course number : 2644
Credits : 3.0
Date : 2017-09-04 -- 2017-09-15
Language : English
Responsible KI department : Department of Physiology and Pharmacology
Specific entry requirements :
Purpose of the course : KI is a medical university with research and education in medicine and health. All PhD students have to obtain basic knowledge regarding the human body in health and disease in case they lack basic higher education knowledge in the field of medicine. The aim of the course is to give PhD students without a medical background a basic overview and introduction to human physiology. The students will gain a basic understanding of how the human organ systems function and interact under normal conditions. The content covered in this course will be useful for further studies where knowledge about human biology is of value.
Learning outcomes : After completing the course, the student will gain a basic understanding of how the human organ systems function and interact under normal conditions. The content covered in this course will be useful for further studies where knowledge about human biology is of value. More specifically, the student will be able to: - Demonstrate knowledge and understanding of basic functions and interactions between organ systems in the human body. - Demonstrate a critical and scientific approach to literature sources for the different course tasks.
Contents of the course : - Overview of cellular and integrative physiology - Basic anatomy - Biochemistry and cell biology - Nervous system - Endocrinology - Digestive system - Cardiovascular physiology - Renal physiology - Respiration - Basic immunology
Teaching and learning activities : Different learning methods such as problem based learning, lectures and a hands-on human lab session will be used. Full time during two consecutive weeks.
Examination : To pass the course, the student must demonstrate that the learning outcomes have been achieved. Oral and written examinations are used for student assessment.
Compulsory elements : Examinations and the hands-on human lab are required. Students that are absent during the quiz or the lab must perform a make-up quiz/lab. Students that are absent from the exam or do not obtain a passing grade in the first examination will be offered a second examination.
Number of students : 10 - 30
Selection of students : Selection is based on 1) the date of admission to doctoral education, 2) the applicant¿s written motivation
More information : The course will be located in facilities at KI Campus in Solna. Lectures will be held during day time.

Course responsible :
Jessica Norrbom
Department of Physiology and Pharmacology

Jessica.Norrbom@ki.se

Contact person :
Stefan Reitzner
Institutionen för fysiologi och farmakologi

stefan.reitzner@ki.se

Title : Surgical Techniques in Rat and Mouse

Course number : 2647
Credits : 2.0
Date : 2017-10-09 -- 2017-10-13
Language : English
Responsible KI department : Comparative medicine
Specific entry requirements : Students need to have completed a laboratory animal science course on how to carry out scientific procedures on the appropriate animal species i.e. EU Function A or equivalent course.
Purpose of the course : Training in surgery is both essential, and a legal requirement, for all those who need to undertake surgical procedures on mice and rats used in research. Applying appropriate techniques to in vivo studies enhances outcomes from research studies, reduces data variability, and is perceived as ethically acceptable. The course includes training sessions covering both advanced and special surgical techniques.
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 especially in module 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 routine, advanced and special surgical procedures competently. In brief, after the course the participants are expected to be able to: 1) Handle pre-, peri- and post-operative care of rats and mice, including asepsis and analgesia; 2) Recognize microsurgery instruments and their use; 3) Set and use a microsurgery microscope; 4) Use appropriate suture materials; 5) catheterize blood vessels and to collect blood.
Contents of the course : Analgesia and perioperative care, aseptic surgical techniques, basic and advanced surgical techniques including instrumentation, suturing and tissue handling, vein and artery cannulation, explorative laparotomy and blood sampling techniques. Rat will be our main animal model during the course (as techniques are easier to learn in a larger model), but mouse will also be available.
Teaching and learning activities : A minor part of the learning activities are lectures (10%). The laboratory activities account for 70% of the course. The remaining part of learning activities are demonstrations and project work (tutoring available).
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 as 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 occasions.
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 surgical or anaesthetic techniques in rodent models), which will be according to written motivation. If necessary, additional selection crterium will be used based on the date for registration as a doctoral student (priority given to earlier registration date).
More information : The course is held from Monday to Friday between 9 am and 5 pm. Location: Learning Lab, von Eulers väg 4A, 2nd floor. Key topics of this course include surgical and anaesthetic procedures on rats and mice, with focus on microsurgery and advanced surgical skills in rodent models. The main instructor of this course is internationally-recognized Professor René Remie, PhD, author and editor of the Manual of Microsurgery on the Laboratory Rat.

Course responsible :
Rafael Frias
Comparative medicine
085246660
rafael.frias@ki.se

Contact person :
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Title : Grounded theory in health research

Course number : 2654
Credits : 3.0
Date : 2017-10-16 -- 2017-10-27
Language : English
Responsible KI department : Department of Clinical Science and Education, Södersjukhuset
Specific entry requirements :
Purpose of the course : The purpose of the course is to give doctoral students a basic knowledge, understanding and skills necessary to design and implement a Grounded Theory study, in addition to evaluation of the results of Grounded Theory studies. The course aim is also to give participants an introductory opportunity to produce their own, original, grounded theory research using the right approach.
Learning outcomes : At the end of the course the participants should: 1. Be able to describe the experience of a classroom climate that incorporates principles of respect, mutuality, cooperation, collaboration, and teamwork. 2. Be able to demonstrate understanding of philosophical and practical underpinnings of grounded theory. 3. Be able to express understanding of the essential characteristics of grounded theory and exploration methodology. 4. Be able to apply knowledge of grounded theory in discussing rationales for design of grounded theory study. 5. Be able to understand and assess the applicability of a grounded theory methodology for a particular research problem. 6. Be able to critically comment/evaluate strength and weakness of studies(published papers) using grounded theory methodology 7. Be able to implicate grounded theory research findings for practice and future research 8. Be able to design grounded theory research proposals including: Title, Background, Research question, Study goal and objectives, Methodology and reasons to choose grounded theory methodology, Study population, Study sample (participants), Sampling method, Sample size, Inclusion and exclusion criteria, Data gathering technique/s, Data analysis method, Limitation, Ethical consideration, Trustworthiness/ Credibility(validity& reliability)
Contents of the course : The course will provide practical, hands-on experience in using grounded theory research. Students will gain a knowledge and understanding of main features and the basic characteristics of grounded theory, the applicability of grounded theory for particular research problems, including those of their own original grounded theory research projects; and how to critically appraise appropriateness of grounded theory. The teachers will share their experience of grounded theory research method, the application of grounded theory in their respective fields and provide advice and consultation on the advanced use of cutting-edge grounded theory. The course will start with a deep discussion about what grounded theory is, the aim of grounded theory and when to use grounded theory. Then teachers will continue with key characteristics of grounded theory research, the applicability of grounded theory for particular research problems, how to conduct a grounded theory study; and evaluation of rigor in this approach. Students will learn to evaluate and make comments on published grounded theory studies in terms of methodology, data gathering, quality of gathered data, data analysis approach, display of result, study limitation and ethical considerations. Finally implications of grounded theory findings for practice and future research will be discussed and students will learn to design a grounded theory research proposal in their respective fields.
Teaching and learning activities : The learning activities of the course are a mix of lectures, discussions, individual and group activities; interviews, seminars, field observations and individual and group presentations.
Examination : The course assessment will include formative and summative assessments. The formative assessment (50%) will be made through Peer learning Activity, critic a grounded theory paper, individual and group presentations, while the summative assessment (50%) will be through a written examination, and individual qualitative data gathering and analysis and finally a written grounded theory proposal in their respective fields. In this way, the students are examined with both group-wise and individual presentations.
Compulsory elements : Active participation in the class discussions, individual and group assignments (individual and group data gathering by interviews and field observations and data analysis), written assignment (a complete grounded theory proposal) and student presentations are mandatory. Compensation according to the instructions of the course director, which means absentees less than 2 lectures is acceptable and should be compensated by individual projects related to absenteeźs session.
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 (priority given to earlier registration date)
More information : The course will be held at the Department of Clinical Science and Education at Södersjukhuset in Stockholm. Lectures will be held 3 days/week and the other days will be group/own work.

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

hamid.khankeh@ki.se

Sjukhusbacken 10
118 83

Stockholm

Contact person :
Jeanette Brynholt Ohrman
Institutionen för klinisk forskning och utbildning, Södersjukhuset
08-6162935
jeanette.brynholt.ohrman@ki.se

Title : Nanotoxicology - potential risks of engineered nanomaterials to human health and the environment

Course number : 2669
Credits : 1.5
Date : 2017-09-18 -- 2017-09-22
Language : English
Responsible KI department : The institute of Environmental Medicine
Specific entry requirements :
Purpose of the course : The purpose of the course is to provide the students with an understanding of the potential toxicity of nanomaterials and how the toxicity is studied.
Learning outcomes : At the end of the course, the students should be able to: - describe and explain the basic principles nanotoxicology - discuss in vitro and in vivo (eco)toxicological approaches to support risk assessment of engineered nanomaterials for human health and the environment
Contents of the course : The course will include the following major topics: epidemiological studies of adverse health effects of particles; introduction to material sciences (physico-chemical characterization of nanomaterials); (eco)-toxicological studies (in vitro and in vivo assessment of nano materials and in silico or modeling approaches for predictive nanotoxicology); and risk assessment of nanomaterials for human health, as well as regulatory/legislative issues related to nanomaterial safety. The course will also provide some examples of the potential applications of the nanotechnologies for clinical applications (nanomedicine).
Teaching and learning activities : The course consists of lectures including invited lectures by well-renowned national and international scientists, group seminars and/or journal clubs sessions.
Examination : Examination is in the form of a written assignment and/or oral presentation.
Compulsory elements : Participation in group seminars and Journal Club sessions 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 : The course is given at KI Campus Solna.

Course responsible :
Bengt Fadeel
The institute of Environmental Medicine
+46852487737
Bengt.Fadeel@ki.se

Nobels väg 13

171 77
Stockholm

Contact person :
Johanna Bergman
Institutet för miljömedicin

johanna.bergman@ki.se

Nobels väg 13

17177
Stockholm

Title : Tumor microenvironment

Course number : 2671
Credits : 1.5
Date : 2017-10-02 -- 2017-10-06
Language : English
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 with in vitro co-culturing and in vivo tumor models.
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 : 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 (priority given to earlier registration date)
More information : The course will be held at CCK lecture Hall, R8:00, Karolinska University Hospital, Solna.

Course responsible :
Rainer Tuominen
Department of Oncology-Pathology

Rainer.Tuominen@ki.se

Contact person :
Suzanne Egyhazi Brage
Institutionen för onkologi-patologi

Suzanne.Egyhazi.Brage@ki.se

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

Course number : 2674
Credits : 7.5
Date : 2017-08-28 -- 2017-11-17
Language : English
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.
Learning outcomes : - Design a qualitative study including selecting the appropriate sampling procedure and data collection methods. - Develop the data instruments including interview/focus groups discussions guides and observation protocols. - Conduct the fieldwork. - Analyze the data. - Write up the findings. - Critically discuss others' qualitative research, e.g. described in research proposals and manuscripts.
Contents of the course : - Background on qualitative methodology. - Theory of qualitative research. - Sampling in qualitative research. - Designing an interview/discussion guide. - Ethical considerations in qualitative research. - Writing a research protocol. - Data collection methods (in-depth interviews, focus groups discussions and observation). - Alternative methods of data collection. - Analysis of qualitative data. - Trustworthiness and validity. - Other approaches to interpretation: Phenomenology, narrative research, oral history. - Qualitative research in evaluation. - Critical review of literature. - Ongoing development as qualitative researcher.
Teaching and learning activities : The course will be taught with a blended learning approach, which will combine self-study and face-to-face practical training sessions. Students will be able to access course materials and interact with each other through a common e-learning platform. Practical sessions will be conducted face-to-face where a theoretical and practical training will be provided in the three dominant qualitative data collection methods, including discussion of examples used in studies. In addition, the students will conduct individual assignments that will allow them to improve their skills.
Examination : Four assignments are to be done during the course. The first three assignments will take the students through a full mini research project. The first assignment will be to write a qualitative research protocol, the second to conduct two individual depth interviews and transcribe these and the third to analyze the interview transcripts. The fourth assignment will be to write a critical review of a published qualitative paper. There will be a written examination at the end of the course, which will be emailed to the students to be returned within 48 hours. In order to obtain a pass for the whole course, students must obtain a pass in the four assignments and in the written examination.
Compulsory elements : Participation in practical sessions, on-line lectures and discussions is compulsory. Non-participation will result in additional assignments at the discretion of the course tutor.
Number of students : 8 - 15
Selection of students : Selection will be based on 1) the relevance of the course syllabus for the applicant's doctoral project (according to written motivation), 2) 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. Four days of practical training will be conducted during the fist week of October 2017 (2nd-6th). The practical training will be conducted by Dr. Donald Skinner Ph.D from The Human Science Research Council South Africa. Dr. Skinner has the extensive experience in qualitative methodology and has published 80 peer-reviewed articles.

Course responsible :
Mariano Salazar
Department of Public Health Sciences

mariano.salazar@ki.se

Contact person :
Mariano Salazar
Institutionen för folkhälsovetenskap

mariano.salazar@ki.se

Title : Introduction to teaching at KI

Course number : 2686
Credits : 1.0
Date : 2017-08-22 -- 2017-09-12
Language : English
Responsible KI department : Department of Learning, Informatics, Management and Ethics
Specific entry requirements :
Purpose of the course : The purpose of this course is to introduce a variety of teaching and learning methods, and to stimulate a reflective approach to teaching in order to enhance students' meaningful learning and active involvement.
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. 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 22 August, 29 August, 12 September. In addition, time for reading and auscultation must be planned by the course participants. The course is given in English.

Course responsible :
Mohammed Seed Ahmed
Department of Learning, Informatics, Management and Ethics

Mohammed.Seed-Ahmed@ki.se

Contact person :
Margareta Krook-Brandt
Institutionen för lärande, informatik, management och etik

Margareta.Krook-Brandt@ki.se

Title : Multi-disciplinary perspectives on active ageing research

Course number : 2688
Credits : 4.5
Date : 2017-09-19 -- 2017-11-28
Language : English
Responsible KI department : Department of Neurobiology, Care Sciences and Society
Specific entry requirements :
Purpose of the course : The purpose of the course is to enable the students to develop an in-depth knowledge of theoretical and methodological challenges in ageing research and to analyse research questions within a framework of different ageing theories with a multi-disciplinary perspective.
Learning outcomes : The students shall be able to: Theorize on complexity of research directed towards older people, and reflect on methodological challenges in ageing research Analyse research on ageing from a multi-disciplinary perspective within the framework of different ageing theories Critically judge and hypothesize on research questions within the field of ageing from different disciplinary viewpoints
Contents of the course : To reach the intended learning outcomes, the course will be built on the research projects of the students involved. Definitions and concepts relevant for the focus of those projects will be penetrated to make students aware of their own frame of reference and of the theory that forms a base for their research design. The course will include an overview of current ageing research issues within different professional and scientific domains in health, covering the four levels health promotion, prevention of disease and disability, rehabilitation and preservation of function. A focus on a persons resources for developing an active life, and their possible implications in research will be analysed.
Teaching and learning activities : Lectures, seminars, study of and group discussions on scientific literature and individual work based on each student's research project.
Examination : The students will be individually examined at a seminar, where a written assignment related to the student's research project will be presented, discussed and evaluated. The paper should include an attempt to apply the perspective of empowerment as well as a multi-disciplinary approach on the project.
Compulsory elements : Active participation in the seminars, which are mandatory. Absence from a seminar must be compensated by means of a written task, suggested by 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 : Presence during all occassions is mandatory:
 19/9 - Introduction, seminar and lecture
 3-4/10 - Seminars and lectures
 27-28/11 - Examination

Course responsible :
Elisabeth Rydwik
Department of Neurobiology, Care Sciences and Society

elisabeth.rydwik@ki.se

Contact person :
Anna Jervaeus
Institutionen för neurobiologi, vårdvetenskap och samhälle

anna.jervaeus@ki.se

Elisabeth Rydwik
Institutionen för neurobiologi, vårdvetenskap och samhälle

elisabeth.rydwik@ki.se

Title : Basic Laboratory Safety

Course number : 2690
Credits : 1.8
Date : 2017-09-25 -- 2017-10-02
Language : English
Responsible KI department : Department of Microbiology, Tumor and Cell Biologi
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.
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 and performance of an approved risk assessment.
Compulsory elements : Presence during some activities, like introduction, group discussions, practical sessions, self tests in KI:s learning platform and examination, is compulsory according to schedule. 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
Department of Microbiology, Tumor and Cell Biologi

Maria.Johansson@ki.se

Contact person :
Annika Carlsson
Institutionen för mikrobiologi, tumör- och cellbiologi

annika.carlsson@ki.se

Title : Measuring physical activity with focus on wearable monitors - applications for clinical and epidemiological studies

Course number : 2693
Credits : 3.0
Date : 2017-10-06 -- 2017-11-10
Language : English
Responsible KI department : Department of Neurobiology, Care Sciences and Society
Specific entry requirements :
Purpose of the course : The primary objective of the course is to promote high quality research in clinical and epidemiological studies through understanding of principles for measuring physical activity and methods for analyzing physical activity data. The course has the primary focus on measurement of physical activity using accelerometry and its use in different study designs. An overview of other methods to measure physical activity such as questionnaires, heart rate monitoring or a combination of different physiological measures will also be covered.
Learning outcomes : By the end of the course the student should be able to: 1. Reflect on the concepts relevant for the relation between physical activity and health and understand measurement principles for assessing these concepts and especially the principles of of wearable monitors such as accelerometry. 2. Choose and justify the best method of choice for assessment of physical activity in accordance with different research questions, study designs and populations. 3. Apply the best method of choice for assessment of physical activity in relation to a specific research question. 4. Design a validation or calibration study in clinical and/or epidemiological studies in different populations. 5. Analyse physical activity data and interpret the outcomes in accordance with different research questions, study designs and populations.
Contents of the course : - Assessment of physical activity using questionnaires and wearable monitors in different types of studies - Sensor development and measurement principles - Calibration and validation - Different approaches handling and analyzing the data and outcomes - Statistical considerations - Interpretation of results
Teaching and learning activities : The course is based on demonstrations, workshops and seminars in combination with a few lectures in order to promote a reflective, analytical and critical approach towards this research field. Students will be encouraged to be interactive in demonstrations, workshops and seminars. There will be hands-on experience with students wearing accelerometer throughout a week and opportunities for exploring, processing and analysis this data.
Examination : The learning outcomes will be examined by a written assignment were the students apply the course content to their own doctoral projects. The written assignments will be presented and discussed in a seminar where the students are respondents and opponents on each other's work. After the seminar the students will be given one week to refine their work based on the feedback they are given.
Compulsory elements : Active participation in workshops and seminars. Absence from a seminar must be compensated by means of a written task, suggested by the course leader.
Number of students : 10 - 20
Selection of students : Selection will be based on 1) the relevance of the course syllabus for the applicant's doctoral project (according to written motivation), 2) date for registration as a doctoral student (priority given to earlier registration date)
More information : Course dates: Oct 6th, Oct 18-20th, Nov 10th. Alfred Nobels Alle 23, Flemingsberg. Invited lecturer: Patrick Bergman, Linné University.

