

FORSKARUTBILDNINGSKURSER
VID MEDICINSKA FAKULTETEN
UMEÅ UNIVERSITET

Höstterminen 2023

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A practical introduction to biobank research, 3.5 ETCS (online)

En praktisk introduktion till biobanksforskning, 3,5 hp (online)

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|-------------------------------|--|
| Course directors | Maria Wennberg, Stina Bodén, Lena Maria Nilsson |
| Course administrator | Maria Wennberg E-mail: maria.wennberg@umu.se |
| Date | Mandatory seminars on-site in Umeå 13 September and 7 December 2023 |
| Language | English |
| Number of participants | 15 |
| Form of teaching | Online lectures 20 hours, Online Seminars 12 hours, Examination task 60 hours |
| Knowledge test | Presenting a proposal for withdrawal of biobank data and samples according to the routines of the NSHDS cohort. Giving feedback on another student's proposal. |

Content

A large proportion of research carried out utilizes research cohorts including biobank samples and survey data combined with other register data. To use already collected cohort data or stored biological samples for research purposes requires planning and preparing the project, and other kinds of practical and methodological considerations. This course will guide you through some of these issues, with examples from the Northern Sweden Health and Disease Study cohort (NSHDS) and refined NSDHS data from the Northern Sweden Diet Database (NSDD). The aim with this course is to give practical knowledge on how to plan and perform observational studies in the NSHDS framework. The knowledge may also be applied on other similar cohorts. In brief, students who successfully complete this course will be able to (1) Describe available data in the NSHDS cohort including NSDD. (2) Demonstrate the process for data application and acquisition. (3) Point out pros and cons of the designs nested case-control and cohort studies. (5) Demonstrate use of nutrition data from NSDD, as main exposure or possible confounding factor. (6) Demonstrate use of biological measurements in biobank research. (7) Consider ethical issues in biobank research. (8) Write an application of data and/or samples from NSHDS to a real or imaginary research project, to demonstrate how data and samples from biobanks can be used.

Minimal required prior knowledge: "Research ethics, 3 ECTS" and "Introductory course to doctoral studies: Research methodology and philosophy of science, 3 ECTS". For doctoral students who participate in the faculty-wide doctoral programme: "Joint point of departures for science and research, 4 ECTS" and "Research ethics, 2 ECTS".

Design of intervention studies within patient-based research, 3 ECTS (online)

Design av interventionsstudier inom patientnära forskning, 3 hp (online)

| | |
|-------------------------------|---|
| Course directors | Erik Rosendahl Phone: +46 90 786 91 37 Email: erik.rosendahl@umu.se |
| | Marlene Sandlund Phone: +46 90 786 95 30 Email: marlene.sandlund@umu.se |
| Department | Department of Community Medicine and Rehabilitation |
| Date | 11 – 12 October and 22 – 23 November Online (or at Campus, if only students living in Umeå) |
| Language | English (or Swedish, if only Swedish-speaking students) |
| Number of participants | 16 |
| Form of teaching | Lectures (online) 12 hours Seminars/Workshops (online) 20 hours Assignment 40 hours |
| Examination | Written assignment about study design relevant to own research project, and active participation in workshops and seminars. |

Content

The course includes theoretical and practical aspects of planning, conducting and evaluating randomized controlled trials, as well as studies with other designs aiming at evaluating interventions within patient-based research. The course gives an overview of criteria and guidelines on how studies should be conducted and reported in papers to achieve high quality, as well as the use of rating scales to assess the quality. The course will also give an insight into Patient and Public Involvement and the concept Complex Interventions. During the course, the student will judge advantages and disadvantages with various designs based on own ongoing or planned study within patient-based research.

Equity and health, 3.5 ECTS

Den jämlika hälsan, 3,5 hp

Course directors

Anna-Karin Hurtig
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Course administrator

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Department

Department of Epidemiology and Global Health

Date

13 – 27 September

Language

English

Number of participants

20

Form of teaching

Lectures 20 hours
Seminars 8 hours
Group-discussions
Home assignments
(Seminars, group-discussions and home assignments are mandatory)

Examination

Written assignment

Content

Inequities in health have got more and more attention, both in the national and global agendas. However, there are different opinions both regarding the definition of equity, and regarding which policies that are appropriate and justified to increase equity. This course introduces the theories which so far have been most influential in health care and public health – utilitarianism, Rawl's theory of justice, fair procedures, communitarianism and feminism. The course investigates how these theories have influenced both research and policy-making.

