Course catalogue for doctoral education

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3046 Causal Inference: emulating a Target Trial to Assess Comparative Effectiveness 2024-04-02 -- 2024-04-05 (English)
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3139 Basic Immunology 2024-01-15 -- 2024-02-09 (English)
3142 Biostatistics III: Survival Analysis for Epidemiologists * 2024-02-05 -- 2024-02-14 (English)
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3180 Bridging Science and Societal Needs Through Design Thinking 2024-03-13 -- 2024-05-22 (English)
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5505 Clinical Oncology for Pre-clinical Doctoral Students 2024-02-19 -- 2024-02-23 (English)
5506 Research Communication in Health Science * 2024-01-31 -- 2024-02-13 (English)
5519 Biostatistics II: Logistic Regression for Epidemiologists * 2024-05-13 -- 2024-05-17 (English)
5520 Incurable Cancers 2024-04-29 -- 2024-05-03 (English)
5531 Practical Introduction to Multilevel Data Analysis: From Data Collection to Results Interpretation 2024-03-06 -- 2024-04-03 (English)
5533 Neural Regulation of Inflammation and Metabolism 2024-05-20 -- 2024-05-24 (English)
5536 Coronary Heart Disease: Present and Future Perspectives in a Pan-Vascular Context 2024-03-18 -- 2024-03-22 (English)
5538 The Basics of Skeletal Biology: from Evolutionary Origins to Translational Research 2024-02-05 -- 2024-02-21 (English)
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5569 Linear Regression Analysis in Neuroscience: Model Choice, Implementation, Analysis Errors and Interpretation * 2024-01-29 -- 2024-02-19 (English)
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5580 Quality Assurance of Clinical Research * 2024-03-04 -- 2024-03-28 (English)
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5626 Basics of Programming for Biomedical and Clinical Research 2024-03-11 -- 2024-03-22 (English)
5634 An Introduction to Intellectual Property Rights in an Academic Context 2024-03-18 -- 2024-03-22 (English)
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5745 Clinical Immunology in Infectious Diseases 2024-04-22 -- 2024-04-26 (English)
5747 Mastering Science Communication and Public Engagement: From Research To Resonance * 2024-02-05 -- 2024-02-20 (English)
5748 Assessing the Value of Medical Innovation 2024-05-20 -- 2024-05-31 (English)
5749 Cytokines in Inflammation 2024-04-08 -- 2024-04-19 (English)
5767 Psychedelic Science – Past, Present, Future 2024-04-15 -- 2024-04-19 (English)
5774 Teknik och personcentrerad vård – Teoretiska perspektiv 2024-05-06 -- 2024-06-02 (Swedish)

Title : Redox Regulation, Oxidative Stress and Selenoproteins

Course number : 2214
Credits : 3.0
Date : 2024-06-10 -- 2024-06-14
Language : English
Level : Doctoral level
Responsible KI department : Department of Medical Biochemistry and Biophysics
Specific entry requirements :
Purpose of the course : The purpose of the course is to give doctoral students and post docs a good understanding of redox biology and redox biochemistry in living cells and organisms. The course is also designed to give the participants experience in scientific networking, and to increase generic skills in understanding, presenting and discussing frontline research topics.
Intended learning outcomes : After the course, each student should have acquired the following knowledge: - Good knowledge of structure-function relationships for the major low molecular-weight antioxidant compounds found in cells (GSH, Ascorbate, tocopherol) - Good knowledge of the major antioxidant and redox regulatory systems and redox sensitive signaling pathways (glutathione-dependent systems, thioredoxin systems, Nrf2/Keap1, Yap1, peroxiredoxins, methionine sulfoxide reductases, peroxidases, catalases, superoxide dismutase, NADPHoxidase, oxidative burst, PTP regulation, cyt c, ASK-1) - Good knowledge of selenoprotein synthesis and selenoprotein function After the course, each student should also have the skill to present and discuss a redox-regulated research project at a level generally expected for presentations held at international cutting-edge conferences in the subject.
Contents of the course : The course is planned as a joint training encompassing an international exchange graduate course, with students and lecturer's primarily recruited from Karolinska Institutet together with Medical University of South Carolina (MUSC) and the Redox Biology Center of the University of Nebraska in Lincoln (UNL), Nebraska, which are two NIH COBRE (Center of Biological Research Excellence) initatives focused on research in redox biology. The course is planned to be annually held and will have the following major components: - Students from MUSC, UNL and Karolinska Institutet - Lecturers from MUSC, Karolinska Institutet and UNL Planned lectures will contain subjects such as the following examples: - ""Glutathione S-transferases in redox regulation and glutathione dependent catalysis"" - ""Nitric oxide (NO) signaling in relation to redox state"" - ""Calcium signaling in oxidative stress and in relation to apoptosis"" - ""Glutaredoxin and thioredoxin systems"" - ""The concepts and effects of redox cycling and selenoprotein reactivity"" - ""Selenoproteomes and dedicated Cys- and/or Sec-dependent redox systems"" - ""Using protein crystallography to probe the function of redox active enzymes"" - ""Redox activities of proline in a cellular context"" - ""The effects of metals on metabolism and oxidative stress in human disease"" - ""With the sight on redox: glutaredoxin and thioredoxin systems in the ocular lens and their relation to cataract"" - ""Redox control of ion channels"" - ""How oxygen can be sensed in the carotid body"" - ""Mitochondrial production of reactive oxygen species in relation to human disease""
Teaching and learning activities : The course it is built upon a pedagogic framework of discussions between graduate students in redox biology with leading experts in the field, combined with cutting-edge lectures, training in oral presentation, career counceling sessions and a written exam for control of detailed basic knowledge in redox biology. It is the firm belief of the course organizers that this pedagogic framework should well support the students to obtain the learning objectives of the course. It should furthermore help the students to prepare for their next level of a career beyond the doctoral examination. The type of teaching will be: - Morning sessions with lectures in basic concepts as well as cutting-edge front-line research findings in the field - Afternoon sessions with student presentations followed by discussions between lecturers and students - Career discussions and future perspectives in the field of redox biology
Examination : The student skills are examined as follows: - Evaluation of the degree of participation in student-lecturer discussions and the level of initiated comments and questions during those discussions (grade pass/not pass) - Evaluation of the presentation of the student's own project (grade pass/not pass) - Results at written examination (at least 60% right answers for the grade of pass) Attendence during compulsory parts of the course as well as the grade of ""Pass"" in all three parts of the examination must be fulfilled for a final grade of ""Pass"".
Compulsory elements : Absence from any part of the course (lectures, student presentations, career discussions, exam and award ceremony) is generally not accepted but could in special cases be compensated by an individually tailored additional discussion and a special written examination organized by the course committee.
Number of students : 10 - 30
Selection of students : Selection will be based on 1) the relevance of the course syllabus for the applicant's doctoral project (according to written motivation), 2) start date of doctoral studies (priority given to earlier start date)
More information : The course during the spring of 2024 will be held at the Redox Biology Center (RBC) at the University of Lincoln (UNL), Lincoln, Nebraska, USA. This means the all participants will need to arrange for their travel and arrive to Lincoln, NE, at the latest during the weekend of June 8-9 and departure from Lincoln at the earliest during the weekend of June 15-16. If VISA and/or ESTA is needed will depend upon your citizenship and all travel preparations must be arranged by the participant. The course will stand all costs for lodning and most of the meals (including most dinners) for the duration of the course. Note that the course is highly demanding, but also much rewarding, with a mix of lectures, seminars, poster sessions and social activities. See the course questionnaire result from prior courses for details.

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Title : Career Skills for Scientists

Course number : 2463
Credits : 1.5
Date : 2024-01-23 -- 2024-03-14
Language : English
Level : Doctoral level
Responsible KI department : Department of Learning, Informatics, Management and Ethics
Specific entry requirements :
Purpose of the course : This course prepares PhD students for life after the dissertation. You start to explore your transferable skills and how to communicate them. You learn about yourself and the many career paths for PhDs. The course also allows you to expand your contacts and network. This course encourages you to explore your interests, talents, and skills.
Intended learning outcomes : After the course, the participants should be able to: - discuss career options and pathways in academic and non-academic settings, covering different organisations in the private and public sectors, - identify transferable skills achieved during doctoral training and explain the value of these skills within and outside academia, - apply what they have learned in the course to communicate their skills in different forms and situations.
Contents of the course : The course sessions cover the exploration of your skills and interests and illustrate different academic and non-academic career paths. You will also get information about finding postdoc positions and preparing your CV. Throughout the course, you will get many chances to practice your "networking" through interaction with different presenters and through the course assignment.
Teaching and learning activities : The course is planned to take place in person. The course is split up into different sessions, given over five weeks, plus one week of final presentations. The course demands active participation and reflection from the participants. The course will be highly interactive and will consist of lectures and discussions. As part of an individual assignment, you will reach out to and interview two persons: one person working in academia and another person working in a non-academic role.
Examination : The examination consists of two parts: Part one - Report about the individual assignment including regarding the two interviews. Part two - Oral presentation of the reflection on the learning experience, including expectations, outcomes, and future application.
Compulsory elements : An absence can be compensated with an extra individual assignment. The student needs to reach out and interview a third person working in academia or working in a non-academic role.
Number of students : 30 - 40
Selection of students : Selection will be based on 1) the relevance of the course syllabus for the applicant's doctoral project (according to written motivation), 2) start date of doctoral studies (priority given to earlier start date)
More information : The course runs over 8 weeks and is built up as follows: A) January 23 – March 14: 10 sessions (in-person) in total (five weeks). The time of the course is from 10.00-12.00 every Tuesday and Thursday, including private study (total +- 6h/week). B) February 27 – March 7: 2 weeks of individual exam prep (total +- 4h/week) + optional internship info sessions. C) March 12 – March 14: 1 week of exam presentations in smaller groups (+- 2h). A more detailed schedule will be available to course participants on the course web. For questions about the course content, contact Y. Vladimir Pabón-Martínez (vladimir.pabonmartinez@ki.se). For practical questions about your application, contact Liisa (liisa.olsson@ki.se). Course examiner: Hanna Jansson (hanna.jansson@ki.se)

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Title : Interview Techniques in Health and Care Research

Course number : 2520
Credits : 4.0
Date : 2024-04-22 -- 2024-05-31
Language : English
Level : Doctoral level
Responsible KI department : Department of Clinical Neuroscience
Specific entry requirements :
Purpose of the course : The course aims to provide course participants with a broad understanding for a research interview; i.e. planning and conducting a research interview within a research program. In addition the participants will be enabled to gain an increased understanding and a professional attitude of the researcher as an instrument for data collection which can be applied and potentially enhance the quality of data in future research interviews.
Intended learning outcomes : After the course the student is expected to be able to (a) Identify and understand the content of a research interview. (b) Demonstrate and master necessary interview tools in order to, (c) Independently, analyze and adapt this knowledge and practical skills in order to compose a research interview; i.e. planning, designing, carrying out and critically evaluating the interview. (d) Communicate and give feedback to other students' research interviews
Contents of the course : a. different perspectives and knowledge for conducting interviews b. the role of empathy in interview communication c. the researcher´s role as an instrument in data collection d. intersubjectivity, biases and ethical considerations of research interviewing e. how to plan an interview guide f. how to formulate questions g. how to conduct an interview with respect for culture and vulnerable groups
Teaching and learning activities : The course will be offered part-time, usually full Days from 9 a.m. to 4 p.m., 1-2 days weekly including lectures, video demonstrations covering various interviews and interview techniques, interview technique training seminars in small groups, supervision seminars (interview guides) with literature discussions and self-monitored studies and practice. Since interview training is a process - which requires testing in vivo, improvements, reflection between training - the course covers approximately a 5-week period.
Examination : Examination will consist of an interview guide and of an individually taped documentation of an interview with a research subject in the own research field presented in the course group. In addition the course participant will critically analyze a fello student's video-taped interview. The presentation will furthermore be within a theoretical frame of reference including the course literature, discussing interviews, interview techniques, potential biases challenging the quality of the interview responses. The reason behind choosing this kind of examination is that it has been proven to give earlier interview student-groups valuable learning experiences which immediately can be applied in the respective research area.
Compulsory elements : The education will be compulsory scheduled all through the course. If the student is unable to be present he/she has to consult the course leader/examiner for adequate opportunities to recover missed hours (usually in the form of written assignments, except for practical training and examination with the video-taped interviews).
Number of students : 12 - 24
Selection of students : Selection will be based on 1) the relevance of the course syllabus for the applicant's doctoral project (according to written motivation), 2) start date of doctoral studies (priority given to earlier start date)
More information :

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Title : Neuropsychopharmacology

Course number : 2526
Credits : 2.0
Date : 2024-05-20 -- 2024-05-24
Language : English
Level : Doctoral level
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 (e.g. pharmacological and cognitive-behavioral therapy (CBT)), and to discuss new ideas and future research ambitions within this field.
Intended 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 : 15 - 30
Selection of students : Selection will be based on 1) the relevance of the course syllabus for the applicant's doctoral project (according to written motivation), 2) start date of doctoral studies (priority given to earlier start date)
More information : The course will be given at KI Solna campus.

Course responsible :
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Title : High Throughput Functional Genomic Technologies in Biomedical Research

Course number : 2537
Credits : 1.5
Date : 2024-04-15 -- 2024-04-19
Language : English
Level : Doctoral level
Responsible KI department : Department of Biosciences and Nutrition
Specific entry requirements :
Purpose of the course : The purpose of the course is to give participants an introduction to high-throughput genomic technologies. Additionally, the participants will be able to understand which high throughput technology to apply in order to answer a specific scientific question.
Intended learning outcomes : At the end of the course the students should be able to select appropriate high throughput genomic technologies in different formats based on modern sequencing and microarray techniques, including gene expression profiling, single cell transcriptomics, ChIP sequencing, methylation profiling and other genomic methods used in modern biomedical research for different types of research questions. They should also be able to discuss advantages and disadvantages of alternative technologies.
Contents of the course : The course includes a combination of lectures, discussions and practical sessions to gain more insight in different technological platforms used for sequencing and microarray analysis in different applications. The course includes an introduction to fundamental concepts and methods used in bioinformatics to study genome function and variation using large-scale sequencing and microarray analysis that can be applied in biomedical research including students own projects.
Teaching and learning activities : Lectures, seminars, demonstrations and data analysis.
Examination : Examination seminar with group presentations and discussions. The students will, in groups, select a paper of a relevant topic for the course, with the help of course leaders if necessary. The paper should be presented with specific focus on the technologies used. Each student should also be able to discuss advantages and disadvantages of alternative technologies and will be individually assessed. This seminar will take 2-3 hours.
Compulsory elements : The students have to take active part in all activities. Attendance is compulsory for demonstrations and data analysis. An alternative time could be provided only under exceptional circumstances. If it is not possible to provide an alternative time during the course, this part will need to be taken at the next course occasion. Other absence can be compensated for by an additional task in agreement with the course organizers.
Number of students : 8 - 30
Selection of students : Selection will be based on 1) the relevance of the course syllabus for the applicant's doctoral project (according to written motivation), 2) start date of doctoral studies (priority given to earlier start date)
More information : The course will be held on Monday 15th of April to Friday 19th, between 09.00 to 16.00. All seminars will be given at Campus Flemingsberg, house NEO, Blickagången 14, 141 57 Huddinge.

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Title : Writing Science and Information Literacy

Course number : 2561
Credits : 3.0
Date : 2024-01-29 -- 2024-03-08
Language : English
Level : Doctoral level
Responsible KI department : Karolinska Institutet University Library
Specific entry requirements :
Purpose of the course : The aim of the course is to develop the medical scientific writing and information literacy skills of the participant.
Intended learning outcomes : After this course, you will be able to demonstrate: -an understanding of how to write an original scientific article and submit it for publication -an understanding of the publication process, including how to use relevant resources to choose a journal in which to publish your research -an ability to write other types of texts required for a scientific career, such as grant applications and popular science texts -an ability to give, take and make use of constructive criticism -an ability to search and manage the medical science literature in a structured way.
Contents of the course : Writing an original scientific article, grant applications and popular science texts; searching and managing the literature; and understanding the publication process, including using relevant resources to choose a journal and navigate peer review.
Teaching and learning activities : This online course will take place in the learning platform Canvas. Content will be taught using various learning objects, from film to group exercises. Formative feedback will be implemented by teachers, peers and via self-assessment.
Examination : The intended learning outcomes are assessed in the summative examination. Participants will write and rewrite a grant application and popular science summary based on teacher and peer feedback. Participants will also complete a number of assignments throughout the course which will aid their ability to search and manage the literature effectively, as well as choose a journal for publication.
Compulsory elements : There will be a number of obligatory assignments and assessments to be completed.
Number of students : 12 - 22
Selection of students : Selection will be based on 1) the relevance of the course syllabus for the applicant's doctoral project (according to written motivation), 2) start date of doctoral studies (priority given to earlier start date)
More information : This course takes place online via Canvas. While much of the course material may be studied at the participant's own pace, there are five live class sessions which will be held via Zoom. Exact dates and times are as follows: Course Introduction 29 Jan 10-12 CET, Writing in the Sciences Discussion Seminar 2 Feb 10-12 CET, Searching Strategically: Tips and Tricks 9 Feb 10-11 CET, Publication Process Discussion Seminar 26 Feb 10.30-12 CET, Peer Review 4 Mar 10.30-16 CET. Participants are encouraged to attend all live sessions. Attendance on 29 Jan and 4 Mar is obligatory. In addition, there are a series of deadlines throughout the course that must be met. Deadlines are as follows: 6 Feb, 13 Feb, 19 Feb, 23 Feb, 29 Feb, and 8 Mar.

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Contact person :
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Title : Writing Science and Information Literacy

Course number : 2561
Credits : 3.0
Date : 2024-04-22 -- 2024-05-31
Language : English
Level : Doctoral level
Responsible KI department : Karolinska Institutet University Library
Specific entry requirements :
Purpose of the course : The aim of the course is to develop the medical scientific writing and information literacy skills of the participant.
Intended learning outcomes : After this course, you will be able to demonstrate: -an understanding of how to write an original scientific article and submit it for publication -an understanding of the publication process, including how to use relevant resources to choose a journal in which to publish your research -an ability to write other types of texts required for a scientific career, such as grant applications and popular science texts -an ability to give, take and make use of constructive criticism -an ability to search and manage the medical science literature in a structured way.
Contents of the course : Writing an original scientific article, grant applications and popular science texts; searching and managing the literature; and understanding the publication process, including using relevant resources to choose a journal and navigate peer review.
Teaching and learning activities : This online course will take place in the learning platform Canvas. Content will be taught using various learning objects, from film to group exercises. Formative feedback will be implemented by teachers, peers and via self-assessment.
Examination : The intended learning outcomes are assessed in the summative examination. Participants will write and rewrite a grant application and popular science summary based on teacher and peer feedback. Participants will also complete a number of assignments throughout the course which will aid their ability to search and manage the literature effectively, as well as choose a journal for publication.
Compulsory elements : There will be a number of obligatory assignments and assessments to be completed.
Number of students : 12 - 22
Selection of students : Selection will be based on 1) the relevance of the course syllabus for the applicant's doctoral project (according to written motivation), 2) start date of doctoral studies (priority given to earlier start date).
More information : This course takes place online via Canvas. While much of the course material may be studied at the participant's own pace, there are five live class sessions which will be held via Zoom. Exact dates and times are as follows: Course Introduction 22 Apr 10-12 CET, Writing in the Sciences Discussion Seminar 26 Apr 10-12 CET, Searching Strategically: Tips and Tricks 3 May 10-11 CET, Publication Process Discussion Seminar 20 May 10.30-12 CET, Peer Review 27 May 10.30-16 CET. Participants are encouraged to attend all live sessions. Attendance on 22 Apr and 27 May is obligatory. In addition, there are a series of deadlines throughout the course that must be met. Deadlines are as follows: 30 Apr, 7 May, 13 May, 17 May, 23 May, and 31 May.

Course responsible :
Jenny Siméus
Karolinska Institutet universitetsbibliotek

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Contact person :
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Title : Basic Course in Medical Statistics - A Distance Course

Course number : 2609
Credits : 3.0
Date : 2024-02-12 -- 2024-02-23
Language : English
Level : Doctoral level
Responsible KI department : Department of Learning, Informatics, Management and Ethics
Specific entry requirements :
Purpose of the course : The aim of the course is to introduce the basic statistical methods and the fundamental principles of statistical inference and to offer basic skills that involve hands-on data analysis using statistical software.
Intended learning outcomes : The course participants shall after the course be able to: 1) perform and interpret basic descriptive statistics from frequency tables and graphical presentations, 2) perform and interpret results from basic inferential statistical analysis and tests, 3) recognize and critically examine the statistics being presented in articles within the field of medical research.
Contents of the course : Concepts being treated are descriptive vs inferential statistics, collection of data and study design, different types of data and level of measurement, independent and dependent samples, correlation and regression, hypothesis testing and different type of statistical errors in relation to the testing and data collection procedure. The major topics for the course are t-test, chi-square test, nonparametric test and regression analysis, and how to evaluate the assumptions for the different techniques.
Teaching and learning activities : The course is an online distance course. On the first day of the course there will be an introduction via Zoom. The teaching and learning methods include pre-recorded video lectures, self-study, individual self-assessment tests, computer-based application exercises, an individual examination, and links to statistical software demonstration videos in SPSS and R. Interaction with other participants or teachers will be possible via the discussion forum in Canvas throughout the course. Participants are welcomed to send e-mails to the teacher or attend open office hours on Zoom. There will be mandatory individual examinations and seminars with group discussions via Zoom the last day of the course.
Examination : Assessment of the intended learning outcomes by a passing grade on the individual examinations. The participants will have to demonstrate their ability to perform, recognize, critically examine and discuss the statistics presented during the seminars.
Compulsory elements : The computer-based exercises, individual examinations, and the seminars on the last day of the course are mandatory. The course leader assesses whether and if so, how absence can be compensated.
Number of students : 40 - 50
Selection of students : Selection will be based on: 1) the relevance of the course syllabus for the applicant's doctoral project (according to written motivation) 2) start date of doctoral studies (priority given to earlier start date). We reserve 14 spots for PhD students from research schools at KI.
More information : Mandatory attendance via Zoom.

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

azadeh.chizarifard@ki.se

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

nora.espahbodi@ki.se

Title : Basic Course in Medical Statistics - A Distance Course

Course number : 2609
Credits : 3.0
Date : 2024-03-04 -- 2024-03-15
Language : English
Level : Doctoral level
Responsible KI department : Department of Learning, Informatics, Management and Ethics
Specific entry requirements :
Purpose of the course : The aim of the course is to introduce the basic statistical methods and the fundamental principles of statistical inference and to offer basic skills that involve hands-on data analysis using statistical software.
Intended learning outcomes : The course participants shall after the course be able to: 1) perform and interpret basic descriptive statistics from frequency tables and graphical presentations, 2) perform and interpret results from basic inferential statistical analysis and tests, 3) recognize and critically examine the statistics being presented in articles within the field of medical research.
Contents of the course : Concepts being treated are descriptive vs inferential statistics, collection of data and study design, different types of data and level of measurement, independent and dependent samples, correlation and regression, hypothesis testing and different type of statistical errors in relation to the testing and data collection procedure. The major topics for the course are t-test, chi-square test, nonparametric test and regression analysis, and how to evaluate the assumptions for the different techniques.
Teaching and learning activities : The course is an online distance course. On the first day of the course there will be an introduction via Zoom. The teaching and learning methods include pre-recorded video lectures, self-study, individual self-assessment tests, computer-based application exercises, an individual examination, and links to statistical software demonstration videos in SPSS and R. Interaction with other participants or teachers will be possible via the discussion forum in Canvas throughout the course. Participants are welcomed to send e-mails to the teacher or attend open office hours on Zoom. There will be mandatory individual examinations and seminars with group discussions via Zoom the last day of the course.
Examination : Assessment of the intended learning outcomes by a passing grade on the individual examinations. The participants will have to demonstrate their ability to perform, recognize, critically examine and discuss the statistics presented during the seminars.
Compulsory elements : The computer-based exercises, individual examinations, and the seminars on the last day of the course are mandatory. The course leader assesses whether and if so, how absence can be compensated.
Number of students : 40 - 50
Selection of students : Selection will be based on: 1) the relevance of the course syllabus for the applicant's doctoral project (according to written motivation) 2) start date of doctoral studies (priority given to earlier start date).
More information : Mandatory attendance via Zoom.

Course responsible :
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Contact person :
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Title : Basic Course in Medical Statistics - A Distance Course

Course number : 2609
Credits : 3.0
Date : 2024-04-08 -- 2024-04-19
Language : English
Level : Doctoral level
Responsible KI department : Department of Learning, Informatics, Management and Ethics
Specific entry requirements :
Purpose of the course : The aim of the course is to introduce the basic statistical methods and the fundamental principles of statistical inference and to offer basic skills that involve hands-on data analysis using statistical software.
Intended learning outcomes : The course participants shall after the course be able to: 1) perform and interpret basic descriptive statistics from frequency tables and graphical presentations, 2) perform and interpret results from basic inferential statistical analysis and tests, 3) recognize and critically examine the statistics being presented in articles within the field of medical research.
Contents of the course : Concepts being treated are descriptive vs inferential statistics, collection of data and study design, different types of data and level of measurement, independent and dependent samples, correlation and regression, hypothesis testing and different type of statistical errors in relation to the testing and data collection procedure. The major topics for the course are t-test, chi-square test, nonparametric test and regression analysis, and how to evaluate the assumptions for the different techniques.
Teaching and learning activities : The course is an online distance course. On the first day of the course there will be an introduction via Zoom. The teaching and learning methods include pre-recorded video lectures, self-study, individual self-assessment tests, computer-based application exercises, an individual examination, and links to statistical software demonstration videos in SPSS and R. Interaction with other participants or teachers will be possible via the discussion forum in Canvas throughout the course. Participants are welcomed to send e-mails to the teacher or attend open office hours on Zoom. There will be mandatory individual examinations and seminars with group discussions via Zoom the last day of the course.
Examination : Assessment of the intended learning outcomes by a passing grade on the individual examinations. The participants will have to demonstrate their ability to perform, recognize, critically examine and discuss the statistics presented during the seminars.
Compulsory elements : The computer-based exercises, individual examinations, and the seminars on the last day of the course are mandatory. The course leader assesses whether and if so, how absence can be compensated.
Number of students : 40 - 50
Selection of students : Selection will be based on: 1) the relevance of the course syllabus for the applicant's doctoral project (according to written motivation) 2) start date of doctoral studies (priority given to earlier start date).
More information : Mandatory attendance via Zoom.

Course responsible :
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Contact person :
Nora Espahbodi
Institutionen för lärande, informatik, management och etik

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Title : Write Your Research Results and Get Them Published

Course number : 2618
Credits : 3.0
Date : 2024-01-22 -- 2024-02-02
Language : English
Level : Doctoral level
Responsible KI department : Department of Women's and children's health
Specific entry requirements :
Purpose of the course : The purpose of this course is to foster excellence in communicating research results by improving the participants' practical and theoretical skills in academic writing.
Intended learning outcomes : After attending the course, the doctoral student should be able to: - Explain the characteristics of different genres in academic writing. - Understand the terminology used in scientific writing. - Compose and revise a scientific paper and an abstract, using the correct structure and language, following the editorial requirements of a journal of their choice. - Design and present a scientific poster using basic rhetoric. - Write with good flow and avoid the most common language pitfalls in academic writing. - Identify and communicate the main scope and significance of their research project. - Communicate their research results outside of the research community (public outreach). - Understand the publication process, ethics in publication, and how to respond to reviewers' comments. - Write a project plan and a cover letter. - Search for and organize references using reference management software. - Reflect upon their own learning process.
Contents of the course : During the course, the PhD student will produce a short manuscript draft, an abstract, a scientific poster, and a popular science summary. The following topics will be covered: - Terminology in scientific writing - Characteristics of genres in academic writing - English in scientific writing including common pitfalls and "quick fixes" - Effective poster presentations - The main scope and significance of a research project - Popular science summary for public outreach - The publication process, including ethics, responding to reviewers' comments, and cover letter - Project plan - Reference search and management - Review of own and other students' assignments
Teaching and learning activities : Lectures, writing exercises, group assignments including giving feedback to colleagues, individual writing, and individual coaching one-on-one with teacher.
Examination : 1) Written assignments reflecting the intended learning outcomes of the course: draft for scientific paper, popular science summary, poster, and abstract. All assignments can (but don't have to) be based on own research. 2) Evaluation sessions, where the course participants give each other constructive feedback on the written assignments as a part of the learning process 3) Individual coaching, where all assignments are discussed and revised together with a teacher.
Compulsory elements : All parts of the course are mandatory. Absence can be compensated: a) during next course occasion b) by individual assignments c) by watching recorded lectures
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), and 2) the date for registration as a doctoral student (priority given to LATER registration date).
More information : This course occasion will take place online. All lectures will be taught in real-time and according to schedule (no pre-recorded lectures, but recorded lectures will be available to make up for absences).
 The scope of the course is scientific writing (manuscript, abstract, and poster), and you can use your research for the assignments (although it is not a requirement to bring any data) to maximize the learning experience and make actual progress in your studies. The course includes manuscript writing, poster design and presentation, cover letter writing, abstract writing, and popular science writing. The popular science part covers the skills needed to successfully write a popular science summary, e.g., for a project plan, grant applications, or your kappa, and is also helpful for oral presentations.
 No prior knowledge or experience of scientific writing is required, and you will benefit equally from the course, whether you have published your research before or not. Please address ALL questions to anna.hildenbrand.michelman@ki.se or phone 070-7890607

Course responsible :
Anna Hildenbrand Michelman
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Lalit Kumar
Institutionen för kvinnors och barns hälsa

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Title : Write Your Research Results and Get Them Published

Course number : 2618
Credits : 3.0
Date : 2024-02-26 -- 2024-03-08
Language : English
Level : Doctoral level
Responsible KI department : Department of Women's and children's health
Specific entry requirements :
Purpose of the course : The purpose of this course is to foster excellence in communicating research results by improving the participants' practical and theoretical skills in academic writing.
Intended learning outcomes : After attending the course, the doctoral student should be able to: - Explain the characteristics of different genres in academic writing. - Understand the terminology used in scientific writing. - Compose and revise a scientific paper and an abstract, using the correct structure and language, following the editorial requirements of a journal of their choice. - Design and present a scientific poster using basic rhetoric. - Write with good flow and avoid the most common language pitfalls in academic writing. - Identify and communicate the main scope and significance of their research project. - Communicate their research results outside of the research community (public outreach). - Understand the publication process, ethics in publication, and how to respond to reviewers' comments. - Write a project plan and a cover letter. - Search for and organize references using reference management software. - Reflect upon their own learning process.
Contents of the course : During the course, the PhD student will produce a short manuscript draft, an abstract, a scientific poster, and a popular science summary. The following topics will be covered: - Terminology in scientific writing - Characteristics of genres in academic writing - English in scientific writing including common pitfalls and "quick fixes" - Effective poster presentations - The main scope and significance of a research project - Popular science summary for public outreach - The publication process, including ethics, responding to reviewers' comments, and cover letter - Project plan - Reference search and management - Review of own and other students' assignments
Teaching and learning activities : Lectures, writing exercises, group assignments including giving feedback to colleagues, individual writing, and individual coaching one-on-one with teacher.
Examination : 1) Written assignments reflecting the intended learning outcomes of the course: draft for scientific paper, popular science summary, poster, and abstract. All assignments can (but don't have to) be based on own research. 2) Evaluation sessions, where the course participants give each other constructive feedback on the written assignments as a part of the learning process 3) Individual coaching, where all assignments are discussed and revised together with a teacher.
Compulsory elements : All parts of the course are mandatory. Absence can be compensated: a) during next course occasion b) by individual assignments c) by watching recorded lectures
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), and 2) the date for registration as a doctoral student (priority given to LATER registration date).
More information : This course occasion will take place online. All lectures will be taught in real-time and according to schedule (no pre-recorded lectures, but recorded lectures will be available to make up for absences).
 The scope of the course is scientific writing (manuscript, abstract, and poster), and you can use your research for the assignments (although it is not a requirement to bring any data) to maximize the learning experience and also to make actual progress in your studies. The course includes manuscript writing, poster design and presentation, cover letter writing, abstract writing, and popular science writing. The popular science part covers the skills needed to successfully write a popular science summary, e.g., for a project plan, grant applications, or your kappa, and is also helpful for oral presentations.
 No prior knowledge or experience of scientific writing is required, and you will benefit equally from the course, whether you have published your research before or not.
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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 : 2024-04-22 -- 2024-05-03
Language : English
Level : Doctoral level
Responsible KI department : Department of Women's and children's health
Specific entry requirements :
Purpose of the course : The purpose of this course is to foster excellence in communicating research results by improving the participants' practical and theoretical skills in academic writing.
Intended learning outcomes : After attending the course, the doctoral student should be able to: - Explain the characteristics of different genres in academic writing. - Understand the terminology used in scientific writing. - Compose and revise a scientific paper and an abstract, using the correct structure and language, following the editorial requirements of a journal of their choice. - Design and present a scientific poster using basic rhetoric. - Write with good flow and avoid the most common language pitfalls in academic writing. - Identify and communicate the main scope and significance of their research project. - Communicate their research results outside of the research community (public outreach). - Understand the publication process, ethics in publication, and how to respond to reviewers' comments. - Write a project plan and a cover letter. - Search for and organize references using reference management software. - Reflect upon their own learning process.
Contents of the course : During the course, the PhD student will produce a short manuscript draft, an abstract, a scientific poster, and a popular science summary. The following topics will be covered: - Terminology in scientific writing - Characteristics of genres in academic writing - English in scientific writing including common pitfalls and "quick fixes" - Effective poster presentations - The main scope and significance of a research project - Popular science summary for public outreach - The publication process, including ethics, responding to reviewers' comments, and cover letter - Project plan - Reference search and management - Review of own and other students' assignments
Teaching and learning activities : Lectures, writing exercises, group assignments including giving feedback to colleagues, individual writing, and individual coaching one-on-one with teacher.
Examination : 1) Written assignments reflecting the intended learning outcomes of the course: draft for scientific paper, popular science summary, poster, and abstract. All assignments can (but don't have to) be based on own research. 2) Evaluation sessions, where the course participants give each other constructive feedback on the written assignments as a part of the learning process 3) Individual coaching, where all assignments are discussed and revised together with a teacher.
Compulsory elements : All parts of the course are mandatory. Absence can be compensated: a) during next course occasion b) by individual assignments c) by watching recorded lectures
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) and 2) the date for registration as a doctoral student (priority given to LATER registration date).
More information : This course occasion will take place online and in person (please state your preferences, if any). All lectures will be taught in real-time and according to schedule (no pre-recorded lectures, but recorded lectures will be available to make up for absences).
 The scope of the course is scientific writing (manuscript, abstract, and poster), and you can use your research for the assignments (although it is not a requirement to bring any data) to maximize the learning experience and also to make actual progress in your studies. The course includes manuscript writing, poster design and presentation, cover letter writing, abstract writing, and popular science writing. The popular science part covers the skills needed to successfully write a popular science summary, e.g., for a project plan, grant applications, or your kappa, and is also helpful for oral presentations.
 No prior knowledge or experience of scientific writing is required, and you will benefit equally from the course, whether you have published your research before or not.
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Lalit Kumar
Institutionen för kvinnors och barns hälsa

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Title : Write Your Research Results and Get Them Published