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

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

Course number : 2702
Credits : 3.0
Date : 2017-10-02 -- 2017-11-24
Language : English
Responsible KI department : Department of Neurobiology, Care Sciences and Society
Specific entry requirements : Students should have knowledge in models of practice in occupational therapy
Purpose of the course : The purpose of the course is to develop theoretical and conceptual understanding on occupational science including how theories and concepts within the discipline can be applied to a specific research-question or research-area. In-depth knowledge also includes development of critical thinking in application of theories and knowledge short-coming and possible development of further understanding.
Learning outcomes : Following the course, participants will be able to: - develop in-depth knowledge on the development of the discipline of occupational science, with focus on the development of ideas, positioning in the knowledge society and epistemological base, - reflect on conceptual questions within occupational science and its relation to other health-related concepts, including relationship to clinical- or research practice, - apply an occupational perspective on a research question or a research area on individual, contextual and societal level and discuss similarities and differences to other perspectives. - reflect on the strengths and weaknesses of a fellow students application of an occupational perspective
Contents of the course : The content of the course regards discussions about the historical roots of the ideas of occupational science and the discipline in relation to the professional application in occupational therapy. Contemporary discussions about central concepts and focuses on individual and societal level will be reviewed in the course. Connecting own research to areas and concepts within the occupational perspective will be central in the course
Teaching and learning activities : The course is a part-time distance course that uses streamed lectures to introduce the course and each of the learning outcomes. This is combined with on-line discussions and 3 group-based on-line seminars that students prepare beforehand and discuss aspects and problem in relation to each of the learning outcomes. The final examination seminar presents and discusses individual papers focusing on application of OS to a research question. Respondent and opponent-roles will be used.
Examination : The examination will be based on the following: - participating in seminar with reflections on the development of ideas in relation to own experience clinically and or in research including comments on others in the seminar, - participating in seminar with reflections on a central concept in the discipline including comments on others in the seminar, - a written assignment of 4-6 pages in which the student by using relevant concepts should apply an occupational perspective on a research question or a research area on individual, contextual and societal level. - an oral presentation of the assignment and performance in the role of opponent reflecting on a fellow students paper.
Compulsory elements : All lectures are compulsory as well as the group-based and the individual based seminar. Absence will be compensated with an individual discussion paper about the topic that has been missed.
Number of students : 8 - 14
Selection of students : Selection of students will be made from a short motivation letter on how this course is planned to support the specific research project of the student.
More information :

Course responsible :
Hans Jonsson
Department of Neurobiology, Care Sciences and Society

Hans.Jonsson@ki.se

Division of Occupational Therapy
Fack 23200
SE-141 83
Huddinge

Contact person :
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Title : Metoder för systematisk litteraturöversikt

Course number : 2704
Credits : 7.5
Date : 2017-09-25 -- 2017-12-15
Language : Swedish
Responsible KI department : Department of Clinical Neuroscience
Specific entry requirements :
Purpose of the course :
Learning outcomes : Efter avslutad kurs förväntas deltagarna: *kunna reflektera över vilket bidrag den egna forskningsöversikten tillför kunskapsfältet och identifiera frågor som kvarstår *ha utvecklat färdigheter i användandet av forskningssyntes som en vetenskaplig process *kunna kritiskt utvärdera procedurer vid systematiska litteraturöversikter
Contents of the course : Utveckla färdigheter att: *använda systematiskt tillvägagångssätt och att sammanfatta kunskap utifrån en vetenskaplig process *reflektera över hur den valda frågeställningen inom ramen för avhandlingsarbetet bidrar till kunskapsbasen inom aktuellt forskningsområde Centralt i kursen är att utveckla färdigheter att använda systematiskt tillvägagångssätt och att sammanfatta kunskap utifrån en vetenskaplig process. Olika syften och metoder för forskningsöversikter exemplifieras. Processen i en systematisk litteratur översikt karaktäriseras av en tydligt formulerad fråga som besvaras genom systematiska och explicita metoder för att identifiera, välja ut, kritiskt bedöma och analysera relevanta studier utifrån frågeställningen.
Teaching and learning activities : Kursen tillhandahåller en introduktion i metoder för systematisk litteraturgenomgång. Kursdeltagaren utvecklar ett protokoll för och genomför en systematisk litteraturgenomgång som fokuserar på en valfri komponent/aspekt som kommer att appliceras i deltagarens eget avhandlingsarbete. Kritiskt bedöma och diskutera svagheter och styrkor i det egna och kursdeltagarnas protokoll och översikter (reviews). Kursen är en distanskurs på deltid som omfattar tre till fyra tillfällen om 1-2 dagar varav ett är slutseminarium. Under kursen varieras arbetsformerna med t.ex. föreläsningar, eget arbete, granskning av andras arbete och gruppdiskussioner, för att kursdeltagarna utifrån denna erfarenhet ska kunna reflektera över hur kunskapen inom det egna forskningsfältet byggs upp. I kursen får deltagarna prova på att arbeta systematiskt utifrån principer om forskningssyntes och även bearbeta och kritiskt granska olika procedurer för forskningsöversikter. Vid första tillfället diskuteras frågeställningen och hur den valda komponenten inom ramen för det egna avhandlingsarbetet kan användas i studentens egna forskning. Till andra tillfället görs en individuell skriftlig plan eller protokoll för hur man implementerar en systematisk forskningsöversikt utifrån frågeställningen om den valda komponenten (2-3 sidor, 1,5 radavstånd, 12 punkter Times, Roman). Uppgiften skickas i form av ett word dokument (döpt med ditt namn).
Examination : Kursen examineras individuellt genom muntlig och skriftlig examination i form av en systematisk forskningsöversikt. För godkänd kurs krävs att lärandemålen är uppfyllda, vilket innebär godkänt resultat på den skriftliga examinationen samt aktivt deltagande i obligatoriska delar. Examinationen består av: 1) En individuell uppsats i formen av en systematisk översikt och består av en litteratur genomgång utifrån den valda frågeställningen (8-12 sidor, 1,5 radavstånd, 12 punkter Times Roman Fokus i den sista uppgiften kommer att vara på: a) hur kursdeltagaren har undersökt och sammanfattat den valda frågeställningen i den individuellt genomförda forskningssyntesen b) hur studenten, i en metoddiskussion, har kritiskt granskat procedurer i den egna systematiska genomgången 2) Aktivt deltagande i det sista seminariet, där den individuella uppgiften (punkt 1) presenteras och diskuteras. Examination för kursen kommer att tillhandahållas under ett år efter kursens slut.
Compulsory elements : Deltagandet i slutseminariet är obligatoriskt. Frånvaro från det sista seminariet ska kompenseras med en skriftlig kritisk diskussion av en annan students skriftliga rapport till det sista seminariet.
Number of students : 10 - 20
Selection of students : 1. Doktorander i Forskarskolan i vårdvetenskap har företräde framför andra sökanden 2. Doktorander har företräde framför andra sökanden 3. KI doktorander har företräde framför andra doktorander 4. Sökandes motivering till att gå kursen
More information : Metoder för systematisk litteraturöversikt inom ramen för det egna avhandlingsarbetet, Kurs 2704, HT 2017 Kursen är en distanskurs på deltid som omfattar fem till sex tillfällen om 1-3 dagar varav ett är slutseminarium.
 Tider och lokal:
 Tillfälle 1-3: 25-27 september, 9.00-16.00.
 Tillfälle 4: 20 oktober, 9.00-16.00 (detta sker i halvklass och ni kommer att närvara antingen fm eller em).
 Tillfälle 5: 17 november, 9.00-16.00 frivillig handledning. OBS detta datum kan komma att ändras i samråd med er!
 Tillfälle 6: (detta sker i halvklass och ni kommer att närvara en av de två dagarna): 14 eller 15 december, 9.00-16.00.
 Samtliga tillfällen är på Nobels väg 9, Solna campus.
 <p>
 De två första dagarna består av föreläsningar och hjälp att starta upp ert eget arbete. Föreläsare under dessa dagar är Agneta Pettersson, (projektledare från SBU, Statens beredning för medicinsk utvärdering), Mervi Flinkman (University of Turku) och Petter Gustavsson (Karolinska Institutet). Dag tre får ni personlig hjälp i bibliotekets lokaler av bibliotekets kunniga personal. Dessa tre första dagar är viktiga för att komma igång med arbetet. <p>
 Kontaktperson: Ann Rudman (ann.rudman@ki.se)

Course responsible :
Ann Rudman
Department of Clinical Neuroscience
073-9343478
Ann.Rudman@ki.se

Contact person :
Anna Jervaeus
Institutionen för neurobiologi, vårdvetenskap och samhälle

anna.jervaeus@ki.se

Title : Social determinants of health

Course number : 2711
Credits : 3.0
Date : 2017-12-11 -- 2017-12-22
Language : English
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 inequalites in health.
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 :
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Title : Calcium signaling

Course number : 2733
Credits : 1.5
Date : 2017-09-04 -- 2017-09-08
Language : English
Responsible KI department : Department of Clinical Science and Education, Södersjukhuset
Specific entry requirements :
Purpose of the course : The aim of this course is to enable the students to get an insight in the fundamental mechanisms of the regulation of cellular Ca2+ homeostasis, the generation and the decoding of Ca2+ signaling, the principles of the methods for measuring Ca2+ concentrations in different cellular compartments, and the general roles of Ca2+ signals in mediating cellular functions.
Learning outcomes : After the course the students should be able to: 1. Critically analyze and interpret how the different constituents of the Ca2+ signaling tool-kit participate in the generation and decoding of Ca2+ signals, and in maintaining Ca2+ homeostasis. 2. Choose appropriate methods for studying different aspects of Ca2+ signaling 3. Critically analyze the existing literature on Ca2+ signaling, generate new ideas and put forward new hypotheses. 4. Design new studies on Ca2+ signaling in the context that is relevant to the research areas of the students themselves
Contents of the course : 1. Phospholipase C and inositol 1,4,5 trisphosphate-mediated signaling. 2. Identity and roles of the molecular players involved in Ca2+ and phospholipid-mediated signaling. 3. Preparation of Ca2+ buffers. 4. Principles of methods used in the study of calcium and phospholipid signaling including fluorescent techniques, electrphysiology and imaging techniques. 5. Regulation of ion channels involved in Ca2+ signaling including voltage sensitive channels, Transient Receptor Potential channels, store- operated channels and intracellular C a2+ channels. 6. Roles of Ca2+ and phospholipid mediated signaling in cellular processes including in secretion and apoptosis. 7. Mechanism of generation and decoding of Ca2+ signals. 8. Spatial and temporal aspects of Ca2+ signaling. 9. How to pick research problems in the areas of Ca2+ and phospholipid signaling and how to approach the problems.
Teaching and learning activities : This course will follow the principles of active learning including the seven steps problem-based-learning (PBL), and flipped classrooms. Emphasis will be on self-directed learning through problem-solving in small groups rather than on cathedral lectures. Generous small-group interactive "lecture sessions" by resource personnel with ample time for questions and answers will be provided. Participants will work on selected problems designed to be starting points, in groups of about ten participants, under supervision of trained facilitators who will be available during all of the sessions. Participants will be provided with an outline of the objectives, areas expected to cover, and reprints of selected learning materials.
Examination : Each student must submit a research proposal in the area of Ca2+ signalling where they will critically analyze the existing literature, identify the gaps in the existing knowledge, put forward a new hypothesis, and choose appropriate methods to test the hypothesis. They will use conventional headings like: specific aims, background, methods, significance, and references. The proposal should be at least one A4 page long, but no longer than three pages.
Compulsory elements : Attendence in all the sessions is obligatory. In case of absence, the participant will have to submit written reports specified by the course-supervisor, to compensate for the absence.
Number of students : 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 will be held at the Department of Clinical Science and Education, Södersjukhuset (Metro Skanstull, Buss number 3 to the entrance of the Södersjukhuset). The course will start every day at 09:00 and end by latest 16:00. Lunch break 12:00-13:00.

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

Contact person :
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Title : Translational medicine in the field of autoimmunity - an overview

Course number : 2760
Credits : 3.0
Date : 2017-10-10 -- 2017-10-26
Language : English
Responsible KI department : Department of Medicine, Solna
Specific entry requirements : -
Purpose of the course : The purpose of this course is to enable the students to get an overview - from bedside to laboratory- regarding a number of autoimmune diseases, including rheumatoid arthritis (RA), systemic lupus erythematosus (SLE), multiple sclerosis (MS) and type I diabetes.
Learning outcomes : The students will get an overview of the basics regarding a number of autoimmune diseases, including rheumatoid arthritis (RA), multiple sclerosis (MS), systemic lupus erythematosus (SLE), and type I diabetes. The students will upon completion of the course have knowledge and insights in the clinical basics of the disease, how it affects the daily life of affected patients as well as the state-of-art immunological aspects of every introduced area.
Contents of the course : The course will be given in two blocks, of three days each. The course will cover basic immunology with focus on aspects of central importance in autoimmune disorders, including rheumatoid arthritis (RA), systemic lupus erythematosus (SLE), multiple sclerosis (MS), and diabetes. The students will get introduced to a number of chronic autoimmune diseases which will be described from bedside to laboratory. A descriptive overview of the clinical and molecular basics will be followed by a face to face patient-interaction where the patients will give their pictures of how it is to live with an autoimmune disorder, and describe into what extent their daily life has been affected since diagnosis. In addition, other perspective of autoimmune diseases will be covered, eg genetic- and environmental factors and aspects of how clinical trials and registries may be utilized to extend the knowledge regarding these chronic disorders.
Teaching and learning activities : The course will feature multiple lectures, interactive discussions with patients, tutorial-style discussions in groups and student oral presentations of scientific articles related to the course subject. The course is full-time three plus three days course with compulsorily reading of selected articles.
Examination : The course examination will include an oral presentation of a selected topic regarding cellular or molecular aspects related to autoimmune diseases. The presentations will be in groups of two to four students, and both insights to the disease area as well as the presentation skills will be subjected to critical review, in-person feedback and individual assessment.
Compulsory elements : The three plus three days and the seminars are mandatory, including the pre-work of discussing scientific journal articles with the assigned mentor and preparing the presentation.
Number of students : 8 - 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 : Lectures and seminars will be held October 10-12 (Tuesday-Thursday) and October 24-26 (Tuesday-Thursday)

Course responsible :
Karin Lundberg
Department of Medicine, Solna

Karin.Lundberg@ki.se

Contact person :
Caroline Grönwall
Institutionen för medicin, Solna

caroline.gronwall@ki.se

Title : Non-coding RNAs, microRNAs and their role in human diseases

Course number : 2772
Credits : 1.5
Date : 2017-12-04 -- 2017-12-08
Language : English
Responsible KI department : Department of Cell and Molecular Biology
Specific entry requirements :
Purpose of the course : To introduce the participants into the world of non-coding RNAs. Participants can learn about their modes of action, biological functions and the methodology to investigate their roles in disease context.
Learning outcomes : After the completed course the student students should be able to - explain the term microRNA, differences and similarities between them and ordinary genes and siRNAs, - summarize the relevance of microRNAs in development and diseases - relate microRNAs to "real-world" situations such as basic biological functions and major human diseases - discuss the role of small RNAs in the diagnosis (biomarkers) and treatment of disease - demonstrate a scientific way of thinking about the possible roles of microRNAs in their own research field. - critically think about advantages and disadvantages of methods used in microRNA research - use some of the most commonly used computational algorithms to predict microRNA targets, microRNAs targeting their gene of interest, microRNAs, which are co-expressed with targets in tissues, predict microRNA-target gene networks.
Contents of the course : The course provides an overview about key concepts about microRNAs and other types of non-coding RNAs and methods used in microRNA research. The roles of these molecules in human diseases and cellular processes will be covered. Lectures and seminars will be given by invited speakers from Karolinska Institutet and other universites in Sweden. Moreover, scientists from abroad will provide a comprehensive overview of their respective fields. Students will work in a computer room and learn how to predict miRNA targets and analyze miRNA function using different computational algorithms. Students will work in groups to present original papers relevant to the content of the course.
Teaching and learning activities : Structured lectures and seminars accompanied by discussions, group-work, problem-based learning, student presentation, computer work in the bioinformatics lab.
Examination : For the final examination, the students will be divided into groups and assigned an article relevant to the topic of the course. The students will then present the article for the whole group of students, with specific focus on the technologies used, background and implications of the findings. Every student will be assessed individually and according to the intended learning outcomes of the course.
Compulsory elements : Active participation in group discussions and in preparation and presentation of the student presentations are mandatory. Participation in the bioinformatics-lab-work is mandatory. Absence from the lectures needs to be compensated according to an arrangement with the course organizers.
Number of students : 8 - 16
Selection of students : Selection will be based on 1) the relevance of the course syllabus for the applicant's doctoral project (according to written motivation), 2) date for registration as a doctoral student (priority given to earlier registration date)
More information : The course takes place at the Eugeniahemmet (T3) in Solna.