Evidence based public health, 4 ECTS

Evidensbaserat folkhälsöarbete, 4 hp

Course director

Lars Lindholm
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Course administrator

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Department

Department of Epidemiology and Global Health

Date

28 August – 12 September

Language

English

Number of participants

20

Form of teaching

| | |
|----------|----------|
| Lectures | 30 hours |
| Seminars | 10 hours |

Examination

Take home assignment

Content

It is desirable to found public health policies on best possible evidence. Almost no potential policy can meet the conditions necessary for randomized control trials. On the other hand, too low evaluation standards can imply that ineffective or even harmful policies are implemented. Research aimed at a foundation for policy-making further requires an understanding of the decision-making process in public organizations. Decision-makers have to balance more or less legitimate interest of different stakeholders, and even make decisions when the evidence is far from perfect. They commonly act under economic and legitimate constraints, such as respect for human rights. Frameworks for compiling available evidence from different sources such as realistic synthesis and Markov-modelling will be presented and discussed. Most of the practical experience of compiling different aspects of health technologies can be found in the health technology assessment literature. Concrete and timely examples will be studied.

Gender-based violence, health, and healthcare, 5 ECTS, (online)

Genusbaserat våld, hälsa och sjukvård, 5 hp

| | |
|-------------------------------|---|
| Course director | Isabel Goicolea Phone: +46 90 786 54 66 Email: isabel.goicolea@umu.se |
| | Fredinah Namatovu Phone: +46 90 786 58 77 Email: fredinah.namatovu@umu.se |
| Course administrator | Ulrika Harju Phone: +46 90 786 51 79 Email: ulrika.harju@umu.se |
| Department | Department of Epidemiology and Global Health |
| Date | 11 September – 17 December |
| Number of participants | 7 |
| Form of teaching | Lectures 15 hours Seminars 3 hours Compulsory group meetings 3 hours |
| Examination | Participation in compulsory meetings, final written assignment |

Content

The course aims to provide an overview of gender-based violence from both an international and national perspective, focusing on the relationship between gender-based violence and health, and the role of the healthcare system in responding to gender-based violence. The course is structured in four parts, each of them including lectures and a seminar/panel discussion. The first and second parts focus on the extent of the problem of gender-based violence, its connection with health, theoretical explanations and definitions and the evolution of institutional responses to gender-based violence. The third part focuses on the healthcare responses to gender-based violence, both from an international and national perspective, including a critical analysis of the consequences of the (bio)medicalization of gender-based violence. The fourth part examines gender-based violence in relation to different groups. Here, issues regarding e.g. functional variation, age, sexuality and racialization are examined.

Grundläggande forskningsmetodik för kliniska doktorander, 15 hp

Basic research methodology for doctoral students in clinical research, 15 ETCS

| | |
|--------------------------|--|
| Kursansvarig | Olov Rolandsson Telefon: +46907853571 E-post: olov.rolandsson@umu.se |
| Kursadministratör | Maria Sandström Telefon: +46 90 786 75 02 E-post: maria.sandstrom01@umu.se |
| Institution | Institutionen för folkhälsa och klinisk medicin |
| Datum | Start september 2023. Avslutas i maj 2024. |
| Språk | Svenska |
| Antal deltagare | 20 |
| Undervisningsform | Föreläsningar, gruppövningar, praktiska datorövningar, seminarier och eget arbete. |
| Examination | Individuell hemtentamen |

Innehåll

Kursens innehåll avser att ge grundläggande kunskaper och färdigheter inom ämnena epidemiologi, biostatistik och kvalitativa forskningsmetoder. Inom kursen går vi igenom grundläggande begrepp, steg i analysprocessen och forsknings trovärdighet. Teori varvas med praktiska övningar och studenterna är välkomna att använda sitt eget data. Inom kursen ges också Good Clinical Practice (GCP) 4,5 hp samt introduktion till olika vanliga metoder relaterade till klinisk forskning.