Course number : 2618
Credits : 3.0
Date : 2024-06-03 -- 2024-06-14
Language : English
Level : Doctoral level
Responsible KI department : Department of Women's and children's health
Specific entry requirements :
Purpose of the course : The purpose of this course is to foster excellence in communicating research results by improving the participants' practical and theoretical skills in academic writing.
Intended learning outcomes : After attending the course, the doctoral student should be able to: - Explain the characteristics of different genres in academic writing. - Understand the terminology used in scientific writing. - Compose and revise a scientific paper and an abstract, using the correct structure and language, following the editorial requirements of a journal of their choice. - Design and present a scientific poster using basic rhetoric. - Write with good flow and avoid the most common language pitfalls in academic writing. - Identify and communicate the main scope and significance of their research project. - Communicate their research results outside of the research community (public outreach). - Understand the publication process, ethics in publication, and how to respond to reviewers' comments. - Write a project plan and a cover letter. - Search for and organize references using reference management software. - Reflect upon their own learning process.
Contents of the course : During the course, the PhD student will produce a short manuscript draft, an abstract, a scientific poster, and a popular science summary. The following topics will be covered: - Terminology in scientific writing - Characteristics of genres in academic writing - English in scientific writing including common pitfalls and "quick fixes" - Effective poster presentations - The main scope and significance of a research project - Popular science summary for public outreach - The publication process, including ethics, responding to reviewers' comments, and cover letter - Project plan - Reference search and management - Review of own and other students' assignments
Teaching and learning activities : Lectures, writing exercises, group assignments including giving feedback to colleagues, individual writing, and individual coaching one-on-one with teacher.
Examination : 1) Written assignments reflecting the intended learning outcomes of the course: draft for scientific paper, popular science summary, poster, and abstract. All assignments can (but don't have to) be based on own research. 2) Evaluation sessions, where the course participants give each other constructive feedback on the written assignments as a part of the learning process 3) Individual coaching, where all assignments are discussed and revised together with a teacher.
Compulsory elements : All parts of the course are mandatory. Absence can be compensated: a) during next course occasion b) by individual assignments c) by watching recorded lectures
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) and 2) the date for registration as a doctoral student (priority given to LATER registration date).
More information : This course occasion will take place online and in person (please state your preferences, if any). All lectures will be taught in real-time and according to schedule (no pre-recorded lectures, but recorded lectures will be available to make up for absences).
 The scope of the course is scientific writing (manuscript, abstract, and poster), and you can use your research for the assignments (although it is not a requirement to bring any data) to maximize the learning experience and also to make actual progress in your studies. The course includes manuscript writing, poster design and presentation, cover letter writing, abstract writing, and popular science writing. The popular science part covers the skills needed to successfully write a popular science summary, e.g., for a project plan, grant applications, or your kappa, and is also helpful for oral presentations.
 No prior knowledge or experience of scientific writing is required, and you will benefit equally from the course, whether you have published your research before or not.
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Lalit Kumar
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Title : Klinisk forskning och Good Clinical Practice: protokoll, informerat samtycke och ansökan i enlighet med lagar/regler

Course number : 2621
Credits : 1.5
Date : 2024-01-29 -- 2024-02-02
Language : Swedish
Level : Forskarnivå
Responsible KI department : Department of Clinical Sciences, Danderyd Hospital
Specific entry requirements : --
Purpose of the course : Kursen ger god kunskap om det regelverk som gäller vid klinisk forskning (registerforskning och kliniska prövningar). Detta är nödvändig kunskap för alla som bedriver klinisk forskning.
Intended learning outcomes : Kunskaper om Good Clinical Practice (GCP) samt forskningsetik (Helsingforsdeklarationen). Kursen täcker de krav på GCP-utbildning som Läkemedelsverket ställer för att delta i en klinisk läkemedelsprövning. Deltagaren ska efter genomgången kurs kunna delta som en prövare i en klinisk prövning. Kunskaper om hur man praktiskt ansöker om klinisk prövning till Regional etikprövningsnämnd, Läkemedelsverket samt till Datainspektionen. Deltagaren ska efter genomgången kurs kunna skriva en ansökan till Regional etikprövningsnämnd och veta hur man skriver sådan till Läkemedelsverket samt till Datainspektionen. Kunskaper rörande regelverket för klinisk prövning (Etikprövningslagen, Dataskyddsförordningen (GDPR, General Data Protection Directory), Biobankslagen, Läkemedelsverkets författningssamling m fl). Deltagaren ska efter genomgången kurs känna till regelverket för att rätt kunna planera en klinisk prövning. Beräkning av deltagarantalet i en studie. Deltagaren ska efter genomgången kurs veta vad som påverkar studiestorlek och kunna ta fram rätt underlag för att kunna beräkna detta. Kunskap om kraven att registrera en studie i publik databas (Clinical Trial Registry) samt hur man gör för att få en studie publicerad. Deltagaren ska efter genomgången kurs kunna registrera en studie i en publik databas. Kunskaper om de krav som ställs vid registerforskning. Deltagaren ska efter genomgången kurs känna till regelverket vid registerforskning.
Contents of the course : Föreläsningar om det regelverk som gäller vid klinisk forskning (registerforskning och kliniska prövningar): Helsingforsdeklarationen, GCP, Etikprövningslagen, Dataskyddsförordningen (GDPR, General Data Protection Directory), Biobankslagen, Läkemedelsverkets författningssamling, Codex: regler och riktlinjer för forskning (codex.vr.se) m fl. Beräkning av patientantal. Genomgång av ansökningshandlingar till Regional etikprövningsnämnd, Läkemedelsverket och Datainspektionen. Hur man skriver en etikansökan och författar en patientinformation. Hur man gör för att registrera en prövning i ett Clinical Trial Registry samt regler för publicering. Praktiska GCP-råd på hur man genomför en klinisk prövning. Kursen lämpar sig också väl för de som bedriver klinisk registerforskning.
Teaching and learning activities : Föreläsningar, diskussioner och seminarier samt examinationsuppgift (studiesynopsis, etikansökan och patientinformation).
Examination : Doktorandens examinationsuppgift kommer att bedömas och diskuteras i seminarieform.
Compulsory elements : Närvaro vid undervisning/seminarier samt inlämning av examinationsuppgift (studiesynopsis, etikansökan och patientinformation). Vid frånvaro från schemalagda aktiviteter måste deltagaren genom kompletterade extra inlämningsuppgift kunna styrka motsvarande inhämtning av kunskap.
Number of students : 10 - 30
Selection of students : Urvalet baseras på 1) kursplanens relevans för den sökandes doktorandprojekt (enligt motivering), 2) startdatum för doktorandstudier
More information : Kursen består av föreläsningar och arbete i seminarieform på Danderyds sjukhus. Examinationsuppgiften (studiesynopsis, etikansökan och patientinformation) genomförs delvis som individuellt arbete 2022-01-30--02-02 (företrädesvis eftermiddagar) och lämnas därefter in för individuell bedömning och återkoppling. Examinationsuppgiften kommer också att diskuteras i i grupp och bedömas i seminarieform.

Course responsible :
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Title : Human Physiology - an overview

Course number : 2644
Credits : 3.0
Date : 2024-01-22 -- 2024-02-02
Language : English
Level : Doctoral level
Responsible KI department : Department of Physiology and Pharmacology
Specific entry requirements :
Purpose of the course : KI is a medical university with research and education in medicine and health. All PhD students have to obtain basic knowledge regarding the human body in health and disease in case they lack basic higher education knowledge in the field of medicine. The aim of the course is to give PhD students without a medical background a basic overview and introduction to human physiology. The students will gain a basic understanding of how the human organ systems function and interact under normal conditions. The content covered in this course will be useful for further studies where knowledge about human biology is of value.
Intended learning outcomes : After completing the course, the student will gain a basic understanding of how the human organ systems function and interact under normal conditions. The content covered in this course will be useful for further studies where knowledge about human biology is of value. More specifically, the student will be able to: - Demonstrate knowledge and understanding of basic functions and interactions between organ systems in the human body. - Demonstrate a critical and scientific approach to literature sources for the different course tasks.
Contents of the course : - Overview of cellular and integrative physiology - Basic anatomy - Biochemistry and cell biology - Nervous system - Endocrinology - Digestive system - Cardiovascular physiology - Renal physiology - Respiration - Basic immunology
Teaching and learning activities : Different learning methods such as problem based learning, lectures and a hands-on human lab session will be used. Full time during two consecutive weeks.
Examination : To pass the course, the student must demonstrate that the learning outcomes have been achieved. Oral and written examinations are used for student assessment.
Compulsory elements : Examinations and the hands-on human lab are required. Students that are absent during the quiz or the lab must perform a make-up quiz/lab. Students that are absent from the exam or do not obtain a passing grade in the first examination will be offered a second examination.
Number of students : 15 - 20
Selection of students : Selection will be based on 1) the relevance of the course syllabus for the applicant's doctoral project (according to written motivation), 2) start date of doctoral studies (priority given to earlier start date)
More information : This course will take place at the Solna campus.

Course responsible :
Stefan Reitzner
Institutionen för fysiologi och farmakologi

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Contact person :
-

Title : Introduction to Qualitative Methods

Course number : 2673
Credits : 4.0
Date : 2024-03-12 -- 2024-04-26
Language : English
Level : Doctoral level
Responsible KI department : Department of Neurobiology, Care Sciences and Society
Specific entry requirements :
Purpose of the course : The aim of the course is that the participants acquire basic knowledge about qualitative research methods including ethical aspects. Hereby the course provides a good foundation for methodological choices and further development of knowledge of specific qualitative methods. The course is suitable for PhD students who plan to use qualitative methods in their thesis as well as for PhD students who do not have qualitative studies in their research plan.
Intended learning outcomes : When completing the course the student should be able to: - Account for the underpinning principles for decisions regarding choice of research methods in general, and in qualitative data collection and data analysis specifically. - Reason scientifically about trustworthiness, credibility and validity in qualitative research. - Account for what characterizes qualitative data and the research questions qualitative methods can answer. - Reason scientifically about different methods of data collection and analysis in relationship to qualitative data and about the relevance of qualitative methods in health care sciences. - Formulate a research question, related to his/her own research area, which can be answered with qualitative methods.
Contents of the course : - Scientific and philosophical foundations of qualitative research. - Methods for qualitative data collection and analysis that are commonly used in health care sciences. - Credibility and validity in qualitative research. - Ethics in qualitative research
Teaching and learning activities : The course uses various teaching methods such as lectures, seminars, group work, individual work, peer-learning and self-study work.
Examination : The course is formative examined through active participation in seminars. The course is summative examined through an individual written assignemnt, an oral presentation of the assignment and peer-review of a fellow student's assignment.
Compulsory elements : Participation in lectures and seminars is mandatory. Absence from seminars is compensated by a written review on a topic related to the seminar content.
Number of students : 10 - 22
Selection of students : Selection will be based on 1) the relevance of the course syllabus for the applicant's doctoral project (according to written motivation), 2) start date of doctoral studies (priority given to earlier start date)
More information : The course starts on 12/3 with individual work preparing for teaching activities. Teaching activities include:
 13/3-14/3 learning activities at KI.
 21/3 - 22/3 learning activities on zoom.
 26/3 learning activities on zoom.
 8/4-9/4 learning activities at KI.
 19/4 learning activities at KI.
 19/4-26/4 individual work with examination assignment.
 The total workload corresponds to approximately 2,5 weeks.

Course responsible :
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Contact person :
Karin Johansson
Institutionen för neurobiologi, vårdvetenskap och samhälle

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Title : Basic Laboratory Safety

Course number : 2690
Credits : 1.8
Date : 2024-01-29 -- 2024-02-09
Language : English
Level : Doctoral level
Responsible KI department : Department of Microbiology, Tumor and Cell Biology
Specific entry requirements : Experience of and/or education in laboratory work.
Purpose of the course : The purpose of the course is to enable the students to obtain an understanding of risks and of principles in safety measures in the medical science laboratory, as well as a consciousness about general and individual responsibilities for the planning and execution of applicable safety measures. The purpose is also to develop skills in performing risk analyses and writing up risk assessments.
Intended learning outcomes : After completing the course, you should be able to: • understand the regulatory framework that governs laboratory safety including the chain of responsibilities • apply the KI rules and routines for laboratory work. • apply the KI routines for waste management and transport. • apply appropriate safety measures. • demonstrate risk awareness by assessing the risks associated with experiments involving chemicals, microbiological agents, cell cultures and human blood/tissues in the laboratory.
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, biosafety measures including personal protection devices, ventilated workplaces, genetically modified microorganisms, biosecurity and dual use, transport of dangerous goods and waste management.
Teaching and learning activities : The mandatory "KI’s Laboratory Safety Introduction for laboratory personnel" is an integral part of this course. In addition, there will be teaching and learning activities such as lectures, group discussions, practical sessions, web-tutorials, quizzes and mentimeter exercises. The course is six days in total.
Examination : The examination is based on an individual written examination, a risk assessment assignment and the active participation and contribution in an oral presentation. The student's certificate of "KI’s Laboratory Safety Introduction for laboratory personnel" needs to be uploaded in the Canvas platform for the course.
Compulsory elements : -Completion with certificate of "KI’s Laboratory Safety Introduction for laboratory personnel". -Completion of mandatory self-tests/quizzes -Presence during course activities, marked as mandatory in the 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) the relevance of the course syllabus for the applicant's doctoral project (according to written motivation), 2) start date of doctoral studies (priority given to earlier start date)
More information : The course is at half speed over two weeks. The course is given on site, Campus Solna.

Course responsible :
Maria Johansson
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Contact person :
Christina Johansson
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Title : Basic Laboratory Safety

Course number : 2690
Credits : 1.8
Date : 2024-04-15 -- 2024-04-26
Language : English
Level : Doctoral level
Responsible KI department : Department of Microbiology, Tumor and Cell Biology
Specific entry requirements : Experience of and/or education in laboratory work.
Purpose of the course : The purpose of the course is to enable the students to obtain an understanding of risks and of principles in safety measures in the medical science laboratory, as well as a consciousness about general and individual responsibilities for the planning and execution of applicable safety measures. The purpose is also to develop skills in performing risk analyses and writing up risk assessments.
Intended learning outcomes : After completing the course, you should be able to: • understand the regulatory framework that governs laboratory safety including the chain of responsibilities • apply the KI rules and routines for laboratory work. • apply the KI routines for waste management and transport. • apply appropriate safety measures. • demonstrate risk awareness by assessing the risks associated with experiments involving chemicals, microbiological agents, cell cultures and human blood/tissues in the laboratory.
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, biosafety measures including personal protection devices, ventilated workplaces, genetically modified microorganisms, biosecurity and dual use, transport of dangerous goods and waste management.
Teaching and learning activities : The mandatory "KI’s Laboratory Safety Introduction for laboratory personnel" is an integral part of this course. In addition, there will be teaching and learning activities such as lectures, group discussions, practical sessions, web-tutorials, quizzes and mentimeter exercises. The course is six days in total.
Examination : The examination is based on an individual written examination, a risk assessment assignment and the active participation and contribution in an oral presentation. The student's certificate of "KI’s Laboratory Safety Introduction for laboratory personnel" needs to be uploaded in the Canvas platform for the course.
Compulsory elements : -Completion with certificate of "KI’s Laboratory Safety Introduction for laboratory personnel". -Completion of mandatory self-tests/quizzes -Presence during course activities, marked as mandatory in the 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) the relevance of the course syllabus for the applicant's doctoral project (according to written motivation), 2) start date of doctoral studies (priority given to earlier start date)
More information : The course is at half speed over two weeks. The course is given on site, Campus Solna.

Course responsible :
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Contact person :
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Title : Intermediate Medical Statistics: Regression Models

Course number : 2738
Credits : 3.0
Date : 2024-04-22 -- 2024-05-03
Language : English
Level : Doctoral level
Responsible KI department : Department of Learning, Informatics, Management and Ethics
Specific entry requirements : Basic Medical Statistics (or equivalent)
Purpose of the course : The aim of the course is to introduce intermediate statistical methods and to facilitate acquirement of skills that involve hands-on data analysis using statistical software.
Intended learning outcomes : After successfully completing this course students are expected to be able to: Understand the basic theory behind the statistical methods introduced in the course and to evaluate their applicability and limitations. Choose a suitable statistical model for assessing a specific research hypothesis using data from a medical science study, evaluate the fit of the model, and interpret the results. Apply the methods discussed in the course on real data.
Contents of the course : The course is an introduction to more advanced statistical methods and requires that the student is familiar with the statistical concepts of descriptive and inferential statistics and has some basic knowledge of linear regression. The course covers multiple linear regression, analysis of variance, logistic regression, and introduction to survival analysis. Concepts examined in this course include dummy variables, interaction between variables, influential observations, collinearity and model selection.
Teaching and learning activities : The course consists of lectures, group discussions and assignments solved individually and in groups. Some group discussions and exercises are compulsory.
Examination : Assessment of the intended learning outcomes by a passing grade on the computer based exercises, and active participation in the final seminar and article presentations.
Compulsory elements : Computer based exercises, seminars, article presentations and some lectures are mandatory. The course leader assesses whether and if so, how absence can be compensated.
Number of students : 18 - 20
Selection of students : Selection will be based on 1) the relevance of the course syllabus for the applicant's doctoral project (according to written motivation), 2) start date of doctoral studies (priority given to earlier start date)
More information : This is on-campus course and the students are expected to be physically present for two weeks. The course will consist of three or four scheduled whole days per week for two weeks. Course dates are: April 22, 23, 25, 26, 29, 30 and May 3.

Course responsible :
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Contact person :
Nora Espahbodi
Institutionen för lärande, informatik, management och etik

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Title : Translational Medicine in the Field of Autoimmunity - an Overview

Course number : 2760
Credits : 3.0
Date : 2024-05-20 -- 2024-06-05
Language : English
Level : Doctoral level
Responsible KI department : Department of Medicine, Solna
Specific entry requirements : Basic knowledge in immunology is required.
Purpose of the course : The purpose of the course is for the students to be able to integrate their knowledge in immunology within the context of human autoimmune disease and treatment. The student should get a deeper understanding of immunological similarities and differences across various autoimmune diseases, and how clinical and translational research is conducted. The student will also get a unique patient perspective on autoimmune disease and research.
Intended learning outcomes : After completing the course, the students should be able to: -Explain immunological concepts and processes in the context of human autoimmune disease. -Formulate research questions in relation to a clinical- and patient perspective. -Discuss: a) parallels and distinctions between different autoimmune diseases, b) patient heterogeneity, and c) different clinical phases of a disease. -Summarise and present research findings in the field of autoimmunity in a clear and concise manner.
Contents of the course : The course covers immunological concepts and processes in autoimmune disorders. The students will be introduced to a number of chronic autoimmune diseases described from bedside to laboratory, including rheumatoid arthritis, systemic lupus erythematosus, multiple sclerosis, skin autoimmunity, and type I diabetes. An overview of the clinical and molecular basics will be followed by a face-to-face patient-interaction, where patients describe how it is to live with an autoimmune condition, and to what extent daily life is affected. Additionally, the course will cover insights into genetic and environmental risk factors, and the role of clinical trials and patient registries – from a translational perspective – in advancing knowledge about these chronic disorders.
Teaching and learning activities : The course is divided into two blocks of three plus three full days, comprising lectures, seminars and interactive patient-meetings/-discussions, with compulsory reading and an individual written assignment as well as a group assignment on the additional days of the course. There are also some online assignments to be completed before the first block of lectures/seminars starts. A poster session, where the students present their group assignments, will conclude the course.
Examination : The course examination includes the individual written assignment and the group assignment / poster presentation of selected topics covering cellular or molecular aspects related to autoimmune disease. The oral poster presentations will be conducted in groups of two to four students. The specific learning outcomes of the course will be subjected to critical review, in-person feedback, and individual assessment.
Compulsory elements : Attendance during the three plus three days is mandatory. Absence (to some extent) can be compensated by an individually written report after agreement with the course leader. The online assignments, the individual assignment (i.e. writing a short popular science article), reading of scientific articles, related group-discussions and the poster presentation, as well as giving feedback to fellow-students on the assignments, is also mandatory.
Number of students : 8 - 30
Selection of students : Selection will be based on 1) the relevance of the course syllabus for the applicant's doctoral project (according to written motivation), 2) start date of doctoral studies (priority given to earlier start date)
More information : The course will be given in two blocks with lectures and seminars: May 20-22 (Monday to Wednesday) and June 3-5 (Monday to Wednesday). Time between the blocks will need to be dedicated to individual and group learning assignments equivalent to four days work.

Course responsible :
Karin Lundberg
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Contact person :
Caroline Grönwall
Institutionen för medicin, Solna

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Title : Present Your Research!

Course number : 2787
Credits : 1.5
Date : 2024-02-05 -- 2024-02-09
Language : English
Level : Doctoral level
Responsible KI department : Department of Women's and children's health
Specific entry requirements : None
Purpose of the course : The purpose of the course is to foster excellence in research communication by empowering doctoral students to communicate their research results more effectively and confidently. The overall aim of the course is to improve the participants' practical and theoretical skills in designing and delivering convincing research presentations.
Intended learning outcomes : After attending the course, the doctoral student should be able to: 1. Plan, design, and deliver a presentation taking both the topic and audience into consideration. 2. Present their research effectively in front of an audience by utilizing delivery skills like body language, vocal variety, pace of speech, and eye contact. 3. Design and use supportive media, e.g., a scientific poster and presentation slides. 4. Build trust and interact with the audience, including answering questions. 5. Use strategies to manage presentation stress to more confidently present their research. 6. Critically assess their own presentations, both in terms of performance and design, as well as that of others. 7. Reflect on own learning and development during the course.
Contents of the course : The following topics will be covered: 1. Creating presentations (e.g., elevator pitch, poster, presentation slides) including goal setting, structure, and design. 2. Giving presentations (using a poster and PowerPoint slides) in front of an audience. 3. Use of supportive media to enhance a presentation. 4. Strategies to manage presentation stress and to present with more confidence and clarity as well as remembering what you want to say. 5. Building trust and interacting with the audience, including answering questions. 6. Effective communication with the audience, including body language, posture, vocal variety, pace of speech, eye contact, and addressing different learning styles. 7. Catching the audience's attention and keeping them engaged. 8. The most common reasons for ineffective presentations and how to avoid them. 9. How to adapt a presentation to different audiences, including language and the choice of illustrations. 10. Keeping the time when presenting. 11. Giving, receiving, and processing constructive feedback on presentations with a focus on personalized guidance.
Teaching and learning activities : Lectures, written assignments, workshops, coaching, filming, group work, and practical exercises in groups.
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, d. Filmclip of own presentation
Compulsory elements : All parts of the course are mandatory including: a. Poster presentation b. Power Point presentation c. Elevator Pitch d. Giving feedback on the other students' presentations e. Filming of own presentation
Number of students : 18 - 22
Selection of students : Selection will be based on 1) the relevance of the course syllabus for the applicant's doctoral project (according to written motivation), 2) start date of doctoral studies (priority given to earlier start date)
More information : The course is in two parallel formats: in-person (in a venue in central Stockholm) and online. Please state your preferences (if any) in the comments field. All lectures are live, real-time, and according to schedule (no pre-recorded lectures).
 The scope of the course is research presentations in different contexts and formats. You will practice presenting your research project (or research of your choice) and other topics to approach presentation skills from different angles. This is a highly interactive course with a multitude of exercises aiming at taking your presentations to the next level while identifying your individual strengths. The focus is on developing each student's authentic and personal style of presenting rather than applying a "one-size-fits-all" template. Furthermore, we will deal with nervousness and other challenges you might face when presenting. The teachers focus on creating a safe environment where the students can practice and try out new presentation approaches and techniques.
 Please address ALL questions to: anna.hildenbrand.michelman@ki.se or phone: 0707890607

Course responsible :
Kristina Gemzell Danielsson
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Contact person :
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Title : Present Your Research!

Course number : 2787
Credits : 1.5
Date : 2024-03-18 -- 2024-03-22
Language : English
Level : Doctoral level
Responsible KI department : Department of Women's and children's health
Specific entry requirements : None
Purpose of the course : The purpose of the course is to foster excellence in research communication by empowering doctoral students to communicate their research results more effectively and confidently. The overall aim of the course is to improve the participants' practical and theoretical skills in designing and delivering convincing research presentations.
Intended learning outcomes : After attending the course, the doctoral student should be able to: 1. Plan, design, and deliver a presentation taking both the topic and audience into consideration. 2. Present their research effectively in front of an audience by utilizing delivery skills like body language, vocal variety, pace of speech, and eye contact. 3. Design and use supportive media, e.g., a scientific poster and presentation slides. 4. Build trust and interact with the audience, including answering questions. 5. Use strategies to manage presentation stress to more confidently present their research. 6. Critically assess their own presentations, both in terms of performance and design, as well as that of others. 7. Reflect on own learning and development during the course.
Contents of the course : The following topics will be covered: 1. Creating presentations (e.g., elevator pitch, poster, presentation slides) including goal setting, structure, and design. 2. Giving presentations (using a poster and PowerPoint slides) in front of an audience. 3. Use of supportive media to enhance a presentation. 4. Strategies to manage presentation stress and to present with more confidence and clarity as well as remembering what you want to say. 5. Building trust and interacting with the audience, including answering questions. 6. Effective communication with the audience, including body language, posture, vocal variety, pace of speech, eye contact, and addressing different learning styles. 7. Catching the audience's attention and keeping them engaged. 8. The most common reasons for ineffective presentations and how to avoid them. 9. How to adapt a presentation to different audiences, including language and the choice of illustrations. 10. Keeping the time when presenting. 11. Giving, receiving, and processing constructive feedback on presentations with a focus on personalized guidance.
Teaching and learning activities : Lectures, written assignments, workshops, coaching, filming, group work, and practical exercises in groups.
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, d. Filmclip of own presentation
Compulsory elements : All parts of the course are mandatory including: a. Poster presentation b. Power Point presentation c. Elevator Pitch d. Giving feedback on the other students' presentations e. Filming of own presentation
Number of students : 18 - 22
Selection of students : Selection will be based on 1) the relevance of the course syllabus for the applicant's doctoral project (according to written motivation), 2) start date of doctoral studies (priority given to earlier start date)
More information : The course is in two parallel formats: in-person (in a venue in central Stockholm) and online. Please state your preferences (if any) in the comments field. All lectures are live, real-time, and according to schedule (no pre-recorded lectures).
 The scope of the course is research presentations in different contexts and formats. You will practice presenting your research project (or research of your choice) and other topics to approach presentation skills from different angles. This is a highly interactive course with a multitude of exercises aiming at taking your presentations to the next level while identifying your individual strengths. The focus is on developing each student's authentic and personal style of presenting rather than applying a "one-size-fits-all" template. Furthermore, we will deal with nervousness and other challenges you might face when presenting. The teachers focus on creating a safe environment where the students can practice and try out new presentation approaches and techniques.
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Title : Present Your Research!

Course number : 2787
Credits : 1.5
Date : 2024-04-15 -- 2024-04-19
Language : English
Level : Doctoral level
Responsible KI department : Department of Women's and children's health
Specific entry requirements : None
Purpose of the course : The purpose of the course is to foster excellence in research communication by empowering doctoral students to communicate their research results more effectively and confidently. The overall aim of the course is to improve the participants' practical and theoretical skills in designing and delivering convincing research presentations.
Intended learning outcomes : After attending the course, the doctoral student should be able to: 1. Plan, design, and deliver a presentation taking both the topic and audience into consideration. 2. Present their research effectively in front of an audience by utilizing delivery skills like body language, vocal variety, pace of speech, and eye contact. 3. Design and use supportive media, e.g., a scientific poster and presentation slides. 4. Build trust and interact with the audience, including answering questions. 5. Use strategies to manage presentation stress to more confidently present their research. 6. Critically assess their own presentations, both in terms of performance and design, as well as that of others. 7. Reflect on own learning and development during the course.
Contents of the course : The following topics will be covered: 1. Creating presentations (e.g., elevator pitch, poster, presentation slides) including goal setting, structure, and design. 2. Giving presentations (using a poster and PowerPoint slides) in front of an audience. 3. Use of supportive media to enhance a presentation. 4. Strategies to manage presentation stress and to present with more confidence and clarity as well as remembering what you want to say. 5. Building trust and interacting with the audience, including answering questions. 6. Effective communication with the audience, including body language, posture, vocal variety, pace of speech, eye contact, and addressing different learning styles. 7. Catching the audience's attention and keeping them engaged. 8. The most common reasons for ineffective presentations and how to avoid them. 9. How to adapt a presentation to different audiences, including language and the choice of illustrations. 10. Keeping the time when presenting. 11. Giving, receiving, and processing constructive feedback on presentations with a focus on personalized guidance.
Teaching and learning activities : Lectures, written assignments, workshops, coaching, filming, group work, and practical exercises in groups.
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, d. Filmclip of own presentation
Compulsory elements : All parts of the course are mandatory including: a. Poster presentation b. Power Point presentation c. Elevator Pitch d. Giving feedback on the other students' presentations e. Filming of own presentation
Number of students : 18 - 22
Selection of students : Selection will be based on 1) the relevance of the course syllabus for the applicant's doctoral project (according to written motivation), 2) start date of doctoral studies (priority given to earlier start date)
More information : The course is in two parallel formats: in-person (in a venue in central Stockholm) and online. Please state your preferences (if any) in the comments field. All lectures are live, real-time, and according to schedule (no pre-recorded lectures).
 The scope of the course is research presentations in different contexts and formats. You will practice presenting your research project (or research of your choice) and other topics to approach presentation skills from different angles. This is a highly interactive course with a multitude of exercises aiming at taking your presentations to the next level while identifying your individual strengths. The focus is on developing each student's authentic and personal style of presenting rather than applying a "one-size-fits-all" template. Furthermore, we will deal with nervousness and other challenges you might face when presenting. The teachers focus on creating a safe environment where the students can practice and try out new presentation approaches and techniques.
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Course responsible :
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Title : Present Your Research!

Course number : 2787
Credits : 1.5
Date : 2024-05-27 -- 2024-05-31
Language : English
Level : Doctoral level
Responsible KI department : Department of Women's and children's health
Specific entry requirements : None
Purpose of the course : The purpose of the course is to foster excellence in research communication by empowering doctoral students to communicate their research results more effectively and confidently. The overall aim of the course is to improve the participants' practical and theoretical skills in designing and delivering convincing research presentations.
Intended learning outcomes : After attending the course, the doctoral student should be able to: 1. Plan, design, and deliver a presentation taking both the topic and audience into consideration. 2. Present their research effectively in front of an audience by utilizing delivery skills like body language, vocal variety, pace of speech, and eye contact. 3. Design and use supportive media, e.g., a scientific poster and presentation slides. 4. Build trust and interact with the audience, including answering questions. 5. Use strategies to manage presentation stress to more confidently present their research. 6. Critically assess their own presentations, both in terms of performance and design, as well as that of others. 7. Reflect on own learning and development during the course.
Contents of the course : The following topics will be covered: 1. Creating presentations (e.g., elevator pitch, poster, presentation slides) including goal setting, structure, and design. 2. Giving presentations (using a poster and PowerPoint slides) in front of an audience. 3. Use of supportive media to enhance a presentation. 4. Strategies to manage presentation stress and to present with more confidence and clarity as well as remembering what you want to say. 5. Building trust and interacting with the audience, including answering questions. 6. Effective communication with the audience, including body language, posture, vocal variety, pace of speech, eye contact, and addressing different learning styles. 7. Catching the audience's attention and keeping them engaged. 8. The most common reasons for ineffective presentations and how to avoid them. 9. How to adapt a presentation to different audiences, including language and the choice of illustrations. 10. Keeping the time when presenting. 11. Giving, receiving, and processing constructive feedback on presentations with a focus on personalized guidance.
Teaching and learning activities : Lectures, written assignments, workshops, coaching, filming, group work, and practical exercises in groups.
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, d. Filmclip of own presentation
Compulsory elements : All parts of the course are mandatory including: a. Poster presentation b. Power Point presentation c. Elevator Pitch d. Giving feedback on the other students' presentations e. Filming of own presentation
Number of students : 18 - 22
Selection of students : Selection will be based on 1) the relevance of the course syllabus for the applicant's doctoral project (according to written motivation), 2) start date of doctoral studies (priority given to earlier start date)
More information : The course is in two parallel formats: in-person (in a venue in central Stockholm) and online. Please state your preferences (if any) in the comments field. All lectures are live, real-time, and according to schedule (no pre-recorded lectures).
 The scope of the course is research presentations in different contexts and formats. You will practice presenting your research project (or research of your choice) and other topics to approach presentation skills from different angles. This is a highly interactive course with a multitude of exercises aiming at taking your presentations to the next level while identifying your individual strengths. The focus is on developing each student's authentic and personal style of presenting rather than applying a "one-size-fits-all" template. Furthermore, we will deal with nervousness and other challenges you might face when presenting. The teachers focus on creating a safe environment where the students can practice and try out new presentation approaches and techniques.
 Please address ALL questions to: anna.hildenbrand.michelman@ki.se or phone: 0707890607

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

Course number : 2858
Credits : 3.0
Date : 2024-05-13 -- 2024-05-24
Language : English
Level : Doctoral level
Responsible KI department : Department of Learning, Informatics, Management and Ethics
Specific entry requirements : Knowledge about regression models. Experience in R, SPSS, STATA or SAS.
Purpose of the course : The aim of the course is to introduce statistical models and methods for the analysis of longitudinal data and to develop statistical skills of analyzing dependent data.
Intended learning outcomes : After successful completion of the course the student will be able to: 1. Understand the underlying characteristics of longitudinal data 2. Identify appropriate tests for longitudinal studies 3. Manage longitudinal datasets and prepare these for statistical analysis using statistical software program R or SPSS 4. Apply both simple and complex statistical methods of longitudinal data 5. Use R or 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, R or 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) start date of doctoral studies (priority given to earlier start date). Please make sure that you have entered the correct start date for doctoral education in your personal profile. 2) the relevance of the course syllabus for the applicant's doctoral project/post doctoral research (according to written motivation).
More information : This is an on-campus course which will consist of five scheduled days per week for two weeks. Attendance is mandatory. The course leader assesses whether and if so, how absences can be compensated.

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

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

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Title : Biomedical Ecology - The Microbiota in Health and Disease

Course number : 2861
Credits : 1.5
Date : 2024-05-20 -- 2024-05-24
Language : English
Level : Doctoral level
Responsible KI department : Department of Microbiology, Tumor and Cell Biology
Specific entry requirements :
Purpose of the course : To support the acquisition of a broad knowledge and systematic understanding of the composition and function of the human microbiota, how it might be related to diseases and health, and what is the potential host-microbe cross-talk. To introduce tools and methodologies that will enable the participants of the course to study the microbiota.
Intended learning outcomes : After finishing the course the student should be able to: - describe major functions of the human-associated microbiota as the largest metabolic "organ" in the body, and reflect on its cross-talk with the host at various body sites - explain how the microbiota is established after birth and how it changes during different stages of life - formulate the impact of the microbiota on the development and function of the immune system - hypothesize on how environmental factors could disturb the composition or function of the microbiota and how such changes might impact health or disease - describe different methods to study the microbiota, including basic data analyses - interpret findings in typical microbiota publications - design a microbiota study
Contents of the course : The course will cover many aspects of the composition and function of the microbiota from different body sites and during life, how it might be correlated to diseases and health, and potential host-microbe crosstalk. Sequencing techniques and principles for basic bioinformatics data analyses will be introduced and compared to biochemical methods. Hands on experience on culturing different E.coli strains from own gut microbiota will be gained. Novel findings will be discussed with lecturers in the research front-line on the translational topics of microbiota in relation to human diseases. The course is suitable for clinical and pre-clinical doctoral students and researchers for which the microbiota is of significance.
Teaching and learning activities : The course combines lectures, student workshops, journal club discussion and practical laboratory work as follows: -lectures by well established front-line researchers in their respective fields, -laboratory sessions covering analysis of the students' own intestinal E. coli from gut microbiota, -workshops/combined with focused literature studies within defined areas which will be summarized in terms of student seminars, -Journal club discussing microbiota publications with lecturers and peers. -peer learning using the competence of the lecturers and course attendees.
Examination : Summative examination includes laboratory work and student presentations that are evaluated by the respective tutor at the specific course module.
Compulsory elements : Laboratory work and student seminars. Participants that are absent from the laboratory part and seminars will have to present a written paper on the subject and in agreement with the indications of the course director.
Number of students : 8 - 30
Selection of students : Selection will be based on 1) the relevance of the course syllabus for the applicant's doctoral project (according to written motivation), 2) start date of doctoral studies (priority given to earlier start date)
More information : The course will be hosted at Biomedicum.