Course responsible :
Matti Nikkola
Department of Cell and Molecular Biology

Matti.Nikkola@ki.se

Contact person :
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Title : The developing brain

Course number : 2780
Credits : 1.5
Date : 2017-08-28 -- 2017-09-01
Language : English
Responsible KI department : Department of Medical Biochemistry and Biophysics
Specific entry requirements :
Purpose of the course : Developmental biology lies at the heart of an effort to understanding complex biological systems. By studying how neural circuits are assembled we can extrapolate key aspects of their function as well as devise strategies for their repair. This course is given to deepen the understanding of how molecular and cellular mechanisms underlie neurobiological function and to widen the horizon of students within the strong Karolinska neuroscience community.
Learning outcomes : By the end of the course the student shall be able to describe the major steps contributing to the development of the nervous system and transfer new knowledge acquired in the course into their specific projects or fields of research.
Contents of the course : The course will cover the main steps of development from neural stem cells to mature circuits, including the patterning of the neural plate and thus the origin of cell types, the interplay between intrinsic and extrinsic factors, gene regulation including epigenetics, neuro-glia interactions and the role of network activity in shaping the final circuits. Different molecular and tracing technologies, and model organisms will be covered. An important aspect of the course regards molecular technologies for labeling, transcriptional analysis and genetic manipulation of defined neural populations. Connections between aberrant developmental processes and neurological disorders will be discussed.
Teaching and learning activities : Lectures by invited international experts, group work and seminar presentations.
Examination : The students should demonstrate their knowledge about the intended learning outcomes stated above including reflect on which aspects are relevant for their own research in a seminar presentation and in discussions.
Compulsory elements : All lectures and the seminar presentation (examination) are compulsory.
Number of students : 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 fall "Tellus" at Scheeles väg 2, 5th floor. 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 :
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 : Cryobiology in assisted reproductive technology

Course number : 2785
Credits : 3.0
Date : 2017-11-27 -- 2017-12-01
Language : English
Responsible KI department : Department of Biosciences and Nutrition
Specific entry requirements :
Purpose of the course : The aim of the course is to instruct the participants in human and mouse reproductive biology with focus on cryopreservation technology and embryo banking, as well as to give them practical experience through practical demonstrations in cryopreservation of gametes and embryos in IVF technology. To provide understanding of principles of cryobiology and components of culture systems used in assisted reproduction technology (ART). Thus the student can evaluate, troubleshoot and improve existing technology.
Learning outcomes : The objectives of this course are that at the conclusion of this course students should have a good understanding of: Folliculogenesis and Fertilization; Preimplantation Embryology; sperm and oocytes retrieval; criteria of selected or scoring the gametes and zygotes for cryopreservation; liquid nitrogen handling; principles of cryobiology. Students should be aware of the general aspects and implication of the cryobiology research and the potentiality that this represents for clinical application; The principles of cryobiology; The Cryoprotectants additives and how they protect the cells by stabilizing intracellular proteins; The factors that affect cellular response to freezing; The different cryopreservation protocols and what is ongoing in this field; The cross-contamination of samples in liquid nitrogen; problems in achieving a good result of cryopreservation procedure; The possible epigenetic effects of the cryopreservation procedure; testicular and ovarian tissue cryopreservation procedures; Storage of the cryopreserved samples, the advantages of the cryopreservation and embryo bank. Finally the students will improve their capacity to produce coherent, logical and concise explanations of data and concepts - both written and oral, through consideration of the course material. Students will also develop their ability to criticize scientific literature related with cryopreservations technology and reproduction physiology in a constructive and informed fashion; Be aware of potential development of cryobiology and IVF in the future.
Contents of the course : Contents . Sperm-and ovogenesis and Hormonal function . Main components of the culture system . Physical-chemical properties of culture system . Functional characteristics of different tissue culture incubators . The influence of the laboratory and clinic environment on embryo culture . The morphology of oocytes, zygotes and cleavage stage embryos as well as morulae and blastocysts . Developmental milestones . Biochemical tests for predicting developmental potential . Possible effects of culture and frozen condition on epigenetics events . Clinical aspects of frozen embryo transfer . The potential of the different cryopreservation techniques in clinic application with focus on IVF . General aspects and implication of the cryobiology in research
Teaching and learning activities : Divided in lectures and laboratory demonstrations: 1. Embryology theory (lectures) 2.Culture system (lectures) 3. cryobiology (lectures) 4. Gametes and embryos quality evaluation (lectures) Lab.1. Laboratory demonstration in gametes and embryo retrieval; In-vitro fertilization and cryoprotectants additive; Handling with liquid nitrogen (lab). Lab.2. Evaluation of the quality of the fertilize oocytes and selection for freezing; performed cryopreservation on the selected samples (lab). Lab.3. Thawing frozen samples and quality assessment (lab). 6. Genetics and epigenetics aspects (lectures) 7. Introduction to the different cryopreservation procedures (lectures) 8. New trends in gametes and embryo cryopreservation (lectures) 9. Fertility preservation and challenge (lecture) 10. Future in human cryobiology and ethical aspects (lecture). Course test, evaluation, discussions, examination and closing of course.
Examination : Examination on day 5, with individual or group presentations of the literature work related to the contents of the course, discussions and feedback. Every student will be individually assessed and the students has to show that all learning outcomes have been reached.
Compulsory elements : The laboratory demonstrations are obligatory; there will be lectures combined with laboratory demo, but if the student will be absent of one laboratory section, the student should present a literature work related to the subject of the missing activity.
Number of students : 8 - 14
Selection of students : Selection will be based on 1) the relevance of the course syllabus for the applicant's doctoral project (according to written motivation), 2) date for registration as a doctoral student (priority given to earlier registration date)
More information : The course will be held at Karolinska Institutet, Department of Biosience and Nutrition, Novum Huddinge.

Course responsible :
Jose Inzunza
Department of Biosciences and Nutrition
08-585 850 93
Jose.Inzunza@ki.se

Hälsovägen 7, Novum

141 86
Stockholm

Contact person :
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Title : Present your research!

Course number : 2787
Credits : 1.5
Date : 2017-09-18 -- 2017-09-22
Language : English
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.
Learning outcomes : After attending the course, the doctoral student should: 1. Be able to design an oral presentation in an asequate way. 2. Be able to design and use supportive media for a successful presentation. 3. Know the basics of presentation techniques and rethoric. 4. Have gained knowledge on how to interact with the audience.
Contents of the course : The scope of the course is to design and give oral presentations of your research results in different contexts. The main content of the course: 1. DESIGN AND DISPOSITION OF AN ORAL PRESENTATION (e.g. poster presentation, short presentation of research results): a. Goals and aims b. Structure c. Simplifications to enhance understanding d. Choice of pictures e. Language f. Time management 2. PRESENTATION TECHNIQUES AND RHETORIC FOR ORAL PRESENTATIONS: a. Body language and posture b. Language and pace c. How to prepare yourself for a presentation d. How to remember what you want to present e. Building confidence (be less nervous) to present f. What to avoid doing during a presentation g. How to deal with questions from the audience 3. DESIGN AND USE OF SUPPORTING MEDIA FOR A PRESENTATION: a. Power Point slides including introduction to power point b. Scientific poster c. Flipchart and other supporting media 4. INTERACTION WITH THE AUDIENCE: a. Catching the audience's attention b. How to address the audience c. Keeping the audience's attention for a longer period of time d. Communicating with the audience e. How to make the audience trust you f. Preparing the presentation with different audiences in mind g. Different learning styles which influences the audience's attention h. How to impress your audience i. Attention curve of the audience j. How to ease the learning of the audience 5. PRACTICAL EXERCISES: a. Presenting in front of an audience: i. Poster presentation ii. Presentation of student's choice iii. Elevator Pitch iv. Power point presentation v. Video recording of presentation with feedback b. Presentation exercises in pairs or small groups c. Presenting to different audiences d. Body language e. Language and pace f. How to use your audience as an asset g. How to interact with your audience h. How to remember your presentation i. Give and receive feedback on presentations j. Deal with nervousness and stay focused on your presentation
Teaching and learning activities : Lectures, written assignments, workshops, coaching, filming, group work, and practical exercises in groups and with a learning peer.
Examination : Formative assessment during active participation in all parts of the course Summative assessment of a. Poster presentation including scientific poster, b. Power Point presentation c. Elevator pitch
Compulsory elements : Three complete presentations (designed and presented to the class): a. Poster presentation including a scientific poster b. Power Point presentation c. Elevator Pitch d. Giving feed back on the other students' presentations e. Reflecting on own learning and development during the course
Number of students : 15 - 22
Selection of students : Selection will be based on 1) the relevance of the course syllabus for the applicant's doctoral project (according to written motivation), 2) 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 :
Kristina Gemzell
Department of Women's and children's health
0851772128
Kristina.Gemzell@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 : 2017-11-20 -- 2017-11-24
Language : English
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.
Learning outcomes : After attending the course, the doctoral student should: 1. Be able to design an oral presentation in an asequate way. 2. Be able to design and use supportive media for a successful presentation. 3. Know the basics of presentation techniques and rethoric. 4. Have gained knowledge on how to interact with the audience.
Contents of the course : The scope of the course is to design and give oral presentations of your research results in different contexts. The main content of the course: 1. DESIGN AND DISPOSITION OF AN ORAL PRESENTATION (e.g. poster presentation, short presentation of research results): a. Goals and aims b. Structure c. Simplifications to enhance understanding d. Choice of pictures e. Language f. Time management 2. PRESENTATION TECHNIQUES AND RHETORIC FOR ORAL PRESENTATIONS: a. Body language and posture b. Language and pace c. How to prepare yourself for a presentation d. How to remember what you want to present e. Building confidence (be less nervous) to present f. What to avoid doing during a presentation g. How to deal with questions from the audience 3. DESIGN AND USE OF SUPPORTING MEDIA FOR A PRESENTATION: a. Power Point slides including introduction to power point b. Scientific poster c. Flipchart and other supporting media 4. INTERACTION WITH THE AUDIENCE: a. Catching the audience's attention b. How to address the audience c. Keeping the audience's attention for a longer period of time d. Communicating with the audience e. How to make the audience trust you f. Preparing the presentation with different audiences in mind g. Different learning styles which influences the audience's attention h. How to impress your audience i. Attention curve of the audience j. How to ease the learning of the audience 5. PRACTICAL EXERCISES: a. Presenting in front of an audience: i. Poster presentation ii. Presentation of student's choice iii. Elevator Pitch iv. Power point presentation v. Video recording of presentation with feedback b. Presentation exercises in pairs or small groups c. Presenting to different audiences d. Body language e. Language and pace f. How to use your audience as an asset g. How to interact with your audience h. How to remember your presentation i. Give and receive feedback on presentations j. Deal with nervousness and stay focused on your presentation
Teaching and learning activities : Lectures, written assignments, workshops, coaching, filming, group work, and practical exercises in groups and with a learning peer.
Examination : Formative assessment during active participation in all parts of the course Summative assessment of a. Poster presentation including scientific poster, b. Power Point presentation c. Elevator pitch
Compulsory elements : Three complete presentations (designed and presented to the class): a. Poster presentation including a scientific poster b. Power Point presentation c. Elevator Pitch d. Giving feed back on the other students' presentations e. Reflecting on own learning and development during the course
Number of students : 15 - 22
Selection of students : Selection will be based on 1) the relevance of the course syllabus for the applicant's doctoral project (according to written motivation), 2) 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 :
Kristina Gemzell
Department of Women's and children's health
0851772128
Kristina.Gemzell@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 : 2017-08-21 -- 2017-08-25
Language : English
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.
Learning outcomes : After attending the course, the doctoral student should: 1. Be able to design an oral presentation in an asequate way. 2. Be able to design and use supportive media for a successful presentation. 3. Know the basics of presentation techniques and rethoric. 4. Have gained knowledge on how to interact with the audience.
Contents of the course : The scope of the course is to design and give oral presentations of your research results in different contexts. The main content of the course: 1. DESIGN AND DISPOSITION OF AN ORAL PRESENTATION (e.g. poster presentation, short presentation of research results): a. Goals and aims b. Structure c. Simplifications to enhance understanding d. Choice of pictures e. Language f. Time management 2. PRESENTATION TECHNIQUES AND RHETORIC FOR ORAL PRESENTATIONS: a. Body language and posture b. Language and pace c. How to prepare yourself for a presentation d. How to remember what you want to present e. Building confidence (be less nervous) to present f. What to avoid doing during a presentation g. How to deal with questions from the audience 3. DESIGN AND USE OF SUPPORTING MEDIA FOR A PRESENTATION: a. Power Point slides including introduction to power point b. Scientific poster c. Flipchart and other supporting media 4. INTERACTION WITH THE AUDIENCE: a. Catching the audience's attention b. How to address the audience c. Keeping the audience's attention for a longer period of time d. Communicating with the audience e. How to make the audience trust you f. Preparing the presentation with different audiences in mind g. Different learning styles which influences the audience's attention h. How to impress your audience i. Attention curve of the audience j. How to ease the learning of the audience 5. PRACTICAL EXERCISES: a. Presenting in front of an audience: i. Poster presentation ii. Presentation of student's choice iii. Elevator Pitch iv. Power point presentation v. Video recording of presentation with feedback b. Presentation exercises in pairs or small groups c. Presenting to different audiences d. Body language e. Language and pace f. How to use your audience as an asset g. How to interact with your audience h. How to remember your presentation i. Give and receive feedback on presentations j. Deal with nervousness and stay focused on your presentation
Teaching and learning activities : Lectures, written assignments, workshops, coaching, filming, group work, and practical exercises in groups and with a learning peer.
Examination : Formative assessment during active participation in all parts of the course Summative assessment of a. Poster presentation including scientific poster, b. Power Point presentation c. Elevator pitch
Compulsory elements : Three complete presentations (designed and presented to the class): a. Poster presentation including a scientific poster b. Power Point presentation c. Elevator Pitch d. Giving feed back on the other students' presentations e. Reflecting on own learning and development during the course
Number of students : 15 - 22
Selection of students : Selection will be based on 1) the relevance of the course syllabus for the applicant's doctoral project (according to written motivation), 2) 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 :
Kristina Gemzell
Department of Women's and children's health
0851772128
Kristina.Gemzell@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 : 2017-12-11 -- 2017-12-15
Language : English
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.
Learning outcomes : After attending the course, the doctoral student should: 1. Be able to design an oral presentation in an asequate way. 2. Be able to design and use supportive media for a successful presentation. 3. Know the basics of presentation techniques and rethoric. 4. Have gained knowledge on how to interact with the audience.
Contents of the course : The scope of the course is to design and give oral presentations of your research results in different contexts. The main content of the course: 1. DESIGN AND DISPOSITION OF AN ORAL PRESENTATION (e.g. poster presentation, short presentation of research results): a. Goals and aims b. Structure c. Simplifications to enhance understanding d. Choice of pictures e. Language f. Time management 2. PRESENTATION TECHNIQUES AND RHETORIC FOR ORAL PRESENTATIONS: a. Body language and posture b. Language and pace c. How to prepare yourself for a presentation d. How to remember what you want to present e. Building confidence (be less nervous) to present f. What to avoid doing during a presentation g. How to deal with questions from the audience 3. DESIGN AND USE OF SUPPORTING MEDIA FOR A PRESENTATION: a. Power Point slides including introduction to power point b. Scientific poster c. Flipchart and other supporting media 4. INTERACTION WITH THE AUDIENCE: a. Catching the audience's attention b. How to address the audience c. Keeping the audience's attention for a longer period of time d. Communicating with the audience e. How to make the audience trust you f. Preparing the presentation with different audiences in mind g. Different learning styles which influences the audience's attention h. How to impress your audience i. Attention curve of the audience j. How to ease the learning of the audience 5. PRACTICAL EXERCISES: a. Presenting in front of an audience: i. Poster presentation ii. Presentation of student's choice iii. Elevator Pitch iv. Power point presentation v. Video recording of presentation with feedback b. Presentation exercises in pairs or small groups c. Presenting to different audiences d. Body language e. Language and pace f. How to use your audience as an asset g. How to interact with your audience h. How to remember your presentation i. Give and receive feedback on presentations j. Deal with nervousness and stay focused on your presentation
Teaching and learning activities : Lectures, written assignments, workshops, coaching, filming, group work, and practical exercises in groups and with a learning peer.
Examination : Formative assessment during active participation in all parts of the course Summative assessment of a. Poster presentation including scientific poster, b. Power Point presentation c. Elevator pitch
Compulsory elements : Three complete presentations (designed and presented to the class): a. Poster presentation including a scientific poster b. Power Point presentation c. Elevator Pitch d. Giving feed back on the other students' presentations e. Reflecting on own learning and development during the course
Number of students : 15 - 22
Selection of students : Selection will be based on 1) the relevance of the course syllabus for the applicant's doctoral project (according to written motivation), 2) 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 :
Kristina Gemzell
Department of Women's and children's health
0851772128
Kristina.Gemzell@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 : 2017-10-09 -- 2017-10-25
Language : English
Responsible KI department : Department of Microbiology, Tumor and Cell Biologi
Specific entry requirements : Students need to have a basic knowledge of biostatistics and epidemiology (e.g. understanding risk ratios and odds ratios).
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.
Learning outcomes : After completion of the course the students should be able to: 1) Understand and demonstrate the value, principles and the different concepts related to systematic reviews and meta-analyses, in 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, and different statistical methods.
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 : To pass the course the student must actively participate in the lectures and group seminars and pass the examinations: 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.
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. 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). A basic understanding of epidemiology and bio-statistics is recommended, so please state relevant experience and which epidemiology/biostatistics courses you completed (written motivation).
More information : The course will start with one intense week (5 full days) of mandatory lectures, discussions and practical sessions (09 Oct-13 Oct). Oct 18th (morning) there will be an "open house" to get direct feedback from the supervisors on your study project (attendance optional). Oct 25 (morning) is the exam, which is again mandatory. The course also requires preparation at home.

Course responsible :
Nele Brusselaers
Department of Microbiology, Tumor and Cell Biologi
0761516212
nele.brusselaers@ki.se

CTMR - Nobelsvag 16 - KISolna

17177
Stockholm

Contact person :
Anna Sidorchuk
Institutionen för folkhälsovetenskap
08-524 800 14
Anna.Sidorchuk@ki.se

Nele Brusselaers
Institutionen för mikrobiologi, tumör- och cellbiologi
0761516212
nele.brusselaers@ki.se

CTMR - Nobelsvag 16 - KISolna

17177
Stockholm

Title : Medical developmental biology

Course number : 2794
Credits : 1.5
Date : 2017-08-21 -- 2017-08-25
Language : English
Responsible KI department : Department of Neuroscience
Specific entry requirements :
Purpose of the course : The main purpose of the course is to acquire a better understanding for issues in developmental and stem cell biology with direct implications for human development and disease.
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 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 be individually assessed by a summative written exam.
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 - 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 : This course is organized by researchers and MDs from the departments of Neuroscience, Women's and Children's Health, and CLINTEC and is an international exchange course between Karolinska Institutet and University of Toronto with guest lecturers also from universities in Hong Kong via the Ming Wai Lau Centre for Reparative Medicine (ki.se/mwlc). In addition to the lectures, workshops, and clinical visits, networking to enhance the interactions and relations between the universities is an important part of the course. The lectures will take place in Inghesalen (campus Solna) Monday-Friday 9-12. The demonstrations in the afternoons will include visits to the IVF and neonatal clinic at the new hospital as well as demos of cutting edge technologies, such as 3D bioprinting.