How to write grant applications, 3 ECTS

Att skriva ansökningar om forskningsanslag, 3 hp

| | | |
|-------------------------------|---|----------|
| Course director | Karl-Erik Renhorn Phone: +46 70 242 98 58 Email: karl-erik.renhorn@umu.se | |
| Course administrator | Susanne Walther Phone: +46 90 786 56 32 Email: susanne.walther@umu.se | |
| Department | Department of Epidemiology and Global Health | |
| Date | 13 November – 1 December | |
| Language | English | |
| Number of participants | 20 | |
| Form of teaching | Lectures | 20 hours |
| | Seminars | 10 hours |
| | Exercises | 15 hours |
| Examination | Presentation of take-home assignment, level of attendance | |

Content

The course will present course participants with tools to enable them to understand research funding systems; to structure their proposal writing; and to compile high-quality research applications, thus increasing their chances for success. The content includes policy background and rationale for public research funding, the procedures and processes of research funding; preparation and planning of application writing, and language and style. A large part of the course will be devoted to individual and group exercises.

Intervjuer och observationer som kvalitativa datainsamlingsmetoder, 3 hp

Interviews and observations as qualitative data collection methods, 3 ECTS

Kursansvarig

Britt-Marie Lindgren
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Jenny Molin
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Kursadministratör

Birgitta Nilsson
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Institution

Institutionen för omvårdnad

Datum

18 – 20 september och 23 – 24 november

Språk

Svenska

Antal deltagare

20

Undervisningsform

| | |
|------------------------|-----------|
| Lektioner | 10 timmar |
| Praktiska övningar | 8 timmar |
| Examinationsseminarium | 10 timmar |

Examinationsform

Skriftlig uppgift

Innehåll

Intervjumetoder som presenteras är; individuella intervjuer som till exempel strukturerade, semi-strukturerade och ostrukturerade intervjuer, narrativa och reflekterande intervjuer samt fokusgruppsintervjuer. Vidare omfattar kursen deltagande och icke-deltagande observationstekniker. Kursen behandlar också tekniker för insamling och utskrift av data.

Introductory course to doctoral studies: Research methodology and philosophy of science, 3 ECTS

Introduktionskurs till forskarstudier: Vetenskapsteori, kunskapsteori och forskningsmetoder, 3 hp

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|-------------------------------|---|
| Course director | Åsa Audulv Phone: +46 90 786 55 42 Email: asa.audulv@umu.se |
| Course administrator | Anna Gåfvels Karlsson Phone: +46 90 786 53 37 Email: anna.gafvels-karlsson@umu.se |
| Date | Week: 39 + 40 (25 September - 6 October) |
| Language | English |
| Number of participants | 30 |
| Form of teaching | Lectures 10 hours Group exercise 15 hours Individual tasks 10 hours |
| Examination | In-class presentation of group work Submission of individual tasks |

Content

This course is an introduction to philosophy of science and common concepts and theories used in research, corresponding to national goals. The course gives an overview of different methods and scientific approaches used at the Medical Faculty. Using the diversity of scientific approaches as point of departure, lectures on philosophy of science will give different perspectives of knowledge in medical research. Generic knowledge, research as part of society and how to communicate research will be in focus. Gender, equality and the importance of research in society will be discussed.

The educational format is a mixture of plenary lectures, a heavy emphasis of group and in-class discussion, participant's own presentations and two assignments to work with in two steps, individually before and in groups during the course.

Introduktion till registerforskning, 1,5 hp

Introduction to register-based research, 1,5 ECTS

| | |
|--------------------------|---|
| Kursansvarig | Christel Häggström Telefon: +46 90 785 72 80 Epost: christel.haggstrom@umu.se |
| Kursadministratör | Susanne Walther Telefon: +46 90 786 56 32 Epost: susanne.walther@umu.se |
| Institution | Institutionen för epidemiologi och global hälsa |
| Datum | 6 – 10 november |
| Språk | Svenska |
| Antal deltagare | 20 |
| Undervisningsform | Föreläsningar 18 timmar Seminarier 12 timmar Praktiska exempel 8 timmar |
| Examinationsform | Att medverka i och klara av praktiska övningar på seminarier |

Innehåll

Detta är en introduktionskurs i registerforskning. Kursen avser att ge generell teoretisk kunskap om och grundläggande praktiska färdigheter för forskning på kvalitetsregister.

Longitudinal data analysis, 1.5 ECTS

Longitudinell analys, 1,5 hp

| | |
|-------------------------------|---|
| Course director | Johan Sommar Phone: +46 90 785 34 53 Email: johan.sommar@umu.se |
| Course administrator | Ulrika Järvholm Phone: +46 90 786 71 43 Email: ulrika.jarvholm@umu.se |
| Department | Department of Public Health and Clinical Medicine |
| Date | 4 December – 7 December |
| Language | English |
| Number of participants | 20 |
| Form of teaching | Lectures 12 hours Data exercise 9 hours |
| Examination | Practical assignment |

Content

The course deals with statistical analysis in studies with repeated or time dependent outcomes.