Course responsible :
Juan Du
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Contact person :
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Stefanie Prast-Nielsen
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Title : Microscopy: Improve Your Imaging Skills - From Sample Preparation to Image Analysis

Course number : 2870
Credits : 6.0
Date : 2024-01-29 -- 2024-02-16
Language : English
Level : Doctoral level
Responsible KI department : Department of Biosciences and Nutrition
Specific entry requirements : The applicants must a) have an active microscopy project involving imaging of a fluorescent sample, started minimum 3 months prior to the start of the course; b) be able to prepare their sample and bring it to the course; c) In their lab or local facility, have been trained on and have regularly used a microscope able to acquire images of fluorescent samples d) have access to that microscope during the course (some assignments require submitting new images); e) set aside time so they can be fully committed to the course for 3 weeks, including the equivalent of about 2 days of work before the course (includes preparing their samples). The applications must contain the following 4 parts: 1) the confirmation that the applicants fulfil the a, b, c, d and e conditions listed above; 2) a brief description of the scientific aim of their own imaging projects; 3) a brief description of their microscopy experience so far, when they started their current microscopy project and which microscope(s) they currently use; 4) fluorescent images of their sample acquired by them on the microscope mentioned above and submitted in the original format delivered by the microscope (please write to Anna Wallén (Anna.Wallen@ki.se) to ask for a link to upload your original images). Applications will only be considered when all these 4 points are present. Researchers who have not yet used microscopy or do not have an active microscopy project are advised to get trained at their local imaging facility, actively acquire images for at least 3 months then apply to the LCI course next year.
Purpose of the course : The aim of this course is to enable PhD students and researchers who have recently acquired images of fluorescent samples but feel insecure about their microscopy skills and knowledge, to become proficient in designing and performing microscopy for their OWN project. The course is NOT aimed at training people to use the LCI facility microscopes. The focus is instead on enabling the students to acquire enough theoretical and practical knowledge to 1) make their scientific question compatible with extracting data from fluorescence images, 2) assess and if needed improve the preparation of their OWN sample to help reliable extraction of meaningful data, 3) assess and if needed improve the imaging settings in their OWN software and on their OWN microscope, available in their lab/facility. The aim of the course is to provide the students with the tools to acquire on ANY wide field, confocal or light sheet microscope, images of their samples that reliably answer their scientific question.
Intended learning outcomes : At the end of the course, the participants should be able to: 1- Scientific question: Formulate their scientific question in terms of which parameters in the image need to be measured and which image resolution is required to enable this measurement. 2- Sample preparation: Assess how their own sample corresponds to/deviates from a perfect sample for light microscopy, justify why they are preparing their sample the way they do, and infer what they can do to improve it. 3- Microscope: Explain how their own microscope works and argue why this is the most suitable type of microscope to answer their scientific question, or why a different type of microscope would be more adequate. 4- Objective: Justify why the objective they use is adequate to answer their scientific question or why another objective would work better. 5- Sampling: Calculate if the pixel size in their images fulfils the Nyquist sampling theorem, explain why this is appropriate for their experiment or which sampling settings would work better. 6- Artifacts: Identify typical pitfalls that prevent reliable data extraction from microscopy images (saturation, bleedthrough, undersampling), explain why they are a problem and which settings can be adjusted to avoid them.
Contents of the course : The course content covers the whole process of producing scientific results for an experiment requiring light microscopy: formulation of the scientific question, sample preparation, choice of microscope, objective and settings for acquisition, image format and management, image processing for data extraction, preparation of figures and text for publication, ethics. The course is fully designed so that, during the course, the students apply all the points above to their OWN project, sample and equipment. The students never use the microscopes at our facility. Aside from the points described in the Learning Outcomes, the participants will be able to learn the following: - The differences (theory and hardware) between wide field, confocal and light sheet microscopes as well as the different types of confocal microscopes - How to pick the best combination of fluorophores for their own sample on their own microscope, identify and eliminate bleed-through and cross-excitation problems - How to find the area of interest in their sample without bleaching it - How to adjust the condenser for proper transmitted light imaging - How to set the following microscope parameters: resolution, pixel size, averaging, scan speed, illumination power, detector gain and offset, camera readout rate, exposure time and binning - Many practical tricks about fixation, mounting and handling of their sample in a way that is optimal for imaging - How to deal with the challenges of imaging fluorescent volumes - What hardware or software autofocus, spectral detector, resonance scanner, two-photon or super resolution microscopy are used for - Many personalized tips on how to improve the preparation and imaging of their own sample on their own microscope (through the workshop where we will image their own sample) - Where to get help to create an image analysis pipeline for their own images and scientific question - The ethics of handling scientific images for publication - How to easily assemble a figure for publications
Teaching and learning activities : Lectures, videos, workshops, group discussions, project presentations, quizzes, assignments and portfolio. The students must prepare their own sample before the course starts and need

to plan accordingly. The course is intensive and requires a few days of work before the course starts as well as a few days afterwards to prepare and submit the final portfolio.
Examination : The final mark (pass or fail) will depend on the way the students demonstrate in the daily, weekly and final portfolio assignments that they have reached the Intended Learning Outcomes.
Compulsory elements : Attendance to all sessions is compulsory. Any absence must be reported to the course leader in advance by e-mail. Absence from any part of the course (lectures, laboratory sessions, discussion sessions and exam) is generally not accepted but could in exceptional cases be compensated by a written additional assignment to ensure the learning outcomes of the day have been reached. If it is not possible to compensate, the student will be given the chance to complete the course by attending the missing sessions the following year.
Number of students : 12 - 20
Selection of students : The selection will be based on the applicants' project and recent microscopy experience, their potential to follow the course and fulfil the imaging assignments, and the usefulness of the course to their current research project.
More information : This is an intensive course. Do not plan any experiments or meetings during the 3 weeks of the course itself. Plan to need some time before and after the course. If you have several projects, describe only the most relevant in the application and prepare the corresponding sample for the course.

Course responsible :
Sylvie Le Guyader
Institutionen för biovetenskaper och näringslära

Sylvie.Le.Guyader@ki.se

Contact person :
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Title : Pragmatic randomised controlled trials in healthcare

Course number : 2917
Credits : 4.5
Date : 2024-04-08 -- 2024-05-17
Language : English
Level : Doctoral level
Responsible KI department : Department of Global Public Health
Specific entry requirements : Participants should have completed an introductory course in either epidemiology, biostatistics or quantitative research methods.
Purpose of the course : This course will enable students to to learn about the key elements of a randomised controlled trial (RCT), what a pragmatic trial is, why it is relevant, how to develop a protocol for a pragmatic RCT, issues in the conduct of an RCT, from writing up the protocol to trial close out. The student will also learn about ethical issues in trials, reporting trials, and nesting relevant studies in a trial. The course is particularly useful for those students with an interest in evaluating pragmatic interventions in healthcare using a randomised trial design and those interested in trials from an epidemiological method perspective.
Intended learning outcomes : At the end of the course, the student should be able to: - Understand the continuum from Explanatory to pragmatic randomized trials - the PRECIS tool. - Understand what makes a trial pragmatic and the relevance of pragmatic trials - Know the CONSORT criteria for reporting of pragmatic randomized trials - Describe the elements of a trial protocol and demonstrate this through development of a pragmatic trial protocol - Have knowledge of PICOT to frame the research question and identify the primary and secondary outcomes - Explain the principles, methods and relevance of randomization and allocation concealment - Describe recruitment strategies, trial governance, quality assurance and control, participant retention and adherence - Dealing with serious adverse events in a pragmatic trial - Describe the data management process including data and safety monitoring plan, data analysis (predefined and post hoc analyses), different data types, measures of effect - Explain the handling of serious adverse events in a pragmatic trial - Explain the ethical principles in conducting RCTs - Know how to embed qualitative studies and economic assessments into pragmatic trials - Understand the practicalities of conducting RCTs - Explain the challenges of conducting a RCT - Demonstrate the ability to develop a protocol for a pragmatic RCT.
Contents of the course : The course is divided into six sections with the following content: Section 1 This is an introduction to different types of randomized controlled trials (RCTs) with particular emphasis on pragmatic randomized controlled trials (pRCTs). We will explain the reasons why one would do a pragmatic RCT and what makes them a special case of randomized controlled trials. We will introduce you to the frameworks for designing and reporting pRCTs, PRECIS and the CONSORT extension for pRCTS. The student will be be guided on working on the first stages of a trial protocol. Section 2:The focus of the course this section is the basic elements of the design of a trial: the research question, the population and setting included in the students study; the intervention and the comparison; the outcomes used to measure the effects of the intervention; and the study target. These basic elements of the trial are summarised in the PICOT acronym. PICOT stands for participants, intervention, comparison, outcome, and target. At the end of the section the student should be able to define their research question, using the PICOT structure; be able to clearly and precisely define the participants and study settings of your randomized controlled trial; define inclusion and exclusion criteria; select outcomes, and specify the target, superiority or non-inferiority. Section 3: The content of the course in this section is randomization and sample size. The student will learn why randomization is important, and what benefits it has for the interpretation of a trial. The student will learn to use tools, such as random number tables and online calculators for randomizing participants. The student will also be introduced to sample size and estimations for simple RCTs and for cluster RCTs. In this section we discuss post recruitment retentions, safety monitoring and data collection. At the end of the section, the student will be guided to write the the randomization and sample size part of their protocol for their planned pRCT. Section 4: The emphasis of the course in this section is data analysis and interpretation. At the end of this section, the student will be guided to write the data analysis part of their protocol for their planned pRCT. Section 5: The section has two subsections - ethics, and economic evaluations. While ethics are important to all research projects, there are particular considerations to be taken into account, particularly when the trial is cluster randomized. These issues will be discussed. Economic evaluations are useful for those conducting a trial and for those making a decision on whether an effective intervention is worth implementing widely. The student will be guided to think through and articulate the ethical issues arising in their protocol. Section 6: The content of the course in this final section is qualitative evaluation alongside pragmatic randomized trials. Qualitative evaluations are an important addition to pRCTs; this is because they can be a valuable part of a process evaluation. Process evaluations are necessary to find out how, and why an intervention works; whereas the pRCT is aimed at finding out if an intervention works; and what its effects are.
Teaching and learning activities : This course is a blended learning course i.e a combination of classroom and online teaching/learning. The course runs for 6 weeks at 50% pace (equivalent to 3 weeks of full time work). There will be one contact session at the beginning of each week for 2.5 hours. This lecture will outline the learning for the week (pace the sessions), discuss some concepts in more detail, clarify issues raised by the students and explain the assignment progress expected at the end of the week. The students will have access to a tutor on one other day of the week to discuss/ clarify any other issues the have arisen during the self learning/ assignment work up phase. The online part of the course is hosted on an Edx platform which each student will have access to. The platform contains lectures, reading material, and exercise as formative assessment. In addition students will have access to a discussion forum to interact and learn from each other - by posting questions and having discussions around topics of relevance as they work through the course. The tutor may also interact on some threads. The final

assessment will be based on a complete trial protocol developed in stages as the course progresses.
Examination : Student achievement of the learning objectives will be assessed through a written protocol that is developed in stages over the course submitted at the end of the course. This will be marked by a tutor. Grades given will be pass/not pass.
Compulsory elements : None of the lectures in the classroom or the tutor interaction sessions are mandatory. However students will be expected to develop the protocol in steps, as prescribed over the duration of the course. This protocol will be the final assessment.
Number of students : 8 - 25
Selection of students : Selection will be based on 1) the relevance of the course syllabus for the applicant's doctoral project (according to written motivation), 2) start date of doctoral studies (priority given to earlier start date)
More information : The course will be held fully online, with a weekly webinar from 2.30-5.30pm on Mondays. The content is largely self-paced and taken over a 6-week period.

Course responsible :
Carina King
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Contact person :
Mariano Salazar
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Title : Statistics with R - from Data to Publication Figure

Course number : 2953
Credits : 3.0
Date : 2024-03-04 -- 2024-03-22
Language : English
Level : Doctoral level
Responsible KI department : Department of Laboratory Medicine
Specific entry requirements :
Purpose of the course : Do you need to turn data into a publication figure? We offer tools and confidence for the student to independently select a statistical method for research questions in their field. The course is practical and includes implementing a basic statistical analysis in R, the leading statistical programming language in bioinformatics and medical science. Furthermore, we give a brief introduction to visualization in R, with a focus on R/ggplot2. Students can bring data from their own research project, or work on data from the course.
Intended learning outcomes : By the end of the course the student should be able to: *download and install the latest versions of R and Rstudio. *know where to look for help when working in R. *know how to import data into R. *use R for basic analysis and presentation of data in their field. *select statistical method and motivate the choice using a structured approach. *communicate efficiently with a statistician about their choice of statistical method.
Contents of the course : Basics of R. Download, install, import data, basic analysis, how to get help. Visualization of data. Learn to speak statistics. A structured approach to selecting statistical method and communicating with a statistician. Practice how to go from data to publication figure using data from your project or more or less friendly data offered by the course.
Teaching and learning activities : Distance learning with online lectures, quizzes and interaction with other students. Lectures at campus or online via ZOOM. Individual project work using your own computer. Digital poster presentation of individual work.
Examination : Poster presentation and peer review.
Compulsory elements : Online quizzes and tasks. Participation during Poster Presentation day.
Number of students : 15 - 25
Selection of students : Selection will be based on 1) the relevance of the course syllabus for the applicant's doctoral project (according to written motivation), 2) start date of doctoral studies (priority given to earlier start date)
More information : The first two weeks of the course are online-based consisting of a general introduction to programming in R, followed with a voluntary workshops. Week three focuses on your own project, from data to figure, interspersed with lectures and workshops. The course concludes with a presentation day. The third week of the course is held at the KI Campus Flemingsberg or online via ZOOM.

Course responsible :
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Eric Rullman
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Title : Introduction to R

Course number : 2958
Credits : 1.5
Date : 2024-03-11 -- 2024-03-22
Language : English
Level : Doctoral level
Responsible KI department : Department of Medical Epidemiology and Biostatistics
Specific entry requirements : Biostatistics I: Introduction for epidemiologists or corresponding courses.
Purpose of the course : The purpose of this course is to introduce students to using the R statistical software to perform basic to intermediate statistical data analysis in a replicable manner.
Intended learning outcomes : After successfully completing this course, students are expected to be able to: - explain basic concepts of the R language and environment, the online- and offline sources of documentation for R, and basic concepts of data management and workflow in a standard statistical analysis, - run a standard statistical analysis interactively within the R environment, - formalize and document such a standard analysis as a stand-alone R script, - produce graphical representations, as part of reporting their analysis, - interpret their scripts for potential simplifications via functional implementation, - find, install and compare extension packages for unfamiliar statistical applications.
Contents of the course : The course will cover the basic elements of a standard statistical workflow: reading data into R; pre-processing and quality assessment of data via numerical and graphical methods; descriptive statistics via summary measures, tabulations and graphics; basic statistical inference in terms of significance testing and confidence intervals; specification, fitting & diagnosis of regression models; exporting and reporting results from the previous steps. The course includes an introduction to the Rstudio integrated development environment to provide a common framework for interactive and scripted analysis. The extensibility of the R system will be demonstrated by example.
Teaching and learning activities : Theoretical concepts and background will be covered via presentations, demonstrations, live exercises and discussions. Students will practice the application of these ideas in individual and small-group lab exercises with support from qualified teaching assistants. Formative assessment will be integrated via quizzes and lab reviews.
Examination : Students will perform an open-book examination based on practical application of the concepts presented during the course to realistic data sets and problems. Students who do not pass the examination will be offered a second examination within two months from the end of the course (excluding academic holidays).
Compulsory elements : The individual examination (summative assessment) is compulsory.
Number of students : 8 - 25
Selection of students : Eligible doctoral students will be prioritized according to 1) the relevance of the course syllabus for the applicant’s doctoral project (according to written information), 2) date for registration as a doctoral student (priority given to earlier registration date). To be considered, submit a completed application form. Give all information requested, including a short description of current research training and motivation for attending, as well as an account of previous courses taken.
More information : The course is extended over time in order to promote reflection and reinforce learning. The course will be given remotely. Course dates are March 11, 12, 14, 18, 20, 22.

Course responsible :
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Contact person :
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Title : Fundamentals of statistical modeling

Course number : 2959
Credits : 1.5
Date : 2024-05-13 -- 2024-05-17
Language : English
Level : Doctoral level
Responsible KI department : The institute of Environmental Medicine
Specific entry requirements : Courses ""Epidemiology I: Introduction to epidemiology"", ""Epidemiology II: Design of epidemiological studies"", ""Biostatistics I: Introduction for epidemiologists"", ""Biostatistics II: Logistic regression for epidemiologists"" and ""Biostatistics III: Survival analysis for epidemiologists""or corresponding courses.
Purpose of the course : The purpose of this advanced course is to provide an introduction to the tools of statistical modeling.
Intended learning outcomes : After successfully completing this course the students should be able to do the following independently of others: - explain the concepts of marginal and conditional distributions, - illustrate the relationship between cumulative distribution, probability mass/density, quantile, sparsity, cumulative hazard, and hazard functions, - propose possible models for the above functions both marginally and conditionally on covariates, - identify suitable models to answer scientific research questions and motivate the choice, - estimate the parameters of the above functions, and - use standard statistical software, evaluate the fit of the model, and critically interpret the results.
Contents of the course : The students are introduced to a general framework for data analyses that hinges on creating statistical models. The course focuses on the intricacies and potentials of modeling in a number of examples and real-data applications. The range of the covered examples is broad, and some examples are worked out in greater details than others. The course will enable students to gain an advanced knowledge of (1) random variables, (2) joint and conditional probability distributions, (3) modeling tools, (4) interpretation of statistical models, (5) relations between known methods, (6) estimation tools, (7) computer programming. The students will improve the level of knowledge of the foundations for data analysis, statistical practice, and use of statistical software. They will also be prepared to pursue more advanced studies in statistics. The focus of the course is on analysis of real data and interpretation.
Teaching and learning activities : The course activities are based on lectures and computer exercises, exercises not requiring statistical software, and literature review. We will provide laptop computers to all participants, but participants are welcome to bring their laptops if they prefer.
Examination : Individual written examination based on practical application of the course content, where the student has to show that all the intended learning outcomes have been achieved. Students who do not pass the examination will be offered a second examination within two months from the end of the course.
Compulsory elements : The individual examination (summative assessment) is compulsory.
Number of students : 8 - 25
Selection of students : Eligible doctoral students are prioritized according to 1) the relevance of the course syllabus for the applicant's doctoral project (according to written motivation), 2) date for registration as a doctoral student. Give all information requested, including a short description of current research training and motivation for attending, as well as an account of previous courses taken. Prior knowledge in any software, e.g. Stata, R or SAS is strongly recommended.
More information : The course will be held at campus KI.

Course responsible :
Matteo Bottai
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Contact person :
Johanna Bergman
Institutet för miljömedicin

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Nobels väg 13

17177
Stockholm

Title : Medicinsk forskningsetik

Course number : 2964
Credits : 1.5
Date : 2024-02-05 -- 2024-02-09
Language : Swedish
Level : Forskarnivå
Responsible KI department : Department of Learning, Informatics, Management and Ethics
Specific entry requirements :
Purpose of the course : Syftet med kursen är att den forskarstuderande: - ska få förståelse för centrala forskningsetiska teorier, principer och riktlinjer och därmed få möjlighet att reflektera över etiska aspekter av den egna forskningen - ska få förståelse för vad som är god vetenskap samt var gränserna går för vad som är etiskt oacceptabel forskning både vad gäller forskning på människor och djur, samt vad som gäller för forskarens egna akademiska integritet - utvecklar ett forskningsetiskt förhållningssätt inom sin egen forskning, gentemot andras forskning och det omgivande samhället
Intended learning outcomes : Den forskarstuderande ska efter avslutad kurs kunna: - redogöra för forskningsetiska teorier, principer och, i viss mån, riktlinjer - kunna redogöra för vanliga forskningsetiska problemsituationer - identifiera, analysera och diskutera forskningsetiska problem och konflikter - genomföra en forskningsetisk argumentation för eller emot ett förfarande
Contents of the course : - Centrala forskningsetiska principer, teorier och argument - Centrala vetenskapsteoretiska begrepp och positioner, och dess relevans för forskningsetik - Forskning på människor, innefattande det informerade samtycket och dess komponenter - Försöksdjursetik, innefattande argument för och emot att använda djur för forskningsändamål, samt de 3 R:en - Etikprövningar och forskningsetiska riktlinjer, såsom Helsingforsdeklarationen - God vetenskaplig sed och avvikelser från god sed i forskningen, exempelvis frågor kring fabricering, förvanskning och plagiering, samt hantering av vetenskapligt författarskap - Intressekonflikter i samband med forskning, såsom jäv och sponsring
Teaching and learning activities : Föreläsningar, grupparbeten och plenumdiskussioner. Undervisningen sker på campus, men kan i förekommande fall ske digitalt.
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. Vid enbart digital undervisning examineras studenterna endast skriftligt.
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 - 33
Selection of students : Urvalet baseras på 1) datum för registrering som doktorand (förtur ges till tidigare datum), 2) kursplanens relevans för den sökandes doktorandprojekt (enligt skriftlig motivation).
More information : Kursen innehåller obligatoriska moment under varje kursdag. Studenterna förväntas därför vara närvarande under alla kursdagar. Kursen arrangeras på plats på Campus Solna.

Course responsible :
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Contact person :
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Title : Medical Research Ethics

Course number : 2964
Credits : 1.5
Date : 2024-02-19 -- 2024-02-23
Language : English
Level : Doctoral level
Responsible KI department : Department of Learning, Informatics, Management and Ethics
Specific entry requirements :
Purpose of the course : The objective of this course is for the doctoral student to: - understand central research ethical theories, principles and guidelines, to gain the possibility to reflect over ethical aspects of his or her own research - understand what is good research and the boundaries for what is ethically unacceptable research with regards to humans and animals, and to the researcher's own academic integrity - develop a research ethical approach within his or her own research, to others' research and to society
Intended learning outcomes : After having completed the course, the doctoral student should be able to: - give an account of research ethical theories, principles, and, to some extent, guidelines - account for common problems that arise in the area of research ethics - identify, analyze, and discuss research ethical issues and conflicts - conduct a research ethical argumentation for or against a matter
Contents of the course : - Central research ethical principles, theories and arguments - Central philosophy of science - concepts and positions, and its relevance to research ethics - Research on humans, including informed consent and its components - Animal research ethics, including arguments for and against using animals for research purposes, and the three R's. - Ethical reviews and research ethical guidelines, such as the Helsinki Declaration - Good research practice and deviations from good research practice within research, for example issues concerning fabricated data, fraud and plagiarism, and handling of authorship in scientific writing - Conflicts of interest in research, such as bias and sponsorship
Teaching and learning activities : Lectures, group work and general discussions. The course takes place on campus, but can be arranged digitally.
Examination : The doctoral student writes an essay on a research ethical theme, in relation to all intended learning outcomes, preferably related to his or her own research. A small number of students get the opportunity to orally present an ethical reflection concerning their research in front of the whole group. When the course is arranged digitally, the students’ examination will be in written form only.
Compulsory elements : Attendance is mandatory for the group work and general discussions. If the student is absent, he or she can to some extent compensate by handing in written answers concerning the cases that have been discussed.
Number of students : 30 - 33
Selection of students : Selection will be based on 1) date for registration as a doctoral student (priority given to earlier registration date), 2) the relevance of the course syllabus for the applicant's doctoral project (according to written motivation).
More information : This course contains mandatory elements on each course day. The students are therefore expected to be present during each course day. This course takes place on site on Campus Solna.

Course responsible :
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Title : Medical Research Ethics

Course number : 2964
Credits : 1.5
Date : 2024-03-18 -- 2024-03-22
Language : English
Level : Doctoral level
Responsible KI department : Department of Learning, Informatics, Management and Ethics
Specific entry requirements :
Purpose of the course : The objective of this course is for the doctoral student to: - understand central research ethical theories, principles and guidelines, to gain the possibility to reflect over ethical aspects of his or her own research - understand what is good research and the boundaries for what is ethically unacceptable research with regards to humans and animals, and to the researcher's own academic integrity - develop a research ethical approach within his or her own research, to others' research and to society
Intended learning outcomes : After having completed the course, the doctoral student should be able to: - give an account of research ethical theories, principles, and, to some extent, guidelines - account for common problems that arise in the area of research ethics - identify, analyze, and discuss research ethical issues and conflicts - conduct a research ethical argumentation for or against a matter
Contents of the course : - Central research ethical principles, theories and arguments - Central philosophy of science - concepts and positions, and its relevance to research ethics - Research on humans, including informed consent and its components - Animal research ethics, including arguments for and against using animals for research purposes, and the three R's. - Ethical reviews and research ethical guidelines, such as the Helsinki Declaration - Good research practice and deviations from good research practice within research, for example issues concerning fabricated data, fraud and plagiarism, and handling of authorship in scientific writing - Conflicts of interest in research, such as bias and sponsorship
Teaching and learning activities : Lectures, group work and general discussions. The course takes place on campus, but can be arranged digitally.
Examination : The doctoral student writes an essay on a research ethical theme, in relation to all intended learning outcomes, preferably related to his or her own research. A small number of students get the opportunity to orally present an ethical reflection concerning their research in front of the whole group. When the course is arranged digitally, the students’ examination will be in written form only.
Compulsory elements : Attendance is mandatory for the group work and general discussions. If the student is absent, he or she can to some extent compensate by handing in written answers concerning the cases that have been discussed.
Number of students : 30 - 33
Selection of students : Selection will be based on 1) date for registration as a doctoral student (priority given to earlier registration date), 2) the relevance of the course syllabus for the applicant's doctoral project (according to written motivation).
More information : This course contains mandatory elements on each course day. The students are therefore expected to participate during each course day. This course is online in its entirety.

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Title : Medical Research Ethics

Course number : 2964
Credits : 1.5
Date : 2024-04-15 -- 2024-04-19
Language : English
Level : Doctoral level
Responsible KI department : Department of Learning, Informatics, Management and Ethics
Specific entry requirements :
Purpose of the course : The objective of this course is for the doctoral student to: - understand central research ethical theories, principles and guidelines, to gain the possibility to reflect over ethical aspects of his or her own research - understand what is good research and the boundaries for what is ethically unacceptable research with regards to humans and animals, and to the researcher's own academic integrity - develop a research ethical approach within his or her own research, to others' research and to society
Intended learning outcomes : After having completed the course, the doctoral student should be able to: - give an account of research ethical theories, principles, and, to some extent, guidelines - account for common problems that arise in the area of research ethics - identify, analyze, and discuss research ethical issues and conflicts - conduct a research ethical argumentation for or against a matter
Contents of the course : - Central research ethical principles, theories and arguments - Central philosophy of science - concepts and positions, and its relevance to research ethics - Research on humans, including informed consent and its components - Animal research ethics, including arguments for and against using animals for research purposes, and the three R's. - Ethical reviews and research ethical guidelines, such as the Helsinki Declaration - Good research practice and deviations from good research practice within research, for example issues concerning fabricated data, fraud and plagiarism, and handling of authorship in scientific writing - Conflicts of interest in research, such as bias and sponsorship
Teaching and learning activities : Lectures, group work and general discussions. The course takes place on campus, but can be arranged digitally.
Examination : The doctoral student writes an essay on a research ethical theme, in relation to all intended learning outcomes, preferably related to his or her own research. A small number of students get the opportunity to orally present an ethical reflection concerning their research in front of the whole group. When the course is arranged digitally, the students’ examination will be in written form only.
Compulsory elements : Attendance is mandatory for the group work and general discussions. If the student is absent, he or she can to some extent compensate by handing in written answers concerning the cases that have been discussed.
Number of students : 30 - 33
Selection of students : Selection will be based on 1) date for registration as a doctoral student (priority given to earlier registration date), 2) the relevance of the course syllabus for the applicant's doctoral project (according to written motivation).
More information : This course contains mandatory elements on each course day. The students are therefore expected to be present during each course day. This course takes place on site on Campus Solna.

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Title : Medical Research Ethics

Course number : 2964
Credits : 1.5
Date : 2024-05-13 -- 2024-05-17
Language : English
Level : Doctoral level
Responsible KI department : Department of Learning, Informatics, Management and Ethics
Specific entry requirements :
Purpose of the course : The objective of this course is for the doctoral student to: - understand central research ethical theories, principles and guidelines, to gain the possibility to reflect over ethical aspects of his or her own research - understand what is good research and the boundaries for what is ethically unacceptable research with regards to humans and animals, and to the researcher's own academic integrity - develop a research ethical approach within his or her own research, to others' research and to society
Intended learning outcomes : After having completed the course, the doctoral student should be able to: - give an account of research ethical theories, principles, and, to some extent, guidelines - account for common problems that arise in the area of research ethics - identify, analyze, and discuss research ethical issues and conflicts - conduct a research ethical argumentation for or against a matter
Contents of the course : - Central research ethical principles, theories and arguments - Central philosophy of science - concepts and positions, and its relevance to research ethics - Research on humans, including informed consent and its components - Animal research ethics, including arguments for and against using animals for research purposes, and the three R's. - Ethical reviews and research ethical guidelines, such as the Helsinki Declaration - Good research practice and deviations from good research practice within research, for example issues concerning fabricated data, fraud and plagiarism, and handling of authorship in scientific writing - Conflicts of interest in research, such as bias and sponsorship
Teaching and learning activities : Lectures, group work and general discussions. The course takes place on campus, but can be arranged digitally.
Examination : The doctoral student writes an essay on a research ethical theme, in relation to all intended learning outcomes, preferably related to his or her own research. A small number of students get the opportunity to orally present an ethical reflection concerning their research in front of the whole group. When the course is arranged digitally, the students’ examination will be in written form only.
Compulsory elements : Attendance is mandatory for the group work and general discussions. If the student is absent, he or she can to some extent compensate by handing in written answers concerning the cases that have been discussed.
Number of students : 30 - 33
Selection of students : Selection will be based on 1) date for registration as a doctoral student (priority given to earlier registration date), 2) the relevance of the course syllabus for the applicant's doctoral project (according to written motivation).
More information : This course contains mandatory elements on each course day. The students are therefore expected to be present during each course day. This course takes place on site on Campus Solna.

Course responsible :
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Title : Introduction to R - Data Management, Analysis and Graphical Presentation

Course number : 2971
Credits : 2.5
Date : 2024-01-17 -- 2024-02-19
Language : English
Level : Doctoral level
Responsible KI department : Department of Laboratory Medicine
Specific entry requirements : Basic statistical knowledge (e.g. taken ""Basic course in medical statistics"" or similar course)
Purpose of the course : To increase the doctoral student's skills in data analysis and data presentation.
Intended learning outcomes : After attending the course, the student will be able to use R for data management, statistical analysis and graphical data presentation. The student will be able to install new functions in R.
Contents of the course : R is a powerful software/programming language for data analysis and graphical presentation. R is free-of-charge, and in most cases a useful alternative to commercial statistical software. The programming language is completely text-based, making it challenging compared to software with a graphical user interface. However, it offers greater flexibility, better control over analyses and an automatic documentation of performed analyses. The course focuses on structure and basic functions of the R programming language . A selection of functions for data management, statistical analysis and graphics is presented. The methods included are commonly used methods in clinical medical science (e.g. t-test, ANOVA, chi2-test, regression and survival analysis, box, line scatter, and bar plots). The course focuses mainly on how the various methods are applied in R and not their theroretical background, underlying assumptions or the theoretical intepretation of the results.
Teaching and learning activities : Online video lectures, web-based seminars and web-based practical exercises (individual and group assignments), peer assessment of other students' solutions. The examination takes place on KI campus.
Examination : Written examination.
Compulsory elements : The practical exercises and the peer assessments of these are compulsory. Students unable to complete the exercises in time due to e.g. illness can get an extension of the deadline.
Number of students : 15 - 20
Selection of students : Selection will be based on 1) the relevance of the course syllabus for the applicant's doctoral project (according to written motivation), 2) start date of doctoral studies (priority given to earlier start date)
More information : The course is web-based, with course dates 17/1 (self-studies), 19/1, 26/1, 2/2, 9/2, 16/2. The examination is in Huddinge 19/2. Between these course dates, there will be deadlines for mandatory home assignments. Laptop is required for the examination.

Course responsible :
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Title : Preclinical Imaging Techniques

Course number : 2987
Credits : 1.5
Date : 2024-05-13 -- 2024-05-17
Language : English
Level : Doctoral level
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.
Intended 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) start date of doctoral studies (priority given to earlier start date)
More information : Course location: Flemingsberg campus, NOVUM level 6, Karolinska Universitetssjukhuset Utbildningslokaler, conference room Gotland, Hälsovägen 7, 141 57 Huddinge

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Course responsible :
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Contact person :
Ying Zhao
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ECM/KFC; Novum, Lab 601; Hälsovägen 7

Title : Anaesthesia, Analgesia and Surgery (mice and rats)

Course number : 2996
Credits : 1.5
Date : 2024-03-12 -- 2024-03-21
Language : English
Level : Doctoral level
Responsible KI department : Comparative medicine
Specific entry requirements : Students need to complete the "Function A" laboratory animal science course ("to carry out scientific procedures on animals"), or must have completed an equivalent course.
Purpose of the course : The course is designed to meet the learning outcomes specified by the education and training recommendations supplied as an annex to EU Directive 2010/63/EU, which has been endorsed by the Swedish legislation L150 (SJVFS 2019:9). Modules included are EU 3.2, 5-7, and EU20-22. Education and training in anaesthesia, analgesia and surgery is both essential, and a legal requirement, for all those who need to undertake such procedures on laboratory animals. Applying appropriate anaesthetic, analgesic and surgical techniques to in vivo studies enhances outcomes from research studies, reduces experimental variability, and is perceived as ethically acceptable.
Intended learning outcomes : After completion of this course, the students should be able to meet the defined learning outcomes as set out in the EU Education and Training Framework, with emphasis on modules 20, 21 and 22. Each module requires both theoretical knowledge, and acquisition and demonstration of practical skills. The list of suggested learning outcomes by such guidelines is comprehensive, but in summary, participants will acquire the knowledge and skills to anaesthetize animals safely and humanely, assess and alleviate post-surgical pain, and be able to conduct surgical procedures competently, using appropriate aseptic technique. Recognition of pain, suffering and distress, appropriate methods of euthanasia, and minor procedures in mice and rats (EU modules 3.2, 5-7) will also be included.
Contents of the course : The course provides guidance and information to individuals who, during their research work with animals, will need to apply sedation or anaesthesia and who will undertake surgical or other painful procedures. It includes details of methods of assessing, preventing and alleviating animal pain. The use of appropriate killing methods of rodents will also be included. The course will include training in the most recently developed behavioural measures of pain, including use of grimace scales. Monitoring of animals during anaesthesia and coping with problems and emergencies are explained and demonstrated. Potential interactions between anaesthetic and analgesic agents and specific research protocols are also explained and discussed. Training is given in the principles of pre-operative animal assessment and care, preparations for surgery, aseptic technique and the principles of successful surgery. The course provides information about possible complications, post-operative care and monitoring along with details of the healing process. It also covers more practical elements for example the demonstration of commonly used instruments and provides an opportunity for trainees to practice some of the practical aspects of basic surgical technique, such as methods of suturing, using appropriate non-animal models.
Teaching and learning activities : The course will adopt a blended learning approach that combines e-learning, live sessions (in-person and digital), discussions, interactive sessions and practical components in the laboratory. Lecture notes and video materials to introduce practical skills will be provided as well. Discussion and problem-solving sessions will be provided, which will encourage students to reflect on the application of the course content in their own research area, and discuss and explain their work to other participants. Laboratory practical sessions (4-5 hours) on introductory anaesthesia and surgical skills will be provided.
Examination : Practical skills are formatively assessed during the laboratory sessions using direct observation of practical skills. A short answer/multiple choice question final examination is held at the end of the course. A pass/fail criteria will be used as a global rate for this course.
Compulsory elements : All components must be completed and active student participation in the discussion and problem solving sessions is required if the student is to be provided with certification of the successful completion of the course. Missed parts of the course as a consequence of a well-justified absence will need to be compensated after agreement with the course director e.g. with a written assignment or in future course editions.
Number of students : 8 - 14
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 : The e-learning teaching materials will be made available to students the week before the course starts. This will enable students to complete them in advance of the discussion sessions, or alternatively, they can complete the content during the scheduled course dates. This added flexibility should enable them to integrate course participation with their other work commitments. The live sessions (face-to-face and webinar) components of the course will be held on weekdays ca. 9 am and 5 pm.

Course responsible :
Chiara Zullian
Komparativ medicin

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Contact person :

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Title : Translational Paediatric Oncology in the Era of Immunotherapy and Omics

Course number : 3022
Credits : 1.5
Date : 2024-04-15 -- 2024-04-19
Language : English
Level : Doctoral level
Responsible KI department : Department of Women's and children's health
Specific entry requirements :
Purpose of the course : This course aims to introduce research on paediatric oncology for doctoral students and junior postdocs, with research projects in this specific area or in an adjacent area. The purpose is to enable students to: - Obtain a comprehensive overview of the different domains within childhood cancer research and to understand the historical milestones forming the paradigms that have led to a cure of 8 out of 10 children with cancer - Get an insight into the current limitations and problems of childhood cancer treatment - Get an understanding of how new methodologies in molecular biology increase our knowledge about tumorigenesis and tumor evolution. - Get an opportunity to hypothesise and suggest ideas about how to develop treatment for the remaining 2 out of 10 children with cancer.
Intended learning outcomes : At the end of the course the students should be able to: - Summarize the basic epidemiological data, tumor biology and genetics, novel therapy modalities like targeted therapies and immunotherapy, including side effects, late effects and follow up within the field of paediatric oncology. - Discuss the ethical issues around childhood cancer research. - Describe and understand the principles of treatment, existing therapies, new targeted therapies and personalized medicine. - Explain and theorize the link between cancer cell biology, tumor microenvironment, immunology, genetics, and drug treatments - current knowledge and development of new drugs. - Understand and discuss the current experimental methodology applied to paediatric oncology research such as in vivo, in vitro and in silico models. - Critically evaluate research findings in paediatric oncology. - Show the acquired knowledge of mechanisms, principles, and treatment options in pediatric oncology through actively engaging in discussions with course leaders and participants.
Contents of the course : The students will be presented with and will discuss problems, possibilities, and research models that are specific for the research area of paediatric oncology. The course will provide a general introduction to the field and focus on distinct, but interconnected topics specific for paediatric oncology, namely ethics, epidemiology, tumor biology and genetics, existing and novel targeted drug treatments as well as immunotherapy, and side effects, late effects and follow up.
Teaching and learning activities : Lectures, seminars, group exercises with supervised discussions, either in person or online. To promote active discussion and participation, each student will prepare a poster and a short oral presentation on their current or intended research before the course and submit a short abstract on this no later than two weeks before the course start. The course will include workshops and site visits.
Examination : To pass the course the students must show that they have reached the learning outcomes of the course. Each student should prepare and present a scientific poster and an oral presentation on a current or intended childhood cancer research project, and answer critical questions from the course leaders and participants. Each participant in the course needs to be able not only to answer questions in a satisfactory way but also to raise relevant questions and discussion points in line with the intended learning outcomes of the course.
Compulsory elements : All course activities are compulsory. Absence can be compensated for by other activities in agreement with the course leaders.
Number of students : 8 - 14
Selection of students : Selection will be based on 1) the relevance of the course syllabus for the applicant's doctoral project (according to written motivation), 2) start date of doctoral studies (priority given to earlier start date)
More information : Monday to Friday will be full days scheduled with lectures, seminars and workshop/site visits. The course will be located at KI Solna.