Course responsible :
Ola Hermanson
Department of Neuroscience
468-5248-7477
Ola.Hermanson@ki.se

Contact person :
Ola Hermanson
Institutionen för neurovetenskap
468-5248-7477
Ola.Hermanson@ki.se

Fredrik Lanner
Institutionen för klinisk vetenskap, intervention och teknik

fredrik.lanner@ki.se

Title : Novel methods and approaches in health risk assessment

Course number : 2795
Credits : 1.5
Date : 2017-09-25 -- 2017-09-29
Language : English
Responsible KI department : The institute of Environmental Medicine
Specific entry requirements : Course Health risk assessment: principles and applications, or corresponding knowledge.
Purpose of the course : The purpose of the course is to give the student knowledge and understanding of how to perform a health risk assessment using systematic review methodology and other novel approaches.
Learning outcomes : After the course the student should be able to: define and analyse the scope and purpose of a health risk assessment to identify the specific questions to address apply and critically discuss methods to identify, assess and integrate scientific evidence in a health risk assessment critically discuss the need for and importance of transparency in health risk assessment
Contents of the course : The course includes novel methods and approaches for reaching evidence-based conclusions in health risk assessment. The scope and purpose of a health risk assessment is analysed with the aim to define specific questions related to risk assessment. Different types of scientific evidence that are used in a health risk assessment are identified. Methods for performing a systematic review are practiced, including searching for scientific studies, selection of studies, extraction of data from studies and assessment of reliability and relevance of studies. Methods for assessment of in vitro, in vivo and epidemiological studies are introduced and discussed. Integration of scientific evidence in weight of evidence approach is addressed. The importance of addressing uncertainty in health risk assessment is highlighted. The need for and importance of transparency in health risk assessment is discussed.
Teaching and learning activities : The course includes lectures, discussions, practical exercises and group assignments.
Examination : Examination is in the form of a written assignment and/or oral presentation.
Compulsory elements : Participation in practical exercises and group assignments are compulsory. Absence can be compensated with an individual assignment.
Number of students : 8 - 20
Selection of students : Selection will be based on 1) the relevance of the course syllabus for the applicant's doctoral project (according to written motivation), 2) date for registration as a doctoral student (priority given to earlier registration date)
More information : The course is held at KI Campus Solna.

Course responsible :
Johanna Zilliacus
The institute of Environmental Medicine
08 52483544
Johanna.Zilliacus@ki.se

Contact person :
Johanna Bergman
Institutet för miljömedicin

johanna.bergman@ki.se

Nobels väg 13

17177
Stockholm

Title : Introduction to Stata for epidemiologists

Course number : 2796
Credits : 1.0
Date : 2017-09-14 -- 2017-09-15
Language : English
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.
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 :
Nicola Orsini
Department of Public Health Sciences

Nicola.Orsini@ki.se

Contact person :
Marita Larsson
Institutionen för folkhälsovetenskap
08-524 801 05
marita.larsson@ki.se

Title : Biostatistics II: Logistic regression for epidemiologists

Course number : 2797
Credits : 2.0
Date : 2017-10-23 -- 2017-11-02
Language : English
Responsible KI department : Department of Public Health Sciences
Specific entry requirements : Knowledge in epidemiology and biostatistics equivalent to "Epidemiology I: Introduction to epidemiology" (course 1577) and "Biostatistics I: Introduction for epidemiologists" (course 1579) or corresponding courses
Purpose of the course : This course focuses on the application of linear and logistic regression in the analysis of epidemiological studies.
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, 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 is extended over time in order to promote reflection and reinforce learning. The course will be given the following dates: October 23, 25, 27, 30, November 1 and 2.

Course responsible :
Nicola Orsini
Department of Public Health Sciences

Nicola.Orsini@ki.se

Contact person :
Marita Larsson
Institutionen för folkhälsovetenskap
08-524 801 05
marita.larsson@ki.se

Title : Applied longitudinal data analysis

Course number : 2798
Credits : 2.5
Date : 2017-09-05 -- 2017-09-13
Language : English
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.
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 September 5, 6, 7, 8, 11, 12 and 13.

Course responsible :
Rino Bellocco
Department of Medical Epidemiology and Biostatistics

Rino.Bellocco@ki.se

.

Contact person :
Gunilla Nilsson Roos
Institutionen för medicinsk epidemiologi och biostatistik
08-524 822 93
gunilla.nilsson.roos@ki.se

Title : Människans Fysiologi - en översikt

Course number : 2827
Credits : 3.0
Date : 2017-12-13 -- 2018-01-12
Language : Swedish
Responsible KI department : Department of Physiology and Pharmacology
Specific entry requirements :
Purpose of the course : KI är ett medicinsk universitet med forskning och utbildning inom medicin och hälsa. Alla doktorander ska inhämta grundläggande kunskaper om den mänskliga kroppen i hälsa och sjukdom i de fall grundläggande medicinsk högskoleutbildning saknas. Denna kurs riktar sig till doktorander utan medicinsk bakgrund. Syftet med kursen är att ge kursdeltagarna en basal och mycket översiktlig introduktion till människokroppens organsystem, dess funktion och samverkan. Innehållet i kursen kommer att vara användbart för fortsatta studier där kunskap om människans fysiologi är av värde.
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 : 10 - 20
Selection of students : Urvalet baseras på 1) datum för doktorandregistrering (där tidigare registreringsdatum har förtur), 2) kursplanens relevans för den sökandes doktorandprojekt.
More information : Kursen ges ihop med studenter på optikerprogrammet på KI Campus i Solna. Föreläsningarna ges på dagtid.

Course responsible :
Daniel Andersson
Department of Medicine, Solna

Daniel.C.Andersson@ki.se

von Eulers väg 8

17177
Stockholm

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

Course number : 2846
Credits : 2.0
Date : 2017-11-20 -- 2017-11-24
Language : English
Responsible KI department : Department of Neurobiology, Care Sciences and Society
Specific entry requirements : Previous knowledge in cognitive processes, brain anatomy and neuroimaging is a requirement.
Purpose of the course : The purpose of the course is to provide methodological tools to link neuroimaging data to cognitive performance and interpret such relationships in the field of normal and pathological aging.
Learning outcomes : After attending the course, the graduate student will be able to (1) describe and differentiate neural and cognitive profiles that accompany normal aging and different types of dementia (2) select the most appropriate methods in order to address scientific questions pertaining to neural correlates of cognitive functions, (3) identify, combine and test different risk factors for dementia (genetic, biological, environmental) on brain integrity and cognition, (4) compute analyses in the most commonly used neuroimaging softwares (e.g., SPM, Freesurfer).
Contents of the course : This course focuses on the study of the neural bases of cognitive decline in normal aging and dementia. The main neuroimaging methods included in this course are: Structural MRI (including volumetry and DTI), functional MRI, molecular PET and MRI (neurotransmission (e.g., dopamine) and markers of Alzheimer's disease amyloid-beta, iron). Each day of the course constitutes a specific subtopic. Day 1 is about "the essentials" on dementia, cognitive trajectories and neural changes in normal aging and dementia. On Days 2 and 3, cognitive and neuroimaging data will be integrated (day 2: structural and functional MRI; day 3: molecular neuroimaging PET/MRI, and multimodal and multivariate imaging). On Day 4, genetic, biological and environmental modifiers of cognition and neural integrity are considered. On Day 5, an introduction to cognitive and brain plasticity in aging is provided.
Teaching and learning activities : The course contains: (1) short lectures that provide up-to-date knowledge about the brain correlates of cognitive decline in normal aging and dementia, (2) seminars where methods linking neuroimaging and cognitive data are discussed based on the literature, (3) hands-on sessions where the students compute analyses on real data. Each subtopic (e.g., atrophy and cognition in normal aging and dementia) includes one lecture with relevant literature, a seminar on the methods used to address the question of interest and/or hands-on implementing the methods on real data.
Examination : The students will be evaluated on group presentations during seminars and on an individual written examination consisting of a 2-page essay describing how the student can test his/her hypotheses related to his/her thesis based on the knowledge and methods acquired during the course. After the end of the course, one week is given to allow the students to send the essay.
Compulsory elements : All parts of the course are compulsory. Absence is compensated for by a written assignment.
Number of students : 8 - 24
Selection of students : Selection will be based on 1) the relevance of the course syllabus for the applicant's doctoral project (according to written motivation), 2) date for registration as a doctoral student (priority given to earlier registration date)
More information : The course takes place everyday from 2017-11-20 to 2017-11-24 from approximately 9:00 to 16:00, with a lunch break and other short breaks in the morning and afternoon. Address: Aging Research Center (ARC) Gävlegatan 16 113 30 Stockholm

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

gregoria.kalpouzos@ki.se

Contact person :
Alireza Salami
Institutionen för neurobiologi, vårdvetenskap och samhälle

alireza.salami@ki.se

Francesca Mangialasche
Institutionen för neurobiologi, vårdvetenskap och samhälle

Francesca.Mangialasche@ki.se

Title : Longitudinal data analysis - classical and modern statistical methods

Course number : 2858
Credits : 3.0
Date : 2017-10-23 -- 2017-11-10
Language : English
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 statistical models and methods for the analysis of longitudinal data and to develop statistical skills of analyzing dependent data.
Learning outcomes : After successful completion of the course the student will be able to: 1. Understand the underlying characteristics of longitudinal data 2. Identify appropriate tests for longitudinal studies 3. Manage longitudinal datasets and prepare these for statistical analysis using statistical software program SPSS 4. Apply both simple and complex statistical methods of longitudinal data 5. Use SPSS to perform the above mentioned statistical analysis 6. Present and interpret the results of analysis.
Contents of the course : The main focus will be on frequently used statistical methods and how these should be used to provide more insight concerning research questions in longitudinal studies. Thus the course covers both classical and modern methods to analyze longitudinal data. Topics include Univariate repeated measures analysis of variance, Multivariate repeated measures analysis of variance, Drawbacks and limitations of classical methods; General linear models for longitudinal data; Linear mixed effects models. The underlying mathematical theory will not be stressed, and the main focus will be on concepts and applications.
Teaching and learning activities : Teaching methods include lectures, computer based exercise and seminars. Participants will have access to materials from a number of studies and are given the opportunity to use the statistical software program, SPSS during practice sessions. In addition, you will have seminars, group discussion and presentations.
Examination : Assessment of attainment of the intended learning outcomes by a passing grade on the computer based exercises, and the performance during the final seminar.
Compulsory elements : Computer based exercises, seminars, presentations and some lectures are mandatory. The course leader assesses whether and if so, how absence can be compensated.
Number of students : 18 - 20
Selection of students : Selection will be based on 1) the relevance of the course syllabus for the applicant's doctoral project (according to written motivation), 2) date for registration as a doctoral student (priority given to earlier registration date).
More information : The course will consist of four scheduled full days per week for two weeks (week 43 & 45). Course dates: October 23-24, 26-27 & November 6-7, 9-10.

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

Mesfin.Tessma@ki.se

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

elisabeth.lofgren@ki.se

Title : Advanced course in SAS programming for health care data

Course number : 2868
Credits : 1.5
Date : 2017-12-04 -- 2017-12-08
Language : English
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.
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 1447 Introductory course in SAS programming (or corresponding courses).

Course responsible :
Thomas Frisell
Department of Medicine, Solna

thomas.frisell@ki.se

Contact person :
Thomas Frisell
Institutionen för medicin, Solna

thomas.frisell@ki.se

Title : In situ hybridization: theory and practice

Course number : 2872
Credits : 1.5
Date : 2017-11-27 -- 2017-12-01
Language : English
Responsible KI department : Department of Medicine, Solna
Specific entry requirements :
Purpose of the course : In situ hybridization is a technique widely-used in many research fields, but it is challenging to set up. The purpose of this course is to enable the students to master this technique and be able to apply this tool in their own research projects.
Learning outcomes : At the end of the course the student should be able: 1. to describe the theoretical background behind in situ hybridization techniques. Discuss pros and cons in relation to the biological problem studied. 2. to design and setup in situ experiment based on her/his own research project, including optimization of conditions of the key steps during the experiment. 3. to perform and document experimental work in accordance with Good Laboratory Practice (GLP) guidelines. 4. to communicate the results in writing and orally.
Contents of the course : The course will cover the basics about theory and practice of in situ hybridization techniques. The focus will be on demonstrating and explaining current in situ hybridization techniques to detect RNAs (microRNA, long-non-coding RNA and mRNA) and DNA molecules in tissues / cells. The participant will get hand-on practice on in situ hybridization technique.
Teaching and learning activities : The course will start with introductory lectures, in which the invited technique experts will talk about the theoretical background and the cutting-edge progress about in situ hybridization techniques. The course participants will have a chance to perform an in situ hybridization experiment under supervision to detect RNAs in tissues. The course will end with an interactive exercise, discussing the theory and the lab data in addition to the application of in situ hybridization technique in the participants' own research projects.
Examination : Interactive exercise discussing how to apply in situ hybridization techniques in the participants' own research projects taking the theoretical aspects regarding in situ hybridization into account. Every student will be individually assessed.
Compulsory elements : All parts are mandatory. Absence from a lecture or discussion may be compensated by a written assignment, on 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 : This course will be co-funded by the Ming Wai Lau Center of Reperative Medicine (MWLC), ki.se/mwlc.

Course responsible :
Ning Xu
Department of Medicine, Solna

ning.xu@ki.se

Contact person :
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Title : Quality assurance of clinical research

Course number : 2873
Credits : 1.5
Date : 2017-11-13 -- 2017-11-17
Language : English
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.
Learning outcomes : Knowledge and understanding Knowledge on how to document data so all moments in a clinical research process can be recreated in a secured way Understand the meaning of the Helsinki Decaration and Good Clinical Practice so that research subjects autonomy and integrity always remain the first priority Knowledge on Swedish, European and international legislations, on which projects that need to be applied for and to which authority, and how such applications are done Skills and abilities Able to decide what different responsabilities the investigator, study team members and sponsor has in the clinical trial Able to summarise a project proposal into a synopsis and based on that make a risk-benefit analysis of the project Able to use simple statistical tools to judge a project proposal's scientific validity Judgement and approach Able to judge project proposals from the patient perspective including a scientific and sound ethical approach Able to evaluate information from different internet database sources
Contents of the course : The course provides insights into research ethics, and how applications to different authorities are done, it presents how clinical trials are undertaken, and how development of new treatments, in particular medicinal products, are done, and how safety reporting to authorities is done. The following laws, regulations and sources are discussed: Act on integrity of personal data, Act on ethical review of research projects, Act on biobanking, Act on patient data in health care, Act on archiving, and international registry's on clinical research. Risk analysis and some statistics are discussed.
Teaching and learning activities : The course is based on e-learning. There are two tracks, in part parallel. One track is based on group work around cases that are presented to the course. The other track is based on individual studies of GCP regulations. Both tracks include study material and tutor support. The pedagogy is based on flipped classroom meaning that instructions and learning resources will be made available early to support the individual learning and group works. Cases and their solutions will be presented and discussed under teachers supervision. Q&A will be provided. The GCP studies will be supported by MC self tests. Webinars may be provided, pending the need from the course.
Examination : In addition to an approved group work there will be an individual multiple choice examination.
Compulsory elements : Each student must participate in a group work. Each student must show activity on the course's home page with at least five questions, presentation and/or comments on others postings. Absence or lack of online activity can after the examiner's assessment be compensated by an individually written essay.
Number of students : 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 : This course is web-based with dedicated time for groupwork, lectures and more. It provides a general introduction to operational conduct in research ethics and how to achieve high quality in scientific work. It is well suited for young researchers in the fields of laborative work, epidemiological research or clinical studies.

Course responsible :
Pierre Lafolie
Department of Medicine, Solna
08-51779647
Pierre.Lafolie@ki.se

Klinisk farmakologi
L7:05 Solna
171 76
Stockholm

Contact person :
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Title : Kvalitetssäkring av klinisk forskning

Course number : 2873
Credits : 1.5
Date : 2017-09-18 -- 2017-09-22
Language : Swedish
Responsible KI department : Department of Medicine, Solna
Specific entry requirements :
Purpose of the course : Kursen ger deltagaren kunskap och förståelse för vad som krävs för att kvalitetssäkra klinisk forskning. Du kommer efter kursen veta hur man ska göra för att säkert och i enlighet med lokala och nationella regelverk, etiska riktlinjer och internationella överenskommelser genomför klinisk forskning. Kursen är användbar för dem som arbetar med translationell eller klinisk laboratorieforskning. Den är också värdefull för forskare som arbetar med kvalitetsregister i vården, annan registerforskning och epidemiologisk forskning. Särskilt stort värde har kursen för de forskare som arbetar med interventioner av olika slag som medicinsk teknik eller kliniska prövningar. Utöver den kompetens kursen ger dig kommer du att kunna avlägga test för erhållande av ett internationellt gångbart certifikat i ICH-GCP (International Conference on Harmonisation - Good Clinical Practice). Oavsett forskningsområde kommer du förstå vikten av att sätta patientens säkerhet främst, och hur man gör för att skapa säkra data som andra kan lita på.
Learning outcomes : Kunskap och förståelse - Ha kunskap om hur man dokumenterar data så att samtliga moment i en klinisk forskningsprocess kan återskapas på ett tillförlitligt sätt - Förstå innebörden av Helsingforsdeklarationen och Good Clinical Practice så att forskningspersoners autonomi och integritet alltid sätts i första rummet - Ha kännedom om nationell, europeisk och internationell lagstiftning, vilka projekt som kräver ansökan till olika myndigheter och hur detta går till Färdighet och förmåga - Ha förmåga att avgöra vilka olika ansvar som prövare, medarbetare och sponsor har i en klinisk prövning - Ha förmåga att sammanfatta ett projektförslag i en synopsis och utifrån detta göra en riskanalys över ett projekt - Visa färdighet i att använda enklare statistiska metoder för att avgöra ett projekts vetenskapliga validitet Värderingsförmåga och förhållningssätt - Kunna värdera forskningsprojektförslag utifrån patientens perspektiv med ett etiskt och vetenskapligt förhållningssätt - Visa förmåga att värdera information från olika källor framförallt databaser på internet
Contents of the course : Kursen ger kunskaper om forskningsetik och hur ansökan till olika myndigheter görs, kunskap om kliniska prövningar, utveckling av nya behandlingar och då särskilt läkemedel, säkerhetsrapportering till myndigheter, personuppgiftslagen, etik-prövningslagen, biobankslagen och patientdatalagen, arkivering, internationella register över kliniska prövningar, riskanalys och viss statistik
Teaching and learning activities : Kursen är en distansutbildning. Den omfattar två huvudspår som delvis går parallellt. Det ena utgör arbete i grupp kring olika arbetsuppgifter som redovisas. Det andra utgörs av inläsning av GCP-regler. Pedagogiken baseras flipped classroom som innebär att läsanvisningar ges tidigt och att studenten därefter individuellt och i grupp arbetar med olika problem, fall och case. Förslag på lösningar presenteras och diskuteras under lärarhandledning. Frågestunder erbjuds under kursen. Inläsningen stöds av frågor som studenten kan använda för att kontrollera sin egen inlärning. Enstaka föreläsningar som webinars kan komma att ges, beroende på den enskilda kursens behov.
Examination : Utöver ett godkänt grupparbete kommer det att ges en individuell examination med flervalsfrågor.
Compulsory elements : Varje student måste delta i godkänt grupparbete. Varje student måste visa aktivitet på kursens hemsida i form av minst fem frågor, presentationer och/eller kommentarer på andras inlägg. Frånvaro eller brist på online aktivitet kan efter examinators bedömning kompenseras med en individuellt skriven uppsats.
Number of students : 10 - 25
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 är webbaserad med vissa fasta tider för grupparbete, föreläsningar mm. Den ger en allmän introduktion till operativ tillämpning av forskningsetik och vetenskaplig kvalitet, och passar väl för blivande forskare med inriktning mot laborativt arbete, epidemiologisk forskning och kliniska studier.