- Introduction to longitudinal data and longitudinal study designs
- Characteristics and description of longitudinal data
- Introduction to Mixed models with random and fixed effects for longitudinal analysis
- Introduction to General Estimation Equation models
- Covariance structures and their implementation within longitudinal analysis
- Model fitting in longitudinal analysis

The course is given in form of lectures, seminars, and practical computer exercises.

The course is intended for students with practical and theoretical knowledge of biostatistics corresponding to the course Research methodology with biostatistics, 7.5 ECTS (see page 21).

Methods in social epidemiology, 3 ECTS

Metoder inom social epidemiologi, 3 hp

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|-------------------------------|---|
| Course director | Miguel San Sebastián Phone: +46 90 786 51 50 Email: miguel.san.sebastian@umu.se |
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| Department | Department of Epidemiology and Global Health |
| Date | 11 – 15 December |
| Language | English |
| Number of participants | 5 at PhD-level |
| Form of teaching | Lectures 18 hours Practical training 12 hours Seminars |

Lectures will be held in the mornings and computer sessions with applied exercises will follow in the afternoon after each lecture session. Hands-on practical session in the computer labs will use Stata software. *Previous knowledge of Stata is required.*

Examination Home exam

Content

Socioeconomic inequalities in health are a major challenge for health policy. Monitoring the changes in the magnitude of these inequalities is essential to assess the effectiveness of health policy interventions. There is a wide variety of summary measures for the magnitude of socioeconomic inequalities in health. These measures choose different perspectives, and it is recommended to assess the magnitude of health inequalities based on a set of diverse measures that together cover all the relevant perspectives. Both simple and sophisticated summary measures are available for each of these perspectives.

This course is designed as an intensive, hands-on learning experience that will foster the development of theoretical knowledge and basic skills in calculating and interpreting different health inequality measurements. The different measurements included in the course are: the relative index of inequality and the concentration index, the principal component analysis applied to socioeconomic status, the measurement of intersectionality, how to conduct a decomposition analysis and propensity matching score. Further topic includes methodological issues when carrying out life course studies and the advantages of multilevel analysis.

Previous knowledge on biostatistics and epidemiology are pre-requisite for taking this course.

Expected learning outcomes

Students who successfully complete this course will be able to:

- Differentiate various measures of health inequalities and judge their weaknesses and strengths.
- Understand the theoretical concepts behind the health inequality measurements.
- Calculate the measures of health inequalities presented in the course.
- Interpret the results of the health inequality measurements.

Omvårdnadens teori och begrepp i relation till forskning och klinisk praxis, 4,5 hp (online)

Nursing theory and concepts in relation to research and clinical practice, 4.5 ECTS (online)

Kursansvariga

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Kursadministratör

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Institution

Institutionen för omvårdnad

Datum

14 september – 14 december

Språk

Svenska

Antal deltagare

20

Undervisningsform

Introduktion med föreläsningar 14-15 sep
Litteraturseminarium 5 okt
Idéseminarium 26 okt
Examinationsseminarium 7 dec

Examinationsform

Individuella papers som diskuteras vid ett
examinationsseminarium

Innehåll

Kursen belyser omvårdnadsämnets utveckling och har fokus på omvårdnadens teori och begrepp. Den modell för omvårdnad, som används och har utvecklats successivt vid Institutionen för omvårdnad, Umeå universitet, fungerar som utgångspunkt för kursen. De olika aspekterna i modellen utgörs av patient/närstående och vårdare/vårdteamet, uppgift och relation, hälsa, miljö, organisation, samhälle, vårdfilosofi och etik. Modellen fungerar som stöd i att systematisera och beskriva omvårdnad, i såväl teori, forskning som klinisk praxis. Utifrån den egna forskningsinriktningen är målet sedan att fördjupa förståelsen för relevanta teorier/begrepp och reflektera över dess betydelse för klinisk praxis.

Kursen bygger huvudsakligen på självstudier och är helt nätburen. Obligatoriska seminarier inklusive diskussioner och slutexamination i form av opponent- och respondentskap ingår och genomförs digitalt.