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Title : Advanced Cancer Biology

Course number : 3024
Credits : 3.0
Date : 2024-01-09 -- 2024-06-11
Language : English
Level : Doctoral level
Responsible KI department : Department of Microbiology, Tumor and Cell Biology
Specific entry requirements : Basic course in tumour biology and oncology.
Purpose of the course : The course aims to provide advanced, cutting edge pre-clinical and clinical knowledge in the field of cancer biology.
Intended learning outcomes : At the end of the course the students should: - Have acquired an updated overview of the cutting edge research activities within the fields of cell- and tumor biology. - Be able to show analytical and critical thinking when discussion advanced problems in cell- and tumor biology, beyond what is found in text books, and evaluate the relevance of the topics presented in the context of their own research activities and PhD studies. - Be able to discuss important aspects of tumor biology, including apoptosis, cell cycle, cancer stem cells, differentiation, virus and bacteria-associated cancer, tumor immunology and effects of chronic inflammation in carcinogenesis, cancer genetics and epigenetics, transcriptomics, proteomics and metabolomics of cancer, tumor microenvironment, angiogenesis, metastasis, tumor heterogeneity and development of new treatments as well as key issues in clinical cancer research.
Contents of the course : The lecturers will give a comprehensive and pedagogical overview of the research area as well as an in-depth discussion of their own research, related, but not limited, to the following topics: apoptosis, cell cycle, cancer stem cells, differentiation, virus and bacteria-associated cancer, tumor immunology and effects of chronic inflammation in carcinogenesis, cancer genetics and epigenetics, transcriptomics, proteomics and metabolomics of cancer, tumor microenvironment, angiogenesis, metastasis, tumor heterogeneity and development of new treatments as well as key issues in clinical cancer research.
Teaching and learning activities : The course will consist of about 20 lectures, with approximately 45 minutes per lecture, at least once a week during one semester. Each lecture will be followed by an open discussion between the students and the invited speaker led by one of the course organizers: this format will provide time for highlighting key issues within the specific topic and will enhance the possibility for the students to expand their networking activities due to direct contact with experts in the field. To increase the learning process and to stimulate the reflection on the course topic, the students will be required to study the most recent literature, still not present in the text books within the presented fields, prior to each seminar. Throughout the course period, the course organisers will have regular meetings with the students to follow up the learning process of each individual participant as well as to receive feedback from the students.
Examination : The students have to show that the intended learning outcomes of the course are reached. This will be individually assessed during the participation in the informal discussions after the seminars and on the basis an individual written assessment, in form of a project description where one or more topics presented during the course should be integrated within the student own research project (Max one and half A4 page, stating: the objective of the project, a brief description of the research plan, and the significance). The project description should be handed in maximum three weeks after the completion of the course to the organizers.
Compulsory elements : Attending the lectures and the written essay are compulsory. Missed seminars can be compensated by other activities after discussion with the course leader.
Number of students : 8 - 20
Selection of students : Selection will be based on 1) the relevance of the course syllabus for the applicant's doctoral project (according to written motivation), 2) start date of doctoral studies (priority given to earlier start date)
More information : Every Tuesday 13:00-14:00, room B0317, Biomedicum, Solnavägen 9, campus Solna.

Course responsible :
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Contact person :
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Title : Grundkurs i SPSS

Course number : 3028
Credits : 1.5
Date : 2024-03-11 -- 2024-03-15
Language : Swedish
Level : Forskarnivå
Responsible KI department : Department of Clinical Sciences, Danderyd Hospital
Specific entry requirements :
Purpose of the course : Kursen kommer att ge dig solida grundkunskaper i statistikprogrammet SPSS inklusive kunskaper i SPSS syntax (programmeringsspråk). Du lär dig bl a hur man lägger upp och strukturerar ett dataset, och hur man kan importera material från andra applikationer till statistikprogrammet SPSS och att tvätta data så att dessa blir i analyserbart skick. En av de viktigaste delarna i analysen är att beskriva det datamaterial som har samlats in samt att hur man dokumenterar sina steg med hjälp av syntax. Vi går grundligt igenom olika procedurer för att bekanta sig med olika typer av variabler. Detta inkluderar även omkodning av variabler, skapa nya variabler från befintliga och selektera ut individer som uppfyller vissa givna villkor. Ändamålet är att hjälpa dig att effektivisera ditt arbete, dokumentera dina analyser med hjälp av syntax och snabbt komma igång med SPSS
Intended learning outcomes : Efter kursen skall kursdeltagaren: - Ha grundläggande kunskaper om statistikprogrammet SPSS för att skapa strukturerade datafiler, modifiera data, samt skapa grafer och tabeller med hjälp av syntax. - Ha kunskap om de vanligaste syntax kommandona för att hantera statistiska data i SPSS. - Självständigt med hjälp av syntax kunna se om modellantaganden är uppfyllda som t.ex. normalfördelningsantagande - Självständigt med hjälp av syntax kunna utföra enklare tester och analyser - Ha ett förhållningssätt till datahantering som visar på grundläggande förståelse för vikten av dokumentation via syntax.
Contents of the course : Olika procedurer för att lära känna olika typer av variabler. Detta inkluderar även omkodning av variabler, skapa nya variabler från befintliga och selektera ut individer som uppfyller vissa givna villkor, samt att med hjälp av syntax utföra grundläggande variabelkommandon. Den beskrivande analysen omfattar både produktion av olika tabeller såväl som val av diagram. Du lär dig vilka typer av tabeller och diagram som är lämpliga beroende på de variabler du studerar. För att erhålla så presentationsfärdiga rapporter som möjligt lär vi oss även att redigera resultatet av analysen.
Teaching and learning activities : Denna kurs som sträcker sig över 5 dagar (3 dagar workshop + en övningsuppgift med avslutande seminarium). Doktoranden får under kursens gång självständigt arbeta med ett datamaterial som innehåller vanliga typer av problem med datahantering före en statistisk analys är möjlig.
Examination : Examination av kursen består av en hemuppgift som redovisas skriftligt. Varje doktorand lämnar enskilt in en lösning där de dokumenterar hur problemen har lösts. Denna uppgift redovisas sedan via en peer-review vid ett slutseminarium. Egen tillgång till SPSS är nödvändig för att göra examinationen.
Compulsory elements : Vid frånvaro från någon workshop får doktoranden göra kompletterande övningsuppgift/-er. Vid frånvaro från redovisning och genomgång av uppgift får doktoranden göra kompletterande övningsuppgift/-er.
Number of students : 10 - 15
Selection of students : Urvalet baseras på 1) kursplanens relevans för den sökandes doktorandprojekt (enligt motivering), 2) startdatum för doktorandstudier
More information : Kursen är obligatorisk på förmiddagarna fram till lunch måndag 11/3 till onsdag den 13/3. På eftermiddagarna är det eget arbete samt även torsdagen den 14/3. En obligatorsik inlämningsuppgift redovisas via peer-rewiev efter lunch fredagen den 15/3. Mer detaljerad information kommer via vår administratör närmar kursstart.

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

Course number : 3032
Credits : 3.0
Date : 2024-04-01 -- 2024-05-03
Language : English
Level : Doctoral level
Responsible KI department : Department of Global Public Health
Specific entry requirements : Students must be familiar with the basics of qualitative and quantitative research before joining the course.
Purpose of the course : Health research problems are complex phenomena with multiple dimensions which are difficult to assess using quantitative or qualitative methodologies alone. Mixed-methods research is a methodology that combines both qualitative and quantitative research allowing the researcher a more comprehensive understanding of the issue under study. Mixed-methods pragmatic research designs provide strengths that offset the weakness of both quantitative and qualitative studies. This course will provide Ph.D students with the theoretical tools and practical experience to design, conduct and report mixed-methods studies in health research.
Intended learning outcomes : At the end of the course the students will: 1. Design a mixed-methods research question (s). 3. Apply different mixed-methods research designs to a health problem. 4. Write a mixed-methods research protocol. 5. Report the results of a mixed-method study. 6. Use mixed-methods to design and evaluate interventions studies. 7. Evaluate the quality of scientific manuscripts using mixed-methods designs.
Contents of the course : 1. Definitions of mixed-methods research. 2. Worldviews and mixed-methods research. 3. Writing a mixed-methods research protocol. 4. Choosing a mixed-methods design. 5. Integrating results in mixed-method studies. 6. Reporting and disseminating mixed-method studies. 7. Application of mixed-methods research in interventions studies. 8. Evaluating the quality of mixed-methods studies.
Teaching and learning activities : The course will start by discussing the quantitative and qualitative research designs and how both research paradigms can be combined to strengthen each other. The course will combine face-to-face lectures, online practical assignments/discussions, self-study and oral presentations. Face-to-face lectures and other activities will be conducted once a week for a period of five weeks. Once a week lectures will allow the students to reflect on the given material and to apply this new knowledge to the practical assignments. Practical assignments will be discussed with the group and feedback will be given.
Examination : Course assignments and take home examination. Both will be graded as fail or pass. In order to pass the course, the student need to pass the assignments and the take home examination. The course assignments will guide the students through the steps needed to design a mixed-methods protocol. Take home examination. The aim of the examination is to test the students on what they have learned over the duration of the course and how well they can apply it. The take home examination will consist on open ended questions where the students will appraise the quality of published mixed-methods studies and the structure of mixed-methods protocols among other topics. The take home exam will have to be submitted through the KI online learning platform one week after the end of the course.
Compulsory elements : Participation in the online practical assignments and discussion will be mandatory.
Number of students : 8 - 15
Selection of students : Selection will be based on 1) the relevance of the course syllabus for the applicant's doctoral project (according to written motivation), 2) start date of doctoral studies (priority given to earlier start date)
More information : The course is spread over four weeks combining face to face and prerecorded lectures with practical activities. Lectures are given once a week and the rest of the time is allocated to practical exercises. In the last week students will present their mixed-methods protocol . This activity is mandatory and goes over two days.

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

Course number : 3035
Credits : 1.5
Date : 2024-05-09 -- 2024-05-28
Language : English
Level : Doctoral level
Responsible KI department : Department of Clinical Neuroscience
Specific entry requirements : Background in medicine, biomedicine, biology, psychology, cognitive science, medical imaging, computational biology or similar. At least basic medical statistics.
Purpose of the course : The main purpose of the course is to provide the students with a solid understanding of the tools available to analyze human brain activity data measured with magnetoencephalography (MEG) and electroencephalography (EEG). The students will develop the ability to critically review results provided by different methods, to select the most adequate tools and experimental designs to answer different questions and to compare their relative advantages.
Intended learning outcomes : After attending the course the student should be able to: 1) follow the usual preprocessing steps of MEG and EEG; 2) give an overview of different methods to analyze the data and explain when to use them; 3) conduct MEG and EEG analysis using several methods; 4) describe different aspects of experimental design to have in consideration when creating a MEG and EEG study; 5) give a brief overview of the usage of MEG and EEG to study brain function; 6) give a brief overview of other techniques to study brain function non-invasively and describe their relative merits and challenges.
Contents of the course : The course focuses on experimental design and analysis of MEG and EEG data. We will briefly introduce the basis of the MEG and EEG signal at a neural level, and how it is measured by the different sensor technologies applied in MEG and EEG. The data processing steps, before statistical analysis, will be explained. The application of general linear model analysis, parametric and nonparametric tests of MEG and EEG data will be explained, including correction for multiple comparisons. We will review experimental design considerations for developing MEG and EEG paradigms. The study of functional connectivity using MEG and EEG data will be introduced.
Teaching and learning activities : The students will attend lectures, implement different steps of the data preprocessing and analysis during the hands-on sessions, present and discuss results.
Examination : The learning outcomes will be assessed throughout the course during the hands-on sessions where the students have to perform data analyses. The students will also complete a more extensive assignment based on one of the hands-on sessions. In the final day of the course the students will present and discuss their assignments with the rest of the group.
Compulsory elements : All parts of the course are mandatory. Absence can be compensated for by completion of an assignment on the material covered in the missed course instance.
Number of students : 8 - 24
Selection of students : Selection will be based on 1) the relevance of the course syllabus for the applicant's doctoral project (according to written motivation), 2) start date of doctoral studies (priority given to earlier start date)
More information : The course runs across five days: May 14 (Tue), 16 (Thu), 21 (Tue), 23 (Thu), and 28 (Tue). An optional "Introduction to Matlab" lecture/tutorial will be offered on May 9 (Tue) before the main course start. Insufficient prior experience with Matlab of some students was identified as a major issue in the last course iteration. Lectures will again be held in person at the same building as the national MEG lab (Nobels väg 9, Karolinska Institutet) and partly also in the MEG lab.

Course responsible :
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Title : Epidemiology I: Introduction to epidemiology

Course number : 3041
Credits : 1.5
Date : 2024-01-29 -- 2024-02-07
Language : English
Level : Doctoral level
Responsible KI department : Department of Medical Epidemiology and Biostatistics
Specific entry requirements :
Purpose of the course : The aim of the course is to give an introduction to epidemiological theory and practice.
Intended learning outcomes : After successfully completing this course students are expected to be able to: -give examples of the contribution of epidemiology to science and discuss the importance of epidemiology as a research discipline. -estimate and in a general way interpret measures of disease occurrence and measures of association, and describe how a specific measure is governed by the study design. -explain strengths and weaknesses of common epidemiological study designs. -identify and explain possible sources of bias in epidemiological studies. -describe theoretical models for causation and discuss the principles of causal mechanisms. -apply knowledge of epidemiological concepts when critically reviewing scientific literature.
Contents of the course : The course gives an introduction to epidemiological theory and practice. It comprises basic principles regarding design, interpretation, and analysis of epidemiological studies. It introduces the concept of causation, concepts related to measures of disease occurrence and measures of association, common designs for epidemiological studies (with main focus on cohort studies), and the role of bias.
Teaching and learning activities : The course focuses on active learning, i.e. putting knowledge into practice and critically reflecting upon the knowledge, rather than memorising facts. Different strategies for teaching and learning will be used, such as lectures, group discussions and various forms of group exercises on selected topics.
Examination : To pass the course, the student has to show that the learning outcomes have been achieved. Assessments methods used are group assignments (formative assessments) along with an individual examination (summative assessment). The examination is viewed as contributing to the development of knowledge, rather than as a test of knowledge. Students who do not obtain a passing grade in the first examination will be offered a second chance to resubmit the examination within two months of the final day of the course. Students who do not obtain a passing grade at the first two examinations will be given top priority for admission the next time the course is offered.
Compulsory elements : The individual examination (summative assessment) is compulsory.
Number of students : 8 - 25
Selection of students : Eligible doctoral students will be prioritized according to 1) the relevance of the course syllabus for the applicant’s doctoral project (according to written information), 2) date for registration as a doctoral student (priority given to earlier registration date). To be considered, submit a completed application form. Give all information requested, including a short description of current research training and motivation for attending, as well as an account of previous courses taken.
More information : The course is extended over time in order to promote reflection and reinforce learning. Course dates are January 29, 31, and February 2, 5, and 7. The course will take place at campus Solna.

Course responsible :
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Title : Biostatistics I: Introduction for Epidemiologists

Course number : 3042
Credits : 3.0
Date : 2024-04-10 -- 2024-04-30
Language : English
Level : Doctoral level
Responsible KI department : The institute of Environmental Medicine
Specific entry requirements :
Purpose of the course : The aim is to introduce classical statistical concepts and methods with emphasis on methods for continuous outcome data.
Intended learning outcomes : After successfully completing this course, students should be able to: - define the concept of probability, laws of probability, and make simple probability calculations, - suggest a statistical distribution to describe a naturally occurring phenomenon and evaluate the appropriateness of the distribution given real data, - present appropriate tabular and graphical descriptions of study data, - explain the difference between hypothesis testing and interval estimation and the relation between p-values and confidence intervals for the mean, - explain the necessary assumptions for inference under various tests for continuous data, - fit and interpret the coefficients of linear regression, with or without adjustment, with or without an interaction, - explain and apply non-parametric tests for differences in distribution, - explain the concepts of confounding and effect modification, describe the difference between them and use models correctly to account for them.
Contents of the course : The course introduces classical statistical concepts and methods with emphasis on methods used in epidemiology and public health. Topics covered include: the importance of statistical thinking; types of data (nominal, binary, discrete and continuous variables); data summary measures; graphical representations; notions of probability; probability models (distributions); principles of statistical inference for the mean via the central limit theorem, concepts of confidence intervals and hypothesis tests; and an introduction to linear regression.
Teaching and learning activities : Lectures, exercises focusing on analysis of real data using statistical software, exercises not requiring statistical software, group discussions, literature review.
Examination : To pass the course, the student has to show that the intended learning outcomes have been fulfilled. The course grade is based on the individual written examination. Students who fail will be offered a re-examination within two months of the final day of the course. Students who fail the re-exam will be given top priority for admission the next time the course is offered. If the course is not offered during the following two academic terms then another re-examination will be scheduled within 12 months of the final day of the course.
Compulsory elements :
Number of students : 8 - 25
Selection of students : Eligible doctoral students are prioritized according to 1) the relevance of the course syllabus for the applicant's doctoral project (according to written motivation), 2) date for registration as a doctoral student. Give all information requested, including a short description of current research training and motivation for attending, as well as an account of previous courses taken. Prior knowledge in any software, e.g. Stata, R or SAS is strongly recommended.
More information : The course is extended over time in order to promote reflection and reinforce learning. Course dates are April 10-16 (week 1) and April 24 -30 (week 2). The course will be held at campus KI.

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Title : Causal Inference: emulating a Target Trial to Assess Comparative Effectiveness

Course number : 3046
Credits : 1.5
Date : 2024-04-02 -- 2024-04-05
Language : English
Level : Doctoral level
Responsible KI department : The institute of Environmental Medicine
Specific entry requirements : Courses "Epidemiology I: Introduction to epidemiology", "Epidemiology II: Design of epidemiological studies", "Biostatistics I: Introduction for epidemiologists", "Biostatistics II: Logistic regression for epidemiologists" or corresponding courses.
Purpose of the course : This course focuses on a general framework for the assessment of comparative effectiveness and safety research, which can be applied to both observational data and randomized trials.
Intended learning outcomes : After successful completion of this course, the student should be able to: - Formulate sufficiently well-defined causal questions for comparative effectiveness research - Specify the protocol of the target trial - Design analyses of observational data that emulate the protocol of the target trial - Identify key assumptions for a correct emulation of the target trial - Decide when g-methods are required for data analysis - Critique observational studies and randomized trials for comparative effectiveness research
Contents of the course : The course introduces students to a general framework for the assessment of comparative effectiveness and safety research. The framework, which can be applied to both observational data and randomized trials with imperfect adherence to the protocol, relies on the specification of a (hypothetical) target trial. The course explores key challenges for comparative effectiveness research and critically reviews methods proposed to overcome those challenges. The methods are presented in the context of several case studies for cancer, cardiovascular, renal, and infectious diseases.
Teaching and learning activities : Lectures, group sessions and self-studies of the course literature.
Examination : A written individual take-home examination will be carried out after the course. Students who do not obtain a passing grade in the first examination will be offered a second examination within two months of the final day of the course.
Compulsory elements : The individual written examination (summative assessment).
Number of students : 8 - 25
Selection of students : Eligible doctoral students will be prioritized according to 1) the relevance of the course syllabus for the applicant’s doctoral project (according to written information), 2) date for registration as a doctoral student (priority given to earlier registration date). To be considered, submit a completed application form. Give all information requested, including a short description of current research training and motivation for attending, as well as an account of previous courses taken.
More information : Pre-course reading is required: Chapters 1-3 of the book: Hernán MA, Robins JM (2020). Causal Inference: What If. Boca Raton: Chapman & Hall/CRC. The book can be downloaded (for free) from https://www.hsph.harvard.edu/miguel-hernan/causal-inference-book/. The individual examination will be performed as a take-home examination. The course is given on-site at Campus Solna.

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

Course number : 3073
Credits : 1.5
Date : 2024-03-11 -- 2024-03-22
Language : English
Level : Doctoral level
Responsible KI department : Department of Learning, Informatics, Management and Ethics
Specific entry requirements :
Purpose of the course : The course aim is that the doctoral student develops a theory of science approach by enabling the doctoral student to understand, employ, reflect upon and critically assess concepts and ideas of theories of science as well as their implications for in particular medical scientific practice. A further aim is to enable the doctoral student to understand, reflect upon and critically assess views on and implications of definitions of health and disease.
Intended learning outcomes : Upon completion of the course, the doctoral student should be able to: - understand central concepts and problems of the theory of science, in particular those of relevance for the medical sciences - identify, analyse and critically assess scientific problems, approaches and arguments from a theory of science perspective, in particular in the field of medical sciences
Contents of the course : The course contains the following parts: 1. Theory of knowledge Concepts such as knowledge, truth, and science, as well as the relations between them, are discussed and problematised. Verification/falsification, logical positivism, falsificationism and demarcation are other concepts and theoretical strands to be treated. 2. Theory of science Central concepts, theories and themes within this area are paradigm, the clinical-medical paradigm, the placebo effect, scientific anomalies, and the nature of and view on knowledge within the medical sciences (e.g. randomised clinical trials). The difference and relation between science and values are also dealt with. 3. Science, pseudo-science and scientific argumentation Demarcation in practice, the difference between science and pseudo-science, and argumentation within the sciences (in particular within the medical sciences) are in focus. 4. The concept of health The concept of health is critically assessed, for example based on notions of objectivity/subjectivity. The consequences of using different types of definitions of health are analysed. Furthermore, the concept of disease is discussed, e.g. in relation to normality.
Teaching and learning activities : The course is given online. The teaching and learning activities used are web lectures, written examination, individual writing exercises, an individual written assignment, and reading of course literature and other distributed materials.
Examination : Course examination consists of three parts: - Written examination - Individual writing exercises - One written individual assignment
Compulsory elements : All parts of the course examination are mandatory.
Number of students : 12 - 16
Selection of students : Selection will be based on 1) the written motivation explaining why the course would benefit the doctoral studies, 2) start date of doctoral studies (priority given to earlier start date).
More information : This course is an online course and it will be arranged (half speed) over two weeks' time.

Course responsible :
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Title : Pathology

Course number : 3109
Credits : 3.0
Date : 2024-05-06 -- 2024-05-20
Language : English
Level : Doctoral level
Responsible KI department : Department of Laboratory Medicine
Specific entry requirements :
Purpose of the course : The aim of the course is to enable doctoral students lacking basic higher education knowledge in medicine to understand basic pathological events, such as tissue injury, repair and inflammation and their relation to the development of diseases, and how these alterations are coupled to the microstructure of pathological tissues.
Intended learning outcomes : After the course the student should 1) understand the mechanisms behind basic pathological events; 2) be able to identify selected pathological tissues at light microscopical level and describe the components/cells and their functions; 3) be able to search for and combine information regarding a selected group of diseases, followed by an oral presentation and discussion.
Contents of the course : The course is divided into two parts. One part illustrates cell injury, adaptation, tissue repair, inflammation, cancer development and classification. Methods in molecular pathology are discussed. During the other part of the course a selected group of diseases are studied both during digital microscopy practices and as a written and an oral presentation. How basic pathological responses to inflammation or injury might be the first steps on a multi-step path to malignancy is also discussed.
Teaching and learning activities : This is a full time course with lectures, demonstrations, microscopy exercises and a project work.
Examination : Written examination and project work.
Compulsory elements : Demonstration/microscopy, pathology ""tour"" and project work are compulsory. Absence is compensated with a written report.
Number of students : 8 - 25
Selection of students : Selection will be based on 1) the relevance of the course syllabus for the applicant’s doctoral project (according to written motivation), 2) start date of doctoral studies (priority given to earlier start date)
More information : This course primarily adopts an online format. The course curriculum includes a blend of pre-recorded video materials and live Zoom lectures scheduled between 9 a.m. and 5 p.m. These sessions will feature guest lecturers who bring their expertise to enrich your learning experience. One unique aspect of this course is the opportunity to explore human tissue sections through a digital microscope. This hands-on experience allows you to delve into the intricacies of pathology, and you'll have the chance to engage in discussions with experienced pathologists to deepen your understanding. If possible, with the help of a guided tour, students can gain insight into the operation of the Pathology department and the processing of materials. As part of your coursework, you will collaborate with your peers on a group project. This project involves completing a specific task, which will culminate in the creation of a short report and a presentation. On the last day of the course, the students should demonstrate their acquired knowledge through a written test conducted via Inspera.

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Title : Forskningsetik

Course number : 3118
Credits : 1.5
Date : 2024-01-09 -- 2024-01-30
Language : Swedish
Level : Forskarnivå
Responsible KI department : Department for Clinical Science, Intervention and Technology
Specific entry requirements :
Purpose of the course : Få en inblick i och förståelse av centrala forskningsetiska teorier, principer och riktlinjer och därmed få möjlighet att reflektera över etiska aspekter av den egna och andras forskning.
Intended learning outcomes : Den forskarstuderande ska efter att ha gått kursen kunna: 1. Redogöra för forskningsetiska teorier, principer och till viss del riktlinjer, 2. Visa kunskap angående vanliga forskningsetiska problemsituationer och de etiska verktygen som kan användas för att hantera forskningsetiska konflikter Färdigheter: Den forskarstuderande ska efter att ha gått kursen kunna: 1. Analysera forskningsetiska konflikter, 2. Ge hållbara forskningsetiska argument för eller mot ett förfarande Förhållningssätt: Den forskarstuderande ska efter att ha gått kursen ha: 1. Utvecklat ett forskningsetiskt förhållningssätt till andra forskarstuderande, handledare och seniora forskare, 2. Förståelse för hur ett etiskt förhållningsätt uppfattas hos allmänheten 3. Förståelse för vilken roll forskarens egen hederlighet och integritet har
Contents of the course : Att ge en introduktion till etiken i samband med forskning och en orientering om dess tillämpning på problem inom det vetenskapliga området. Kursen behandlar bl.a. följande teman: centrala etiska principer, teorier och argument, forskningsetik/forskaretik, grundläggande värderingar och normer för god sed i forskningen, innehåll i och värdet av regelverk så som Helsingforsdeklarationen dess funktion, tillämpning, möjligheter och begränsningar, etikprövningar, avvikelser från värderingar, forskningsfusk och vetenskaplig oredlighet. Det informerade samtyckets historia och komponenter. Försöksdjursetisk, innefattande argument för och emot att använda olika djur för forskningsändamål samt de 3 R:en. Hantering av vetenskapligt författarskap (medförfattarskap, författarordning) och intressekonflikter i forskningen.
Teaching and learning activities : Föreläsningar (ca 6t), gruppövningar, seminarier(ca 8t) och muntlig och skriftlig presentation
Examination : Vi bedömer att lärandemålen för kursen är uppnådda genom examination som består av fyra delkomponenter: i) formativ bedömning i samband med aktivt deltagande i seminarier, ii) en muntlig presentation av etiska dilemman i eget eller aktuellt forskningsområde, iii) ett skriftligt PM där synpunkter från opponent på den muntliga presentationen inarbetats, och iv) opponering på annan students presentation av etiska dilemman i forskning. Godkänd kurs innebär att det framgår att erforderliga kunskaper, färdigheter och förhållningssätt har uppnåtts genom aktivt deltagande i seminarier och godkänd muntlig och skriftlig presentation av examinationsuppgiften samt opponering på annan students presentation av etiskt dilemma.
Compulsory elements : Obligatoriskt är att delta vid introduktionstillfället och vid seminarier. Vid frånvaro kan detta kompenseras med utökat PM skrivande och muntlig presentation för kursen eller kursgivare.
Number of students : 14 - 25
Selection of students : Urvalet baseras på 1) kursplanens relevans för den sökandes doktorandprojekt (enligt motivering), 2) startdatum för doktorandstudier
More information : Kursen ges en eftermiddag per vecka (tisdagar kl 13.30-17.15) under totalt fyra veckor. Kursen innehåller föreläsningar, seminarier, gruppövningar samt muntliga och skriftliga presentationer. Mellan kurstillfällena finns material att läsa enligt det schema som ges till antagna. Kursen går digitalt.

Course responsible :
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Title : Epidemiology III. Analysis and Interpretation of Epidemiological Data

Course number : 3129
Credits : 1.5
Date : 2024-05-23 -- 2024-05-31
Language : English
Level : Doctoral level
Responsible KI department : The institute of Environmental Medicine
Specific entry requirements : Knowledge equivalent to "Epidemiology I: Introduction to epidemiology", "Epidemiology II: Design of epidemiological studies", "Biostatistics I: Introduction for epidemiologists" or corresponding courses.
Purpose of the course : The purpose of the course is to familiarise the student with principles for epidemiological data analysis and critical interpretation of study results.
Intended learning outcomes : After successfully completing this course you as a student are expected to be able to: - reason about principles of causal inference, - analyse and interpret interaction between causes, - discuss examples of the application of mediation analysis, - evaluate methodological aspects when critically reviewing individual epidemiological studies, - apply good practices for quantitative bias analysis to epidemiological data.
Contents of the course : The course focuses on issues related to causal inference, principles of epidemiological data analysis, and interpretation of epidemiological concepts and principles of relevance when critically reviewing individual epidemiological studies.
Teaching and learning activities : Lectures, group discussions and various forms of group exercises on selected topics, will be used. The course focuses on active learning, i.e. putting knowledge into practice and critically reflecting upon the knowledge, rather than memorising facts.
Examination : To pass the course, the student has to show that all the intended learning outcomes have been achieved. Assessments methods used are group assignments (formative assessments) along with a written individual take-home examination. The examination is viewed as contributing to the development of knowledge, rather than as a test of knowledge. Students who do not obtain a passing grade in the first examination will be offered a second chance to resubmit the examination within two months of the final day of the course. Students who do not obtain a passing grade at the first two examinations will be given top priority for admission the next time the course is offered.
Compulsory elements : Individual examination task (summative assessment).
Number of students : 8 - 25
Selection of students : Eligible doctoral students will be prioritized according to 1) the relevance of the course syllabus for the applicant’s doctoral project (according to written information), 2) date for registration as a doctoral student (priority given to earlier registration date). To be considered, submit a completed application form. Give all information requested, including a short description of current research training and motivation for attending, as well as an account of previous courses taken.
More information : Course dates are May 23, 24, 29, 30, 31. The individual examination will be performed as a take home examination. The course is given on-site at Campus Solna. Some elements are provided online.

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

Course number : 3133
Credits : 1.5
Date : 2024-05-13 -- 2024-05-17
Language : English
Level : Doctoral level
Responsible KI department : Department of Medicine, Solna
Specific entry requirements :
Purpose of the course : Atherosclerosis will be discussed from the molecular, cellular, genetic, clinical and epidemiological viewpoints. Therefore, participants with a medical background will have the possibility to be more exposed to experimental work and, conversely, participants with a non-medical background will be enabled to obtain good knowledge of distinct clinical manifestations of atherosclerosis. This will be useful for, among others, bioinformaticians in the field. In addition, the course gives the participants the possibility to network with other students in the cardiovascular field.
Intended learning outcomes : The participant should be able to: 1. Relate risk factors with the pathology of atherosclerosis 2. Discuss the development of the atherosclerotic lesion on cellular and molecular level 3. Motivate the use of different models (in vitro-, epidemiological, animal model) to study atherosclerosis and apply them to a given project.
Contents of the course : Atherosclerosis will be discussed from the molecular, cellular, genetic, clinical and epidemiological viewpoints. Topics to be covered include discussions of the roles of the following in atherosclerosis: lipids and lipoproteins; oxLDL; thrombosis; plaque stability; inflammation; innate and adaptive immunity; proteinases; blood pressure; and diabetes/insulin resistance. Examples of in vitro and animal models as well as clinical studies will be discussed.
Teaching and learning activities : Lectures, project group, presentation by participants.
Examination : To pass the course, the participant has to: 1) Give a presentation in a seminar and to be able to discuss the different aspects of atherosclerosis with the course leader and the other participants. 2) To be able to discuss the other participants' presentations. 3) Pass a written exam recapitulating the course's content.
Compulsory elements : Examination is compulsory to pass the course.
Number of students : 8 - 25
Selection of students : Selection will be based on 1) the relevance of the course syllabus for the applicant's doctoral project (according to written motivation), 2) start date of doctoral studies (priority given to earlier start date)
More information : The course location will mainly be at Karolinska University Hospital in Solna. The designated time is 9:00 to 16:00 Monday to Friday including time for individual studies and group work.

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Contact person :
-

Title : Epidemiology II. Design of Epidemiological Studies

Course number : 3138
Credits : 1.5
Date : 2024-06-03 -- 2024-06-12
Language : English
Level : Doctoral level
Responsible KI department : The institute of Environmental Medicine
Specific entry requirements : Knowledge in epidemiology equivalent to "Epidemiology I: Introduction to epidemiology" or corresponding courses.
Purpose of the course : The course focuses on key considerations in designing and critically interpreting different types of case-control studies, as well as matching in cohort and case-control studies.
Intended learning outcomes : After successfully completing this course you as a student are expected to be able to: - in a self-directed manner, formulate the principles of different types of common epidemiological study designs. - mainly independently, explain how a specific measure of disease occurrence and measure of association is governed by the study design. - in a self-directed manner, explain and discuss epidemiological concepts, including accuracy, in the context of different epidemiological study designs. - draw conclusions from epidemiological scientific papers and to review and criticize these regarding study design, results and accuracy. Learning outcomes are classified according to Bloom's taxonomy: knowledge, comprehension, application, analysis, synthesis, and evaluation.
Contents of the course : The course focuses on issues related to study design with emphasis on case-control methodology and different types of sampling strategies, study base, study efficiency, matching in epidemiological studies, induction time, interpretation of epidemiological evidence.
Teaching and learning activities : Lectures, group discussions and various forms of group exercises on selected topics, will be used. The course focuses on active learning, i.e. putting knowledge into practice and critically reflecting upon the knowledge, rather than memorising facts.
Examination : To pass the course, the student has to show that the learning outcomes have been achieved. Assessments methods used are group tasks (formative assessments) along with a written individual task (summative assessment).The examination is viewed as a contributing to the development of knowledge, rather than as a test of knowledge. Students who do not obtain a passing grade in the first examination will be offered a second examination within two months of the final day of the course. Students who do not obtain a passing grade at the first two examinations will be given top priority for admission the next time the course is offered.
Compulsory elements : The individual examination.
Number of students : 8 - 25
Selection of students : Selection will be based on 1) the relevance of the course syllabus for the applicant's doctoral project (according to written motivation), 2) start date of doctoral studies (priority given to earlier start date)
More information : The course is extended over time in order to promote reflection and reinforce learning. Course dates are June 3, 4, 5, 10 and 12. The course will be held at campus KI with elements of online studies.