Course responsible :
Pierre Lafolie
Department of Medicine, Solna
08-51779647
Pierre.Lafolie@ki.se

Klinisk farmakologi
L7:05 Solna
171 76
Stockholm

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

Course number : 2893
Credits : 1.5
Date : 2017-10-23 -- 2017-10-27
Language : English
Responsible KI department : Department of Medical Epidemiology and Biostatistics
Specific entry requirements : Epidemiology I: Introduction to Epidemiology, Biostatistics I: Introduction for epidemiologists, Epidemiology II: Design of epidemiological studies, Biostatistics II: Logistic regression for epidemiologists and Biostatistics III: Survival analysis for epidemiologists or corresponding courses
Purpose of the course : This course focuses on potential designs and analyses using twin- and family-data. Methods to estimate within-family associations and heritability are covered.
Learning outcomes : After successfully completing this course you as a participant are expected to be able to: - discuss the difference between a within-family analysis and a more standard (e.g. between-family) statistical analysis, - select an appropriate within-family/heritability analysis for a given dataset, based on a specific research question, - discuss how to perform within-family/heritability analyses using the statistical software R, - interpret the output from a within-family/heritability analysis, and compare with a more standard statistical analysis, - discuss assumptions made in heritability analysis, and how violations may affect the results.
Contents of the course : The aim of empirical research is often to estimate the causal effect of a particular exposure on a particular outcome. A complicating feature of observational studies is that the exposure-outcome association is typically confounded, and cannot be given a causal interpretation. The standard approach to deal with confounding is to control for confounders in the analysis, e.g. by regression modeling. However, many confounders may be difficult to measure, or unknown to the investigator. An appealing solution is to study within-family associations, which are automatically controlled for all factors that are shared within the family (e.g. socioeconomic status, genetic factors). In this course we will focus on the theory and practice of within-family analyses. In many studies, the research question is to what extent a phenotype is caused by genetic factors. Frequently though, there may be no obvious candidate gene, and financial limitations may prohibit a genome wide scan. An appealing solution is to study whether the phenotype tends to run in families; the stronger genetic influence, the larger familial heredity. A commonly used design to estimate the fraction of variation in an outcome which may be attributable to genes and environment is the classic twin methodology. In this course we will cover the concept of heritability, its underlying assumptions, and applications in the classic twin method. Within-family analysis and bivariate heritability analysis (i.e., quantitative genetic analysis of two phenotypes) complement each other. Although within-family analyses require fewer assumptions, bivariate heritability analyses may yield additional information. In this course we will compare and contrast the methods.
Teaching and learning activities : Different strategies for teaching and learning, such as interactive lectures, small group discussions and exercises on selected topics, will be used.
Examination : An individual, oral examination will take place the last day of the course. Each student will present a hypothetical study in which all the intended learning outcomes should be addressed. The examination will be performed in small groups with one examining teacher in each group. Feedback from peers will also be emphasized. Students who do not obtain a passing grade in the first examination will be offered a second examination within two months of the final day of the course. Students who do not obtain a passing grade at the first two examinations will be given top priority for admission the next time the course is offered. If the course is not offered during the following two academic semesters, then a third examination will be scheduled within 12 months of the final day of the course.
Compulsory elements : The individual, oral examination.
Number of students : 8 - 25
Selection of students : Eligible doctoral students, 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 responsible :
Ralf Kuja-Halkola
Department of Medical Epidemiology and Biostatistics

Ralf.Kuja-Halkola@ki.se

Contact person :
Gunilla Nilsson Roos
Institutionen för medicinsk epidemiologi och biostatistik
08-524 822 93
gunilla.nilsson.roos@ki.se

Title : Stem cell niches

Course number : 2894
Credits : 1.5
Date : 2017-09-11 -- 2017-09-15
Language : English
Responsible KI department : Department of Cell and Molecular Biology
Specific entry requirements :
Purpose of the course : To increase the understanding of the complex interplay of stem cells with their environment.
Learning outcomes : After the completed course, the participants will understand how the environment controls cellular processes and instructs cells. The students can hypothesize on how disease alters the environment to impact on the cells. The students can reason regarding differences between in vivo and in vitro environment.
Contents of the course : The microenviroment of the stem cell, and the functional and structural characteristics that define a stem cell niche. Methods for identifying and analyzing stem cells and their environments. Fate mapping as a tool for studying stem cells niches. Different stem cell niches in vivo. Mimicking physiological stem cell niches in vitro using bioengineering techniques. Stem cell niches in health and disease.
Teaching and learning activities : The learning and teaching activities include lectures, group discussions, seminars and audience response sessions with mentometer.
Examination : The students are examined with individual and group presentations on the course themes.
Compulsory elements : The discussions and seminars are obligatory. Compensation is according to the instructions of the course director.
Number of students : 15 - 20
Selection of students : Selection will be based on 1) the relevance of the course syllabus for the applicant's doctoral project (according to written motivation), 2) date for registration as a doctoral student (priority given to earlier registration date)
More information : The main venue of the course is the seminar room A216 at CMB, Berzelius v 35. Entrance from the court yard of CMB.

Course responsible :
Matti Nikkola
Department of Cell and Molecular Biology

Matti.Nikkola@ki.se

Contact person :
Linda Lindell
Institutionen för cell- och molekylärbiologi
08-524 872 90
linda.lindell@ki.se

von Eulers väg 1

171 77
Stockholm

Title : Autophagy, metabolism and cancer

Course number : 2898
Credits : 1.5
Date : 2017-11-06 -- 2017-11-10
Language : English
Responsible KI department : Department of Physiology and Pharmacology
Specific entry requirements : General prior knowledge in cell biology
Purpose of the course : The main purpose of this course is to enable deep understanding of the main principles of the process of autophagy and metabolic pathways as well as their regulation in cancer. Furthermore, students should reach an advanced level in the fields of autophagy and metabolism as the course syllabus has prominent educational significance for the doctoral student that covers these two broad scientific fields, which can be applied both for basic and clinical research.
Learning outcomes : After completion of the course the students should be able to demonstrate broad knowledge and a systematic understanding of the fundamental processes of autophagy and metabolism as well as in-depth and up-to-date knowledge of these pathways and their integrating in cancer survival and development. In particular the course participants should be able to: a) Describe the fundamental mechanisms of autophagy pathways and their regulation in cancers. b) Describe the main metabolic pathways in normal and tumor conditions. c) Explain the relation between autophagy and metabolism. d) Describe the main methods to monitor autophagy and metabolism. d) Apply the knowledge acquired during the course to create a theoretical research project proposal.
Contents of the course : Fundamental aspects of cellular autophagy and metabolism and how these pathways are regulated in physiological and pathological conditions will be covered. Particular focus will be given to human cancers.
The following topics listed below will be overviewed:
Cellular and molecular mechanisms of different autophagic pathways, genetic and pharmacological modulation of autophagy, the role of autophagy in cancers; metabolic pathways, cancer cell metabolism, metabolic control of autophagy, current methods to assay autophagy and metabolism.
Teaching and learning activities : The course will include a series of learning activities, such as introductory and comprehensive lectures/seminars, group work, student's presentations and general discussion.
Examination : The course assignment will consist on an individual presentation of a research proposal, based on the course topics. One or two students will be appointed as reviewer(s) for each presentation to provide peer feedback for the presenter, in line with concept of formative assessment. The course organizers will describe the content and organization of the presentation and discussion during the introductory lecture on the starting of the course. 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 individual presentation of a research proposal are mandatory. Absence from mandatory parts of the course will be compensated by other activities after discussion with the course leaders.
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 :
Helin Norberg
Department of Physiology and Pharmacology

helin.norberg@ki.se

Contact person :
Erik Norberg
Institutionen för fysiologi och farmakologi

erik.norberg@ki.se

Title : Digital photomicroscopy

Course number : 2904
Credits : 1.5
Date : 2017-10-09 -- 2017-10-13
Language : English
Responsible KI department : Department of Laboratory Medicine
Specific entry requirements :
Purpose of the course : The purpose of this course is to teach the students how to handle a microscope and to document the results of research in digital form. The ethics regarding adjusting/clarifying or manipulating an image will also be discussed.
Learning outcomes : After completing the course, the participants will have a working knowledge of the fundamentals of optical microscopy and be able to use appropriate presentation methods for conveying their research results in a clear and informative way. The participants will be able to differ between clarification and manipulation, and will be able to clarify their images without altering them. Image processing software will be used, inlcuding Adobe Photoshop® as well as other digital microscopy software for image aquisition. The participants will have a sound foundation for their work in adjusting their images for publication in a responsible and honest manner.
Contents of the course : The course will include theory and practice investigating conventional-light microscopy, dark field, ultraviolet fluorescence, phase contrast and interference (DIC). Additionally, the course will dedicate one day to confocal microscopy and the analysis and measurement of data through theoretical and practical sessions. Following the mastery of microscopy, the course explores fundamentals of digital photography. The participants wil be exposed to digital cameras and their proper operation. There is an overview of video and still digital cameras relative to application needs. Relevant issues such as capture, processing transmission and storage concerns are explored. Participants will work individually with popular editing software such as Adobe Photoshop® as well as other imaging software. Excercises have been created to develop imaging processing imperatives such as file resolution and type, adjusting of tones and contrast, and composition. The participants will learn the difference between clarifying an image and altering it.
Teaching and learning activities : The course will consist of lectures and practical microscopy laborations.
Examination : Each participant's knowledge will be assessed through an oral examination during a practical microscopy laboration.
Compulsory elements : Practical microscopy sessions are compulsory, as is an overall attendance of 100%. Absence can be compensated for by completing extra work as agreed with the course organizer.
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 will be held 08:30-17:00 Monday through Friday. Information regarding the venue will be sent to course participants well ahead of time.

Course responsible :
Moustapha Hassan
Department of Laboratory Medicine
08-585 838 62
Moustapha.Hassan@ki.se

Contact person :
Jennifer Usterud
Institutionen för laboratoriemedicin
08-585 832 38
jennifer.usterud@ki.se

Title : Public Health Research- concepts and theories

Course number : 2928
Credits : 3.0
Date : 2017-09-11 -- 2017-09-22
Language : English
Responsible KI department : Department of Public Health Sciences
Specific entry requirements :
Purpose of the course : This course is designed for students in all areas related to advancing the health of the population or who want an understanding of the theories and concepts relevant when doing public health research. After this course the student should be able to put her/his research in a public health context and relate it to key public health concepts.
Learning outcomes : The learning outcomes are: 1. Discuss what constitutes a public health issue; 2. Reflect upon key public health concepts in relation to your own research area; 3. Discuss how theory can aid in advancing research in public health; 4. Reflect upon the role of political and social discourses on public health issues and health policies
Contents of the course : The course provides knowledge on key concepts and theories in the multidisciplinary field of public health and an overview of the development of public health as a research area. Areas that will be covered include the concept of health and how it may be measured, global health needs and priorities, health policies, health prevention and promotion as well as determinants of health and health inequalities. Theories in these areas as well as on social stratification, gender and intersectionality are explored.
Teaching and learning activities : Different strategies for teaching and learning will be used such as lectures, group-discussions, peer reviewing and article seminars. The focus will be on critically reflecting upon the knowledge and relating it to your own research.
Examination : To pass the course the student has to achieve the learning outcomes and this will be assessed in small group assignments and an individual assignment.
Compulsory elements : Group assignments, article seminars and seminar on individual assignment are compulsory. If the student is unable to attend, a written report of the questions related must be handed in.
Number of students : 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 :
Sara Fritzell
Department of Public Health Sciences

Sara.Fritzell@ki.se

Contact person :
Janne Agerholm
Institutionen för folkhälsovetenskap

janne.agerholm@ki.se

Title : Hospital acquired infections and antibiotic resistance in high endemic setting

Course number : 2929
Credits : 3.0
Date : 2017-09-25 -- 2017-10-06
Language : English
Responsible KI department : Department of Public Health Sciences
Specific entry requirements :
Purpose of the course : To enable doctoral students in the field of global health and/or infectious diseases and infection control or with a genuine interest in these areas to acquire good knowledge about: antibiotic resistance development in community and hospital and the impact on patient care, transmission of hospital acquired infections of (HAI), the burden of HAI including excess morbidity, mortality and costs as well as strategies to prevent selection of antibiotic resistance and HAI through surveillance, screening, infection control and antibiotic stewardship as well as HAI case management.
Learning outcomes : - To understand the development of antibiotic resistance development and the impact of antibiotic selective pressure on bacteria - To understand the factors influencing antibiotic resistance and including health seeking pattern, health system, antibiotic use in community and hospital, economic incentives and perception of health and treatment in the population. - To understand the risk factors and transmission of HAI in high endemic settings. - To understand surveillance of HAI in health care facilities, the diagnostic criteria, diagnostics, treatment and follow up. - To understand the burden of HAI including excess morbidity, mortality and costs due to HAI - To understand measures to prevent HAI including infection control measures and antibiotic stewardship.
Contents of the course : Risk factors for antibiotic resistance development including health seeking pattern, health system, antibiotic use in community and hospital, economic incentives and perception of health and treatment in the population as well as agricultural use of antibiotics and how antibiotics and antibiotic resistance is spread in the environment. Transmission of Hospital Acquired G- Infections, especially carabapenem resistant strains of Klebsiella Pneumonia, Acinetobacter Baumannii, Pseudomonas Aeruginosa and how it effects critical care as well as measures to prevent spread as Surveillance, Screening, Infection Control and Antibiotic Stewardship .
Teaching and learning activities : - There will be one introduction lecture at Karolinska Institutet prior to departure. - Lectures (might be spread out during the course) in total two days focusing on the learning outcomes. - Two days in a provincial setting to understand the living conditions and selective pressure for resistance development including animal and humans use of antibiotics and how it is spread in the environment. - Bed side teaching at tertiary referral hospitals to get an understanding regarding the prevalence and spread of G- infections, as well as measures to prevent spread as Surveillance, Screening, Infection Control and Antibiotic Stewardship. - Group work, e.g family visit and patient cases that are presented and discussed.
Examination : Formative assessment during group work presentations and discussion. Summative written examination at Karolinska Institutet
Compulsory elements : All the course activities are mandatory. Absence might be compensated for through assignments in agreement with the course leader.
Number of students : 8 - 20
Selection of students : Selection will be based on 1) the relevance of the course syllabus for the applicant's doctoral project (according to written motivation), 2) date for registration as a doctoral student (priority given to earlier registration date)
More information : The course is taught in Hanoi, Vietnam, by Karolinska Institutet Public Health Sciences and Linköping University and Prof. Håkan Hanberger in collaboration with Hanoi Medical University and major hospitals including Vietnam National Children's Hospital, Bach Mai Hospital and National Hospital for Tropical Diseases within the Training and Research Academic Collaboration (TRAC) Sweden Vietnam. The course is taught in Vietnam and will have a mix of Swedish and Vietnamese students, the Vietnamese students will get the credit points from their university. The Swedish students will have to cover travel and accommodation with own funds, however some support for the travel and hotel costs can be arranged.

Course responsible :
Mattias Larsson
Department of Public Health Sciences
0852483382
Mattias.Larsson@ki.se

Contact person :
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Title : Tropical medicine and infections

Course number : 2930
Credits : 3.0
Date : 2017-12-04 -- 2017-12-15
Language : English
Responsible KI department : Department of Public Health Sciences
Specific entry requirements :
Purpose of the course : To enable doctoral students in the field of global health and/or infectious diseases or with a genuine interest in these areas to acquire good knowledge about: - risk factors for Tropical diseases including living conditions, environment, food, latrines, water, vectors as mosquitoes, domesticated animals. - epidemiology and disease pattern including incidence/prevalence as well as prevention including vaccination and vector control - case management including symptoms, diagnostics, diagnosis and treatments for tropical diseases including Dengue, Malaria, Scrub typhus, Leptospirosis, Rickettsia, Japanese Encephalitis, Cryptosporidiosis/ Cryptosporidium/Crypto, Rabies, Streptococcus suis, tetanus, Melioidosis, Hand foot mouth disease, Parasitic infections, as well as HIV including opportunistic infections and TB, HBV, HCV, nosocomial infections and antibiotic resistance.
Learning outcomes : At the end of the module students will be able to: - understand the living conditions, food habits, and the environment and how that effect the disease pattern in a tropical lower-middle income country. - understand poverty related conditions as malnutrition, kwashiorkor and marasmus, rheumatic fever and stunting. - understand the health seeking pattern and health system as well as the impacts of health seeking behavior in a tropical lower-middle income country. - discuss current issues in tropical medicine and infection research, prevention and control in low and middle income countries - analyse broader context of prevention and control interventions - explain the importance of the pathogenesis and understand the case management of a great variety of infectious diseases
Contents of the course : Tropical medicine and infection epidemiology, pathogenesis, clinical aspects, diagnostic methods. Principles for therapy. Immunology and vaccines. Public health and socio-economic aspects. New control policies and research strategies.
Teaching and learning activities : There will be one introduction lecture at Karolinska Institutet prior to departure. The two weeks of the course consist of structured teaching including lectures, seminars, bedside teaching and study visits. - Lectures (might be spread out during the course) a total of two days focusing on the learning outcomes. - Two days in a provincial setting to understand the living conditions and risk factors including environment, food, latrines, water, domesticated animals and vectors. A homestay in a rural family will be arranged. - Bed-side teaching including both adult and pediatric patients at major referral hospitals in big cities. - Group work, e.g family visit and patient cases that are presented and discussed.
Examination : Formative assessment during group work presentations and discussion. Summative written examination at Karolinska Institutet.
Compulsory elements : All the course activities. Absence might be compensated for through assignments in agreement with the course leader.
Number of students : 8 - 20
Selection of students : Selection will be based on 1) the relevance of the course syllabus for the applicant's doctoral project (according to written motivation), 2) date for registration as a doctoral student (priority given to earlier registration date)
More information : The course is taught in Ho Chi Minh City, Vietnam, by Karolinska Institutet, Public Health Sciences and Department of Medicine, Solna, with Prof. Sven Britton in collaboration with University of Medicine and Pharmacy, Ho Chi Minh City, Vietnam, and Linköping University within the Training and Research Academic Collaboration (TRAC). Mix of Swedish and Vietnamese students. The Swedish students will have to cover travel and accommodation with own funds, however some support for the travel and hotel costs can be arranged.

Course responsible :
Mattias Larsson
Department of Public Health Sciences
0852483382
Mattias.Larsson@ki.se

Contact person :
Sven Britton
Institutionen för medicin, Solna

Sven.Britton@ki.se

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 : 2017-10-09 -- 2017-10-13
Language : English
Responsible KI department : Department of Microbiology, Tumor and Cell Biologi
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.
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 takes place at MTC, KI.