Oral presentation, 1.5 ECTS (online)

Muntlig presentation, 1,5 hp (online)

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|-------------------------------|--|
| Course director | Lars Larsson Phone: + 46 90 786 71 53 Email: lars.larsson@umu.se |
| Course administrator | Gunilla Mårald Phone: + 46 90 786 71 78 Email: gunilla.marald@umu.se |
| Department | Centre for educational development (UPL) |
| Date | 4-8 September |
| Language | English |
| Number of participants | 25 |
| Form of teaching | Workshops Practical assignments Group work Exercises Lectures |
| Examination | Mandatory assignments Mandatory workshops |

Content

The goal of the course is to provide the students with tools and opportunities to develop oral presentation skills, with focus on oral presentations at conferences. The course includes sessions about rhetoric and body language, visual communication, storytelling and popular science presentations. There will be several opportunities to prepare and practice oral presentation, and to give, receive and use feedback for development of presentation skills.

The course is built on John Dewey's concept "learning by doing" and David Kolb's theories about experiential learning. Hence, course participants are expected to actively engage in all course activities.

Application

<https://app.eduadmin.se/form/a8b161cc76bfc02f/1972503?publicFormId=7dc186b0-1588-49d9-bf7b-026faaa56925&userGuid=6019d66a-2758-4769-b866-6172c925b0ce>

Qualitative data analysis, 7.5 ECTS

Kvalitativ dataanalys, 7,5 hp

Course director

Isabel Goicolea
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Kristina Lindvall
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Course administrator

Angelica Johansson
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Department

Department of Epidemiology and Global Health

Date

28 September – 30 October 2023

Language

English

Number of participants

10 at PhD-level

Form of teaching

| | |
|-------------------|----------|
| Lectures | 22 hours |
| Seminars | 12 hours |
| Group works | 12 hours |
| Group supervision | 5 hours |

Examination

Literature seminar, course project, individual paper and article analysis

Content

The course focuses on the basic principles and steps of Qualitative Data Analyses using examples from mainly Grounded Theory method but also other methods. Participants will perform the basic steps of analyzing qualitative data (their own or of a teacher-provided). Moreover, participants will examine and discuss critically various examples of scientific studies that employ Grounded Theory method and other qualitative methods.

Regression models in medical sciences, 3 ECTS (online)

Regressionsmodeller för medicinska vetenskaper, 3 hp (online)

| | |
|-------------------------------|---|
| Course director | Marie Lindkvist Phone: +46 90 786 61 04 Email: marie.lindkvist@umu.se |
| Course administrator | Susanne Walther Phone: +46 90 786 56 32 Email: susanne.walther@umu.se |
| Department | Department of Epidemiology and Global Health |
| Date | 30 October – 26 November |
| Language | English |
| Number of participants | 20 |
| Form of teaching | Web lectures Web seminars Written exercises Computer exercises |
| Knowledge test | Home examination |

Content

The PHD-students must have access to SPSS on their own computer. The emphasis of the course is on the understanding of statistical reasoning in the analysis of epidemiological data analysis and in medical and public health research.

Regression analysis is a statistical technique used for analysing the relationship between the outcome (dependent variable) and the explanatory variables (independent variables). In this course, several regression models will be described and applied. The course will start with a repetition of linear regression model which deals with a continuous outcome variable. After that, binary logistic regression (for binary outcome variable) and Cox regression (for “time to event” outcome variable) will be introduced and applied. Basic concepts in survival analysis, including censoring, survival function and hazard function, will be discussed. Finally, regression models where the outcome is counts are processed (Poisson regression and negative binomial regression).

Students will further practice the application of different analytical approaches in computer exercises. During the course, medical and epidemiological research articles will be discussed and evaluated with focus on the statistical methods.

Research ethics, 3 ECTS (online)

Etik i forskningen, 3 hp (online)

Please note! Compulsory for all doctoral students admitted before July 1 , 2021

| | | |
|-------------------------------|---|----------|
| Course director | Klas-Göran Sahlén Phone: +46 90 786 63 58 Email: klas-goran.sahlen@umu.se | |
| Course administrator | Ulrika Harju Phone: +46 90 786 51 79 Email: ulrika.harju@umu.se | |
| Department | Department of Epidemiology and Global Health | |
| Date | 11 – 15 September | |
| Number of participants | 30 | |
| Form of teaching | Online Lectures | 20 hours |
| | Online Seminars | 10 hours |
| Knowledge test | Home exam | |

Content

Basic concepts and history of research ethics. Ethical reflections on different kind of data. Application to ethical review board. Research on groups with limited autonomy. Misconduct in research. Publication ethics. Archives, openness and secrecy for research data. Data management plan. Introduction to ethics in animal research. Discussion on students' own project.