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Title : Basic Immunology

Course number : 3139
Credits : 3.0
Date : 2024-01-15 -- 2024-02-09
Language : English
Level : Doctoral level
Responsible KI department : Department of Medicine, Solna
Specific entry requirements : A clear interest in Immunobiology. Basic understanding of cell and molecular biology (as an example - you should roughly remember what 'translation', 'G1 phase', 'splicing', or 'endocytosis' all are off the top of your head (without necessity for molecular details)).
Purpose of the course : The student will 1) learn basic concepts in Immunology, 2) get an overview of the various immune cell types and their function and development, and 3) meet the Immunology faculty of Karolinska Institutet. This course is a good starting point for more advanced/thematically focused courses in Immunology. While no prior knowledge in immunology is required, basic immunology concepts will be discussed in depth and detail. Therefore, the course is also valuable for students that wish to broaden and deepen their general immunological knowledge.
Intended learning outcomes : - To describe basic principles of innate and adaptive immunity and how different components of the immune system cooperate - To describe how altered functions of the immune system components can lead to a variety of diseases - To explain the importance of a selection of high-end research papers, and a selection of experimental technologies for advancing the field of immunology - To create an experimental plan to address an outstanding question in the field of immunology - To reflect on how your newly gained knowledge of the immune system may influence your current work, or how it inspired you to address new questions.
Contents of the course : This is a full-time course, which consists of 2 parts. In part 1 we discuss basic immunological concepts underlying innate and adaptive immune responses. In part 2 we revisit and discuss these concepts in the context of disease. More specifically, in part 1 we will discuss development and function of key cell types mediating immune responses, pathogen recognition by cells of the innate immune system, generation of antigen receptor repertoires, principles of self/non-self discrimination and immunological tolerance, and mechanisms of humoral and cellular immune responses. In part 2 this knowledge will be applied to more clinical contexts such as defense against infection, autoimmune diseases, allergic diseases, tumors, or transplantation. Part 1 will take four full days and one half-day. The second part will follow after a teaching-free period of several weeks and will take 3 full days. The purpose of dividing the course into two parts is that the participants should have time to thoroughly study the literature from part 1 (fundamental immunological mechanisms) before learning more applied immunology in part 2. Considering the substantial literature requirement plus work on the assignments, we estimate that an extra 2.5 days of self-studying is needed during the teaching free period.
Teaching and learning activities : Lectures: The majority of the course consists of lectures by KI faculty, specialized in the particular topic they lecture on. International speaker + related preparatory assignment: Towards the end of each course part, we aim to have a seminar by a very renowned international speaker. The purpose of these seminars is to 1) give the course participants the opportunity to get inspired by cutting-edge research at international top level, to 2) deepen the students' knowledge in two different areas of immunology, and to 3) provide examples of different experimental approaches and how their application may lead to answering outstanding questions in immunology. The speakers have been asked to start with a more general introduction of their field of research, and then present some of the past and ongoing work in their lab. To facilitate the students' understanding of these seminars, we will prepare for the seminars with an assignment, which will be discussed just prior to the international seminar. The seminars themselves are open for the whole KI/KS immunology community. Assignments: In addition to the assignment related to the international speaker, the course will include individual and group assignments requiring additional work during teaching-free period has small individual assignments and an extensive group assignment – the latter spanning the teaching-free period. Daily round-up: We will conclude most days with a group discussion session during which the students have the possibility to ask questions regarding the topics of the day.
Examination : In order to pass the course, the students are required to: 1) attend at least 95% of all scheduled activities, 2) actively participate in lectures and group activities, and 3) submit all assignments at a sufficient quality level. A single missed day of the course can be tolerated, but the student will be asked to work on an additional individual assignment based on the topic(s) of this day.
Compulsory elements : Lecture attendance and submission of all course assignments is compulsory.
Number of students : 12 - 30
Selection of students : Selection will be based on 1) the relevance of the course syllabus for the applicant's doctoral project (according to written motivation), 2) start date of doctoral studies (priority given to earlier start date)
More information : 15 Jan – Jan 19: 9:00-17:00; Feb 6 – Feb 8: 9:00-17:00; Feb 9: 9:00-12:00. Lectures will take place in lecture halls on Solna campus.

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Title : Biostatistics III: Survival Analysis for Epidemiologists

Course number : 3142
Credits : 1.5
Date : 2024-02-05 -- 2024-02-14
Language : English
Level : Doctoral level
Responsible KI department : Department of Medical Epidemiology and Biostatistics
Specific entry requirements : Epidemiology I: Introduction to epidemiology, Biostatistics I: Introduction for epidemiologists and Biostatistics II: Logistic regression for epidemiologists or equivalent courses, and practical experience applying statistical models.
Purpose of the course : This course focuses on the application of survival analysis methods to epidemiological studies. The statistical software Stata will be used in the course.
Intended learning outcomes : After successfully completing this course students should be able to: - propose a suitable statistical model for assessing a specific research hypothesis using data from a cohort study, fit the model using standard statistical software, evaluate the fit of the model, and interpret the results. - explain the similarities and differences between Cox regression and Poisson regression. - discuss the concept of timescales in statistical models for time-to-event data, control for different timescales using standard statistical software, and argue for an appropriate timescale for a given research hypothesis. - discuss the concept of confounding in epidemiological studies and control/adjust for confounding using statistical models. - apply and interpret appropriate statistical models for studying effect modification and be able to reparameterise a statistical model to estimate appropriate contrasts. - critically evaluate the methodological aspects (design and analysis) of a scientific article reporting a cohort study.
Contents of the course : This course introduces statistical methods for survival analysis with emphasis on the application of such methods to the analysis of epidemiological cohort studies. Topics covered include methods for estimating survival (life table and Kaplan-Meier methods), comparing survival between subgroups (log-rank test), and modelling survival (primarily Poisson regression and the Cox proportional hazards model). The course addresses the concept of 'time' as a potential confounder or effect modifier and approaches to defining 'time' (e.g., time since entry, attained age, calendar time). The course will emphasise the basic concepts of statistical modelling in epidemiology, such as controlling for confounding and assessing effect modification
Teaching and learning activities : Lectures, exercises focusing on analysis of real data using statistical software, exercises not requiring statistical software, group discussions, literature review.
Examination : The course grade is based solely on a written examination. The examination will contain two sections and a passing grade must be obtained for each section in order to obtain a passing grade for the course. Students who do not obtain a passing grade on both sections and wish to take the examination again must retake the entire examination (i.e., both sections) even if they previously obtained a passing grade on one of the two sections. The focus of the exam will be on understanding concepts and their application to analysis of epidemiological studies rather than mathematical detail. Students who do not obtain a passing grade in the first examination will be offered a second examination within 2 months of the final day of the course. Students who do not obtain a passing grade at the first two examinations will be given top priority for admission the next time the course is offered. If the course is not offered during the following two academic terms then a third examination will be scheduled within 12 months of the final day of the course.
Compulsory elements : The individual examination (summative assessment).
Number of students : 8 - 25
Selection of students : Eligible doctoral students are prioritized according to 1) the relevance of the course syllabus for the applicant's doctoral project (according to written motivation), 2) date for registration as a doctoral student. Give all information requested, including a short description of current research training and motivation for attending, as well as an account of previous courses taken. Prior knowledge in any software, e.g. Stata, R or SAS is strongly recommended.
More information : The course is extended over time to promote reflection and reinforce learning. Course dates are February 5, 7, 9, 12 and 14.

 We have provided a self assessment text (https://biostat3.net/download/self-assessment/self-assessment-stata.pdf) for you to confirm that you understand the central concepts. We advise all potential applicants to take the test prior to applying for Biostatistics III. If you attempt the test under examination conditions (i.e. without referring to the answers), we would recommend.
1. if you score 70% or more then you possess the required prerequisite knowledge
2. if you score 40% to 70% you should revise the areas where you lost marks
3. if you score less than 40% you should, at a minimum, undertake an extensive review of central concepts in statistical modelling and possibly consider studying inter-mediate-level courses (e.g., Biostatistics II) before taking Biostatistics III.
The statistical software Stata will be used throughout the course. Participants are expected to possess basic knowledge of Stata prior to the start of the course. An introduction to Stata can be downloaded from the course webpage (www.biostat3.net). Participants are expected to have prerequisite knowledge equivalent to the learning outcomes of the courses Epidemiology I, Biostatistics I and Biostatistics II.
 The course will be held at campus KI.

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Title : Clinical Trials in Cardiovascular Research

Course number : 3173
Credits : 1.5
Date : 2024-01-15 -- 2024-01-19
Language : English
Level : Doctoral level
Responsible KI department : Department of Medicine, Solna
Specific entry requirements :
Purpose of the course : To enable doctoral students to: -Improve their knowledge and skills related to clinical trial planning and design as well as successful running of different types of clinical trials (observational studies,registries, randomized trials); -Acquire an overview of some recent key trials in the cardiovascular arena.
Intended learning outcomes : After the course, the participants should be able to: -design a clinical trial -account for the relevant regulatory aspects involved in the process of designing and running a clinical trial -analyze and interpret trial data -critically review literature of clinical trials -handle important statistical issues (e.g. different types of adjustments for confounders, biases, how to perform subgroupanalysis in trials, statistical methods for meta-analyses) related to different trial designs (e.g. observational studies,registries, randomized trials and meta-analyses).
Contents of the course : Lectures/Workshops on the following topics: -Different designs of clinical trials -Requirements from regulatory agencies and post marketing surveillance -Upcoming and ongoing cardiovascular clinical trials -Statistical issues in clinical trials -How to interpret clinical trials
Teaching and learning activities : - Lectures/workshops, debates on important clinical trials (2 days) - Home-based studying and preparation of the exam - group work (2 days) - Presentation and discussion of your own design of a clinical trial (1 day)
Examination : Home-based group assignment (design of a clinical trial on a topic of students' choice) which will be presented/discussed on the examination date. Each individual will be assessed on the basis of the achievement of the intended learning outcomes of the course.
Compulsory elements : Participants should attend all the sessions and be involved in group work and presentation of the home assignment. The students who have missed course sessions will be assigned extra-reading and home work to compensate the absence.
Number of students : 8 - 30
Selection of students : Selection will be based on 1) the relevance of the course syllabus for the applicant's doctoral project (according to written motivation), 2) start date of doctoral studies (priority given to earlier start date)
More information : January 15th and 16th: frontal teaching/workshops. January 17th and 18th: home study and preparation of the exam in groups of 4/5 students (home-based). January 19th: exam. Location: Karolinska University Hospital/Karolinska Institutet, Solna.

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Title : Bridging Science and Societal Needs Through Design Thinking

Course number : 3180
Credits : 4.5
Date : 2024-03-13 -- 2024-05-22
Language : English
Level : Doctoral level
Responsible KI department : Department of Neurobiology, Care Sciences and Society
Specific entry requirements :
Purpose of the course : The course aims to introduce Design thinking methodology and provide practical applications of Design thinking in improvement work and in research within complex contexts, from an interprofessional viewpoint. After the course, the student will be able to synthesize information from diverse knowledge traditions, and use a tools skillset in relevant aspects of research to a variety of societal contexts in multi-disciplinary collaborations.
Intended learning outcomes : After the course, the student will be able to: - demonstrate in-depth insights in how Design thinking can be used to explore the possibilities and limitations of science, as well as its role in society and the human responsibility for its use (Module 1) - identify relevant questions within a complex problem area, - use Design thinking as a tool to address societal challenges through interdisciplinary collaboration (Module 2) - demonstrate a critical, independent, creative and scientific rigor to identify and formulate questions; plan tasks within given time frames and equally, to assess such work of others (Module 3) - demonstrate the ability to utilize Design thinking methods to identify needs of deepened knowledge within a field (Module 3) - demonstrate the ability to make use of scientific approaches together with Design thinking in relation to specific societal challenges (Module 3)
Contents of the course : The course content focuses on Design thinking methodology [1] as support for both developmental work and innovation in the surrounding societal and or scientific environment. The course entail the following three modules: Module 1 An introduction to Design thinking (0.5 hp) Main content: An orientation to Design thinking theory and process methodology. Module 2 Practical application of Design thinking in improvement work (0.5 hp) Main content: The module focuses on experience based learning in groups, where students take on generically formulated societal challenges with Design thinking-process. Module 3 Design thinking and innovation within research (3.5 hp) Main content: The module focuses on Design thinking in relation to the research studies of the student. The students identify how Design thinking can be used to increase the quality and societal relevance of their research. Also, students identify different societal challenges the research studies can potentially address. [1] Design thinking is a systematic, human-centered approach to solving complex problems within all aspects of life. The approach goes far beyond traditional concerns such as shape and layout. And unlike traditional scientific and engineering approaches, which address a task from the view of technical solvability, user needs and requirements as well as user-oriented invention are central to the process. Hasso Plattner Institute Academy, 2019.
Teaching and learning activities : The course entails a problem oriented teaching and learning style, where students are provided with a pedagogy that enables them to take active responsibility for individual and group learning. In general, teaching will be performed through lectures, workshops and through supervision of individual tasks.
Examination : Active participation and presentation in Module 1 and 2. An individual written exam in Module 3. Each individual student needs to reach all intended learning outcomes to pass the course.
Compulsory elements : Compulsory sessions are: 1. Participation in compulsory group work. 2. Oral presentations. 3. Provide feedback to at least one other student's work. Absence from the compulsory sessions or assessment seminar can be compensated through supplementary activity.
Number of students : 1 - 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) start date of doctoral studies (priority given to earlier start date)
More information : Dates for spring semester 2024: Wednesdays 13+20 March, 10+17 April, 8+22 May, online. Students will be able to further their research interests and will collect data to gain insights from relevant societal stakeholders.

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

Course number : 3181
Credits : 1.5
Date : 2024-03-06 -- 2024-04-10
Language : English
Level : Doctoral level
Responsible KI department : Department of Learning, Informatics, Management and Ethics
Specific entry requirements :
Purpose of the course : The purpose of this course is to introduce for PhD students/postdocs who are planning to start teaching a variety of teaching and learning activities, and to stimulate a reflective approach to teaching in order to enhance students' meaningful learning and active involvement.
Intended learning outcomes : At the end of the course we expect you to: - Explain general aspects of how to facilitate student learning in different teaching situations - Reflect upon your 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 different contexts like 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 a colleague/peer teaching and reflect upon their experiences.
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 learning, literature studies, observing 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 an observed session of teaching.
Compulsory elements : The assessment seminar the last day of the course is mandatory. If absent, the student needs to present his/her knowledge at a separate occasion.
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) start date of doctoral studies (priority given to earlier start date)
More information : The course is based on theories of experiential learning, a reflective approach and learning through active participation and collaboration. To profit as much as possible from the learning experience of the course, it is important that you are prepared and present at all scheduled sessions. The scheduled sessions will take place on 6 March (campus day), 20 March (webinar), 27 March (webinar) and 10 April (online examination seminar). All these sessions are half-days from 9.00 am-12.00 pm with an exception on the last day (online examination webinar). The last day is mandatory, and you should attend from 9.00 am-12.00 pm or from 13.00 pm-16.00 pm. In addition, time for reading, reflecting, writing and auscultation must be planned by the course participants.

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Title : Core Concepts in Global Health and Global Burden of Disease

Course number : 3185
Credits : 3.0
Date : 2024-01-22 -- 2024-05-15
Language : English
Level : Doctoral level
Responsible KI department : Department of Global Public Health
Specific entry requirements :
Purpose of the course : The purpose of the course is to provide students with a broad perspective on global health and the range of solutions to critical health issues; students will also develop their skills in critical analysis, and will develop confidence in building and presenting arguments in favour of or against various solutions to addressing health issues at a global level.
Intended learning outcomes : -Describe broad trends and inequality in the burden of disease in low, middle and high-income countries; and discuss globalisation and the drivers of these trends; -Understand how data on the global burden of disease is collected and analysed; -Describe key actors, institutions and legal regimes in global health; -Discuss challenges in implementing the health-related Sustainable Development Goals; -Discuss the role of health systems in addressing current global health challenges -Review individual projects and publications in view of the overall aims of the SDG
Contents of the course : -Trends in the global burden of disease, including infectious disease, non-communicable disease, mental health, accidents and violence; -Drivers of global inequalities in health; Challenges in measuring and analysing the global burden of disease; including a critical review of indicators and measurement platforms - Global health governance and financing; Service delivery, health systems and concepts of quality of care -The legal basis underpinning action in global health; -Development theories and the role of culture in global health -Historical review of key approaches and strategies, initiatives and international agendas in global health including maternal, reproductive and child health, HIV, malaria, rational drug use/drug resistance in health and beyond, humanitarian aid and other -Implementation of Sustainable Development Goals for health, particularly Goal 3; -Current challenges in global health, such as migration, climate change and Ebola.
Teaching and learning activities : The course is structured through a combination of lectures, group work and self-directed learning in order to provide students with the tools to be analytical and reflective about how their own PhD topics fit into the wider context of global health. The course will start with a one-week course with lectures and seminars, followed by bi-weekly seminars (with the option to follow remotely) to discuss recent publications or other key events/congresses. Peer-review of the work of fellow students and critical reading and commenting via the learning managment system is part of the course. The one-week on-site lectures will demand that students prepare selected a lecture. A reading list will be provided three weeks in advance.
Examination : Students will be asked to write a 2000 word essay on their PhD topic summarizing linkages to global context and their research addresses global health and development summarising the learning from this course and applying it to their PhD topic and to peer-review the essay of one colleague. The essay is take-home. The course is pass/fail.
Compulsory elements : The exam and the seminars are compulsory. If a participant cannot join in the seminars, he/she is expected to read the articles and to write a short essay to share with other students via the learning management platform.
Number of students : 8 - 15
Selection of students : Selection will be based on 1) the relevance of the course syllabus for the applicant's doctoral project (according to written motivation), 2) start date of doctoral studies (priority given to earlier start date)
More information : On the first week (22nd to 26th of January 2023), there will be lectures and seminars about 6 hours per day. These activities will be a combination of onsite and online teaching. The next activities will be online seminars conducted over Zoom on the following dates: 19th February, 11th Mar,ch 25th March, 15th April, 29th April and 6th May. The final assignment must be submitted by 15th of May 2023.

Course responsible :
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Title : The Vascular Brain

Course number : 3193
Credits : 1.5
Date : 2024-05-20 -- 2024-05-24
Language : English
Level : Doctoral level
Responsible KI department : Department of Clinical Neuroscience
Specific entry requirements : Understanding of basic cell biology and molecular biology.
Purpose of the course : Brain function depends on constant supply of glucose and oxygen from blood vessels. Efficient communication between neural cells and vessels is essential for correct brain function and relies on selective transport of nutrients across the blood-brain barrier. Brains are particularly vulnerable to dysfunction of blood flow and loss of barrier properties which can lead to dementia and neurodegenerative disease. The purpose of the course is to deepen the understanding of concepts underlying cerebrovascular development, cell signaling, imaging methods and vascular contributions to neurodegenerative diseases.
Intended learning outcomes : After the completed course, the students should be able to describe and understand the principles of molecular and cellular mechanisms responsible for neurovascular development, imaging and vascular contribution to neurological disease. The student should be able to use the acquired knowledge in their specific projects and areas of research.
Contents of the course : The course covers central aspects of neurovascular development, cerebrovascular cell biology, blood-brain barrier function, principles of cerebral blood flow and vascular contribution to dementia and neurodegenerative disease. The course will cover genetic animal models, tracer technologies and imaging methods available to study blood vessel function in rodent models and human patients. We will discuss mechanisms leading to vascular dysfunction and loss of blood brain barrier properties as well as recent therapeutic methods to cross the blood-brain barrier for treatments of neurological disease. Highlights from the neurovascular field will be presented in the frame of a minisymposium.
Teaching and learning activities : Lectures by invited Swedish and international experts, minisymposium, group and individual work, seminar presentations.
Examination : The students should demonstrate that they have reached the intended learning outcomes stated above and to reflect on which aspects are relevant for their own research in during the presentations and discussions.
Compulsory elements : All lectures and minisymposium are compulsory to attend. Absence cannot be compensated for.
Number of students : 8 - 30
Selection of students : Selection will be based on 1) the relevance of the course syllabus for the applicant's doctoral project (according to written motivation), 2) start date of doctoral studies (priority given to earlier start date)
More information : The course will be composed of lectures in the hybrid format (in person at Karolinska Institutet) and via zoom for international lecturers. Typically the lectures will start at 10.00 and finish at 15:00 with a lunch break 12.00-13.00. Lectures from speakers in US will take place at 15.00-16:00. The lectures will take place on Monday to Friday and examination will be based on participation in lectures, discussions and include a written assignment. The course may have participants from universities partnering with Karolinska Instituet via the Eurolife and NeurotechEU frameworks. These participants, as well as other international doctoral students, may participate online without the need to travel to Sweden.

Course responsible :
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Contact person :
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Title : Global Health Economics

Course number : 3196
Credits : 3.0
Date : 2024-03-11 -- 2024-03-22
Language : English
Level : Doctoral level
Responsible KI department : Department of Global Public Health
Specific entry requirements : Students should be familiar with basic concepts of health economics.
Purpose of the course : The aim of this course will be to learn about the principles of health economics and the role of this discipline in managing healthcare and taking decisions using different economic tools. Students will learn how health care systems are financed around the world, the principles of Universal Health Coverage (UHC) and financial protection and how it can be measured. Different perspectives of economic evaluations and the four most common types of health economic analysis (cost analysis, cost-effectiveness analysis, cost-utility analysis and cost-benefit analysis) will be described and a brief introduction to modeling in health economics will be given. It will also focus on the unique challenges found in performing economic evaluations in low- and middle-income countries (LMICs) such as validated tools to collect effectiveness/utility measurements and collecting cost data.
Intended learning outcomes : At the end of the course the students will be able to: • Describe and discuss the definitions, key methods, measurements and indicators of UHC, financial protection and patient costs (out-of-pocket (OOP) expenditures, opportunity costs and catastrophic costs) • Explain different perspectives for economic evaluations (health care system, government, third party payer, societal, etc) • Describe common health economic evaluation methods, explain advantages and disadvantages with the different methods and discuss which method that would be preferable in different low- and middle-income settings. • Learn how to calculate costs and outcomes for a health economic evaluation • Critically assess different tools to collect effectiveness and utility measurements • Describe the different health outcomes used in economic evaluation including DALYs, QALYs and different kinds of socio-economic outcomes related to patient costs
Contents of the course : The course will introduce key concepts of health economics and methodology to analyze how scarce resources are used in the health sector and in relation to health. OOP spending and opportunity costs is increasingly recognized as an important barrier to accessing health care, particularly in LMICs where a large portion of health expenditure comes from OOP payments and social safety net systems are often weak. Emerging UHC policies prioritize reduction of poverty impact such as catastrophic and impoverishing healthcare costs. In addition, the course will explore and describe the main kinds of health economic perspectives and evaluations (i.e. cost analysis, cost-effectiveness analysis, cost-utility analysis and cost-benefit analysis) and the challenges that are unique to LMIC settings when it comes to conducting health economic evaluations. This course will highlight methodological challenges in collecting effectiveness/utility and cost data in LMIC contexts. The course will also give an introduction to how modeling techniques can be used in health economics. The course provides training in health economic analyses and presentations, both written and oral.
Teaching and learning activities : The course will have a blended learning approach with the combination of face-to-face lectures, online practical assignments/discussions, self-study and oral presentations and a final written assignment. Face-to-face lectures and other activities will be conducted over the two-week period. Practical assignments in the form of discussions and exercises will be discussed with the group (if applicable online) and peer feedback will be given.
Examination : Course assignments, oral presentation and final written assignment will be graded as fail or pass. In order to pass the course, the student needs to pass the oral presentation and the written assignment. The course assignments will guide the students through the steps needed to design and conduct a health economic study. The aim of the examination is to test the students on what they have learned over the duration of the course and how well they can apply it. The written assignment will be submitted through the KI online learning platform.
Compulsory elements : Participation in the group work, oral presentation, and submitting a final written assignment will be mandatory. Absence can be compensated by an assignment from the course leader.
Number of students : 8 - 20
Selection of students : Eligible doctoral students, with required prerequisite knowledge, will be selected based on 1) the relevance of the course syllabus for the applicant's doctoral project (according to written motivation), 2) date for registration as a doctoral student (priority given to earlier registration date).
More information : Please note - this will NOT include face-to-face lectures. This course will be held completely online through Zoom with "live" lectures (CEST time zone), and there will be a requirement for live attendance for the group work.

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

Course number : 3214
Credits : 3.0
Date : 2024-04-09 -- 2024-05-30
Language : English
Level : Doctoral level
Responsible KI department : Comparative medicine
Specific entry requirements : Previous education in laboratory animal science to carry out scientific procedures on animals (i.e. Function A).
Purpose of the course : The course provides education to doctoral students and scientists who will be involved in the design of scientific procedures involving research animals as part of their research. This course also provides education in laboratory animal science to doctoral students who are not necessarily directly involved with studies using in vivo models but would like to learn how to better interpret and analyze scientific data generated from animal studies.
Intended learning outcomes : After completion of this course, students should be able to meet the defined learning outcomes outlined in the EU Education and Training guidelines, specifically for modules 7 (rodents), 9, 10-11, as well as encompassing learning outcomes from EU modules 1 and 2, 6.1, and 20-22. The list of suggested learning outcomes by the EU guidelines is extensive but in summary, participants will acquire the knowledge required to design and evaluate scientific procedures involving research animals. By the course's conclusion, participants should be able to: • Demonstrate a broader and deeper level of understanding of legal requirements and responsibilities, ethics, animal welfare, and the 3Rs in relation to animal research. • Describe how to conduct scientific procedures, with or without the use of anaesthesia techniques, with a focus on rodents. • Recognize principles of sound experimental design and statistical analysis of animal studies. • Relate principles of good scientific practice in research using animals.
Contents of the course : This course follows the most recent EU guidelines for the education and training of persons designing scientific procedures and projects using animals, i.e. Function B, as stated in the EU Directive 2010/63 and the Swedish legislation (SJVFS 2019:9) on the protection of animals used for scientific purposes. In particular, this course will cover the Function B-specific modules established in the European Union guidelines such as modules EU 7 (Minimally invasive procedures without anesthesia for rodents and lagomorphs), EU 9 (Ethics, animal welfare, and the 3Rs - level 2), EU 10 (Design of procedures and projects - level 1), and EU 11 (Design of procedures and projects - level 2). Moreover, the course will offer a refresher on knowledge related to learning outcomes outlined in EU modules 1-2, 6.1, and 20-22. The course contents are based on the EU Education and Training Framework and include the following areas: • Legislation, ethics, laboratory animal welfare, and the principles of the 3Rs. • Procedures pertaining to animals utilized in scientific research, with a particular emphasis on rodents. • Experimental design and the statistical analysis of animal studies. • Adherence to good scientific practices in animal research.
Teaching and learning activities : This course adopts a blended learning approach, combining in-person seminar lectures, webinars, e-learning, independent study, group tasks, student presentations, in-class discussions, and interactive sessions.
Examination : Real-world application of acquired knowledge will be assessed through oral presentations and scenario-based discussions with feedback from teachers and the other course participants. Theoretical knowledge will be tested with multiple-choice questions.
Compulsory elements : Full course attendance and active participation are mandatory. To be eligible for the final exam, students must have attended a minimum of 70% of the live sessions. Any missed parts of the course must be compensated in agreement coordination with the course leader.
Number of students : 8 - 14
Selection of students : This course is primarily aimed at principal investigators and senior researchers, but postdoctoral fellows and doctoral students at the advanced stage of their studies are also eligible to apply. Priority will be given to individuals actively involved in projects related to animal models.
More information : The teaching days are scheduled in eight separate days (Apr 9, Apr 11, Apr 17, Apr 24, May 15, May 21, May 28, and May 30) between approx. 9 am and 5 pm. The course includes international, national, and local experts in laboratory animal science. This course is FELASA-accredited and follows the specific learning outcomes for Function B modules in accordance with the EC Education and Training Framework, recently endorsed by the new Swedish L150 (SJVFS 2019:9).

Course responsible :
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Contact person :
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Title : Basic Electron Microscopy for Cell Biologists

Course number : 3219
Credits : 1.5
Date : 2024-03-11 -- 2024-03-15
Language : English
Level : Doctoral level
Responsible KI department : Department of Cell and Molecular Biology
Specific entry requirements :
Purpose of the course : The students take this course in order to learn about the ways electron cryomicroscopy (Cryo-EM) methods are used in the study of biological problems, and to gain knowledge in the theoretical basis of electron microscopy and some practical starting skills in electron microscopy methods.
Intended learning outcomes : After the completed course, the students understand and can explain the theoretical basis of Cryo-EM techniques, and explain how different kinds of biological research problems are studied using these techniques. The students have basic knowledge on the application of different preparation methods, and can critically analyse and relate them to cell biological research questions. The students have basic (novice level) practical knowledge on the different practical preparation techniques.
Contents of the course : The course introduces students to cryo-EM and the kind of biological problems such as different biological functions and structures that are studied using electron microscopy. The course includes training in basic methods used to do research on biological material such as subcellular structures. The course includes theoretical lectures, discussions, a small literature project and practical sessions on specimen preparation for cryo-transmission electron microscopy. Most important sample preparation methods for cryo-electron microscopy: vitrification, cryo-confocal imaging for object identification, cryo-FIB-SEM preparation methods for transmission electron microscopy, cryo-volume imaging using FIB-SEM and cryo-transmission electron microscopy. There will be practicals on relevant methods in cryo-electron microscopy.
Teaching and learning activities : The learning and teaching activities include talks (lectures), discussions, laboratory activities and demonstrations.
Examination : The outcomes are examined through an individual quiz with multiple choice questions, and a short individual written report/reflection on how the participants can employ EM techniques in their own research.
Compulsory elements : The practical laboratories and demonstrations are obligatory. Absence from obligatory moments is regulated by instructions of the course leader.
Number of students : 8 - 12
Selection of students : Selection will be based on 1) the relevance of the course syllabus for the applicant’s doctoral project (according to written motivation), 2) start date of doctoral studies (priority given to earlier start date).
More information : The course will be held on the Karolinska Institutet's Solna campus. Lectures and final exam will be held in Biomedicum while practicals and demonstrations will be held in the KI 3D-EM facility (Nobels v. 12E). Designated time is 9:00 to 17:00 Monday to Friday including time for individual studies and group work. The days typically consist of lectures before lunch and practicals/demonstrations in the afternoons. Practicals and demonstrations will include vitrification, cryo-confocal imaging for object identification, cryo- FIB-SEM preparation methods for transmission electron microscopy, cryo-volume imaging using FIB-SEM and cryo-transmission electron microscopy.

Course responsible :
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Solnavägen 9

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

Course number : 5222
Credits : 1.5
Date : 2024-03-04 -- 2024-03-11
Language : English
Level : Doctoral level
Responsible KI department : Department of Neurobiology, Care Sciences and Society
Specific entry requirements :
Purpose of the course : Facilitating a critical dialogue about concepts of prevention and promotion along a knowledge continuum within health care sciences research.
Intended learning outcomes : Based on relevant conceptual resources, upon completion of the course the learner is expected to be able to: 1) critically appraise and reflect on the rationale for conceptual foundations on which to build research addressing illness prevention in healthcare science. 2) critically appraise and reflect on the rationale for conceptual foundations on which to build research addressing health promotion in healthcare science. 3) compare as well as analyze differences and similarities in research addressing health promotion and illness prevention in healthcare sciences. 4) demonstrate reflective reasoning about ethical issues concerning design, data gathering, analysis, intervention, and implementation of projects along a prevention/promotion continuum in healthcare sciences.
Contents of the course : The course builds on a coordinated series of lectures, panel discussions, and debates comprising topics of health promotion and illness prevention grounded in current research conducted across departments at Karolinska Institutet and in collaboration with partner universities. The course commences with an introduction to concepts of illness prevention/health promotion relating to healthcare sciences, followed by illustrations intended to generate discussion about research methods as well as clinical and social implications. The course will build on historically relevant topics as well as ongoing research. Illustrations can come from i.e. public health, family medicine and primary care, and health sciences such as nutrition, nursing, occupational science, physiotherapy, psychology, and social work.
Teaching and learning activities : This course is designed to constitute a series of short expert lectures, panel discussions from current projects, and ethics debates, which will culminate in the foundations for an oral examination. The learning experience builds on a mix of active reading and reflection in combination with dialogue in tandem with taking part of lectures, panels, and debates. The course requires active involvement of the learner through active participation in the scheduled learning activities.
Examination : The examination will consist of an individual oral presentation in a group format, through which all participants can learn from each other in a scholarly exchange of ideas and perspectives. Each participant has to show that all the ILOs are reached. Results will be assessed as Pass/not pass
Compulsory elements : All course activities are mandatory. Absence of max 20% can be compensated for by additional tasks in agreement with the course organiser. At least 80% attendance and passing the final examination is mandatory for a grade of "pass" in the course.
Number of students : 8 - 16
Selection of students : Selection will be based on 1) admission in research school in health sciences, 2) the relevance of the course syllabus for the applicant’s doctoral project (according to written motivation), 3) start date of doctoral studies (priority given to earlier start date).
More information : Course will be offered with a combination of campus and online learning activities. This course is designed to constitute a series of short expert lectures, panel discussions from current projects, and ethics debates, which will culminate in the foundations for an oral examination.