Course responsible :
Matti Nikkola
Department of Cell and Molecular Biology

Matti.Nikkola@ki.se

Contact person :
Anita Göndör
Institutionen för mikrobiologi, tumör- och cellbiologi
08 524 862 03
anita.gondor@ki.se

Title : Sex and gender perspectives in cardiovascular research

Course number : 2944
Credits : 1.0
Date : 2017-09-01 -- 2017-12-08
Language : English
Responsible KI department : Department of Medicine, Solna
Specific entry requirements : Second cycle - Master´s level study in medicine or biomedicine
Purpose of the course : "Every cell has sex and every person is gendered". This course encourages students to examine the validity and implications of this statement in the field of experimental and clinical cardiovascular research, and; in particular, in relation to their PhD projects. It will focus on what the current evidence and regulations suggest in respect to implementation of sex and gender perspectives in the field of experimental medicine with further implementation in cardiovascular medicine and research.
Learning outcomes : After completion of both the online module and the face-to-face part of the course, students are expected to be able: I) to account for sex and gender in biomedical research involving animals, cells or tissues; II) to account for sex and gender when considering aspects of cardiovascular research in humans.
Contents of the course : This short course consists of two modules. The first module consists of a web-based course developed by Canadian Institute of Gender and Health with the title SEX AND GENDER IN BIOMEDICAL RESEARCH, as well as individual work designed by course organizers mainly including web based tools for requirement of relevant information. The face-to-face module will concentrate on cardiovascular research topics. It will include a number of in-house seminars/workshops with guest lecturers (Meet an Expert - Get Inspired) who will facilitate and enhance the learning process as it draws on team-based learning approaches, while promoting a sense of community among the students. Examples of experimental research towards reproductive cardiovascular health, sex-specific cell signaling in health and disease, will be linked with presentations of subjects of importance regarding sex/gender perspectives in cardiovascular disease development, and with presentation of symptoms, availability and feasibility of treatment regimens and outcomes.
Teaching and learning activities : The course consists of an online creative, flexible and free-accessible module that anyone can take in one's own pace (about 8 hours to complete) and a face-to-face day with seminars/workshops with guest lecturers (Meet an Expert - Get Inspired).
Examination : Exam format: I) assessment of the web-based course: pass when acquire the answer to 90% of questions. II) presentations of assigned work, either individually or in group.
Compulsory elements : The participants must have to pass and get a certificate from the web-based course SEX AND GENDER IN BIOMEDICAL RESEARCH and attend the seminars/workshop. The participants should write a reflective report (1-2 A4 pages; estimated to take about one day to complete).
Number of students : 8 - 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 :

Course responsible :
Karolina Kublickiene
Department for Clinical Science, Intervention and Technology
08-58583859
Karolina.Kublickiene@ki.se

Karolinska Universitetssjukhus-Huddinge campus
Kvinnokliniken K-57
14186
Stockholm

Contact person :
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Title : Exploring entrepreneurial opportunities in research - Identify

Course number : 2954
Credits : 1.5
Date : 2017-09-25 -- 2017-09-29
Language : English
Responsible KI department : Department of Learning, Informatics, Management and Ethics
Specific entry requirements :
Purpose of the course : Exploring entrepreneurial opportunities in research begins with the discovery and identification of intellectual assets in the daily work. The aim of this course is to increase the awareness of the potential of innovation and entrepreneurship, by identifying opportunities for entrepreneurship in connection to research.
Learning outcomes : After the course, a doctoral student shall be able to; - demonstrate an understanding of the opportunities of innovation and entrepreneurship for utilisation of research, - discover and identify intellectual assets in their own research project, - explore the potential of different intellectual assets, - communicate a value proposition describing the need, approach, benefit and competition for identified intellectual assets, - assess their new skills and reflect on possible future effects, from ones individual perspective.
Contents of the course : This course lays the foundation for the awareness of the potential of innovation and entrepreneurship. It begins with an introduction to entrepreneurship, what it is and how it can be used in the doctoral education. The doctoral students are then given a number of practical tools to identify intellectual assets within daily work to use in a minor innovation projects based on their own research.
Teaching and learning activities : The course runs over five full days, including three days of training and two days of own work. Learning activities consist of seminars and workshops as well as group and individual work. With the individual assignments the doctoral students are given the opportunity to take a closer look at the actual benefits of the new knowledge and put it into a larger context, with value for their own research.
Examination : The doctoral student is examined individually, on a written report and the design of a poster.
Compulsory elements : Attendance is mandatory for all participants. The course director assesses if and in that case how absence can be compensated.
Number of students : 10 - 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 days are Monday full day, Wednesday and Friday half days. This course is the first of three courses in Exploring entrepreneurial opportunities in research. We recommend you to take all three courses during the same semester.

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

samer.yammine@ki.se

Contact person :
Liisa Olsson
Institutionen för lärande, informatik, management och etik
08-524 872 37
liisa.olsson@ki.se

Title : Exploring entrepreneurial opportunities in research - Develop

Course number : 2955
Credits : 1.5
Date : 2017-10-23 -- 2017-10-27
Language : English
Responsible KI department : Department of Learning, Informatics, Management and Ethics
Specific entry requirements :
Purpose of the course : In order to develop a business idea, whether in an economical or social context, you need to apply a number of business concepts. The aim of this course is to introduce relevant business tools in order to develop a business idea stemming from research.
Learning outcomes : After the course, a doctoral student shall be able to; - use design tools to gain an understanding for the user experience to develop solutions to user needs, - transform ideas into prototypes of products, services or processes, - use business tools such as business modelling to develop a potential business idea stemming from research, - assess their new skills and reflect on the possible future effects, from an organisational perspective.
Contents of the course : This course lays the foundation for development of an already identified business idea. It begins with an introduction to prototyping using the design thinking approach. The doctoral students are then given a number of business tools to develop a business opportunity, stemming from their research, into a business model.
Teaching and learning activities : This course lays the foundation for development of an already identified business idea. It begins with an introduction to prototyping using the design thinking approach. The doctoral students are then given a number of business tools to develop a business opportunity, stemming from their research, into a business model.
Examination : The doctoral student is examined individually, on a written report and the development of a prototype and business model.
Compulsory elements : Attendance is mandatory for all participants. The course director assesses if and in that case how absence can be compensated.
Number of students : 10 - 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 : Monday full day, Wednesday and Friday half days. This course is the second of three courses in Exploring entrepreneurial opportunities in research. We recommend you to take all three courses during the same semester.

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

samer.yammine@ki.se

Contact person :
Liisa Olsson
Institutionen för lärande, informatik, management och etik
08-524 872 37
liisa.olsson@ki.se

Title : Exploring entrepreneurial opportunities in research - Test

Course number : 2956
Credits : 1.5
Date : 2017-11-27 -- 2017-12-01
Language : English
Responsible KI department : Department of Learning, Informatics, Management and Ethics
Specific entry requirements :
Purpose of the course : The final step when exploring opportunities of entrepreneurship is to communicate and test your business idea on the market. The aim of this course is to package an already developed business idea for introduction into the start-up world
Learning outcomes : After the course, a doctoral student shall be able to; - identify and test the potential of a developed business idea, whether in an economical or social context, - package a business idea into a complete business plan, - communicate ("pitch") the business plan to people within the start-up world, such as potential investors, - assess their new skills and reflect on the possible future effects, from a societal perspective.
Contents of the course : This course lays the foundation for packaging and communication of an already developed business proposal. It begins with an introduction to product road map followed by a comprehensive business plan. The doctoral students are then given a number of practical business tools to write and test a complete business plan of the developed idea.
Teaching and learning activities : The course runs over five full days, including three days of training and two days of own work. Learning activities consist of seminars and workshops as well as group and individual work where the doctoral student is introduced to the start-up world. With the individual assignments the doctoral students are given the opportunity to take a closer look at the actual benefits of the new knowledge and put it into a larger context, with value for society.
Examination : The doctoral students are examined individually, on a written report and completion of a business plan.
Compulsory elements : Attendance is mandatory for all participants. The course director assesses if and in that case how absence can be compensated.
Number of students : 10 - 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 : Monday full day, Wednesday and Friday half days. This course is the third of three courses in Exploring entrepreneurial opportunities in research. We recommend you to take all three courses during the same semester.

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

samer.yammine@ki.se

Contact person :
Liisa Olsson
Institutionen för lärande, informatik, management och etik
08-524 872 37
liisa.olsson@ki.se

Title : Medicinsk forskningsetik

Course number : 2964
Credits : 1.5
Date : 2017-10-09 -- 2017-10-13
Language : Swedish
Responsible KI department : Department of Learning, Informatics, Management and Ethics
Specific entry requirements :
Purpose of the course : Syftet med kursen är att fördjupa den forskarstuderandes förståelse för medicinsk forskningsetik och god forskningssed; samt att förbättra den studerandes förmåga att kritiskt reflektera och argumentera kring etiska problem som kan uppstå i samband med forskning. Detta i syfte att ge den forskarstuderande förbättrade möjligheter att reflektera kring etiska aspekter av den egna forskningen.
Learning outcomes : Den forskarstuderande ska efter avslutad kurs: - kunna redogöra för centrala forskningsetiska teorier och principer. - kunna identifiera, analysera och diskutera etiska problem som kan uppstå i samband med forskning på människor och djur. - ha ett forskningsetiskt förhållningssätt.
Contents of the course : Kursen innehåller följande moment: - Centrala forskningsetiska teorier och principer. - Forskningsetiska riktlinjer, t ex Nürnbergkoden och Helsingforsdeklarationen. - Forskningsetiskt problematiska fall. - Etiska aspekter på forskning på människor. - Informerat samtycke och dess etiska grund. - Etiska aspekter på djurförsök, innefattande argument för och mot att använda djur för forskningsändamål, samt "de tre R:en". - Avvikelser från god forskningssed, fusk, fabricerade data och plagiat. - Hantering av vetenskapligt författarskap (medförfattarskap, författarordning). - Intressekonflikter i forskningen. - Etikprövning. - Centrala vetenskapsteoretiska begrepp och positioner, och dess relevans för forskningsetik.
Teaching and learning activities : Föreläsningar, grupparbeten och plenumdiskussioner.
Examination : Deltagaren genomför en skriftlig forskningsetisk reflektion företrädesvis angående det egna forskningsprojektet. Ett fåtal studenter ges möjlighet att muntligt redovisa en forskningsetisk reflektion, i relation till samtliga lärandemål, angående sin forskning för samtliga deltagare.
Compulsory elements : Gruppdiskussioner och plenumdiskussioner är obligatoriska. Vid frånvaro kan studenten i viss utsträckning kompensera detta genom att lämna in skrivna svar angående de fall som diskuterats.
Number of students : 30 - 35
Selection of students : Urvalet baseras på 1) datum för doktorandregistrering (där tidigare registreringsdatum har förtur), 2) kursplanens relevans för den sökandes doktorandprojekt (enligt motivering).
More information :

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

Gert.Helgesson@ki.se

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

annelie.jonsson@ki.se

Title : Medical research ethics

Course number : 2964
Credits : 1.5
Date : 2017-11-27 -- 2017-12-01
Language : English
Responsible KI department : Department of Learning, Informatics, Management and Ethics
Specific entry requirements :
Purpose of the course : The objective of this course is to provide the doctoral student with tools to deepen his or her knowledge of medical research ethics and good research practice; and to enhance the doctoral student's ability to critically discuss and reflect upon ethical questions that can derive from research. This is to provide the doctoral student with enhanced possibilities to reflect on ethical aspects of his or her own research.
Learning outcomes : After having completed the course, the doctoral student should: - be able to give an account of important research ethical theories and principles. - be able to identify, analyze and discuss ethical problems in research on humans and animals - have an ethical approach to research
Contents of the course : The course includes the following: - Important research ethical theories and principles. - Ethical guidelines on how to conduct research, such as the Helsinki Declaration. - Cases that are problematic from an ethical point of view. - Ethical aspects concerning research on humans. - Informed consent and its ethical basis. - Ethical aspects concerning research on animals, including arguments for and against using animals for research purposes, as well as the three R:s. - Deviations from good research practice, fraud, fabricated data and plagiarism - Handling of authorship in scientific writing - Conflicts of interest in research - Ethical review - Important concepts and positions in philosophy of science, and connections between philosophy of science and research ethics
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 :

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

Gert.Helgesson@ki.se

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

annelie.jonsson@ki.se

Title : Medical research ethics

Course number : 2964
Credits : 1.5
Date : 2017-09-04 -- 2017-09-08
Language : English
Responsible KI department : Department of Learning, Informatics, Management and Ethics
Specific entry requirements :
Purpose of the course : The objective of this course is to provide the doctoral student with tools to deepen his or her knowledge of medical research ethics and good research practice; and to enhance the doctoral student's ability to critically discuss and reflect upon ethical questions that can derive from research. This is to provide the doctoral student with enhanced possibilities to reflect on ethical aspects of his or her own research.
Learning outcomes : After having completed the course, the doctoral student should: - be able to give an account of important research ethical theories and principles. - be able to identify, analyze and discuss ethical problems in research on humans and animals - have an ethical approach to research
Contents of the course : The course includes the following: - Important research ethical theories and principles. - Ethical guidelines on how to conduct research, such as the Helsinki Declaration. - Cases that are problematic from an ethical point of view. - Ethical aspects concerning research on humans. - Informed consent and its ethical basis. - Ethical aspects concerning research on animals, including arguments for and against using animals for research purposes, as well as the three R:s. - Deviations from good research practice, fraud, fabricated data and plagiarism - Handling of authorship in scientific writing - Conflicts of interest in research - Ethical review - Important concepts and positions in philosophy of science, and connections between philosophy of science and research ethics
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 :

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

Gert.Helgesson@ki.se

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

annelie.jonsson@ki.se

Title : Medical research ethics

Course number : 2964
Credits : 1.5
Date : 2017-11-06 -- 2017-11-10
Language : English
Responsible KI department : Department of Learning, Informatics, Management and Ethics
Specific entry requirements :
Purpose of the course : The objective of this course is to provide the doctoral student with tools to deepen his or her knowledge of medical research ethics and good research practice; and to enhance the doctoral student's ability to critically discuss and reflect upon ethical questions that can derive from research. This is to provide the doctoral student with enhanced possibilities to reflect on ethical aspects of his or her own research.
Learning outcomes : After having completed the course, the doctoral student should: - be able to give an account of important research ethical theories and principles. - be able to identify, analyze and discuss ethical problems in research on humans and animals - have an ethical approach to research
Contents of the course : The course includes the following: - Important research ethical theories and principles. - Ethical guidelines on how to conduct research, such as the Helsinki Declaration. - Cases that are problematic from an ethical point of view. - Ethical aspects concerning research on humans. - Informed consent and its ethical basis. - Ethical aspects concerning research on animals, including arguments for and against using animals for research purposes, as well as the three R:s. - Deviations from good research practice, fraud, fabricated data and plagiarism - Handling of authorship in scientific writing - Conflicts of interest in research - Ethical review - Important concepts and positions in philosophy of science, and connections between philosophy of science and research ethics
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 :

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

Gert.Helgesson@ki.se

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

annelie.jonsson@ki.se

Title : Applications of CRISPR/Cas9 technology: genome editing and beyond

Course number : 2970
Credits : 1.5
Date : 2017-10-09 -- 2017-10-13
Language : English
Responsible KI department : Department of Microbiology, Tumor and Cell Biologi
Specific entry requirements :
Purpose of the course : CRISPR/Cas9 technology provides a precise and easy way for genome manipulation in cells or in organisms, and therefore is an extremely powerful tool for research. This course aims to help students to understand the CRISPR/Cas9 system and its broad range of applications in research and clinics, and how to use this tool for their own research.
Learning outcomes : After the completed course, the students should have knowledge and understanding of (1) the mechanism of CRISPR/Cas9 molecular machinery; (2) how to use CRISPR/Cas9 technology in eukaryotic cells to edit genomes and what are its limitations; (3) what other applications the system has in research as well as in clinics; (4) ethical issues and concerns related to the application of this technology. In term of technical skills, at the end of the course the students should be able to design guide RNA to target specific loci of interest for their own research
Contents of the course : The course will include lectures by invited experts about the CRISPR/Cas9 technology, how to use it for genome editing in cells or organisms, as well as examples of exploitation for different applications in research (such as cell imaging, whole genome screening approaches and transactivation/repression of genes) and in clinics. A computer session will be done for the student to design gRNA for their own CRISPR/Cas9 based approach. In seminars, the students will present and discuss recent literature about CRISPR/Cas9 technology.
Teaching and learning activities : The learning activities of the course will consist of lectures from invited experts in the morning and seminars in the afternoon. In addition, one practical computer session will give to the students the opportunity to design CRISPR/Cas9-based strategies for their own research. A problem-solving session will also be part of the course. In group of three, the students will have to design a strategy to solve a given problem and present it to others at the end of the course.
Examination : Examination will consist of an oral presentation in which students, in group of three, will present their CRISPR-Cas9 based strategy to answer a given problem.
Compulsory elements : Presence at lectures, seminars, and final presentation and discussion is mandatory. To compensate for absence a written essay on the missed topic shall be performed.
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 take place at Dept. of Microbiology, Tumor and Cell Biology (MTC) (Nobels väg 16, Solna Campus). More information about the exact schedule will be provided to course participants before the beginning of the course.

Course responsible :
Sylvain Peuget
Department of Microbiology, Tumor and Cell Biologi

sylvain.peuget@ki.se

Contact person :
-

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

Course number : 2971
Credits : 2.5
Date : 2017-11-08 -- 2017-12-11
Language : English
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.
Learning outcomes : After attending the course, the student will be able to use R for data management, statistical analysis and graphical data presentation. The student will be able to install new functions in R.
Contents of the course : R is a powerful software/programming language for data analysis and graphical presentation. R is free-of-charge, and in most cases a useful alternative to commercial statistical software. The programming language is completely text-based, making it challenging compared to software with a graphical user interface. However, it offers greater flexibility, better control over analyses and an automatic documentation of performed analyses. The course focuses on structure and basic functions of the R programming language . A selection of functions for data management, statistical analysis and graphics is presented. The methods included are commonly used methods in clinical medical science (e.g. t-test, ANOVA, chi2-test, regression and survival analysis, box, line scatter, and bar plots). The course focuses mainly on how the various methods are applied in R and not their theroretical background, underlying assumptions or the theoretical intepretation of the results.
Teaching and learning activities : Lectures and online video material, practical exercises (individual and group assignments), peer assessment of other students' solutions.
Examination : Written examination
Compulsory elements : The practical exercises and the peer assessments of these are compulsory. Students unable to complete the exercises in time due to e.g. illness can get an extention of the deadline.
Number of students : 10 - 20
Selection of students : Selection will be based on 1) the relevance of the course syllabus for the applicant's doctoral project (according to written motivation), 2) 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: 8/11, 10/11, 17/11, 24/11, 1/12, 8/12, 11/12. Between these course dates, there will be deadlines for mandatory home assignments. Laptop required for programming exercises. The duration of the course has been extended from 1.5 to 2.5 credits. The evaluation report link refers to the previous, shorter version of the course (course number 2657).