Research methodology with biostatistics, 7.5 ECTS

Forskningsmetodik med grundläggande statistik, 7,5 hp

| | |
|-------------------------------|---|
| Course director | Henrik Holmberg Phone: +46 90 786 66 59 Email: henrik.holmberg@umu.se |
| Course administrator | Karin Johansson Phone: +46 90 786 55 11 Email: karin.johansson@umu.se |
| Department | Department of Epidemiology and Global Health |
| Date | Course week 1: 2 October – 6 October Course week 2: 23 – 26 October |
| Language | English |
| Number of participants | 35 |
| Form of teaching | Lectures 32 hours Practical exercises 16 hours |
| Examination | Home exam |

Course content

The course is an introduction to epidemiology and biostatistics. Basic epidemiological and statistical concepts are covered, and issues of study design and validity are discussed. In biostatistics, lectures focus on sampling, descriptions of data and common tools for data analysis. Practical exercises are also included.

Research writing in the medical sciences, 5 ECTS (online)

Akademiskt skrivande i medicinsk vetenskap, 5 hp (online)

Course director

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Course administrator

Anna Gåfvels Karlsson
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Date

week 38 – week 43

Language

English

Examination

Three written texts representing research text sections, two rounds of peer review, and three text analyses of model texts

Course content

The aim of this course is to improve the English writing of researchers in the medical sciences who write in diverse disciplines. A primary goal of the course is to familiarize writers with the types of rhetorical organization, academic phraseology, disciplinary vocabulary and sentence structures of research texts in their own field. Participants learn to conduct text analysis and corpus analysis on model texts within their own disciplines/research so they can refine their understanding of research journals' expectations. Another goal is to familiarize participants with writing strategies that have been found through research to be most effective for second language research writers. Included in strategy instruction is the introduction of computer-based writing tools, such as academic phrase lists, outlining tools, and useful online writing labs.

Participants work in disciplinary groups in three instances via Zoom and have regular access to the instructor via group tutorials. Instructional lectures are available on the Canvas site for each text section and are based on model texts provided by the Medical Faculty. Participants write three sections of their research texts during the 6-week course, participate in two rounds of written peer review, and receive instructor feedback on each of the three texts.

Writing science: How to write and publish scientific papers, 5 ECTS

Vetenskapligt skrivande: Att skriva och publicera vetenskapliga artiklar,
5 hp

| | |
|-------------------------------|---|
| Course directors | Magnus Andersson Phone: +46 90 786 63 36 Email: magnus.andersson@umu.se Anders Eklund Phone: +46 90 785 40 24 Email: anders.eklund@umu.se |
| Department | Faculty of Science and Technology |
| Date | 19/10, 26/10, 2/11, 9/11, 16/11, 23/11 |
| Language | English |
| Number of participants | 30 |
| Form of teaching | Lectures Writing group discussions and exercises Concluding classroom discussions |
| Examination | Mandatory attendance. Writing/editing/reviewing exercise for each meeting that builds on the same short article. Analysis and peer review of a set of published papers. |

Course content

This is an advanced course in scientific writing. To succeed as a scientist the ability to write scientific papers is a central and very important skill. The aim of the course is that students should acquire tools and learn the craft to become skilled scientific writers. It includes the three components of effective communication: content, structure and language. We present the purpose and significance of the major general structure of a scientific paper. Here we highlight why an article must contain the topic of the research, a knowledge gap, a clear research question, a description of methods, results, discussion and conclusions. We present different narrative techniques and analyse how they can be used for better flow and continuity within and between sections. We develop writing skills down to the detailed level of internal structures of paragraphs and sentences.

We meet once a week for six weeks. Each meeting starts with a short lecture focused on scientific writing in practice and based on experience with, for example, journals and editors. Then we make a short introduction to the writing exercise and split into small writing groups of three students. Each student has prepared a text, or revised the text according to the specific exercise, and the other students in the group have

commented on the result. Together the students analyze, discuss, and revise the texts to further improve them. The exercises derive from the book *Writing Science*, which from chapter to chapter provides new tools to better tell the story. Each week, we cover three chapters and the corresponding exercises. Finally we reunite, summarize, conclude, and present the exercise for the next meeting.