Course responsible :
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Contact person :
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Title : Advanced Scientific Writing

Course number : 5227
Credits : 1.5
Date : 2024-05-13 -- 2024-05-17
Language : English
Level : Doctoral level
Responsible KI department : Department of Women's and children's health
Specific entry requirements : Knowledge corresponding to basic doctoral courses in scientific writing at KI and some experience of scientific writing.
Purpose of the course : This is an advanced course in scientific writing, specifically designed for post docs and PhD students in the later part of their education. The aim is to improve the participants´ ability to write, revise and review original scientific articles.
Intended learning outcomes : After passing the course, the participant will: - have a better understanding of how to write an original scientific article, including use of the proper structure and language - be aware of and, thereby, able to avoid the common mistakes involved in writing scientific articles - have the ability to offer constructive criticism regarding these matters to other scientists (e.g., co-workers, as peer reviewers for journals) - be able to assess constructive criticism of their manuscripts from other scientists and revise accordingly
Contents of the course : This is an advanced course in scientific writing that requires prior knowledge and experience in writing research articles. The participant will be writing and revising manuscripts based on their own research (written, at least in part, before the course begins) as well as peer reviewing the manuscripts of other course participants. The teachers will focus on giving feedback in great detail on the scientific articles of the students and also guiding the revision of the manuscripts after the review sessions.
Teaching and learning activities : Lectures, individual writing and revising of manuscript, individual and group peer reviewing of the manuscripts of other course participants, group discussions including feedback from the teachers.
Examination : Writing and rewriting a manuscript based on the comments and feedback from the other course participants and teachers, thoughtful peer reviewing of the manuscripts of other course participants, active participation in group exercises.
Compulsory elements : All scheduled teaching, unless stated otherwise or the participant informs the teachers in advance of an acceptable reason for not being present. Absence can be compensated for by individual work specified by the teachers or in connection with the next time the course is taught.
Number of students : 8 - 12
Selection of students : Selection will be based on 1) personal motivation, including prior experience in manuscript writing 2) the relevance of the course syllabus for the applicant's doctoral project (according to written motivation), 3) the start date of doctoral studies (priority given to an earlier start date)
More information : This is an advanced course on scientific writing for postdocs and PhD students later in their education. The focus will be on writing and revising your own manuscript with a lot of individual coaching. To participate, a requirement is to bring a manuscript draft to work on. The course takes place online using the platform Zoom. All lectures will be given according to the schedule in real-time; no prerecorded material.
Please address ALL questions to: anna.hildenbrand.michelman@ki.se or phone: 0707890607

Course responsible :
Anna Hildenbrand Michelman
Institutionen för kvinnors och barns hälsa
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Contact person :
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Title : Advanced presentation techniques: Oral Presentation of Own Research

Course number : 5231
Credits : 1.5
Date : 2024-05-20 -- 2024-05-24
Language : English
Level : Doctoral level
Responsible KI department : Department of Women's and children's health
Specific entry requirements : Basic course in presentation techniques or similar knowledge level.
Purpose of the course : The purpose of the course is to build skills and increase the participant's confidence in presenting own research results. This is an advanced course in presentation skills requiring prior experience of presenting your research. The course is specifically targeting post docs and PhD students in the later part of their education.
Intended learning outcomes : After passing the course, the participant will: - be able to structure and build compelling presentations based on own research results - have skills in how to consistently deliver in an engaging manner - be capable of building instant rapport and get an audience on their side every time - understand the best use of voice, body language and posture - be able to make their mark and be remembered - understand how to deal with challenges during presentations, e.g. hostile audience members, difficult questions, technology problems, nervousness and blacking out - have knowledge of a broad variety of presentations styles in order to find their own - be able to use supportive media - be able to design presentation slides that support the message
Contents of the course : The course is highly personalized, tailored to the specific needs of the individual participants. A variety of techniques will be presented and tried out to enable the participants to develop in their own way to become more professional at presenting, yet remaining authentic. The course includes: - presentation structure - presentation techniques - dealing with the audience - overcoming challenges, e.g. hostile audience members, questions, nervousness, technology issues - body language, voice and presence on stage - filming of an elevator pitch, which the participants get to keep after the course to use e.g. on a webpage - how to design successful PowerPoint presentation slides - how to use supporting media
Teaching and learning activities : Lectures, group work, exercises, individual coaching and filming.
Examination : Presentations and participating in exercises during the course.
Compulsory elements : All scheduled teaching and group work is compulsory. Absence can be compensated for during individual assignments or during the next course occasion.
Number of students : 8 - 12
Selection of students : Selection will be based on 1) Personal motivation, including previous experience and/or relevant courses on the topic 2) the relevance of the course syllabus for the applicant's doctoral project (according to written motivation), 3) the start date of doctoral studies (priority given to earlier start date)
More information : Welcome to apply for PhD course 5231 Oral presentation of own research! This is an advanced presentation techniques course for Postdocs and PhD students who have previous experience presenting their research results and want to improve their skills further. The focus will be on presenting your results in different formats and includes a lot of individual coaching. The course is given online, with all lectures in real-time and according to schedule (no pre-recorded lectures).
 Please address ALL questions to: anna.hildenbrand.michelman@ki.se or phone: 0707890607

Course responsible :
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Contact person :
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Title : Psychoneuroimmunology

Course number : 5252
Credits : 4.5
Date : 2024-01-15 -- 2024-02-16
Language : English
Level : Doctoral level
Responsible KI department : Department of Clinical Neuroscience
Specific entry requirements :
Purpose of the course : Psychoneuroimmunology is the study of the functional and bidirectional relationships between the nervous system, the endocrine system, the immune system and behavior. The main purpose of the course is to provide the student with an overview of present knowledge in this field and to offer an opportunity to apply a crossdisciplinary mechanistic perspective across physiological and pathological conditions. The students are given good opportunities to network and to interact with leading national and international researchers in a quickly developing area. We also wish this course to be an opportunity to interact with other PhD students with overlapping research interests.
Intended learning outcomes : At the end of the course, the doctoral student will be able to: 1) Understand and describe the essential concepts in psychoneuroimmunology, and the basic mechanisms by which the nervous, the endocrine, and the immune system communicate. 2) Critically discuss how these concepts and mechanisms are relevant for health. 3) Critically reflect on the literature in the field of psychoneuroimmunology. 4) Identify knowledge gaps, and design an adequate research plan for a study in psychoneuroimmunology.
Contents of the course : An overview of the essential concepts and the research in the different areas of psychoneuroimmunology will be provided. The adaptive and pathological consequences of immune activation on brain functions and behavior, including fatigue, pain, mood regulation, social behavior, and neuropsychiatric symptoms, as well as how the immune system is modulated by brain inputs, such as during stress, will be described. In addition, the course will give an opportunity to understand how behaviors can be proactively activated to improve overall defense against microbes. Models/tasks used in psychoneuroimmunology research will also be the subject of a seminar. The course will additionally include a journal club, where specific papers will be discussed; and time is reserved to prepare the written and oral presentations of a mock research project, as well as for tutoring sessions to help in the preparation.
Teaching and learning activities : - Lectures and seminars, which will provide an overview of the essential concepts and the research in the different areas of psychoneuroimmunology for the use of the doctoral student in the preparation of the examination assignment (written and oral presentations). - Journal club. - Meet-the-experts session, where the students will have the opportunity to meet and interact with leading national and international researchers in psychoneuroimmunology. - The doctoral student has access to supervision in the preparation of the written examination. - The oral presentations will take place during a seminar in the end of the course. Note that the course will be provided fully online. Zoom and Gather Town will be used for the classroom activities.
Examination : The examinations will consist in a written (2-3 pages) and oral presentation of a mock research project that is well motivated in background of the current state of knowledge/lack of knowledge in psychoneuroimmunology. Each student need to show that all intended learning outcomes have been reached in order to pass the course.
Compulsory elements : - Written and oral examination. - Participation in the examination seminar. In case of absence from the scheduled examination seminar, another occasion for examination can be arranged as agreed upon with the course leader. The compulsory elements can be adapted, for instance by providing more support or additional time to provide the assignments, on a case-by-case basis (e.g. students with special needs) - please talk to the course leader at the start of the course.
Number of students : 8 - 40
Selection of students : Selection will be based on 1) the relevance of the course syllabus for the applicant’s doctoral project (according to written motivation), 2) start date of doctoral studies (priority given to earlier start date)
More information : The course is divided in two parts:
 Weeks 1-2: January 15, 2024 to January 26, 2024.
 Week 3: February 12, 2024 to February 16, 2024.
 This course is given jointly by the doctoral programmes Allergy, immunology and inflamation (Aii) and Neuroscience (Neuro). See: https://staff.ki.se/doctoral-programmes.

Course responsible :
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Julie Lasselin
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Title : Human Physiology - distance course

Course number : 5253
Credits : 3.0
Date : 2024-04-15 -- 2024-04-26
Language : English
Level : Doctoral level
Responsible KI department : Department of Physiology and Pharmacology
Specific entry requirements :
Purpose of the course : KI is a medical university with research and education in medicine and health. All PhD students have to obtain basic knowledge regarding the human body in health and disease in case they lack basic higher education knowledge in the field of medicine. The aim of the course is to give PhD students without a medical background a basic overview and introduction to human physiology. The students will gain a basic understanding of how the human organ systems function and interact under normal conditions. The content covered in this course will be useful for further studies where knowledge about human biology is of value and can hopefully add value to the PhD project and beyond.
Intended learning outcomes : After completing the course, the student will have gained a basic understanding of how the human organ systems function and interact under normal conditions. 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 : The course will cover the following areas within human physiology: - 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 : The course is given as a distance course on the course platform used at KI and through online seminars and lectures. For each area there will be recorded lectures, study questions, quizzes and live occasions. There will also be asynchronous group discussions and seminars.
Examination : The learning outcomes are examined with a project presentation and a written online test. Students that are absent from the examinations or do not obtain a passing grade in the first examination will be offered a second examination.
Compulsory elements : The students need to participate in group discussions and send in seminar assignments during the course. If absent or if assignments are not sent in, a new deadline will be issued.
Number of students : 15 - 20
Selection of students : Selection will be based on 1) the relevance of the course syllabus for the applicant's doctoral project (according to written motivation), 2) start date of doctoral studies (priority given to earlier start date)
More information : This course will be held online.

Course responsible :
Stefan Reitzner
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Contact person :
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Title : How to Conduct Systematic Reviews and Meta-Analyses

Course number : 5254
Credits : 3.0
Date : 2024-05-13 -- 2024-05-29
Language : English
Level : Doctoral level
Responsible KI department : Department of Clinical Neuroscience
Specific entry requirements : Students need to have basic knowledge of biostatistics (corresponding to KIs Basic Course in Medical Statistics or Biostatistics I) and it is recommended to have basic knowledge in epidemiology (corresponding to Epidemiology I course).
Purpose of the course : Systematic reviews represent the gold standard approach to identifying, evaluating, summarising, and synthetizing scientific evidence (with meta-analysis as a tool for quantitative synthesis), and they have contributed greatly to the current body of scientific knowledge. This course aims to introduce the concepts and procedures of systematic reviews and meta-analyses and will help applicants to get started with their own study.
Intended learning outcomes : At the end of the course the students should be able to: 1) Understand and demonstrate the value, principles and the different concepts related to systematic reviews and meta-analyses, in particular compared to other types of studies (incl. narrative reviews, original research); 2) Identify the strengths, limitations, and pitfalls of systematic reviews and meta-analysis; 3) Independently formulate study hypotheses, and plan and generate a study protocol to perform a systematic review and meta-analysis, justifying the selection of the eligible studies and statistical methodology; 4) Apply basic methods of meta-analyses; 5) Critically reflect on other students individual project work and provide feedback in a scientifically constructive way (peer-review); 6) Interpret and critically evaluate scientific studies relevant to the course content.
Contents of the course : 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 various tools to facilitate the systematic search and data-management, as well as how to apply different statistical methods and programs.
Teaching and learning activities : Interactive lectures, seminars, individual article review, group discussions, practical sessions (one on systematic literature search, one on statistical methods) and homework tasks will be used. The course focuses on active learning, i.e. putting knowledge into practice and critically reflecting upon the knowledge, rather than memorising facts. Therefore, much of the focus of the course is on the individual project where students are required to develop a full study protocol including several important aspects covered in the lectures, peer assessment, article reviews and group discussions. Students will also peer-review each other's projects and this will form the basis for the final examination seminar. Throughout the course, the students will work on an individual project and will have to peer-review the project of another student. Further, students will critically review and discuss relevant scientific articles. There will be several group discussions with other students and experienced teachers, with a focus on peer-assessment (discussing each other's projects), and the lectures are interactive allowing for critical discussions.
Examination : 1) Individual project work: To develop a written comprehensive yet concise study protocol including several important aspects as discussed during the course; 2) Peer-review of other students' projects followed by an oral presentation of their own project and opposition of other students projects during the group examination; 3) Critically review scientific articles relevant to the course content. To pass the course, the student has to show that all intended learning outcomes have been reached.
Compulsory elements : Compulsory attendance includes the scheduled lectures and seminars (i.e. full first week of the course + exam). One is required to come well prepared for each seminar (see reading list). Absence will need to be replaced by individual assignments following discussion with the course coordinator, 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 : 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). Since a basic understanding of biostatistics is required, and a basic understanding of epidemiology is recommended, please state your relevant experience.
More information : The course is designed for PhD students, in particular those who are at an early stage of their doctoral education, and those with an interest in conducting systematic reviews and meta-analysis. - The course will start with one intense week of mandatory lectures, discussions, and practical sessions (from May 13 to May 17). - On May 22 (09:00-12:00), there will be an "Open office" to get direct feedback from the supervisors and librarians on your study project (attendance optional). - On May 29 (09:00-13:00), there will be the examination day, which is mandatory to attend. - The course also requires preparation at home before the course starts and during the course. - The lectures will be held at KI campus Solna.

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Title : Early Child Development: Extended Interactions Between Neural Networks, Body and Environment

Course number : 5255
Credits : 1.5
Date : 2024-03-18 -- 2024-03-22
Language : English
Level : Doctoral level
Responsible KI department : Department of Women's and children's health
Specific entry requirements : Course #3220 Basic Human Neuroscience at KI or corresponding knowledge (basic knowledge about brain development and child neurodevelopment)
Purpose of the course : This 5-module program (one per day) builds on top of the current best research and understanding of neurodevelopment in early childhood as a process that emerges from the interplay between brain networks, body, and environment. As well as the latest advancements in their implications for atypical developmental trajectories, clinical assessment methods, and early intervention strategies. Understanding neurodevelopment in children during the first years of life requires zooming out and considering how brain functions are built and how experience mediates this process. The main purpose of this course is to provide students with the fundamental concepts of early child neurodevelopment as a process that emerges from the interplay between extended brain-body networks into the world. Besides, the course will focus on the importance of early clinical assessment of neurodevelopment, follow-up, and intervention strategies in high-risk children. The course will focus on the clinical aspects of child neurodevelopment and is not considering the basic knowledge (pre-clinical models, embryology, genetics, anatomy) of brain development. The focus will be on the translational research into clinical practice.
Intended learning outcomes : By the end of the course the student should be able to: • Demonstrate critical understanding of how early child neurodevelopment emerges from the interplay between different modes and different time scales of extended brain-body networks into the world. • Apply theory to practice demonstrating advanced reasoning skills in the assessment of how brain functions are built and how experience mediates this process. • Describe how clinical follow-up programs, early interventions, and policies can support children’s development
Contents of the course : This course will cover 5 modules over 5 days; 1) The development of brain networks: continuous feedback from the body and the environment 2) From motor abilities to abstract thinking 3) Connections between aberrant developmental processes and neurodevelopmental disorders 4) Early evaluation, follow-up and repair strategies 5) Future directions: advanced neuroimaging data analytic approaches and integration with biological measures
Teaching and learning activities : Lectures by invited national and international experts on the field, seminars, work in groups, students’ presentations. There will also be time every day for literature review and preparation for the examination seminar.
Examination : The students should demonstrate their knowledge, skills and critical understanding included in the intended learning outcomes stated above in a concluding examination seminar at the end of the last day and in discussions during the course. They should also reflect on the aspects that are relevant for their own research in discussions.
Compulsory elements : All lectures and seminars are compulsory. Absence from a lecture or seminar can be compensated for by a written assignment.
Number of students : 8 - 15
Selection of students : Selection will be based on 1) the relevance of the course syllabus for the applicant's doctoral project (according to written motivation), 2) start date of doctoral studies (priority given to earlier start date)
More information : The course is 100% digital using zoom (Monday-Friday). All lectures, seminars and group work are compulsary, but there will be time every day for literature review and preparation for the examination seminar.

Course responsible :
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Title : Introduktionskurs i kliniska studier: från idé till arkivering

Course number : 5274
Credits : 1.5
Date : 2024-02-19 -- 2024-02-23
Language : Swedish
Level : Forskarnivå
Responsible KI department : Department of Oncology-Pathology
Specific entry requirements :
Purpose of the course : Syftet med kursen är att kursdeltagarna tillägnar sig en praktisk förståelse och inblick i processen, principer och regler inom uppstart, genomförande och avslut av kliniska studier.
Intended learning outcomes : Efter kursen förväntas doktoranden: - kunna planera och ta fram ett studieprotokoll inklusive en grundlig metodisk utvärdering och val av lämplig studiedesign. - känna till de olika regelverken kring en klinisk studie (Helsingforsdeklarationen, Etikprövningslagen, EU-förordningen 536/2014 CTR, Dataskyddförordningen GDPR mfl) och utifrån dessa kunna planera, genomföra och avsluta en klinisk studie på rätt sätt. - känna till de olika avtal som krävs vid uppstart, av en klinisk studie. - kunna reflektera kritiskt över andra studenters forskningsprojekt på ett vetenskapligt konstruktivt sätt.
Contents of the course : - Genomgång av studieprocessen /studieplanering - Att skriva studieprotokoll - Statistik och metodgenomgång - Studiegenomförande (datainsamling, journalanteckningar, säkerhetsrapportering mm) - Genomgång av olika begrepp och aktörer inom kliniska studier (inkl. medicinteknik och IVDR) - Föreläsningar om Good Clinical Practice (GCP), Helsingforsdeklarationen och andra regelverk - Ansökningar (Etikprövningsmyndigheten, Läkemedelsverket, Biobank) - Etik i forskningen utifrån regelverken (Helsingforsdeklarationen, Etikprövningslagen, CTR mfl); att väga risk mot nytta, att skriva en patientinformation, samtyckesprocessen mm, - Avtal/kostnadsberäkning - Avslut/Arkivering/Rapportering
Teaching and learning activities : Föreläsningar från myndigheter och personer specialiserade inom sina respektive områden, gruppövningar, seminarier samt muntliga och skriftliga presentationer. Kursen fokuserar på praktiskt lärande genom att omsätta kunskap i praktisk bemärkelse och kritisk reflektion av kunskap.
Examination : För att bli godkänd i kursen måste studenten visa att lärandemålen har uppnåtts. Detta bedöms genom aktivt deltagande i seminarier och godkänd muntlig och skriftlig presentation. Deltagarna kommer att delas in i mindre grupper. Målet är att gå igenom studieprotokollen inom varje grupp, kritiskt analysera innehållet och ge feedback till varandra. Deltagarna kommer att slutföra flera uppgifter under hela kursen, vilket kommer att hjälpa deras förmåga att skriva ett studieprotokoll. Intyg i GCP ingår om man blir godkänd.
Compulsory elements : Obligatorisk närvaro vid föreläsningar, gruppövningar och presentationer. Frånvaro tas igen vid ett senare kurstillfälle samråd med kursansvarig.
Number of students : 10 - 15
Selection of students : Urvalet baseras på 1) kursplanens relevans för den sökandes doktorandprojekt (enligt motivering), 2) startdatum för doktorandstudier
More information : Kursen kommer att hållas vid Karolinska Universitetssjukhusets lokaler i Solna. Inbjudna föreläsare från olika regulatoriska myndigheter. För att bli godkänd i kursen måste studenten visa att lärandemålen har uppnåtts. Detta bedöms genom aktivt deltagande i seminarier och godkänd muntlig och skriftlig presentation. Intyg i GCP ingår om man blir godkänd.

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Title : Basic tumor histopathology

Course number : 5275
Credits : 1.5
Date : 2024-02-12 -- 2024-02-16
Language : English
Level : Doctoral level
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.
Intended 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 OneDrive.
Examination : The students will get different case studies including digital images from tumors tissues and their clinical history via the OneDrive 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 Committee for 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 : 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) start date of doctoral studies (priority given to earlier start date)
More information : Online course

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Title : Get started with R – Programming Basics, Data Analysis and Visualisation

Course number : 5300
Credits : 3.0
Date : 2024-02-05 -- 2024-02-18
Language : English
Level : Doctoral level
Responsible KI department : Department of Neurobiology, Care Sciences and Society
Specific entry requirements :
Purpose of the course : The course is practical and aims at teaching students how to: Use the programming environment R and RStudio, which includes installation, how to handle errors, problem solve and access helper documents. Use basic concepts of programming, such as data types, logical and arithmetic operators, if else conditions, loops and functions. Use common R packages to perform basic statistical analysis (e.g., t-test, chi2-test, correlation) and visual presentation (e.g., boxplot, histogram and heat-map) of data in R.
Intended learning outcomes : After attending the course the student should know: • How to download, install and navigate R and RStudio • How to solve common problems arising from data formatting and handling • Common programming concepts and how to employ them in R • How to import data and packages in R • How to use R for basic statistical analysis and visual presentation of data
Contents of the course : Course participants start the course by installing and familiarising with the R and RStudio environment. This includes version control, as well as structuring and documenting code for publication. Next, basic concepts shared between all programming languages are introduced, such as data types and operators. Students will also learn how to use recommended naming conventions, syntax and how to comment code. Methods for importing packages and data is then introduced and students will learn how to search for help and get examples of common problems that may arise. Finally, students will practice using packages for data management, statistical analysis and visual presentation. Methods include distribution tests, power-analysis, t-test, chi2-test, correlation, boxplot, scatterplot and bar plot. Visual presentation will mainly use the ggplot2 package, providing a good example of object-oriented programming in R. Throughout all lectures focus will be on application and understanding of the methods used, not statistical assumptions or interpretation of the results. Examples will primarily be taken from experimental research and tasks will use dataframes available upon installation of R. However, when possible students are encouraged to use their own data. The last day of the course can either be used to continue to apply R on own data or to learn procedures that can be performed with R which most other statistical software’s cannot. Such as, managing folders and files, querying databases and importing codes and algorithms.
Teaching and learning activities : Distance learning with online interactive lectures. Group and individual exercises where a teacher will be available to help. Assignments and Canvas quizzes that the student completes on their own. Reviewing other students’ code and interaction with other students. Individual project work. Four days each week will consists of lectures in the morning introducing concepts and tasks in the afternoon, where these concepts are put to practice. The last day of each week will be a larger exercise where the student is required to combine introduced concepts into a whole. This exercise will be reviewed by a fellow student who will have the opportunity to comment on ways to improve the work. The 11th (last) day is optional and described in the previous paragraph.
Examination : Project presentation and review.
Compulsory elements : Canvas quizzes and tasks. Individual projects and reviews of other students’ project. Participation during project presentation and review. Students who miss obligatory elements will complete extra tasks associated with the specific element. Course participants unable to participate during the project presentation will have the presentation for the course administrator but will miss the opportunity to get their work reviewed by other participants.
Number of students : 15 - 25
Selection of students : Selection will be based on 1) the relevance of the course syllabus for the applicant's doctoral project (according to written motivation), 2) start date of doctoral studies (priority given to earlier start date)
More information : From Monday to Thursday, the course consists of Zoom lectures in the morning (9:00 - 12:00) after which (13:00-16:00) quizzes and tasks will be provided for the student to complete alone. Both Fridays students will hand in an exam assignment, which will be presented and reviewed by another student.

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Title : Fundamentals of Statistical Genetics and Data Visualization

Course number : 5308
Credits : 1.5
Date : 2024-03-18 -- 2024-03-22
Language : English
Level : Doctoral level
Responsible KI department : Department of Medicine, Solna
Specific entry requirements : Knowledge of basic statistics; knowledge of logistic and linear regression; familiarity of R software and scripting in R; familiarity with UNIX commands; knowledge in epidemiology equivalent to the course Epidemiology I; Introduction to Epidemiology or corresponding courses.
Purpose of the course : The course aims to enable doctoral students and postdocs to acquire an understanding of statistical genetics in complex diseases based on theory and practical examples. The course will focus on teaching fundamental principles in genetic epidemiology and genomic data analysis. The course will be conducted in the classroom (or online) along with assigned times for practical exercises and will use the UPPMAX platform, the Uppsala Multidisciplinary Center for Advanced Computational Science. This is a national resource and platform for high-performance computing https://uppmax.uu.se/. Students will get an UPPMAX account, which will facilitate computational analyses and implementation of course activities and practicals. Computational tools and software are readily available in UPPMAX.
Intended learning outcomes : The intended learning outcomes (ILOs) include to be able to: 1. Describe statistical methods for genetic studies 2. Explain new and old practices in the design and execution of computational genetic studies and integration of gene expression data 3. Differentiate and apply different methods for computational genetics 4. Develop programming skills and critical thinking to conduct problem-solving solutions using genetic data
Contents of the course : Topics to be covered: • Association studies and meta-analysis • Principal component analysis (PCA) • Expression quantitative trait loci (eQTLs) • Computational methods for gene x environmental (GxE) interactions • Methods and estimation of polygenic risk scores (PRS) • Methods and application of Mendelian randomization (MR)
Teaching and learning activities : Teaching and Learning Activities (TLAs) include: 1. Pre-reading and notes based on past and current statistical methods followed by group discussion 2. Presentation of independent project based on a past or current statistical method 3. In pairs, propose an idea to solve a biological question of your choice – use whiteboard or brainstorming techniques 4. Create a systematic protocol for executing the idea proposed in step 3. Present your data analysis plan and genomic data to be investigated. Provide an interpretation of the results and defend why your approach is appropriate for how to tackle the biological question of your choice.
Examination : Assessments tasks (AT) include: 1. Daily quizzes 2. Summarize discussion on past and current methods 3. In a group of 3, write a critical assessment of each group member' presentation 4. Present your idea in one PowerPoint slide 5. Present the abstract for your project and analysis protocol
Compulsory elements : Students absent during the course elements are asked to perform computational exercises and practicals independently. Students will then submit data analysis interpretation in writing.
Number of students : 8 - 30
Selection of students : Selection will be based on 1) the relevance of the course syllabus for the applicant's doctoral project (according to written motivation), 2) start date of doctoral studies (priority given to earlier start date)
More information : The course is an entire week course. The course will be conducted in the classroom (location to be determined). The course consists of a combination of lectures, computer practicals, and group discussions. Moreover, to facilitate the course activities and implementation of the course regarding computational activities, we have a project number for the course in uppmax, and each student will have an uppmax account to access course exercises. The students have the alternative to work on their own computers using docker images. We have confirmed lecturers: Professor Suzanne Leal, Department of Neurobiology, Columbia University, New York, USA, Director of the Center for Statistical Genetics and Senior Research Associate at the Rockefeller University, USA Professor Michael Nothnagel, University of Cologne, Cologne Center for Genomics, Department of Statistical Genetics and Bioinformatics, Germany

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Title : Clinical Oncology for Pre-clinical Doctoral Students

Course number : 5505
Credits : 1.5
Date : 2024-02-19 -- 2024-02-23
Language : English
Level : Doctoral level
Responsible KI department : Department of Oncology-Pathology
Specific entry requirements : The course is in English but understanding Swedish is recommended since the course is partly based at the clinic.
Purpose of the course : The aim of this course is to introduce preclinical PhD students, with no or little education in clinical oncology and who do research within the field of cancer, to clinical cancer care and modern concepts of cancer treatments in order to educate a new generation of pre-clinical cancer researchers and to give a broad overview of translational cancer research focusing on clinical oncology. In the future, these researchers will be the backbone of Cancer Tumor Boards and part of the clinical decision-making in cancer.
Intended learning outcomes : After completing the course, the participants should be able to: • Understand clinical cancer management, personalized cancer medicine and outcome evaluation in cancer in order to make decisions based on scientific evidence. • Understand the concept of modern cancer treatments in relation to basic cancer biology. • Reflect on and discuss the concept of clinical trials, the role of translational research and the challenges thereof. • Reflect on and discuss the most important problems that need to be solved in cancer. • Reflect on and discuss future goals in cancer prevention, diagnostics and therapy.
Contents of the course : • Participation in the scheduled clinical work and multidisciplinary cancer conferences. • Seminars and group discussions. • A central concept of the course is clinically centered teaching where the student will follow a clinician specialized in the field of the student´s area of research. The course deals with clinical oncology, new concepts in cancer management, clinical trials and how to apply translational cancer research in the clinic. Further the student will be encouraged to consider the practical importance of cancer research and what it means to have a clinical perspective in research. Different types of cancer will be represented.
Teaching and learning activities : The course consists of group seminars, group discussions and participation in the clinical work including multidisciplinary conferences in the clinical field of the student´s area of research. Full time for one week.
Examination : Assessment is conducted through participation in the clinical work and the course seminars where the student is expected to demonstrate an ability to discuss on principles in personalized cancer management in relation to translational cancer research. To pass the course, the participant is required to have achieved all intended learning outcomes of the course and completed all assignments as well as participated actively in group discussions during the course.
Compulsory elements : The group seminars and clinical participation are compulsory. Single missed occasions can be compensated during the course after discussion with the course director.
Number of students : 8 - 16
Selection of students : Selection will be based on 1) the relevance of the course syllabus for the applicant's doctoral project (according to written motivation), 2) start date of doctoral studies (priority given to earlier start date)
More information : Venue: Karolinska University Hospital and Bioclinicum.

Course responsible :
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Contact person :
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Title : Research Communication in Health Science

Course number : 5506
Credits : 1.5
Date : 2024-01-31 -- 2024-02-13
Language : English
Level : Doctoral level
Responsible KI department : Department of Learning, Informatics, Management and Ethics
Specific entry requirements :
Purpose of the course : The course aims at enabling students to obtain basic knowledge of science communication and to prepare students for effectively communicating research both to peers within academia as well as to a wider audience.
Intended learning outcomes : At the end of the course, students are expected to be able to: - explain the main characteristics and outline of different types of scholarly communication (manuscript, abstract, posters and oral presentation). - understand principal concepts associated with scientific communication. - communicate own research adjusted to different contexts by using various means of interaction. - based on theories of communication and learning assess the quality of peers' research and give constructive feedback accordingly.
Contents of the course : Participants will be given the opportunity to develop practical skills and theoretical knowledge in how to deliver a coherent message in written and verbal communication. There will be a focus on basic concepts such as how to improve one’s academic writing; how to adapt presentation techniques and rhetoric in versatile settings; how to use different media (such as posters, projection media, whiteboard) and how to express oneself clearly.
Teaching and learning activities : The pedagogic framing is based on student activity with interactive lectures, seminars and workshops. The scheduled face-to-face activities in the course will be mixed with individual work and feedback from teachers and peers via the web-based learning platform Canvas and through Zoom.
Examination : The knowledge and skills acquired in the course will be assessed through written assignments (outline of poster and letter to editor or journal abstract) and oral presentation (7-minute platform presentation). For a pass grade, an approved exam in all subjects is required.
Compulsory elements : Assignments, seminars and group activities are mandatory. Absence from compulsory sessions can be compensated by replacement activities.
Number of students : 8 - 20
Selection of students : Selection will be based on 1) the relevance of the course syllabus for the applicant's doctoral project (according to written motivation), 2) start date of doctoral studies (priority given to earlier start date)
More information : This is a 1.5 credit course spread out over two weeks and requires some time for independent work outside of scheduled class time. Scheduled sessions are on the following dates: 31 January (Campus Day), 6 February (Webinar), 8 February (Webinar) and 13 February (Examination webinar). The course is given in English.

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Title : Biostatistics II: Logistic Regression for Epidemiologists

Course number : 5519
Credits : 1.5
Date : 2024-05-13 -- 2024-05-17
Language : English
Level : Doctoral level
Responsible KI department : Department of Medical Epidemiology and Biostatistics
Specific entry requirements : Knowledge in epidemiology and biostatistics equivalent to Epidemiology I: Introduction to epidemiology and Biostatistics I: Introduction for epidemiologists or corresponding courses
Purpose of the course : The course introduces statistical methods for the analysis of categorical outcome data.
Intended learning outcomes : After successfully completing this course you as a student are expected to be able to: - choose the appropriate regression model for studying a specific research hypothesis using data collected from an epidemiological study, implement the model using standard statistical packages, assess the goodness of fit, and interpret the results, - explain the concept of confounding in observational studies and use statistical models to to control/adjust for confounding, - apply appropriate statistical models to study and interpret effect modification, - carefully read an epidemiological paper to critically review the methodological aspects of the article, with emphasis on the study assumptions, design, analysis and interpretation Intended learning outcomes are classified according to Bloom´s taxonomy: knowledge, comprehension, application, analysis, synthesis, and evaluation (Bloom, 1956, extended by Anderson and Krathwohl, 2001).
Contents of the course : The course focuses on the formulation and application of the logistic regression model in the analysis of epidemiological studies to estimate relative and absolute effect measures. Topics covered include a brief introduction to binary outcome data, measures of associations in two-by-two tables, univariable and multivariable models, interpretation of parameters for continuous and categorical predictors, flexible modeling of quantitative predictors, confounding and interaction, model fitting and a glance to model diagnostics.
Teaching and learning activities : Lectures, computer based assignments with applications focusing on analysis of real data sets, using statistical packages such as Stata or R, hand based exercises, group discussions and literature review.
Examination : The student has to show that the learning outcomes have been achieved to pass the exam. The course grade is based on the individual written examination (summative assessment). The focus of the examination will be on the understanding of the underlying principles of categorical data models and their application to analysis of epidemiological studies, and therefore less emphasis will be given to mathematical details. Students who do not obtain a passing grade in the first examination will be offered a second examination within two months of the final day of the course. Students who do not obtain a passing grade at the first two examinations will be given priority for admission to the next course's offering. If the course is not offered during the following two academic terms then a third examination will be scheduled within 12 months of the final day of the course.
Compulsory elements : The individual take-home written examination (summative assessment).
Number of students : 8 - 25
Selection of students : Eligible doctoral students are prioritized according to 1) the relevance of the course syllabus for the applicant's doctoral project (according to written motivation), 2) date for registration as a doctoral student. Give all information requested, including a short description of current research training and motivation for attending, as well as an account of previous courses taken. Prior knowledge in any software, e.g. Stata, R or SAS is strongly recommended.
More information : The course will be held at campus KI.

Course responsible :
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Title : Incurable Cancers

Course number : 5520
Credits : 1.5
Date : 2024-04-29 -- 2024-05-03
Language : English
Level : Doctoral level
Responsible KI department : Department of Biosciences and Nutrition
Specific entry requirements : Recommended: Basic course in tumor biology and oncology or similar
Purpose of the course : This translational course is designed for PhD students and junior postdocs that wish to connect their knowledge on tumor biology to clinical reality. The students will learn about the clinical behavior of cancers that are particularly hard to treat, including carcinomas of the lung, pancreas, esophagus, and liver. The course provides a basic historical overview of efforts to treat these cancers and will discuss the possible reasons for failure to make significant progress. A focus will then lie on novel developments that in recent years have begun to spark significant improvements in the treatment of "incurable cancers". By connecting molecular tumor biology and clinical reality, the course shall inspire the student to develop their own approaches to cure potentially "incurable" cancers.
Intended learning outcomes : After completion of the course, the students should be able to: - Appreciate the complexity of cancers and differentiate between tumor types with a generally good and bad prognosis - Reflect on the reasons why treatment of some cancer types has been particularly challenging - Describe the basics of the most important treatment strategies in oncology and how they failed for specific cancer types - Present an overview of recent improvements in cancer treatment on a molecular level, and their effects on cancers that are regarded hard to treat.
Contents of the course : This course will provide information on clinical treatment strategies and introduce the concept of incremental progress that has driven developments in oncology for decades. It will discuss why conventional treatments that are successful for some cancers, fail in others. Then, the course will cover clinically important examples of tumor types that challenge the paradigm of incremental progress, and introduce novel therapies from a more preclinical perspective.
Teaching and learning activities : Seminars by clinicians (oncologists and surgeons) and by basic researchers. Group discussions and staged "Molecular Tumor Boards", in which preclinical knowledge will be applied to clinical patient cases. Field visits to the hospital.
Examination : Active participation in the Molecular Tumor Board discussions and the seminars, where the student shall demonstrate the ability to discuss general concepts of cancer therapy. To pass the course, the participant is required to: - Complete all assignments and participate actively in group discussions during the course. - Pass an oral examination on the concluding day.
Compulsory elements : Attendance to all the activities of the course and the oral examination are mandatory. Absence from mandatory parts of the course will have to be compensated for by other activities after discussion with the course leaders.
Number of students : 8 - 20
Selection of students : Selection will be based on 1) the relevance of the course syllabus for the applicant's doctoral project (according to written motivation), 2) start date of doctoral studies (priority given to earlier start date)
More information : The course runs over the whole week and will be held mainly on Huddinge campus.

Course responsible :
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NEO, research group MGE
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Contact person :
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Title : Practical Introduction to Multilevel Data Analysis: From Data Collection to Results Interpretation

Course number : 5531
Credits : 3.0
Date : 2024-03-06 -- 2024-04-03
Language : English
Level : Doctoral level
Responsible KI department : Department of Learning, Informatics, Management and Ethics
Specific entry requirements : Knowledge of basic statistics (including correlations and regression analysis) and basic ability to use a statistical program, preferably R. Alternatively, familiarity with recommended preparatory reading: A. Field, J. Miles, and Z. Field "Discovering statistics using R" chapters 3 (the R environment), 4 (exploring data with graphs), 6 (correlation) and 7 (regression).
Purpose of the course : The purpose of this course is to give doctoral students a possibility to acquire practical understanding and hands-on statistical skills required to use multilevel analysis in their research projects. The course also aims at inspiring the students to apply novel data collection designs in their research (e.g., hierarchical and cross-classified data, clustered randomized trials, collecting data with diary and experience sampling designs, using data from tracking and mobile devices).
Intended learning outcomes : After completing this course doctoral students will be able to: - Formulate a research question relevant to their research projects that can be answered by the multilevel data analysis. - Describe a range of data collection methods that are suitable for the multilevel data analysis. - Propose a multilevel model suitable for addressing a research question and fit the model using standard statistical software. - Describe and interpret the results of the multilevel data analysis.
Contents of the course : The course covers those aspects of the multilevel data analysis that are necessary for doctoral students to successfully use this method in their research projects. This includes a complete introduction to selected topics covering both theoretical assumptions behind the method and basic explanation of statistical procedures used to estimate multilevel models. During the first two weeks of the course, students will discuss the research questions that may be answered by the multilevel data analysis, as well as the types of multilevel data designs and methods of data collection. During the third and fourth week, students will work with step-by-step tutorials for analyzing multilevel data using R programming language, and interpreting the results.
Teaching and learning activities : The course will start with short presentations of students' research projects, followed by a goal setting workshop. All the teaching materials, including pre-recorded lectures and tutorials, will be available on the course website for students to interact with. The course will be organized in the flipped classroom format, meaning that students will be required to get familiar with available materials before scheduled teaching time (e.g., seminars). The teaching of the course will be coaching-based, which means that the instructors will be available during workshops and Q&A seminars twice a week. Time not scheduled for workshops, Q&A, and feedback sessions will be reserved for students' own work on the four examination assignments. One of these assignments will require students to run statistical analyses following the provided tutorials available for R and Jamovi (on request Mplus code can also be provided). Students will be able to individually decide whether they want to work on their own data or on example datasets. Feedback on the assignments will be openly presented for all students' benefit during the feedback session.
Examination : The examination consists of two parts. During the first three weeks of the course, students will be required to submit three short assignments regarding an example research question, methods that can be used to collect data suitable for multilevel analyses, and the analysis strategy. During the fourth week of the course, students will be required to submit one longer assignment presenting the results of multilevel analyses that a student has conducted during the course. This assignment will be equivalent to the methods and results sections of a scientific article and will be graded pass or fail.
Compulsory elements : The course is equivalent to two weeks of full-time study, but it will run for four weeks and will require students to devote on average 20 hours of work a week. About 5 hours of live meetings will be scheduled, while remaining 15 hours will be dedicated to own work with flexible schedule. Presence is required during the introduction seminar as well as workshops, Q&A, and feedback sessions at least once a week. Absences can be compensated for by scheduling additional consultation time with one of the instructors.
Number of students : 8 - 20
Selection of students : Selection will be based on 1) the relevance of the course syllabus for the applicant's doctoral project (according to written motivation), 2) start date of doctoral studies (priority given to earlier start date)
More information : Live online workshop sessions are planned for Wednesdays 06/03, 13/03, 20/03, 27/03 and 03/04 at 13-15. Live online Q&A sessions are planned for Mondays 11/03, 18/03, 25/03 at 13-15.