Course responsible :
Jonatan Lindh
Department of Laboratory Medicine
08-58581201
Jonatan.Lindh@ki.se

Avd. för klin. farmakologi, C1:68
Karolinska universitetssjukhuset Huddinge
14186
Stockholm

Contact person :
Marine Andersson
Institutionen för laboratoriemedicin
08-585 81064
Marine.Andersson@ki.se

Title : Basic pharmacoepidemiology in a global context

Course number : 2972
Credits : 3.0
Date : 2017-11-13 -- 2017-11-24
Language : English
Responsible KI department : Department of Public Health Sciences
Specific entry requirements :
Purpose of the course : The purpose of the course is that the participants should gain basic knowledge about different study designs used in pharmacoepidemiological studies. The participants should further gain basic knowledge about how to design, conduct, analyse and interpret pharmacoepidemiological studies as well as treatment effects and adverse reactions to pharmaceuticals. The participants should also gain knowledge about determinants of drug use in countries at various income levels. The course will qualify the participants to critically review and evaluate pharmacoepidemiological studies.
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 and for health policy making - Discuss common study designs and methods used in pharmacoepidemiological studies, including clinical trials - Explain the applications of these methods for studies of effects and adverse effects of drugs and economic consequences - Describe different types of data sources on drug exposure and explain their strengths and weaknesses - Describe systems for the reporting of adverse effects and explain their use for pharmacoepidemiological studies - Explain design of and methods to evaluate interventions qualitatively and quantitatively - Independently evaluate pharmacoepidemiological studies from scientific literature
Contents of the course : The course will provide an introduction to what pharmacoepidemiology is, how pharmacoepidemiological studies are conducted, how to interpret pharmacoepidemiological findings, and the relevance of pharmacoepidemiology for public health and for health policy making. The participants will be introduced to basic concepts in pharmacoepidemiology and drug statistics methodolody (the ATC/DDD system). Choice of study design and common pitfalls in pharmacoepidemiological research will be discussed. Determinants of drug use such as health systems, policies, prescriber and patient factors in various contexts (low-, middle- and high-income countries) will be explored. Methods to improve use of drugs 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. Clinical trials will be discussed. The role of pharmacoepidemiological studies in pharmacovigilance (drug safety) will also be discussed.
Teaching and learning activities : The course will use KI:s learning platform. Learning activities include lectures, seminars, individual work and group work.
Examination : Individual oral and written presentation of group work. Each student will be assessed individually.
Compulsory elements : It is compulsory to attend seminars and to participate in individual work and group work. 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 at KI Solna Campus (Widerströmska Huset, Tomtebodavägen 18A, floor 4). It will be a full time course with lectures and group activities from 9-17 every day. It will be possible to participate online (e.g. via Adobe Connect).

Course responsible :
Cecilia Stålsby Lundborg
Department of Public Health Sciences
0852483366
Cecilia.Stalsby.Lundborg@ki.se

Contact person :
Marita Larsson
Institutionen för folkhälsovetenskap
08-524 801 05
marita.larsson@ki.se

Title : Fluorescence microscopy: High content image acquisition and analysis

Course number : 2973
Credits : 3.0
Date : 2017-10-02 -- 2017-10-13
Language : English
Responsible KI department : Department of Cell and Molecular Biology
Specific entry requirements :
Purpose of the course : Fluorescence microscopy is for most researchers an essential tool. Lately, this technique developed more and more from 'simply' acquiring good looking images towards complex, high content imaging techniques. High content imaging is defined by the large number of image data generated either from live cell imaging, or microscopy on fixed samples. Examples are z-stack imaging, cell migration, protein dynamics, multi-position imaging, tiling & stitching, whole mount imaging, and automated image acquisitions in screening assays. The purpose of this course is to make the participants familiar with all of these high content techniques; from acquisition to analysis and presentation.
Learning outcomes : After passing the complete course, the participants will be familiar with diverse high content fluorescence microscopy applications. They will be competent in designing and performing experiments involving high content fluorescence microscopy. The participants will be able to analyse their data using an image analysis software, and how to present the data in a scientific format.
Contents of the course : Basic principles of fluorescence microscopy. Confocal Laser Scanning Microscopy: z-stack, tiling & stitching. Live Cell Imaging: long term imaging, protein dynamics (FLIP/FRAP). Automated Image Acquisition Microscope: multi-well imaging, screening. Hands-on sessions with diverse high content imaging experiments. Image analysis: ImageJ/CellProfiler. Lectures and workshops. Poster presentation
Teaching and learning activities : The pedagogic learning activities in the course consist of lectures, research seminars, hands-on experience at the microsopes/imaging, group discussions, experimental design, data processing and poster presentation.
Examination : There will be 2 examinations. In the end of the first week, there will be an assessment of written versions of experimental designs involving high content imaging experiments and image analysis. In the second week, the participants will present a scientific poster showing the results of their high content microscopy experiments performed during that week. The poster presentations will be attended by course participants, lecturers, course assistants, and others that are interested.
Compulsory elements : All activities (lectures, research seminars, microscope sessions, group discussions, data processing and poster presentations) are compulsory. If students are unable to attend they have to discuss with course organizer how this can be compensated. Compensation of microscopy sessions is not possible.
Number of students : 12 - 18
Selection of students : Selection will be based on 1) the relevance of the course syllabus for the applicant's doctoral project (according to written motivation), 2) date for registration as a doctoral student (priority given to earlier registration date)
More information : The course content will cover: Basic principles of fluorescence microscopy; Confocal Laser Scanning Microscopy: z-stack, tiling & stitching; Live Cell Imaging: long term imaging, protein dynamics (FLIP/FRAP); Automated Image Acquisition Microscope: multi-well imaging, screening; Hands-on sessions with diverse high content imaging experiments; Image analysis: ImageJ/CellProfiler lectures and workshops; Poster presentation. The course takes place at CMB, seminar room A216, Berzelius v 35 with entrance from the court yard of CMB.

Course responsible :
Florian Salomons
Department of Cell and Molecular Biology
0852487395
Florian.Salomons@ki.se

Contact person :
Matti Nikkola
Institutionen för cell- och molekylärbiologi

Matti.Nikkola@ki.se

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

Course number : 2979
Credits : 1.5
Date : 2017-11-13 -- 2017-11-17
Language : English
Responsible KI department : Department of Microbiology, Tumor and Cell Biologi
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.
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 : The course takes place at MTC in Solna.

Course responsible :
Anita Göndör
Department of Microbiology, Tumor and Cell Biologi
08 524 862 03
anita.gondor@ki.se

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 : 2017-11-13 -- 2017-12-01
Language : English
Responsible KI department : Department of Molecular Medicine and Surgery
Specific entry requirements :
Purpose of the course : The purpose of the course is to give the student an overview over the design and conduct of clinical research, including writing a study protocol and critically reflecting on its content.
Learning outcomes : After completion 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 : 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 clinical research. The content of the course is as follows: 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) Examination and course evaluation. 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 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, 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.
Examination : To pass the course the student must actively participate in the course and pass the examinations: 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.
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 : Preference will be given to students early on in their PhD education, who have a clinical research focus, and where the benefits of this course will be greatest. Date of registration as a PhD student, suitability of PhD project, and the motivation to attend the course given will be used in the selection process.
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. There is one mandatory seminar during the second week (Friday). The oral exam will take place at the end of the third week (Friday). The course entails 3 credits, requiring 2 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 2980 has previously been given with course number 1794. It now gives 3 credits from earlier 4 credits. The decision to shorten the course was based on student feedback from course 1794. The evaluation report below is based on course 1794.

Course responsible :
Eivind Ness-Jensen
Department of Molecular Medicine and Surgery

eivind.ness-jensen@ki.se

Contact person :
Kalle Mälberg
Institutionen för molekylär medicin och kirurgi

kalle.malberg@ki.se

Eivind Ness-Jensen
Institutionen för molekylär medicin och kirurgi

eivind.ness-jensen@ki.se

Title : Rare disease genomics

Course number : 2981
Credits : 1.5
Date : 2017-12-04 -- 2017-12-08
Language : English
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.
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 and encouraged to bring their own data.
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 :
Anna Lindstrand
Department of Molecular Medicine and Surgery

Anna.Lindstrand@ki.se

Contact person :
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Title : Hypertension

Course number : 2983
Credits : 1.0
Date : 2017-09-21 -- 2017-10-05
Language : English
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.
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 : 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 activities will be at Danderyd University Hospital (lecture rooms located in building 18, floor 5) on September 21 and 28, and October 5, all at 13:00-17:00. Assigned group work to be done between these three dates. Total course module length is 3 days.

 This course is one module within the Cardiovascular Research (CVR) programme at Karolinska Institutet.

 The linked course evaluation report refers to the previous course 2922 (0,6 hp).

Course responsible :
Thomas Kahan
Department of Clinical Sciences, Danderyd Hospital
08 123 568 61
Thomas.Kahan@ki.se

Contact person :
Nina Ringart
Institutionen för kliniska vetenskaper, Danderyds sjukhus
08-123 564 12
nina.ringart@ki.se

Nailin Li
Institutionen för medicin, Solna
08-51773996
Nailin.Li@ki.se

Clinical Pharmacology Unit
Karolinska University Hospital-Solna
17176
Stockholm

Title : Functional magnetic resonance imaging: data analysis and experimental design

Course number : 2985
Credits : 1.5
Date : 2017-11-07 -- 2017-11-23
Language : English
Responsible KI department : Department of Neuroscience
Specific entry requirements : Background in medicine, biomedicine, biology, psychology, cognitive science, medical imaging, computational biology or similar.
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 activity data measured with functional magnetic resonance imaging (fMRI). 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.
Learning outcomes : After attending the course the student should be able to: 1) follow the usual preprocessing steps of fMRI; 2) give an overview of different methods to analyze the data and explain when to use them; 3) conduce fMRI analysis using several methods; 4) describe different aspects of experimental design to have in consideration when creating a fMRI study; 5) give a brief overview of the usage of magnetic resonance imaging to study brain structure and function; 6) give a brief overview of other techniques to study brain function non-invasively and describe their relative merits and challenges.
Contents of the course : The course focuses on experimental design and analysis of fMRI data. We will briefly introduce the basis of the blood-oxygen-level dependent (BOLD) signal and how it is measured. Structural measures of gray and white matter will also be introduced as well as other techniques to measure functional activity non-invasively. The image processing steps, before statistical analysis, will be explained. The application of general linear model analysis to fMRI data will be explained, including random effects analysis and correction for multiple comparisons. We will review experimental design considerations for developing a fMRI paradigm. The study of functional connectivity using fMRI data will be introduced. Finally, we will also introduce machine learning techniques and graph theoretical analysis for functional data.
Teaching and learning activities : The students will attend lectures, implement different steps of the data preprocessing and analysis during the hands-on sessions, present and discuss results.
Examination : The learning outcomes will be assessed throughout the course during the hands-on sessions where the students have to perform data analyses. The students will also complete a more extensive assignment based on one of the hands-on sessions. In the final day of the course the students will present and discuss their assignments with the rest of the group.
Compulsory elements : All parts of the course are mandatory. Absence can be compensated for by completion of an assignment on the material covered in the missed course instance.
Number of students : 8 - 24
Selection of students : Selection will be based on 1) the relevance of the course syllabus for the applicant's doctoral project (according to written motivation), 2) date for registration as a doctoral student (priority given to earlier registration date)
More information : The course will be from 9.00 to 16.00 on the following days: Tuesday 2017-11-07, Thursday 2017-11-09, Tuesday 2017-11-14, Thursday 2017-11-16 and Thursday 2017-11-23.

Course responsible :
Rita Almeida
Department of Neuroscience

rita.almeida@ki.se

Contact person :
Peter Fransson
Institutionen för klinisk neurovetenskap

Peter.Fransson@ki.se

Jonathan Berrebi
Institutionen för klinisk neurovetenskap

Jonathan.Berrebi@ki.se

Title : Adverse outcome pathways (AOPs)-principles and applications in toxicology and health risk assessment

Course number : 2986
Credits : 1.5
Date : 2017-11-06 -- 2017-11-10
Language : English
Responsible KI department : The institute of Environmental Medicine
Specific entry requirements :
Purpose of the course : The purpose of the course is to enable the acquirement of knowledge and understanding in how the concept of Adverse outcome pathways (AOPs) can provide a framework for research in toxicology and for applications for health risk assessment. An AOP is a description of a sequence of events starting with the interaction of a chemical with a biomolecule in a target cell or tissue (molecular initiating event), progressing through key events and ending in an adverse outcome.
Learning outcomes : At the end of the course the student should be able to: describe the principles and components of Adverse Outcome Pathways (AOPs) explain how experimental studies can support the development of AOPs discuss how AOPs can be used as a central framework for mechanistic toxicity studies, toxicity testing and health risk assessment
Contents of the course : The course will include the concept and principles of Adverse Outcome Pathways (AOPs). Development and assessment of AOPs. Examples of different AOPs. Application of the AOP concept in toxicological research and health risk assessment.
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 - 14
Selection of students : Selection will be based on 1) the relevance of the course syllabus for the applicant's doctoral project (according to written motivation), 2) date for registration as a doctoral student (priority given to earlier registration date)
More information : The course is held at KI Campus Solna

Course responsible :
Johanna Zilliacus
The institute of Environmental Medicine
08 52483544
Johanna.Zilliacus@ki.se

Contact person :
Johanna Bergman
Institutet för miljömedicin

johanna.bergman@ki.se

Nobels väg 13

17177
Stockholm

Title : Preclinical Imaging Techniques

Course number : 2987
Credits : 1.5
Date : 2017-11-20 -- 2017-11-24
Language : English
Responsible KI department : Department of Laboratory Medicine
Specific entry requirements : Students must have passed the courses in laboratory animal science: Function A - Rodents and lagomorphs before attending this course.
Purpose of the course : The purpose of the course is to provide an overview on state-of-the-art small animal imaging techniques including fluorescence imaging, bioluminescence imaging, ultrasound, photoacoustic imaging, computed tomography (CT), magnetic resonance imaging (MRI) and Positron Emission Tomography (PET). The course will cover (1) basic theory and instrumentation principles of various imaging modalities, (2) applications of small animal imaging in translational research, (3) multi-modality imaging and co-registration for accurate diagnostic and follow-up of treatment efficacy and (4) hands-on training in imaging acquisition, imaging analysis and imaging reconstruction.
Learning outcomes : The intended learning outcome will be that at the end of the course, the student is expected to: (1) understand the basic concepts and outcomes of the different imaging modalities; (2) gain the knowledge and practical experience to run small animal imaging with various techniques; (3) process and analyze imaging data; (4) to run multi-modality imaging, evaluate data and co-registration; (5) be able to choose the right imaging modality, animal models and design for the animal experiment in preclinical studies in their own research field.
Contents of the course : This course will fully cover the background, theory and principles underlying each imaging modality used in preclinical imaging, with extensive practical training in the lab. There will be a general introduction to all the different imaging modalities including theory, principle of concept and application in research. For each modality, students will be introduced to theory and instrumental principles, experimental design in different research areas, research project case study and critical review. In the hands-on sessions, students will have the opportunity to acquire images in different animal models and to use several kinds of software to process imaging analysis, imaging reconstruction and co-registration.
Teaching and learning activities : Lectures/seminars, group discussions, critical review literature studies, and hands-on training.
Examination : The intended learning outcomes will be assessed by individual assignment. The individual assignment is to describe a research project in the student's own research area utilizing the small animal imaging techniques introduced during the course. In the assignment, students are required to describe detailed experimental design, rationale behind the experimental design and methodology in data acquisition/analysis. Students must complete the assignment by the end of the course. Students who do not obtain a passing grade in the first examination will be offered a second examination within two weeks of the final day of the course. The examination includes a written report of 1-2 pages and oral presentation.
Compulsory elements : The individual assignment, as well as attendance during the theoretical and hands-on parts of the course, is compulsory.
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 will be held Monday Through Friday, approximately 8:30-17:00. More exact information regarding the schedule and venue will be sent to the course participants well ahead of time.

Course responsible :
Moustapha Hassan
Department of Laboratory Medicine
08-585 838 62
Moustapha.Hassan@ki.se

Contact person :
Jennifer Usterud
Institutionen för laboratoriemedicin
08-585 832 38
jennifer.usterud@ki.se

Title : For the benefit to mankind - get your research into broader use inspired by Nobel Prizes

Course number : 2988
Credits : 1.5
Date : 2017-10-23 -- 2017-11-21
Language : English
Responsible KI department : Department of Microbiology, Tumor and Cell Biologi
Specific entry requirements :
Purpose of the course : To increase the understanding of various pathways and mechanisms that can be used for translating biomedical research into wider use.
Learning outcomes : After the completed course, the participants will be able to describe and apply various mechanisms used for translating biomedical research into wider use. The participants will also gain knowledge about some Nobel Prize awarded discoveries and how these have been translated into important health innovations.
Contents of the course : The course will have a focus on various aspects of translating science into wider use, but also include research and innovation policy and some of the current theories in this field. The course gives insights into the wide variety of different mechanisms that can be used for translating biomedical research into wider use. In his will, Alfred Nobel stated that the Nobel Prize will be awarded to those who "have conferred the greatest benefit to mankind". With this in mind, the course will initially use Nobel Prize awarded discoveries in Physiology or Medicine as cases. Each student will select a Nobel Prize that they find interesting, and investigate which pathways have been used to get the discovery and the subsequent knowledge into wider use, and ultimately for the benefit of mankind on a larger scale. The course will also include discussions on various blockers and enhancers in the pathways, and how these can be overcome or used. With this knowledge in hand, you will also get the possibility to apply the tools developed on the course to your own doctoral research project and investigate potential mechanisms to get your research into wider use.
Teaching and learning activities : The learning activities in this course include lectures by senior investigators, case studies, presentations and discussions. Each student will select either a Nobel Prize awarded discovery (or an important health innovation that is widely used in health care today) and then investigate the pathways how these discoveries came into use. The students will then present their case, and together make a palette of different mechanisms that have been used for advancing research into wider use. The students will then apply this knowledge on their own research project, and present various mechanisms that they intend to use. Using a "two stars and a wish" feedback scenario, the students will be encouraged to give feedback to each other.
Examination : Examination is based on the presentation of the two various cases (Nobel Prize case and own research case). For the Nobel Prize case, both a written short paper and an oral presentation is necessary. For the own research case, an oral presentation is necessary.
Compulsory elements : The lectures, the case investigation, the mid-time feedback session for each case, case presentations, own research case presentation and discussions are compulsory.
Number of students : 10 - 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 part time with four booked occasions and individual study with assignments between. It takes place at MTC in Solna and at the Nobel Museum in Stockholm. The course start is in the room A302 at MTC.