Course responsible :
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Contact person :

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Title : Neural Regulation of Inflammation and Metabolism

Course number : 5533
Credits : 1.5
Date : 2024-05-20 -- 2024-05-24
Language : English
Level : Doctoral level
Responsible KI department : Department of Medicine, Solna
Specific entry requirements :
Purpose of the course : The purpose of this course is to give doctoral students and post-docs insights into the neuro-immune crosstalk, particularly in the regulation of inflammation and metabolism, and how engineering, neuroscience, immunology and clinical medicine can come together to find new ways to treat disease.
Intended learning outcomes : At the end of the course, the course participants will be able to: 1) Define prototypical neural circuits that regulate inflammation and metabolism, in particular in the pathogenesis of and recovery from autoimmune diseases, cardiovascular diseases and infection, 2) Identify the components of the ""inflammatory reflex"" and discuss neural regulatory mechanisms for cytokine release, 3) Contrast advantages and drawbacks with major neural based treatment approaches for inflammatory and metabolic diseases, 4) Define bioelectronic medicine and explain its potential role in clinical medicine summarize challenges in engineering and medicine for development of bioelectronic medicine technology.
Contents of the course : Neural control of organ systems will be discussed in molecular, cellular and clinical perspectives. Special attention will be given to the mechanisms that detect and regulate inflammation and metabolism. The neurophysiology of nerve stimulation and other treatments that involve interfacing with the nervous system will be reviewed. Progress in neural interfacing and device development within the emerging field will be discussed.
Teaching and learning activities : Lectures, a student project group and a student presentation.
Examination : Project presentation and written examination.
Compulsory elements : Lectures, project group participation, active participation in presentation and passing the examination is compulsory for ""PASS"". Limited absence from lectures can be compensated for after individual discussion with 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) start date of doctoral studies (priority given to earlier start date)
More information : Full time at Solna campus. This course is given jointly by the doctoral programmes Cardiovascular Research (CVR) and Allergy, immunology and inflammation (Aii). See: https://staff.ki.se/doctoral-programmes.

Course responsible :
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Contact person :
Laura Tarnawski
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Title : Coronary Heart Disease: Present and Future Perspectives in a Pan-Vascular Context

Course number : 5536
Credits : 1.5
Date : 2024-03-18 -- 2024-03-22
Language : English
Level : Doctoral level
Responsible KI department : Department of Clinical Sciences, Danderyd Hospital
Specific entry requirements :
Purpose of the course : The course aims to give the student an overview of the state of art of research on ischemic heart diseases and focuses on the areas where implementation is needed to answer relevant research questions.
Intended learning outcomes : The participants should at the end of the course: 1. Have a general 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 knowledge gaps in the research field
Contents of the course : We will discuss the factors affecting the risk for coronary heart disease across selected low and high income settings; the cardinal symptoms and the underlying mechanisms; novel and emerging cardiac biomarkers; established and novel preventive measures. In addition, we will give an overview of vascular disease in other vascular beds to put coronary artery disease in a pan-vascular context. Finally, we will address the gaps in knowledge in this research field.
Teaching and learning activities : The course will be delivered as a full-time course during five consecutive days. It will consist of lectures, time for own reading of the literature and preparing the course tasks, group works, oral presentations/discussions and a final exam.
Examination : Formative assessment by peers and lecturers during the group works and discussions and summative assessment of the written examination.
Compulsory elements : The course participants should attend all the course lectures and the sessions of group work and presentation/discussion. The participants who have missed some of the sessions will be assigned additional reading and essay work to compensate the absence.
Number of students : 8 - 20
Selection of students : Selection will be based on 1) the relevance of the course syllabus for the applicant's doctoral project (according to written motivation), 2) start date of doctoral studies (priority given to earlier start date)
More information : The course will be held digitally to enable students from other universities within Sweden and abroad to participate.

Course responsible :
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Contact person :
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Title : The Basics of Skeletal Biology: from Evolutionary Origins to Translational Research

Course number : 5538
Credits : 3.0
Date : 2024-02-05 -- 2024-02-21
Language : English
Level : Doctoral level
Responsible KI department : Department of Women's and children's health
Specific entry requirements : KI's Laboratory safety test for laboratory Staff: https://staff.ki.se/kis-laboratory-safety-test
Purpose of the course : The course aims to enable doctoral students and postdoctoral fellows to acquire a comprehensive knowledge in different aspects of skeletal biology, from development to function in health and disease, as well as the most recent advances in regenerative medicine of bone and cartilage tissues. The course will cover basic cell biological, developmental and clinical aspects of skeletal physiology in health and disease. This course will also give students a glimpse of skeletal-related practical work, as well as the opportunity to develop their critical thinking by discussing the topics and connecting the learned concepts to students' respective study plans.
Intended learning outcomes : At the end of the course, the student will be able to: - explain the functions of the most common cell-types and extracellular matrix components within bone and cartilage tissues during development and homeostasis - connect processes in cellular biology to clinical manifestations - discuss skeletal functions in relation to health and in examples of disease - describe novel technologies in bone and cartilage regenerative medicine - discuss the purposes of histochemically staining and imaging skeletal tissue sections, and how to do this, from their own practical experiences. - integrate the obtained knowledge into their own doctoral project
Contents of the course : The course will cover key theoretical and experimental knowledge in skeletal biology from function to clinical applications. The content is divided by interlinked theoretical modules: 1) introduction and origins, 2) Bone tissue and cells, 3) Hormonal regulation of the skeleton, 4) Diseases and aging, 5) Genetic and epigenetic regulation of the skeleton, 6) Regenerative medicine, 7) Scientific interactions and networking. The combination of theoretic knowledge with "hands on" experimental practice and clinical insights, will bring together classical and advanced translational methods that will prepare the students for a career in skeletal biology research.
Teaching and learning activities : There are several activities with specific outcomes: - Lectures: Lectures will be conducted by world leading researchers in their fields. Students will be able to gain theoretical knowledge about the given research area. -Students will get to meet one of the former patients of one of the lecturers of the course, to see how molecular biology techniques can be used to make real world impacts to a patient's lives. -Break-out discussions: Students will discuss questions provided by the most recent speakers in groups of 3-4, with each session lasting for 12 minutes. Students will frequently be re-allocated into new discussion groups. The remaining time will be used to have a group discussion and summarise the day. - Laboratory work: Histochemical staining of mouse bone sections. Students will take sections of mouse bones (prepared in advance by the organisers) and conduct safranin O/fast green staining, allowing a distinction between bone, cartilage and bone marrow tissues. Imaging and quantification of the stained tissue sections. Students will capture images of their stained slides and be shown how to recognise different structures and to quantify the growth plate height at two different ages. Students will submit this quantification and representative images as a course assignment.
Examination : Students will be asked to prepare a 10-minute presentation linking at least one of the course's scientific themes, including the major points from intended learning outcomes (ILOs), to their own project. In addition, the aspects of ILOs in each presentation will be followed by 5-10 minutes of questions from the audience (other students and examiners). This activity will encourage the students to think about what they have learnt and apply it to their own current and future research.
Compulsory elements : Attendance: Students should not miss more than 4 hours of the course. For each lecture missed, a half-page summary of the topic should be submitted. Practical sessions will be mandatory, but in the case of illness, course organisers will devise an alternative task dependent on the student´s prior expertise. Participation in group discussions: Students will be expected to participate in the group discussions both virtually and in-person. Practical session: Students will conduct histochemical staining and collect their own data. Each student will submit a one page piece of coursework including representative images and quantification. Examination: See below.
Number of students : 8 - 16
Selection of students : Selection will be based on 1) the relevance of the course syllabus for the applicant's doctoral project (according to written motivation), 2) start date of doctoral studies (priority given to earlier start date)
More information : Week 1: Monday 5th February 2024 -Thursday 8th February 2024; Week 2: Monday 12th February 2024 - Thursday 15th February 2024; Week 3: Monday 19th February 2024- Wednesday 21st February 2024. Many of the days are short, allowing time for the learning material to be absorbed, and so that students have the chance to continue lab activities if necessary.

Course responsible :
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Title : Implementation Research in Health

Course number : 5540
Credits : 5.0
Date : 2024-04-08 -- 2024-05-07
Language : English
Level : Doctoral level
Responsible KI department : The institute of Environmental Medicine
Specific entry requirements :
Purpose of the course : The purpose of the course is to educate doctoral students in the latest knowledge regarding theory and methods in the field of dissemination and implementation research to promote the systematic uptake of research findings into routine practice.
Intended learning outcomes : At the end of the course, the student should be able to: 1. Define core concepts in dissemination and implementation research 2. Apply knowledge and understanding of theories, models and frameworks of implementation research 3. Demonstrate how to develop a program theory for an implementation study 4. Design a process and outcome evaluation of an implementation study 5. Apply knowledge of mixed-methods evaluations 6. Critically appraise published implementation studies in health
Contents of the course : As this course aims at giving doctoral students knowledge in theory and methods in implementation research in health, the content focuses on the following themes: 1. Theories, models, and frameworks in implementation research 2. How to apply a theoretical perspective using relevant change theories 3. Implementation strategies, barriers and facilitators 4. Appropriate study designs for process and outcome evaluation 5. Systematic and critical appraisal of published implementation studies 6. Dissemination of scientific results
Teaching and learning activities : The course is based on lectures 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 student's 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 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 and methods in the field of implementation research will be assessed in relation to the expected learning outcomes through the following examinations: a. Contribution to group-work, in discussions and short seminar reports. b. A written project report and oral presentation of the report and opposition.
Compulsory elements : Participation in 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 1) the relevance of the course syllabus for the applicant's doctoral project (according to written motivation), 2) start date of doctoral studies (priority given to earlier start date)
More information : Lectures, individual- and group-assignments will be given on Campus Solna on different days of the week. Lectures are given by experts in the field.

Course responsible :
Lydia Kwak
Institutet för miljömedicin

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Contact person :
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Title : Genome Instability in Cancer Development and Therapy

Course number : 5557
Credits : 1.5
Date : 2024-04-08 -- 2024-04-12
Language : English
Level : Doctoral level
Responsible KI department : Department of Medical Biochemistry and Biophysics
Specific entry requirements :
Purpose of the course : The course aims at providing the students with a comprehensive overview of genome instability and its role in cancer development and progression. Genome instability can on one hand be beneficial, creating possibility for natural selection during evolution. On the other hand, it can lead to severe consequences when the level of genomic alterations causes development of cancer. Mutations and other deviations of DNA can be the consequence of inefficient or error-prone DNA repair processes and can originate from a wide range of sources including genotoxic stress due to transcription, DNA replication, DNA structures or chromatin topology. The students will at the end of the course have become acquainted with the DNA damage response and the different mechanisms involved in sensing, tolerating and repairing DNA damage and how this is exploited in cancer treatment. The student will gain a deeper understanding of how the DNA damage response connects to different cellular responses such as chromatin remodelling and epigenetics, as well as transcription, replication, cell cycle progression and apoptosis. Possibilities for design of anti-cancer treatment strategies, both with regards to DNA damaging chemo- and radiotherapy as well as emerging treatments targeting key players in the DNA damage response (targeted therapies), will be discussed and applied to the students own research projects.
Intended learning outcomes : After successfully completing this course the students will be able to: - identify different types of genome instability and describe their role in cancer development and progression - discuss and explain different mechanisms involved in sensing, tolerating and repairing DNA damage and how this is exploited in cancer treatment - understand the mechanism of action of DNA damaging inducing anti-cancer treatments and drugs targeting the DNA damage response - describe and understand state-of-the-art strategies for targeting the DNA damage response in cancer - critically assess different molecular biology assays to study DNA repair and replication in cells and how this can be applied in their own research - understand and theorize about how the DNA damage response connects to different cellular responses such as chromatin remodelling and epigenetics, as well as transcription, replication, cell cycle progression and apoptosis and apply this knowledge in their own research projects
Contents of the course : The course will cover the topics stated in the learning outcomes, including key sources and biological responses to DNA damage, state-of-the-art techniques to detect DNA damage and genomic alterations in vitro and in vivo and the consequences of genome instability for cancer development and therapy success.
Teaching and learning activities : The course consists of lectures and seminary by experts in their fields and group exercises such as journal clubs. To promote active learning, lectures and seminars are followed by discussions between the students and the speakers and the students will apply knowledge from the course in their own research projects in the examination.
Examination : To pass the course the students must show that they have reached the learning outcomes of the course. The course assignment will consist of: 1) an individual oral presentation about integrating topics from the course into the students' own research projects in line with the intended learning outcomes of the course. 2) the students are expected to ask questions on each other's presentations and be able to discuss and answer questions from fellow students and course leaders in line with the intended learning outcomes of the course.
Compulsory elements : Attending the lectures, seminars, group exercises and the examination seminar are compulsory. Absence can be compensated by other activities after discussion with the course leader.
Number of students : 8 - 20
Selection of students : Selection will be based on 1) the relevance of the course syllabus for the applicant's doctoral project (according to written motivation), 2) start date of doctoral studies (priority given to earlier start date)
More information : The course involves lectures and seminars by both national and international experts in the field of genome stability and cancer biology, together with journal clubs. The students will have ample opportunity to interact with the speakers and discuss relevant biology as well as general queries about scientific practice. Although the majority of the course will be conducted on KI campus (Biomedicum/SciLifeLab) promoting interactions between the students, some lectures will be held via digital platforms (Zoom) to cover the global scope of cutting-edge genome instability research.

Course responsible :
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Contact person :
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Title : Linear Regression Analysis in Neuroscience: Model Choice, Implementation, Analysis Errors and Interpretation

Course number : 5569
Credits : 3.0
Date : 2024-01-29 -- 2024-02-19
Language : English
Level : Doctoral level
Responsible KI department : Department of Neurobiology, Care Sciences and Society
Specific entry requirements : Basic Course in Medical Statistics (for example KI courses in basic statistics for doctoral students) and being familiar with basic R programming.
Purpose of the course : The main purpose is for students to understand basic regression analysis principles through a variety of examples with Neuroscience data and help students adapt them to the needs of their research questions using the R language. The course content has been developed to solve regression problems often faced in Neuroscience and all examples will be based on Neuroscience studies.
Intended learning outcomes : After the course the student is supposed to: - Be able to explain how linear regression analysis works and decide when regression should/should not be used depending on the research question. - Be able to implement and assess a linear regression model in a basic statistical programming language from scratch but also with packages (This course is not focused on learning R, basic R programming skills are required).
Contents of the course : The course covers both theoretical and practical regression aspects, with a focus on the application and errors of linear regression modelling. Special focus throughout the course will be given to the: - Regression optimization, warnings and errors produced and their relation to study design, available data (singularity, autocorrelation, small sample sizes, outliers), and model output (heterogeneous residuals etc). - Search for alternative models that can tackle a scientific question more accurately. - Understanding fixed and random effects. The course focuses mainly on the application of linear regression. Thus, the student will learn how/why linear regression works by using simulated and real datasets from the field of Neuroscience (including brain imaging, neuropsychological assessment, fluid markers). The course is divided in two parts: Part one: 1) Statistical hypothesis testing versus statistical modelling (Introduction). 2) Linear regression. 3) Alternative linear regression models (PCR, PLS, lasso/ridge/elastic net, variable selection models). Part two: 4) Polynomial regression. 5) Introduction to random and fixed effects.
Teaching and learning activities : Teaching is predominantly in the form of lectures and computer labs. Student activities will include group discussions and presentations, quiz, Q&A sessions, computer labs, and two assignments. The students will receive the time schedule before the course to adjust their working activity accordingly.
Examination : Examination of the course's intended learning outcomes is carried out through a written classroom examination.
Compulsory elements : Lectures, student group discussion and labs. The course responsible assesses whether and if so, how absence can be compensated.
Number of students : 10 - 25
Selection of students : Selection will be based on 1) the relevance of the course syllabus for the applicant's doctoral project (according to written motivation), 2) start date of doctoral studies (priority given to earlier start date)
More information : The course consists of classroom lectures (10 lectures) in the morning (9:00 - 12:00) and quizzed and tasks in the afternoon (13:00 - 16:00), Monday - Friday on week 1, Thursday - Friday on week 2 and Monday - Wednesday on week 3. Monday (19th of February) there will be a classroom exam from 9:00 to 12:00. The remaining days of the course are free.

Course responsible :
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Title : Quality Assurance of Clinical Research

Course number : 5580
Credits : 1.5
Date : 2024-01-15 -- 2024-02-09
Language : English
Level : Doctoral level
Responsible KI department : Department of Medicine, Solna
Specific entry requirements :
Purpose of the course : This course is suitable for any kind of clinical researcher at KI. The purpose of the course is to carry insights to the participant how to create trustful data, and how to become a trusted researcher. The course brings information of what is required to act safely and in accordance with local rules, national legislation and international treaty's when involved in clinical research. Whether your research is interventional or non-interventional, using quantitative or qualitative methodology, you will after this course know how to act to secure your research persons, your data and your professional career.
Intended learning outcomes : Knowledge and understanding: Conclude which legislations affects clinical research and how they do it. Deduce how clinical research integrity is affected by fabrication, falsification and plagiarism. Account for common problems that may arise in clinical research. Competence and skills: Differentiate the responsibilities between the investigator, the study team members, and the sponsor in a clinical study. Analyse the validity of a research project proposal or publication with a risk-benefit analysis. Translate general research quality systems into own research area. Judgement and approach: Critically identify good clinical scientific practices and deviations from it in clinical research. Judge data validity and their reproducibility. Handling bias, sponsorship, and scientific authorship in a paper.
Contents of the course : This course presents different quality systems in clinical research including good clinical practice (GCP). In more detail the course also discusses: How and when the informed consent shall be asked for in relation to the research. Why you can’t substitute research persons. What to consider when constructing a study protocol. How to handle violations to the protocol. Why you need to screen for unwanted effects. What is the responsibility on your shoulders as an investigator? What you can do to safeguard your research and career.
Teaching and learning activities : You should have some basic experience using Canvas as this software is our learning management system. The course is provided in a digital format with video lectures, readings, discussion postings and self-tests. It is divided into two phases. These correspond to one-week full time course distributed over four weeks. The course is self-paced. In the first phase digital lectures are provided on research quality. There are self-tests after each lecture. The first phase includes the GCP course. The second phase lets the student pick an article from a selection of different research areas for an in-depth critical analysis using the analysing tools provided. Finally, the student has to present how quality is applied to, or how it could be incorporated, in the students’ own research area. The faculty is available and on stand-by during the study period (office hours). The study path of each student is monitored.
Examination : Having cleared all preceding moments including self-tests and mandatory multiple choice test, an individual final examination with short answer questions is taken. The theme for this refers to implementation of the quality standards in the students own research field. If the final exam is not cleared a new final exam will be offered at next course occasion.
Compulsory elements : There will be a mandatory attendance check upon study start. If no-show, the seat will be cancelled and referred to another student on the waiting list for the course. Each self-test must be passed to be considered completed. There is a mandatory multiple choice test to pass halftime into the second phase. To be able to take the final exam all preceding moments must have been cleared.
Number of students : 25 - 35
Selection of students : The seats will be admitted according to relevance for the students thesis as described in the motivation and registration date as PhD-student at KI.
More information : This course corresponds to 1 week study work. It is a self-paced course over 4 weeks. It is fully digital. It consists of video lectures and multiple choice quizzes. There is a mandatory introduction webinar the first day, in the morning. The exam is open the last day between 09.00-17.00 (9 am to 5 pm), and takes usually 2 hours. During the course there is a written analysis that has to be done.

Course responsible :
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Contact person :
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Title : Quality Assurance of Clinical Research

Course number : 5580
Credits : 1.5
Date : 2024-03-04 -- 2024-03-28
Language : English
Level : Doctoral level
Responsible KI department : Department of Medicine, Solna
Specific entry requirements :
Purpose of the course : This course is suitable for any kind of clinical researcher at KI. The purpose of the course is to carry insights to the participant how to create trustful data, and how to become a trusted researcher. The course brings information of what is required to act safely and in accordance with local rules, national legislation and international treaty's when involved in clinical research. Whether your research is interventional or non-interventional, using quantitative or qualitative methodology, you will after this course know how to act to secure your research persons, your data and your professional career.
Intended learning outcomes : Knowledge and understanding: Conclude which legislations affects clinical research and how they do it. Deduce how clinical research integrity is affected by fabrication, falsification and plagiarism. Account for common problems that may arise in clinical research. Competence and skills: Differentiate the responsibilities between the investigator, the study team members, and the sponsor in a clinical study. Analyse the validity of a research project proposal or publication with a risk-benefit analysis. Translate general research quality systems into own research area. Judgement and approach: Critically identify good clinical scientific practices and deviations from it in clinical research. Judge data validity and their reproducibility. Handling bias, sponsorship, and scientific authorship in a paper.
Contents of the course : This course presents different quality systems in clinical research including good clinical practice (GCP). In more detail the course also discusses: How and when the informed consent shall be asked for in relation to the research. Why you can’t substitute research persons. What to consider when constructing a study protocol. How to handle violations to the protocol. Why you need to screen for unwanted effects. What is the responsibility on your shoulders as an investigator? What you can do to safeguard your research and career.
Teaching and learning activities : You should have some basic experience using Canvas as this software is our learning management system. The course is provided in a digital format with video lectures, readings, discussion postings and self-tests. It is divided into two phases. These correspond to one-week full time course distributed over four weeks. The course is self-paced. In the first phase digital lectures are provided on research quality. There are self-tests after each lecture. The first phase includes the GCP course. The second phase lets the student pick an article from a selection of different research areas for an in-depth critical analysis using the analysing tools provided. Finally, the student has to present how quality is applied to, or how it could be incorporated, in the students’ own research area. The faculty is available and on stand-by during the study period (office hours). The study path of each student is monitored.
Examination : Having cleared all preceding moments including self-tests and mandatory multiple choice test, an individual final examination with short answer questions is taken. The theme for this refers to implementation of the quality standards in the students own research field. If the final exam is not cleared a new final exam will be offered at next course occasion.
Compulsory elements : There will be a mandatory attendance check upon study start. If no-show, the seat will be cancelled and referred to another student on the waiting list for the course. Each self-test must be passed to be considered completed. There is a mandatory multiple choice test to pass halftime into the second phase. To be able to take the final exam all preceding moments must have been cleared.
Number of students : 25 - 35
Selection of students : The seats will be admitted according to relevance for the students´thesis as described in the motivation and the registration date as a PhD-student at KI.
More information : This course corresponds to 1 week of study work. It is a self-paced course over 4 weeks. It is fully digital. It consists of video lectures and multiple choice quizzes. There is a mandatory introduction webinar the first day, in the morning. The exam is open the last day between 09.00-17.00 (9 am to 5 pm), and takes usually 2 hours. During the course there is a written analysis that has to be done.

Course responsible :
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Contact person :
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Title : Nervous System Injury and Repair

Course number : 5595
Credits : 1.5
Date : 2024-02-05 -- 2024-02-09
Language : English
Level : Doctoral level
Responsible KI department : Department of Clinical Neuroscience
Specific entry requirements : Basic Neuroscience course or corresponding knowledge. The basic neuroscience course should include neuroanatomy, CNS cell-types and their functions, and some CNS injury/disorders.
Purpose of the course : The purpose of the course is for participants to gain broad knowledge concerning the biological consequences after injuries (e.g. trauma, stroke, surgery) to the nervous system (CNS/PNS). The course aims to provide an overview of the pathobiology that follows after injury, experimental models/methods, regenerative and non-regenerative features, species differences, treatment strategies, as well as clinical features and biomarkers. Importantly, the course intends for the participants to appreciate various research efforts and opportunities for nervous system repair, as well as providing a translational outlook on these topics. Hence, the participant will learn the fundamental features and topics associated to nervous system injury and repair.
Intended learning outcomes : The student should be able to: 1) Describe various injuries to the nervous system and its consequences to the neuronal networks and circuits 2) Give examples of, and put into context, the cellular and molecular pathobiological mechanisms that are initiated after an injury to either the central or peripheral nervous system. 3) Describe some distinct features of regeneration vs no regeneration in various circumstances and species. 4) Give examples of how to study injury and repair of the nerve system, including changes in neuronal networks and pathobiology. 5) Give example of repair/treatment strategies and diagnostic methods, as well as discuss some of the difficulties treating the CNS and potential hurdles in translation of treatments.
Contents of the course : The course will cover topics related to the consequences following injury to the nervous system, including the secondary injury, post-injury phases, and potential outcomes. This includes cellular and molecular events such as inflammation, reactive gliosis, CNS scarring (glial/fibrotic scarring), demyelination/remyelination, neuronal network reformation, and more. Moreover, we will cover how these events can be studied and what experimental models/methods are used. We will discuss and give examples of the possibilities for diagnostics and the reparative potential of different treatment strategies. Thus, we will cover and provide up-to-date information regarding both pre-clinical and clinical efforts and applications, including knowledge gaps. Students will participate in group sessions that will facilitate discussion regarding the above topics and there will be assignments focusing on specific aspects of nervous system injury and repair.
Teaching and learning activities : The course runs daytime for one week full-time with a mix of lectures by invited scientists. There will be group session and assignments, as well as individual studies. Participants will prepare and give oral presentations. Active participation that allows interaction between the PhD-students will be promoted.
Examination : The examination part includes: the group assignments, short formative examination questions at the end of some of the days during the course week, the oral presentations by the students and the following general discussions between all participants. All students are individually assessed.
Compulsory elements : In order to achieve the learning outcomes all participants are expected to be present the whole week. The group assignments, the oral presentations by the students and the following general discussion between all participants are compulsory. Students that are absent from these parts will have to individually submit a written presentation of the subject according to the instructions of the course organizer.
Number of students : 8 - 16
Selection of students : Selection will be based on 1) the relevance of the course syllabus for the applicant's doctoral project (according to written motivation), 2) start date of doctoral studies (priority given to earlier start date)
More information : 9-17 all days at campus KI Solna.

Course responsible :
Jacob Kjell
Institutionen för klinisk neurovetenskap

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Contact person :
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Title : Basics of Programming for Biomedical and Clinical Research

Course number : 5626
Credits : 3.0
Date : 2024-03-11 -- 2024-03-22
Language : English
Level : Doctoral level
Responsible KI department : Department of Microbiology, Tumor and Cell Biology
Specific entry requirements :
Purpose of the course : To give students theoretical knowledge about programming, introduce widely used programming techniques and give practical experience in solving real-world research problems using programming languages widely spread in academia. The course requires no programming experience. Minor experience with any programming language or data analysis is an advantage.
Intended learning outcomes : After the completed course, the participants will be able to solve programming problems in research process: pick the appropriate method of decomposition, create algorithms and data structures, implement the created algorithms using R/Python programming language, write maintainable and reusable code, visualise data, work in group with other programmers and prepare code for publishing. Theoretical knowledge obtained during the course will help students to continue improvement of their programming skills either themselves or through other courses.
Contents of the course : Programming techniques, types of problem decomposition, functional programming, object-oriented programming, modular code, data import and export, data visualisation, parallel programming.
Teaching and learning activities : The course consists of lectures, hands-on labs (individual and group).
Examination : The participants will be examined by completed individual laboratory practicals and the final project report.
Compulsory elements : The practicals and group works are mandatory. Absence has to be compensated according to the instructions of the course director.
Number of students : 8 - 16
Selection of students : Selection will be based on 1) the relevance of the course syllabus for the applicant's doctoral project (according to written motivation), 2) start date of doctoral studies (priority given to earlier start date)
More information : The course takes place at Campus Solna. It is full time and intensive. For any questions about course contents and practicals, email iurii.petrov@scilifelab.se who is the main teacher of the course.

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

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Title : An Introduction to Intellectual Property Rights in an Academic Context

Course number : 5634
Credits : 1.0
Date : 2024-03-18 -- 2024-03-22
Language : English
Level : Doctoral level
Responsible KI department : Department of Learning, Informatics, Management and Ethics
Specific entry requirements :
Purpose of the course : This course aims to enable the participants to get a broad overview of intellectual property rights and discuss how intellectual property rights can be used to support and impact academic research. The course also aims to introduce the role intellectual property rights play in the utilization of life science research. The purpose of the course is to spread general awareness about intellectual property rights to academic researchers by mixing discussions with hands-on search exercises.
Intended learning outcomes : After completion of the course, the participant shall be able to: • demonstrate a basic understanding of how patent information can be used in a research context • reflect on the value of using patent information in a research context • identify intellectual assets in research projects • perform a search for patent documents and assess their relevance in relation to the purpose of the search
Contents of the course : Intellectual property rights are the legal rights that protect the results of intellectual work. The right to patent is one of the most well-known rights; it protects inventions that are novel, non-obvious and have an industrial use. The focus of the course is to discuss various aspects of intellectual property rights that are essential to know for a future career both within and outside academia. During the course, the participants will be able to learn from various stakeholders from the intellectual property rights industry. Topics include: • your right to intellectual assets as a researcher in Sweden (teachers' exception) • how you can manage intellectual property rights in research collaborations, including other jurisdictions than Sweden • how publishing your research results can affect your legal possibilities to protect your results • how you can identify research groups to collaborate with using patent information • ethical considerations of patenting in relation to open science / access / innovation.
Teaching and learning activities : The course will be built on five seminars, each three hours long, over the course of one week. The seminars will be followed by workshops that will introduce tools and databases that can be used to identify and evaluate intellectual property rights. The workshops will be based on the participants' own research projects.
Examination : The participants are examined individually on a written report.
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 : 8 - 16
Selection of students : Selection will be based on 1) the relevance of the course syllabus for the applicant's doctoral project (according to written motivation), 2) start date of doctoral studies (priority given to earlier start date)
More information : This course will give you insight in how you can use intellectual property rights in your research and how you can protect your results using them. The course is organized by the Unit for Bioentrepreneurship in collaboration with KI Innovations. The course is made available under the Stockholm School of Entrepreneurship umbrella meaning that you will meet fellow doctoral students from other universities in Stockholm. During the course some of the seminars will be held by external collaborators such as The Swedish Patent and Registration Office and industry representatives. The course is on-campus course and takes place in Solna.

Course responsible :
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Institutionen för lärande, informatik, management och etik
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Contact person :
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Title : Scientific Illustration and Data Visualisation

Course number : 5642
Credits : 3.0
Date : 2024-04-08 -- 2024-04-19
Language : English
Level : Doctoral level
Responsible KI department : Department of Clinical Neuroscience
Specific entry requirements :
Purpose of the course : This course will enable the participant to obtain knowledge and skills in scientific illustration and visualisation: how to use digital tools to create images and figures to communicate scientific ideas, concepts, results, and interpretations to different target audiences and in different formats.
Intended learning outcomes : After the course, the student is expected to: - Be able to critically evaluate the suitability and effectiveness of scientific illustrations and visualisations for different target groups and contexts - Be able to create effective scientific illustrations by using appropriate software - Be able to create effective data visualisations using statistical software - Be able to reflect critically on ethical and legal aspects of scientific visualisation
Contents of the course : - General principles of illustration and graphic design - Data visualisation: diagrams and figures - Photographs, photomicrographs, and other images in science - Softwares and file formats - Ethical and legal aspects on visualisation - Visual research communication in context: figures, presentations, posters, graphical abstracts
Teaching and learning activities : The course emphasises interactivity and practical skills training. Lectures will be used to introduce and cover theoretical aspects. Practise in working with digital tools for illustration and visualisation will be performed during practical workshops with supervision. We will use well-established software packages that are open source and/or for which Karolinska Institutet has a licence available for students. Students will create their own illustrations and visualisations and submit them during the course; these will be discussed in group seminars, revised based on the feedback, and resubmitted.
Examination : Examination takes place through a final illustration/visualisation exercise which will be submitted and discussed.
Compulsory elements : Seminars for discussion of students' submitted illustrations and visualisations will be mandatory. In case of absence, a written reflection can be submitted instead.
Number of students : 8 - 20
Selection of students : Selection will be based on 1) the relevance of the course syllabus for the applicant's doctoral project (according to written motivation), 2) start date of doctoral studies (priority given to earlier start date)
More information : The course will be held online

Course responsible :
Gustav Nilsonne
Institutionen för klinisk neurovetenskap

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Contact person :
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Title : Researching the Human Gastrointestinal Tract, Liver and Pancreas – An Overview

Course number : 5696
Credits : 1.5
Date : 2024-03-11 -- 2024-03-15
Language : English
Level : Doctoral level
Responsible KI department : Department of Medicine, Huddinge
Specific entry requirements :
Purpose of the course : This course will increase the interest in and knowledge about how to study the gastrointestinal tract, which includes the liver and the pancreas, for clinical and translational research purposes. The course aims to give an overview of anatomy, function, and common diseases of the GI tract, how they are linked to metabolic features and alterations, and how the disease panorama can be studied in a translational context. The course also highlights the possibilities and challenges how to perform sampling, tissue handling, biobanking and registration according to good clinical and laboratory practice.
Intended learning outcomes : 1) To describe the normal anatomy and function of the gastrointestinal tract. 2) To relate the disease panorama of the gastrointestinal tract, including brief knowledge of etiologies and pathogenesis, to the most important current research questions. 3) To discriminate between and motivate the choice of the various possibilities for sampling from the gastrointestinal tract for morphologic, metabolic, immunologic, microbiotic, and genetic research purposes as well as for using samples for different in vitro techniques. 4) To reflect upon and discuss issues of creating your own sample collection in a biobank, including ethical and legal aspects and required registries.
Contents of the course : The course will present an overview of the basic anatomy and physiology of the gastrointestinal tract, the metabolism of the liver and the pancreas, and the disease panorama of the gastrointestinal tract. Different aspects of non-alcoholic fatty liver disease, inflammatory bowel disease, autoimmune liver and pancreatic diseases, IgG4 systemic disease and pathological conditions of the small bowel, including post-surgical metabolic complications and sarcopenia will be discussed. Various autoimmune and metabolic aspects of disease will be highlighted. A workshop will be dedicated to sampling techniques, resources and pitfalls, including endoscopic and parenchymatous biopsies, tissue handling and storage, and how to create your own sample collection in a biobank, including legal and ethical aspects. The role of the microbiome for metabolic and gastrointestinal diseases will be covered in a workshop and hot topics in microbiota research discussed in the journal club format.
Teaching and learning activities : The course will be based upon: 1) Lectures given by experts 2) Interactive workshops highlighting key topics 3) Literature reviews with journal clubs 4) Case-based discussions focusing on clinical cases linked to research questions.
Examination : Multiple choice questions covering the normal anatomy and function of the gastrointestinal tract, the gastrointestinal disease panorama, metabolic and immunological aspects, sarcopenia and the role of the microbiome (learning objectives 1 and 2) Oral assignments with supervised case-based discussions in smaller groups linking patient cases to research questions (learning objectives 3 and 4)
Compulsory elements : Workshops, journal clubs, oral group assignments with case-based discussions and the MCQ examination.
Number of students : 12 - 20
Selection of students : Selection will be based upon 1) the relevance of the course syllabus for the applicant´s doctoral project (according to written motivation), and 2) start date of the doctoral studies (priority given to earlier start date)
More information : The course starts on Monday at 09.30 and ends on Friday at 13.00 at Campus Flemingsberg

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Course responsible :
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Miroslav Vujasinovic
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Title : Introduction to Medical Education Research

Course number : 5725
Credits : 4.5
Date : 2024-01-22 -- 2024-03-22
Language : English
Level : Doctoral level
Responsible KI department : Department of Learning, Informatics, Management and Ethics
Specific entry requirements :
Purpose of the course : The participants should develop their understanding of what kind of issues/phenomena that are researched in medical education and get familiar with qualitative and quantitative approaches and methods used in the research field.
Intended learning outcomes : After the course the student is expected to be able to: 1. Reason and argue about the significance of the Medical Education research field in relation to the Higher Educational field. 2. Identify, analyse and describe different kinds of issues and phenomena that are researched in Medical Education. 3. Reflect on and express strengths and limitations of different research approaches and methods used in Medical Education Research.
Contents of the course : The course content includes studies of the Medical Education field especially: * Significance of professional educational programmes, disciplines and subjects in the medical and health care field. * Researching different areas within medical education - student learning, teaching, course/curriculum design, assessment and evaluation. * Researching learning and teaching in clinical education and the health care field - supervision, professional development and patient education. * Qualitative and quantitative approaches and methods in Medical Education research. * Characteristics of high-quality Medical Education research.
Teaching and learning activities : The course is situated within the framework of blended learning with face-to-face meetings combined with web seminars. This means that the course works well for distance learners. The course opens with introductory work conducted in the learning platform Canvas, followed by two mandatory campus days. The rest of the course is primarily conducted via Canvas through web seminars, individual written assignments, as well as group discussions and peer feedback. Participants need to be able to attend the campus days as well as the scheduled web seminars and group discussions through the learning platform Canvas. The course design is based on the student's active participation in his/her own learning process.
Examination : The examination assessment consists of two main parts: * A reflective paper based on an analysis of a self-chosen doctoral thesis within Medical Education. The analysis and reflection are expected to relate to the learning outcomes. * Written and oral self and peer assessment related to assignments and web seminars. The assessment criteria (correspondence, coherence, capacity and critical appraisal) must be fulfilled to pass the course.
Compulsory elements : Assignments, web seminars, campus days and group work are compulsory. In order to compensate for absence, students can submit a written report based on the topics discussed during the missed opportunities no later than 1 week after the course.
Number of students : 1 - 24
Selection of students : The course occasion is offered within a research school but is also open to other applicants. Selection for other applicants will be based on 1) the relevance of the course syllabus for the applicant's doctoral project (according to written motivation), 2) start date of doctoral studies (priority given to earlier start date)
More information : The course is based on theories of experiential learning, a reflective approach and learning through active participation and collaboration. To profit as much as possible from the learning experience of the course, it is important that you are prepared and present at all scheduled sessions. The scheduled sessions are as follows. Campus days January 30 & 31 (9-16). Webinars February 7, February 14, February 21, February 28 and March 13 (all webinars scheduled 9-12). Examination seminar/webinar (hybrid) March 18 (9-16). In addition, time for reading, reflecting, writing and peer feedback must be planned by the course participants.

Course responsible :
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Contact person :
Per Palmgren
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Title : Nucleic Acid Chemistry and Therapy

Course number : 5737
Credits : 3.0
Date : 2024-02-05 -- 2024-02-23
Language : English
Level : Doctoral level
Responsible KI department : Department of Laboratory Medicine
Specific entry requirements :
Purpose of the course : The purpose of the course is to enable participants to aquire good and up to date knowledge of nucleic acid chemistry and nucleic acid therapy. The intention is to increase general knowledge about nucleic acids and how these can undergo different reactions as well as how oligonucleotides are chemically synthesized and modified for therapeutic or other use. We expect that this will stimulate and inspire the students in their own research whether they work on nucleic acid biology, therapy, analyse nucleic acids or use nucleic acids/oligonucleotides as tools for investigations. It is an intention to increase understanding of nucleic acids, how these molecules work and how they can be used in therapy. In addition, knowledge on how oligonucleotides are synthesized and how these can be modified will enhance the insight and enable the students to improve their use of oligonucleotides as tools or potential therapeutics.
Intended learning outcomes : At the end of the course the students - should be able to explain the underlying chemistry of nucleic acids and how these can react at different parts of the structure. - should be able to explain how oligonucleotides can be synthesized and modified and why currently used modifications and conjugations are done. - should understand the different modalities of Nucleic acid therapies, a field that boomed in the last decade. - should be able to make selections of modifications and to design oligonucleotides/nucleic acids, for use as potential therapeutics.
Contents of the course : Introduction to Nucleic acid chemistry and nomenclature Reactions at nucleic acid bases, ribose and deoxyribose sugars Reactions at phosphates and phosphate modifications Methods for synthesis of native and modified oligonucleotides Common modifications used for oligonucleotide therapy Introduction to Oligonucleotide therapy Antisense, pre-mRNA Splice-switching, siRNA, mRNA and DNA-targeting ON therapy mRNA and Crispr/Cas as potential therapeutic agents The problem of oligonucleotide delivery in therapy
Teaching and learning activities : The course consist of lectures by experts and seminars in the presence of experts on different aspects of nucleic acid chemistry and oligonucleotide/nucleic acid therapy as well as workshop activity including presentations by the students. Additional home work combined with individual and group activities in the class room will be a part of the learning.
Examination : Oral presentations on workshops as well as a written account with specific course related questions.
Compulsory elements : The lectures, seminars and workshop activities with student presentations will be compulsory. Absence will be compensated by extra assignments. The student will also submit reports from a workshop in written form for review and approval, in connection to the student presentations.
Number of students : 8 - 16
Selection of students : Selection will be based on 1) the relevance of the course syllabus for the applicant's doctoral project (according to written motivation), 2) start date of doctoral studies (priority given to earlier start date)
More information : There will be a mix of scheduled activities and work on your own, including literature search and summation of a topic as a group activity.

Course responsible :
Roger Strömberg
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Contact person :
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Title : Introduction to Biomaterials and Engineering Methods in Medicine

Course number : 5738
Credits : 3.0
Date : 2024-03-18 -- 2024-03-29
Language : English
Level : Doctoral level
Responsible KI department : Department of Medicine, Solna
Specific entry requirements :
Purpose of the course : This doctoral course is designed to enable doctoral students to acquire a comprehensive understanding of biomaterials and their applications in the field of medicine. With this course, students will gain essential knowledge and skills to engage in advanced research and development in biomaterials, fostering their long-term academic and professional growth. By exploring the interdisciplinary nature of biomaterials, the course not only facilitates specialized knowledge but also critical thinking, problem-solving abilities, and effective communication skills. Furthermore, the course offers insights into areas beyond the immediate learning objectives, such as ethical considerations and the broader societal impact of biomaterials in medical applications.
Intended learning outcomes : After completing the course, the doctoral student shall be able to: • Summarize the fundamental concepts of biomaterials and their roles in medical applications. • Analyze and evaluate different types of biomaterials in terms of their properties, biocompatibility, and potential clinical uses. • Apply acquired knowledge to critically assess the challenges and opportunities in the design and development of biomaterials for specific medical purposes. • Synthesize information from diverse sources to propose innovative approaches in biomaterials research and design. • Communicate complex biomaterials concepts effectively to both specialized and non-specialized audiences. • Recognize ethical considerations related to biomaterials usage in medicine and contribute to responsible research practices. • Collaborate within interdisciplinary teams to address complex biomedical challenges.
Contents of the course : • Introduction to Biomaterials: Definitions, classifications, and historical overview. • Materials Science Fundamentals: Structure-property relationships, mechanical properties, and degradation mechanisms. • Biological Responses to Biomaterials: Host reactions, biocompatibility, and immunomodulation. • Biomaterials for Specific Applications: Implants, drug delivery systems, tissue engineering scaffolds, and diagnostic tools. • Surface Modification and Functionalization: Techniques to enhance biocompatibility and performance. • Emerging Trends in Biomaterials: Nanotechnology, smart materials, and regenerative medicine. • Ethical and Societal Considerations: Balancing technological advancements with patient welfare and societal impacts.
Teaching and learning activities : The course employs a variety of teaching methods to foster active learning and critical engagement, including: • Lectures: In-depth coverage of core concepts and principles by experts in the field. • Group Discussions: Collaborative exploration of case studies, current research, and ethical dilemmas. • Practical Workshops: Hands-on experience with biomaterials characterization techniques and design exercises. • Guest Lectures: Industry professionals and researchers sharing real-world insights and experiences. • Individual and Group Presentations: Students showcase their understanding of course topics. • Independent Study: Reading assignments to supplement lecture materials.
Examination : Assessment methods are designed to evaluate students' achievement of the learning objectives in connection to: • Written Examinations: Assessing comprehension of theoretical concepts and their practical applications. • Course Projects: Design and presentation of biomaterials solutions for specific medical challenges. • Class Participation and Group Activities: Contribution to discussions and collaborative problem-solving. • Final Presentation: Synthesis of course content and demonstration of critical thinking skills. • Ethical Case Analysis: Written analysis of ethical dilemmas related to biomaterials use in medicine.
Compulsory elements : Mandatory active participation in at least 12 h of lectures/seminars.
Number of students : 2 - 20
Selection of students : 1) the relevance of the course syllabus for the applicant’s doctoral project (according to written motivation) 2) start date of doctoral studies (priority given to earlier start date)
More information : The course will be given Monday to Friday between March 18 until March 29. The lectures will be given in the morning (9-12 am) sessions and the afternoon session (1-4 pm) will be based on distance working, group working and project preparation and presentations. The last two days of the course will cover an individual and group presentations that each students (or group) will showcase their understanding of course topics.

Course responsible :
Onur Parlak
Institutionen för medicin, Solna

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Contact person :
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Title : Antigen Presentation and T cell Activation

Course number : 5739
Credits : 1.5
Date : 2024-05-27 -- 2024-05-31
Language : English
Level : Doctoral level
Responsible KI department : Department for Clinical Science, Intervention and Technology
Specific entry requirements : Basic immunology course, or otherwise have attained the same level of previous knowledge.
Purpose of the course : This course will provide an overview of antigen presentation and T cell activation. This course is suitable for PhD students with basic immunology knowledge who want to deepen their knowledge in important aspects of various lymphocyte subsets biology.
Intended learning outcomes : - Describe and compare different types of antigen capture and processing, antigen presentation pathways, e.g. MHC class I & II, MR1 and CD1 system, peptide/lipid/glycolipid presentation, as well as the main T cell subsets and invariant lymphocytes. - Identify gaps of knowledge about T lymphocyte activation, differentiation, and antigen-presentation. - Formulate a research question (including experimental plan) related to lymphocyte activation in steady state, disease, or cell therapy.
Contents of the course : The following will be covered during the course: Thorough walk-through of the antigen presentation pathways, both MHC class I and II, upstream and downstream of TCR activation. The CD1 system, presentation of lipids, glycolipids, MR1 presentation and MAIT cell activation will be discussed. Manipulation of T cell activation for instance by checkpoint inhibitors, T cell exhaustion, the impact of tumor micro-environment, and practical applications such as immunotherapy, will also be covered.
Teaching and learning activities : The course will be based on lectures, as well as time for questions and discussions. In addition, work (in small groups) will enable the students to gain deeper knowledge in a specific 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 in an 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 : 12 - 22
Selection of students : Selection will be based on 1) the relevance of the course syllabus for the applicant's doctoral project (according to written motivation), 2) start date of doctoral studies (priority given to earlier start date)
More information : The course will take place on campus.

Course responsible :
Isabelle Magalhaes
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Contact person :
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Title : Healthcare Science and Care Sciences: Conceptual Foundations

Course number : 5741
Credits : 1.5
Date : 2024-01-24 -- 2024-01-31
Language : English
Level : Doctoral level
Responsible KI department : Department of Neurobiology, Care Sciences and Society
Specific entry requirements :
Purpose of the course : The aim of the course is two-fold. First, to introduce concepts that shape and are shaped by ideas and histories in the spectrum of healthcare science and care sciences. Secondly, to trigger critical reflection about how these ideas impact on a knowledge continuum relevant in understanding choice of research methods as well as in impacting on research, higher education, and practice.
Intended learning outcomes : Based on relevant conceptual resources, upon completion of the course the learner is expected to be able to: 1. Identify, situate, and compare central concepts and ideas in healthcare science and care sciences research. 2. Reflect and critically explore an alignment between relevant concepts and methodologies, such as design, clinical/community research, and implementation in a continuum of healthcare and care sciences research. 3. Identify models and methods that form the basis for studying interventions aimed at promoting health, preventing and treating disease, rehabilitation, and contributing to the development of sustainable, ethically grounded, evidence-based, and person-centered care.
Contents of the course : The course commences with an introduction of concepts related to healthcare science and care sciences, to trigger critical dialogue about: what is care science, what is healthcare science, and what is it not? Illustrations will be used to generate discussion about research methodologies, methods, and how these are situated in conceptual contexts of relevance. The course builds on illustrations from different fields such as nursing, occupational therapy, physical therapy, psychology, public health, and social work.
Teaching and learning activities : The course is designed to constitute a series of expert lectures, and seminars in combination with active group work, individual writing, and oral presentations, which will culminate in a written examination. The learning experience builds on a combination of active reading and own reflection in combination with dialogue around learning activities with other course participants and faculty.
Examination : The examination will consist of an individual oral presentation. Each participant has to show that all the ILOs are reached. Results will be assessed as pass/not pass
Compulsory elements : All course activities are mandatory and will be offered in a combination of on-campus and online meetings. Absence of max 20% can be compensated for by additional tasks in agreement with the course organiser. Passing the final examination and fulfilling attendance requirements is mandatory for a grade of "pass" in the course.
Number of students : 8 - 16
Selection of students : Selection will be based on 1) admission to the Mälarområdets Research School in Care Sciences, 2) the the relevance of the course syllabus for the applicant’s doctoral project (according to written motivation), and 3) start date of doctoral studies (priority given to earlier start date).
More information : The first 2 days of the course will be on campus Flemingsberg and the remain course days will be made available online. The course is designed to constitute a series of expert lectures and seminars in combination with active group work, individual writing, and an oral presentation.

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Contact person :
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Title : Weight of Evidence and Systematic Review Methodology in Health Risk Assessment of Chemicals

Course number : 5742
Credits : 1.5
Date : 2024-02-12 -- 2024-02-16
Language : English
Level : Doctoral level
Responsible KI department : The institute of Environmental Medicine
Specific entry requirements :
Purpose of the course : The purpose of the course is to build knowledge and understanding in how to apply weight of evidence and systematic review methodology in assessing health risks of chemicals.
Intended learning outcomes : At the end of the course the participant should be able to: • define specific questions to be addressed in a health risk assessment of chemicals • apply and discuss methods to assemble, weigh and integrate scientific evidence in health risk assessment of chemicals • reflect on the need for and importance of systematic approaches in health risk assessment of chemicals
Contents of the course : Health risk assessment of chemicals is the scientific method to assess the risk to humans of exposure to different types of chemical substances, such as environmental pollutants, pharmaceuticals, chemicals in cosmetics or other everyday products, pesticides, food additives and other substances in food. The health risk assessment is based on a specified question that is answered by analysis of different type of data from in vivo, in vitro, in silico and epidemiological studies. The course will address methodology for weight of evidence assessment and systematic review and specifically how to, in a systematic manner, plan the assessment, identify data, assess the relevance and reliability of the data and integrate the data to be able to answer the assessment question. The course will cover the following: identification of a risk assessment question, systematic literature searches, organizing the data into lines of evidence, assessment of the relevance of the data, assessment of reliability of the data and integration of the data in a weight of evidence approach.
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 oral presentation of group assignments with feedback from teachers and the other students.
Compulsory elements : Participation in the exercises and group assignments is compulsory. Absence can be compensated with an individual task.
Number of students : 5 - 10
Selection of students : Selection will be based on 1) the relevance of the course syllabus for the applicant's doctoral project (according to written motivation), 2) start date of doctoral studies (priority given to earlier start date)
More information : Professionals from authorities and companies internationally will also attend the course. The course will be given online using Zoom.

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Title : Fundamentals of Quality Assurance in Medical Science and Public Health Research

Course number : 5743
Credits : 1.5
Date : 2024-04-15 -- 2024-04-24
Language : English
Level : Doctoral level
Responsible KI department : Department of Global Public Health
Specific entry requirements : None
Purpose of the course : The goal of this course is to provide an introduction to quality assurance practices in public health intervention studies as well as observational studies within medical sciences and public health research. This course will provide you with the basic knowledge and skills necessary to carry out human subjects research studies in compliance with relevant regulations and standards of the fields. The purpose is also to help you apply key skills that you will need throughout your career, such as research planning and documentation. This course is targeted for human subjects researchers working with personal data derived from epidemiological cohorts, healthcare records, administrative registers, or qualitative studies, as well as those carrying out public health intervention or implementation studies.
Intended learning outcomes : Upon successful completion of the course, the student will be able to: Reason regarding how key pieces of legislation and international treaties impact studies that rely on personal data. Describe and discuss recommendations and restrictions that influence researchers' decisions to share data, including balancing ethical and legal concerns against the principals of open science. Explain the concept of Good Clinical Practice (GCP) and contrast the structured requirements of GCP with recommendations for best practices within observational and public health intervention studies. Distinguish the roles and responsibilities of the research team members (including doctoral students and their supervisors) in relation to the processing and handling of personal data and the planning and documentation of studies, and discuss how these are regulated in different research settings. Reflect on the steps required for study planning and protocol development, secure data collection and management, and appropriate research documentation of human research studies, at the level of the doctoral student researcher. Appraise and critique the quality assurances practices of studies employing personal data, including the student's own planned or ongoing studies. Critically reflect on the role of quality assurance practices in promoting the application of sound scientific and ethical principals in medical research.
Contents of the course : Students will develop an understanding of quality assurance practices across different human subjects research settings, with a practical focus of bringing these principals to bear on the student's own ongoing research. Through self-directed learning and a series of lectures, students will become familiar with the principals of quality assurance. Guided discussions will focus on the challenges encountered in the practical application of quality assurance principals, how to align the quality assurances practices with the specific needs of the study, and the roles that different members of the larger research team play in the larger process. Students will become familiar with legislation and regulations that guide ethical and scientifically sound medical research. Students will learn practical approaches and about tools available to help them plan and document their own research and securely collect and manage data.
Teaching and learning activities : This course uses a blended learning approach, relying on online activities (including recorded lectures, quizzes, and discussion boards), self-directed learning, and live group discussions (online or in person) focusing on concrete applications of quality assurance principals in different kinds of studies.
Examination : To pass the course, the student must show that the learning outcomes have been achieved. Assessments methods include both formative assessments and an individual examination (or summative assessment). All forms of assessments are used with the goal of contributing to the development of the student's knowledge and skills. Formative assessments include quizzes and in class activities such as discussions, short presentations, and group assignments. The purpose of these is to allow students to receive feedback throughout the course in order to track their learning and identify areas where they need further development. An individual written examination is used as the summative examination. Students who do not obtain a passing grade will be offered two additional chances to resubmit their exam. Students who do not obtain a passing grade upon re-examination will be given top priority for admission the next time the course is offered.
Compulsory elements : The final summative examination is compulsory.
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) start date of doctoral studies (priority given to earlier start date)
More information : Some parts of the course take place online, but several in-person classes and discussion sessions will be held on campus. In-person meetings are planned to take place on April 15, 17, 22, and 24.

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Title : Immunometabolism: A Hands-on Course on a Frontrunning Research Field

Course number : 5744
Credits : 1.5
Date : 2024-03-25 -- 2024-03-29
Language : English
Level : Doctoral level
Responsible KI department : Department of Medicine, Solna
Specific entry requirements : Basic knowledge of immunology or cellular metabolism
Purpose of the course : This course aims to convey knowledge on the regulation of metabolism in immune cells. Moreover, the course emphasizes the cutting-edge research on cellular and mitochondria energy production, and includes hands-on experiments and data evaluation using a Seahorse flux analyzer.
Intended learning outcomes : After successful completion of this course students are expected to be able to: - Identify the basic concepts of energy production and metabolism in different immune cells. - Understand the molecular mechanisms underlying energy metabolism changes in response to various immunological stimuli. - Argue and judge scientific data about immunometabolism and methods applied to respond to specific questions. - Analyze the two major metabolic pathways of the cell: glycolysis and oxidative phosphorylation using the Seahorse flux analyzer.
Contents of the course : The behavior of different immune cells is largely determined by the status of their intracellular energy metabolism and external signals which activate a metabolic reprogramming. The course will have an introduction on the different immune cells and their role in disease. The course will then specifically focus on the branch of metabolism, such as oxidative phosphorylation and glycolysis, which underlie immune cell functioning in health and disease states (e.g. infections, cancer and cardiometabolic diseases). The course includes a hands-on module where the students will learn how to measure and critically analyze cellular metabolism using Seahorse flux analyzer in different immune cells.
Teaching and learning activities : Lectures, laboratory practice and group discussion.
Examination : A course participant has to achieve all intended learning outcomes for the course in order to pass the course. This is tested at the end of the course by: - Individual presentations by the students on specific metabolic data in immune cells chosen by the participants. - Analysis of the metabolic data from the seahorse flux analyzer (Seahorse) generated during the laboratory practice.
Compulsory elements : All course activities are mandatory. Absence can be compensated for in exceptional circumstances by a written assignment in agreement with the course leader.
Number of students : 8 - 30
Selection of students : Selection will be based on 1) the relevance of the course syllabus for the applicant's doctoral project (according to written motivation), 2) start date of doctoral studies (priority given to earlier start date)
More information : The course will be hold from monday to friday (day of the examination) The lectures will take place Mainly at the Rolf Luft Centrum L103 Karolinska Hospital The laboratory practices will take place in the same structure.
This course is given jointly by the doctoral programmes Cardiovascular Research (CVR), Allergy, immunology and inflammation (Aii) and Metabolism and Endocrinology (MetEndo). See: https://staff.ki.se/doctoral-programmes

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Title : Clinical Immunology in Infectious Diseases

Course number : 5745
Credits : 1.5
Date : 2024-04-22 -- 2024-04-26
Language : English
Level : Doctoral level
Responsible KI department : Department of Medicine, Huddinge
Specific entry requirements : Basic knowledge in immunology corresponding to the course 2302/3139/3187 (Basic immunology) is required.
Purpose of the course : This course will introduce the students into the field of clinical immunology in the context of infections. This includes a focus on immunological responses to specific pathogens and therapeutic approaches in the clinic. The combination of lectures by experts in the field as well as a site visit of a clinical immunology-focused company/division will expose the students to a wide range of practical applications and real-world scenarios in clinical immunology. Through engaging lectures, students will gain a comprehensive understanding of the immune system's response to various infectious agents, including bacteria, viruses, fungi, and parasites. They will explore the intricate mechanisms of host-pathogen interactions, immune evasion strategies employed by pathogens, and the development of immune memory. Moreover, the course will delve into the diagnostic tools and techniques used in clinical immunology, such as serological assays, flow cytometry, and molecular biology methods. Students will learn how these tools aid in the identification and characterization of infectious agents, as well as in monitoring the progression and treatment of infectious diseases. Overall, this course will equip students with a solid foundation in clinical immunology, enabling them to comprehend the complexities of immune responses to infections and appreciate the significance of immunological research in developing effective therapeutic interventions. Finally, this course will increase the students' skills to communicate research projects.
Intended learning outcomes : By completing this course the students will be able to account for different immunological processes in the host defence against pathogens. In particular, the students will be able to explain the concepts of innate and adaptive immunity and their important roles at different stages in the host defence against pathogens. Student will also be able to describe differences in acute and chronic infections with respect to immunological processes.
Contents of the course : Examples of topics that will be covered during the course: Immunological processes important in the host defense against pathogens; Innate and adaptive immunity; Different acute and Chronic infections; Emerging infections; Infections and the link to autoimmune disease; Immune responses to various pathogens; The latest therapies used in the clinics to fight infections. The course also involves site visits to a biotech company or the Division of Clinical Immunology, KI. The students will be asked to study one specific topic of a relevant clinical immunological topic in a group project work, the topic will be provided by the course leaders at the beginning of the course. An oral presentation is expected from all students at the end of the course.
Teaching and learning activities : The course will be given over one week (full time). At the first course day, the course organizers will provide a basic introduction to the course followed by student presentations. Each student is expected to give a brief presentation (10-15min) of their own (doctoral/post-doc) research project(s), which should indicate relevance for the course. During the other course days, invited lecturers will present an overview over a specific topic in conjunction to their own research advances concerning clinical immunology. Each student is expected to ask questions to the lecturers every course day in order to ensure active participation by all participants throughout the course. At the end of each course day, there will be an interactive Question & Answer session to summarize the main points and to provide feedback both from the course leaders and from the course participants. These sessions may also include quizzes and group discussions. Finally, the students will be asked to study one specific topic of clinical immunology in a group project work. The topic will be provided by the course leaders at the beginning of the course. An oral presentation is expected from all students at the end of the course.
Examination : The course examination will be in the form of a group assignment that is presented orally on the last course day, with each student presenting. Every student will be evaluated and assessed individually. The group presentations are peer-reviewed by the course leaders and the other students. Each student has to show that all intended learning outcomes have been reached.
Compulsory elements : Students are required to attend all course days, to actively participate during the course and in the group work, and to present 1) their own research project that indicates relevance for the course, and 2) a given topic in an oral presentation in order to pass the course. Absence can be compensated with an individually written report (topic to be decided 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) start date of doctoral studies (priority given to earlier start date)
More information : The course will take place at Flemingsberg campus. Additionally, the course will include usage of the online-platform Canvas, where the course leaders will provide material relevant for the course, e.g. literature, slides, or additional information.

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Title : Mastering Science Communication and Public Engagement: From Research To Resonance

Course number : 5747
Credits : 3.0
Date : 2024-02-05 -- 2024-02-20
Language : English
Level : Doctoral level
Responsible KI department : Department of Learning, Informatics, Management and Ethics
Specific entry requirements :
Purpose of the course : The course aims to train students in science communication and public engagement. The focus lies on communication with peers and engagement with the general public. Emphasis is on storytelling, understanding your audience and improve presentation skills with creative tools and explorative approach. The course is given in an interdisciplinary setting. The course was previously given under the name "Communicating science in various contexts, focusing on oral and visual presentation" (3147).
Intended learning outcomes : After the course the student is expected to be able to: 1. Orally present their own research adapted to different target groups 2. Apply storytelling on science and research 3. Practically apply how visuals and media can support research and presentation to different target groups 4. Reflect on one's own and others presentation skills, including giving and receiving feedback 5. Understand the importance - and application - of dialogue in science communication
Contents of the course : During the course each participant will be given the opportunity to develop practical and theoretical knowledge in: -Communication theory and practice -Strategic communication -Storytelling, how to storify your science -Presentation techniques and stage presence -Dialogue mechanics like feedback, team collaboration and how to understand target groups -Use of different media -How to work with citizen engagement (3rd mission of the university) -How to communicate in an interdisciplinary setting
Teaching and learning activities : Part of the theoretical material will be organized in the course learning platform Canvas, the workshops will take place on campus. The course design is based on active learning and learning by doing applying theories and methods shared by facilitators. Theory seminars/ guest lectures all include active learning segments. Focus lies on practical training in presentation skills.
Examination : The examination consists of four deliveries. 1. Reflective statement based in experience, feedback and research/literature within communication and learning. 2. Oral presentation in a popular scientific context 3. Professional presentation 4. Team presentation Students will receive feedback on all presentations from teacher and peers.
Compulsory elements : All sessions are mandatory as they build on each other. Absence from sessions or a delivery session shall be compensated through supplementary activity to secure learning.
Number of students : 15 - 30
Selection of students : Selection will be based on creating an heterogenous group to increase interdisciplinary learning opportunity.
More information : The course is equivalent to two weeks of full-time studies. Scheduled class room sessions in Campus Solna are on the following dates:5-6 Feb, 12-13 Feb, 19 and 20 Feb 2024. The course is given in English.

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Title : Assessing the Value of Medical Innovation

Course number : 5748
Credits : 3.0
Date : 2024-05-20 -- 2024-05-31
Language : English
Level : Doctoral level
Responsible KI department : Department of Learning, Informatics, Management and Ethics
Specific entry requirements :
Purpose of the course : Progress in medical innovation stands as a catalyst for worldwide economic growth. Whether within pharmaceuticals, medical devices, biotechnology, information technology, or a fusion of these advancements, the potential advantages extend significantly to private businesses and societal well-being. However, due to long development times and rigorous regulations, these innovative concepts require a lot of financing to establish their presence in the market. Consequently, assessing the value of novel medical innovations remains crucial. The primary objective of this course is to empower researchers with the proficient capability to effectively assess the worth of emerging technologies or processes within the medical industry.
Intended learning outcomes : Upon completing this course, Ph.D. students should be able to: • Concisely outline the core of innovative medical industry technologies or procedural designs to validate such innovations. • Apply the diverse skill sets of young professionals from various disciplines to work interdisciplinary. • Identify and learn the methodology of researching intellectual property rights associated with new medical technologies. • Employ databases to gauge the potential scope of a market and perform a comprehensive written and verbal analysis.
Contents of the course : The learning will build on" real cases" from challenge providers from various Swedish organizations, encompassing scientists, physicians, and engineers who harbour fresh ideas for innovations or processes. Site visits to industry partners, MedTech's, Biotech's and Pharma companies to explore their innovation strategies, learn market insights and expand students' professional network. Students will explore different presentation techniques and interdisciplinary communication strategies. A multifaceted evaluation process considers pivotal factors such as market size and potential, intellectual property dynamics, and the anticipated return on investment. Underlying this framework, student teams will actively participate in creating a comprehensive market assessment.
Teaching and learning activities : The teaching will be a unique combination of skills from Karolinska Institutet and the Carlson Management School, utilizing blended activities, workshops and teaching material to highlight and contrast the similarities or differences between different geographical regions and regulatory bodies. Through collaborative teamwork, PhD students and Postodocs from Karolinska Institutet will embark on a dynamic journey with peers from Minnesota University to conduct a rapid yet comprehensive market analysis of promising medical technologies and services. By engaging in this process, students will gain valuable insights into a spectrum of domains, ranging from university-driven innovations to the intricate operations of venture firms and the creative minds of inventors. This hands-on experience will give them a holistic understanding of how innovation and entrepreneurship intersect in medical technology, fostering a keen awareness of the challenges and opportunities ahead in this dynamic industry.
Examination : The grade will be determined by the assessments carried out within the framework of the course. Grading pass/fail will be contingent upon faculty member evaluations and innovation provider feedback. Furthermore, passing will be determined on the final written assignment, a report delivery, which includes the following: • An executive summary • A detailed product description • A comprehensive market demand analysis • A fundamental assessment of intellectual property • A pro forma return on investment analysis • A conclusive recommendation
Compulsory elements : Attendance is mandatory for all participants. Replacement activities can compensate for 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) start date of doctoral studies (priority given to earlier start date).
More information : Course days are 2 weeks in total with 2 online sessions of 3 hrs each. May 20-24 and May 27-31, Monday to Friday. The course is a classroom course and is given in English.

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Title : Cytokines in Inflammation

Course number : 5749
Credits : 3.0
Date : 2024-04-08 -- 2024-04-19
Language : English
Level : Doctoral level
Responsible KI department : Department of Medicine, Solna
Specific entry requirements : Knowledge in immunology corresponding to course "Basic Immunology" is required
Purpose of the course : The aim of the course is to enable an increased understanding of the function of cytokines in the context of a healthy immune system and in different disease contexts.
Intended learning outcomes : At the end of the course the participant should be able to: - select adequate experimental methods to analyse cytokines based on specific scientific questions. - present and discuss the relevance of cytokines in the context of their research project. - compare and contrast the function of cytokines in different organs and different diseases. - explain how a disease can be treated with drugs targeting cytokines. - hypothesize future treatment of a disease, where the modification of a cytokine pattern is the target.
Contents of the course : The course contains lectures on the roles of cytokines in health and disease. Different methodologies for analysis of cytokines will be covered by theoretical and practical sessions.
Teaching and learning activities : The course is partly theoretical, partly practical, where lectures, research seminars and laboratory demonstrations are integrated. Time is also allocated for discussing lab results and the content of the lectures. Practical laboratory sessions will be conducted in small groups.
Examination : The participant has to: - actively participate in the discussions during the course and show that the learning outcomes of the course are reached by the end of the course - prepare a group presentation of a selected topic on the course's content and in the context of their own research project. The presentations will be evaluated by the course organisers. Every student will be assessed individually.
Compulsory elements : All activities included in the course are compulsory. Absence needs to be compensated by an assignment in agreement with the course coordinators.
Number of students : 8 - 20
Selection of students : Selection will be based on 1) the relevance of the course syllabus for the applicant's doctoral project (according to written motivation). 2) start date of doctoral studies (priority given to earlier start date)
More information : The course will contain lectures (equivalent to 6 days), practical sessions (equivalent to 3 days), student assignment presentations and discussions. The lectures will be at the Solna campus. The exact venue, schedule and information about the practical sessions will be communicated closer to the beginning of the course.

Course responsible :
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Title : Psychedelic Science – Past, Present, Future

Course number : 5767
Credits : 1.5
Date : 2024-04-15 -- 2024-04-19
Language : English
Level : Doctoral level
Responsible KI department : Department of Neurobiology, Care Sciences and Society
Specific entry requirements :
Purpose of the course : The purpose of the course is to provide a broad overview of psychedelic science.
Intended learning outcomes : The student should after the course be able to: - Give an account of the history of psychedelic use and research. - Describe the current state of knowledge in the field of psychedelic science. - Discuss methodological challenges and safety concerns related to psychedelic science. - Present an idea for a future psychedelic research project.
Contents of the course : The course will examine the past, present, and future of psychedelic use and research. The lectures will cover the history of psychedelic use in various cultural contexts, pharmacology and phenomenology of psychedelics, the potential therapeutic effects of psychedelic-assisted psychotherapy, and the methodological, ethical, and safety issues associated with clinical research on psychedelics. Future avenues in psychedelic research will be discussed in interactive discussions with the students.
Teaching and learning activities : The course will run day time for one week full-time with a mix of lectures by invited internationally leading scientists, participants group assignments as well as individual studies.
Examination : The examination part includes oral presentations by the students and 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 that needs to be presented orally to the course examinator.
Number of students : 8 - 12
Selection of students : Selection will be based on 1) the relevance of the course syllabus for the applicant's doctoral project (according to written motivation), 2) start date of doctoral studies (priority given to earlier start date)
More information : Location: Campus Solna

Course responsible :
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Title : Teknik och personcentrerad vård – Teoretiska perspektiv

Course number : 5774
Credits : 3.0
Date : 2024-05-06 -- 2024-06-02
Language : Swedish
Level : Forskarnivå
Responsible KI department : Department of Neurobiology, Care Sciences and Society
Specific entry requirements :
Purpose of the course : Teknik i form av materiella föremål, instrument, apparater och hjälpmedel har alltid varit en del av hälso- och sjukvården, olika professioners kompetens och ansvarsområden, samt patienters hälsa och ohälsa. På senare år har forskning initierats för att utveckla ny teknik för att främja patienters hälsa och stödja personcentrerade arbetssätt. Forskning om hur artificiell intelligens, välfärdsteknik och digital teknik kan ersätta, komplettera – eller användas parallellt med – tidigare beprövad teknik har aktualiserat ämnets gränsöverskridande och mångvetenskapliga karaktär. Kursens övergripande mål är att doktorander fördjupar sig i teoretiska perespektiv på teknik och identifierar möjligheter och begränsningar med att integrera teknik och personcentrerad vård. Kursen kommer att belysa kritiska perspektiv på teknik i förhållande till personcentrerad vård, såsom monitorering och makt, etik och hälsa. Detta omfattar ett dubbelt fokus på människan och tekniken och kritisk granskning av relationen mellan dessa. Personcentrerad vård kommer att relateras till såväl professionell vård som egenvård och informell vård och omsorg. Kursdeltagarna ges möjlighet att under kursen relatera kursens tematik till ett eget forsknings- och intresseområde.
Intended learning outcomes : Kunskap och förståelse Studenten ska efter genomgången kurs kunna: - förklara huvudsakliga likheter och skillnader mellan olika teoretiska perspektiv på teknik - diskutera teknik i förhållande till personcentrerad vård, hälsa och hållbarhet Färdighet och förmåga Studenten ska efter genomgången kurs kunna: - tillämpa aktuella teoretiska perspektiv om teknik för utveckling av personcentrerad vård Värderingsförmåga och förhållningssätt Studenten ska efter genomgången kurs kunna: - värdera ontologiska och epistemologiska utgångspunkter i olika teoretiska perspektiv på teknik - reflektera över teknikens inverkan på personens hälsa och ohälsa - diskutera teknikens avsedda och icke avsedda konsekvenser för personcentrerad säker vård
Contents of the course : - teknik i medicinhistoriskt perspektiv och hållbarhet - hälsa och personcentrerad vård - teoretiska perspektiv på teknik och relationer mellan människa och teknik - teknikutveckling, design, etik och säker vård - tillämpning av teoretiska perspektiv på teknik inom personcentrerad vård
Teaching and learning activities : Läsning av litteratur, föreläsningar (inspelade filmer och live), webbinarier samt tillämpning av kursens tematik till eget valt forsknings- och intresseområde. Kursen ges som distanskurs på halvfart och pågår under fyra veckor.
Examination : Examination baseras på aktivt deltagande i webbinarier samt inlämning och webbinariebehandling av en individuell skriftlig uppgift.
Compulsory elements : Deltagande i webbinarier är obligatoriskt. Om studenten ej kan närvara vid webbinarier skall motsvarande skriftlig seminarieuppgift inlämnas.
Number of students : 8 - 25
Selection of students : Urvalet baseras på 1) kursplanens relevans för den sökandes doktorandprojekt (enligt motivering), 2) startdatum för doktorandstudier
More information : Distanskurs med föreläsningar och webbinarium online. Kursintroduktion: måndag 6/5. Webbinarium: onsdag 8/5, onsdag 15/5, onsdag 22/5 samt fredag 31/5. Datum för föreläsningar (en föreläsning per kursvecka) ej fastställda än.

Course responsible :
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Contact person :
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