Course responsible :
Matti Nikkola
Department of Cell and Molecular Biology

Matti.Nikkola@ki.se

Contact person :
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Title : Mechanisms in regulation of development and function of the blood- and lymph- vasculature

Course number : 2989
Credits : 1.5
Date : 2017-10-23 -- 2017-10-27
Language : English
Responsible KI department : Department of Medical Biochemistry and Biophysics
Specific entry requirements :
Purpose of the course : To educate course participants in the mechanisms that control vascular morphogenesis and function in development, physiology and various pathologies. To stimulate understanding of how developmental aspects/models can be applied to understand human disease. To give the participants a clear view on the advantages and potential drawbacks with transgenic technologies in the study of vascular biology. To present recent conceptual advances in the field as well as future challenges and promises. Altogether this will provide insight on the relation between defective function at the single cell level and systemic alteration.
Learning outcomes : After completing the course, the doctoral student should: -Be able to discuss central concepts in vascular biology related to blood/lymph vessel formation and function. -Be able to discuss vascular mechanisms in cardiovascular disease, including stroke, and their risk factors. -Be able to discuss the principles of common methods used in vascular biology research and evaluate the advantages and disadvantages of using these techniques.
Contents of the course : This course will cover: -Basic and molecular principles of how blood/lymph vessels develop, are remodeled and are functionally integrated with the surrounding tissue. -The role of blood/lymph vessels in various pathological conditions with emphasis on cardiovascular disease. -Discussion on recent targeting strategies in cardiovascular-related disease. -Scientific methods and experimental model systems that are commonly used to study vascular mechanisms in normal and pathological conditions.
Teaching and learning activities : The theoretical part of the course includes lectures, group discussions and project work presentations. The practical part of the course includes demonstrations of common vascular model systems (e.g. retina preparations) and advanced imaging technologies (in vivo live imaging using two-photon confocal microscopy).
Examination : To pass the course, a participant has to: -actively participate in the discussions during the course -present their project work -demonstrate an understanding of scientific perspectives of basic vascular biology research
Compulsory elements : Project work presentations are mandatory. In the case of motivated absence during presentations a written report covering the topic of the group presentation has to be submitted to the course leaders who will evaluate the work and either approve, or in the case of insufficient quality, ask for revision.
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 : Scheeles väg 2, Solna

Course responsible :
Lars Jakobsson
Department of Medical Biochemistry and Biophysics

Lars.Jakobsson@ki.se

Contact person :
Daniel Nyqvist
Institutionen för medicinsk biokemi och biofysik

daniel.nyqvist@ki.se

Linda Fredriksson
Institutionen för medicinsk biokemi och biofysik

linda.fredriksson@ki.se

Title : Multivariate prediction modelling with applications in precision medicine

Course number : 2990
Credits : 1.5
Date : 2017-12-11 -- 2017-12-15
Language : English
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.
Learning outcomes : After successfully completing this course you as a student are expected to be able to: - Perform and assess basic quality control and outlier detection - Apply unsupervised and supervised statistical learning methods to detect patterns in data - Devise cross-validation strategies for parameter estimation, model selection and prediction performance evaluation - Make informed judgement of how to apply basic principles for variable selection - Critically evaluate prediction models in real-world applications
Contents of the course : Personalised medicine is a cornerstone of tomorrows health care, and is based on the idea of stratifying patients into groups based on e.g. disease risk, prognosis or probability of treatment response and administrate the most suitable therapy for each individual. The capability to generate vast amounts of quantitative molecular data from DNA- and RNA-sequencing and other molecular profiling methods is providing unprecedented opportunity for implementation of personalized precision medicine approaches in the health care system. Molecular profiling typically generates data with tens of thousands of variables of which only a subset is relevant for treatment decisions. The promise of personalised medicine relies on our ability to turn the vast molecular datasets into clinically actionable predictive models of individualised therapy response. Application of statistical learning methods and prediction modelling is a central component in developing these models, and in developing the biomarker panels that can be used for molecular subtyping, risk stratification and prediction of treatment response. This course provides an introduction to statistical learning methods and prediction models that are relevant for personalised medicine with a focus on real-world applications. This course aims to provide an introduction to methodologies for prediction modelling with a focus on biomedical applications, molecular epidemiology and personalised medicine. The course covers basic theory and introduction to modern statistical and machine learning methods for prediction modelling in high-dimensional data, together with applied data analysis through computer-based exercises. Lectures and exercises will cover the full process going from the initial data set and through data normalisation, quality control, outlier detection, application of unsupervised learning methods, application of supervised learning methods, variable selection, cross-validation and model evaluation. The main objective of the course is to provide basic theory and practical knowledge that will enable course participants to apply covered methodologies in their own research. Topics covered include: data import and basic visualisation, data pre-processing, quality control and outlier detection, unsupervised learning, supervised learning, cross-validation for parameter estimation and estimation of prediction performance, variable selection, recently developed methods (e.g. deep learning, conformal prediction).
Teaching and learning activities : The course is based on a combination of lectures, which covers methods and theory, together with computer-based exercises in R, where real-world data are analysed and interpreted. Previous experience from practical experience applying statistical models in a computer-based environment (e.g R, SAS, Stata, Matlab, Python) is strongly recommended.
Examination : The individual examination will be performed as a take-home examination. It consists of an individually written lab-report where results from an applied data analysis mini-project should be summarised and critically evaluated. Students who do not obtain a passing grade in the first examination will be offered a second examination within two months of the final day of the course.
Compulsory elements : The individually written examination.
Number of students : 8 - 25
Selection of students : Eligible doctoral students, 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
Department of Medical Epidemiology and Biostatistics

mattias.rantalainen@ki.se

Contact person :
Gunilla Nilsson Roos
Institutionen för medicinsk epidemiologi och biostatistik
08-524 822 93
gunilla.nilsson.roos@ki.se

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

Course number : 2991
Credits : 1.5
Date : 2017-11-22 -- 2017-12-01
Language : English
Responsible KI department : Department of Medical Epidemiology and Biostatistics
Specific entry requirements : Epidemiology I, Introduction to epidemiology; Epidemiology II, Design of epidemiological studies; Biostatistics I, Introduction for epidemiologists; Biostatistics II, Logistic regression for epidemiologists; and Biostatistics III: Survival analysis for epidemiologists, or equivalent courses
Purpose of the course : This course aims to enable practicing epidemiologists to make more efficient use of already-available case-control data and to design case-control studies that will extend the possibilities for future analysis.
Learning outcomes : After successfully completing this course you as a student are expected to be able to: - select a suitable epidemiological design for addressing a specified research question and justify the choice of design compared to other options. - compare the risk estimates obtained by different sampling strategies from the same underlying cohort and interpret these estimates for common designs. - compare and contrast the purpose of time-matching and confounder-matching in (nested) case-control studies, and generalise the resulting risk sets to a wide range of standard and non-standard designs. - compute weights that enable the reconstruction of an underlying cohort from a (nested) case-control sample and recognise that two-stage designs, re-use of case-control data, and extended/extreme case-control designs can all be analysed using appropriate weights to reflect the sampling - discuss the designs of published studies with particular attention to the choice of controls and devise more efficient alternatives.
Contents of the course : The overall aim of this course is to present statistical approaches that enable researchers to design more efficient case-control studies and to exploit more efficiently the data provided by nested case-control studies conducted in well-defined cohorts (such as national registers). In particular, the course will focus on different sampling designs in terms of their (biased) representation of the underlying cohort, and how to reconstruct the correct numbers at-risk to produce unbiased parameter estimates, including several important quantities (other than the odds ratio). The course will demonstrate the application of these methods to re-use controls from a prior study or after breaking the matching in a matched case-control study, conduct more flexible and informative analysis, and make efficient use of costly data.
Teaching and learning activities : Lectures interspersed with tutorials consisting of workshops and journal club sessions. In the workshops, participants will develop and refine a study design to address a clinical/epidemiological research question which will be presented and discussed. Journal clubs will consist of discussion and debate concerning key papers that will be assigned.
Examination : The course grade will be based on a take-home assignment involving a proposed epidemiological study. The participant will submit a short written report and an oral presentation where they will present and defend their proposal. A passing grade must be obtained for both the written and oral section in order to obtain a passing grade for the course. Students who obtain a passing grade on one of these sections will be allowed to revise that part of their work and be re-examined under the same conditions. The exam will have a strong emphasis on intuitive understanding and ability to explain/communicate rather than on technical or mathematical detail. The take-home examination will be explained on the first day of the course, assigned on the last day, and due within ten days of the end of the course. Students who do not obtain a passing grade in the first examination will be offered a second examination within 2 months of the final day of the course.
Compulsory elements : The individual examination
Number of students : 8 - 25
Selection of students : Eligible doctoral students, 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 November 22, 24, 27, 29 and December 1. The course is extended over time, but still five full course days, in order to promote reflection and reinforce learning.

Course responsible :
Marie Reilly
Department of Medical Epidemiology and Biostatistics
08-524 839 82
Marie.Reilly@ki.se

Contact person :
Gunilla Nilsson Roos
Institutionen för medicinsk epidemiologi och biostatistik
08-524 822 93
gunilla.nilsson.roos@ki.se

Title : Biostatistics III: Survival analysis for epidemiologists

Course number : 2992
Credits : 1.5
Date : 2017-11-13 -- 2017-11-21
Language : English
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.
Learning outcomes : After successfully completing this course students should be able to: - propose a suitable statistical model for assessing a specific research hypothesis using data from a cohort study, fit the model using standard statistical software, evaluate the fit of the model, and interpret the results. - explain the similarities and differences between Cox regression and Poisson regression. - discuss the concept of timescales in statistical models for time-to-event data, be able to control for different timescales using standard statistical software, and argue for an appropriate timescale for a given research hypothesis. -discuss the concept of confounding in epidemiological studies and be able to control/adjust for confounding using statistical models. - apply and interpret appropriate statistical models for studying effect modification and be able to reparameterise a statistical model to estimate appropriate contrasts. - critically evaluate the methodological aspects (design and analysis) of a scientific article reporting a cohort study.
Contents of the course : This course introduces statistical methods for survival analysis with emphasis on the application of such methods to the analysis of epidemiological cohort studies. Topics covered include methods for estimating survival (life table and Kaplan-Meier methods), comparing survival between subgroups (log-rank test), and modelling survival (primarily Poisson regression and the Cox proportional hazards model). The course addresses the concept of 'time' as a potential confounder or effect modifier and approaches to defining 'time' (e.g., time since entry, attained age, calendar time). The course will emphasise the basic concepts of statistical modelling in epidemiology, such as controlling for confounding and assessing effect modification.
Teaching and learning activities : Lectures, exercises focusing on analysis of real data using the free statistical software R, exercises not requiring statistical software, group discussions, literature review.
Examination : The course grade is based solely on a take-home examination. The focus of the exam will be on understanding concepts and their application to analysis of epidemiological studies rather than mathematical detail. The course examination will be held within two weeks of the final day of the course. Students who do not obtain a passing grade in the first examination will be offered a second examination within 2 months of the final day of the course. Students who do not obtain a passing grade at the first two examinations will be given top priority for admission the next time the course is offered. If the course is not offered during the following two academic terms then a third examination will be scheduled within 12 months of the final day of the course.
Compulsory elements : The individual examination
Number of students : 8 - 25
Selection of students : Eligible doctoral students, 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 13, 15, 17, 20 and 21. The course is extended over two weeks (but still 5 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 self-assessment 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
Department of Medical Epidemiology and Biostatistics

mark.clements@ki.se

Contact person :
Gunilla Nilsson Roos
Institutionen för medicinsk epidemiologi och biostatistik
08-524 822 93
gunilla.nilsson.roos@ki.se

Title : Ischemic heart disease

Course number : 2993
Credits : 1.0
Date : 2017-10-16 -- 2017-10-18
Language : English
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.
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 : 10 - 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 :
Bruna Gigante
The institute of Environmental Medicine

Bruna.Gigante@ki.se

Contact person :
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Title : Functional Neuroanatomy

Course number : 2994
Credits : 1.5
Date : 2017-10-09 -- 2017-10-13
Language : English
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.
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 - 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 :
Tobias Karlsson
Department of Neuroscience

tobias.karlsson@ki.se

Contact person :
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Title : Systematic reviews and meta-analyses in animal research - an introduction

Course number : 2995
Credits : 1.0
Date : 2017-11-22 -- 2017-11-23
Language : English
Responsible KI department : Comparative medicine
Specific entry requirements :
Purpose of the course : Systematic reviews are routinely used for scientific purposes in clinical studies, and are also currently rapidly gaining more attention in the field of animal research. Systematic overviews of all scientific literature on a well-defined specific research question are an important tool to improve the scientific quality of animal experiments, to improve translation of data generated from animals into the clinical situation, and to avoid unnecessary duplication of animal experiments, which are both an ethical and legal obligation. The aim of systematic reviews is to provide a comprehensive, objective, evidence-based and up-to-date overview of the current knowledge, which can be quantitatively summarized by means of a meta-analysis. Therefore, systematic reviews may result in new insights without having to use new animals. Systematic reviews can actually replace and refine animal experiments by better understanding the problems and limitations in previous experiments and by reducing the number of animals needed. This course objective is to encourage the use and conduct of systematic reviews and meta-analysis in animal research in order to 1) increase scientific quality, 2) to improve translation of animal data to the clinical situation, and 3) to prevent unnecessary duplication of animal studies.
Learning outcomes : After completion of the course the students should be able to: 1) Understand and demonstrate the value, principles and the different concepts related to systematic reviews and meta-analyses in animal studies; 2) Understand the difference between a classical review (so-called narrative) and systematic reviews; 3) Identify the strengths, limitations and pitfalls of systematic reviews and meta-analysis in animal research; 4) Interpret and apply basic methods of meta-analyses in animal studies.
Contents of the course : Key contents of the course include 1) Basic concepts in systematic reviews and meta-analyses, 2) strengths, problems and limitations of systematic reviews and meta-analyses, 3) conducting a systematic literature search, 4) data-extraction and quality assessment of included studies, 5) Statistical methods used in meta-analyses and interpretation. The course consists of two parts. The first part is "flipped-classroom" consisting of the mandatory course literature (see below) and the e-learning module "Introduction to systematic reviews and meta-analysis of animal studies", developed by our collaborators in SYRCLE (Systematic Review Centre for Laboratory Animal Experimentation; Radboud University Medical Center, Nijmegen, The Netherlands). The second part will be a two-day workshop during which we will build upon the acquired knowledge - with a clear focus on practical aspects of conducting systematic searches and meta-analyses, including the systematic literature search, data-extraction and quality assessment, and the statistical analyses (introducing the free software developed by Cochrane: RevMan).
Teaching and learning activities : This is a hands-on course based on active learning. The course will cover theoretical concepts mainly through the e-learning module and reading the mandatory course literature. Discussions in group and practical sessions will be used to facilitate deeper understanding, and to acquire the necessary skills to perform the different steps in systematic reviews and meta-analyses.
Examination : To pass the course the student must 1) complete the e-learning module, 2) read the mandatory course literature before the workshop, 3) actively participate during the two-day workshop, and 4) pass the final written examination (home exam/self-reflection) to consolidate the acquired knowledge.
Compulsory elements : The e-learning module needs to be completed before the course starts (certificates of completion need to be sent to the course organizer before the face-to-face workshop), and the students need to read the mandatory course literature. The face-to-face two-day workshop is mandatory (entire days). In case of well-justified circumstances, missed parts of the workshop may be replaced by a written assignment as approved by the course director.
Number of students : 8 - 16
Selection of students : Preference will be given to applicants where the benefits of this course will be greatest. Date of registration as a doctoral student, suitability of doctoral project, and the motivation to attend the course given will be used in the selection process.
More information : Prior education and training in laboratory animal science is advised, but not required. Face-to-face teaching and hands-on training will take place during Wednesday and Thursday between 9 am and 5 pm. Location: at computer room available at KI Library facilities in Solna. This course is arranged by the Laboratory Animal Science Education and Training Unit, Comparative Medicine. The course is a collaboration between Laboratory Animal Science Education and Training Unit, Comparative Medicine, Karolinska Institutet, and the course leaders and instructors on "How to conduct systematic reviews and meta-analyses" in clinical studies at Karolinska Institutet.

Course responsible :
Rafael Frias
Comparative medicine
085246660
rafael.frias@ki.se

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

Course number : 2996
Credits : 1.5
Date : 2017-11-28 -- 2017-11-30
Language : English
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.
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, using 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 as 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 : Face-to-face teaching will be held from Tuesday to Thursday between approx. 9 am and 5 pm. Location: Learning Lab, von Eulers väg 4A, 2nd floor. Key topics of this course include basic and advanced anaesthetic and analgesia, and basic surgical procedures on laboratory animals, with focus on anaesthesia, pain recognition and analgesia in rodent models. The main instructor of this course is internationally-recognized expert Professor Paul Flecknell, MA, VetMB, PhD, DECLAM, DLAS, DECVA, (Hon) DACLAM, (Hon) FRCVS, author of the Handbook Laboratory Animal Anaesthesia, 4th Edition, and a number of research publications and educational

material in the field. and editor of the Manual of Microsurgery on the Laboratory Rat.

Course responsible :
Rafael Frias
Comparative medicine
085246660
rafael.frias@ki.se

Contact person :
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Title : Brain aging

Course number : 2997
Credits : 3.0
Date : 2017-08-14 -- 2017-08-25
Language : English
Responsible KI department : Department of Cell and Molecular Biology
Specific entry requirements :
Purpose of the course : To increase the understanding of brain aging and its cellular and molecular mechanisms, including tools and technologies applied.
Learning outcomes : Upon completion of the course, the doctoral students can describe important concepts in the cellular and molecular mechanisms relating to brain aging, describe differences between normal and pathological brain aging, and critically evaluate important methods and technologies applied in brain aging research.
Contents of the course : Physiological and pathological brain aging and their cellular and molecular mechanisms; from basic neuroscience to clinical diseases such as neurodegenerative diseases and Alzheimer disease. Differences between normal and pathological brain aging. Transition from normal to pathological brain aging. Risk factors for pathological brain aging. Methods and technologies used in the study of brain aging.
Teaching and learning activities : The course is organized as a summer school, which encompasses lectures, small group discussions, student presentations, participation in a scientific symposium and a scientific conference, and site visits to research laboratories.
Examination : The students are examined with individual and group presentations on the course themes. Each student has to be able to show that all the learning outcomes for the course are reached.
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 Karolinska Institutet, King's College London, Peking University and Keio University. Note that the total number of participants is 20, with five doctoral students participating from each one of the four universities. The course takes place at Karolinska Institutet (CMB, Nobel Forum and Aula Medica).

Course responsible :
Matti Nikkola
Department of Cell and Molecular Biology

Matti.Nikkola@ki.se

Contact person :
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