J.nr.	Title	Course leader	Preliminary ECTS	Learning outcomes
B69/26	Flow cytometry	Charlotte Christie Petersen	2,9	1. Understanding the physics behind flow cytometry 2. Understanding the applications and limitations of flow cytometry 3. Practical knowledge and experience with flow cytometry experiment design 4. Understanding essential flow cytometry controls 5. Awareness of common (and not so common) pitfalls 6. Hands-on, practical experience with data analysis 7. Ability to critically evaluate flow cytometry results 8. Requirements for publication of flow cytometry experiments
B100/40	Laboratory animal science	Thea Thougaard Johansen/Barselsvikar	3,9	The participants should obtain basic knowledge about the Laboratory animal science, which will make it possible for them to participate in research contributing to the humane use of laboratory animals ensuring high standards of animal welfare and quality in the performing, evaluating and reporting of laboratory animal experiments. • Insight into Danish legislation concerning animals used for scientific purposes, the ethical aspects working with laboratory animals as well as the principles of the 3 Rs. • Basic insight into the biology of laboratory animal, including normal/abnormal behaviour, housing, breeding, welfare and feeding. • Basic insight into occupational health and safety when working with laboratory animals. • Practical experience with handling and euthanizing laboratory animals as well as minimally invasive injections and blood sampling techniques. • Basic knowledge of anaesthesia for minor procedures in common laboratory animals.
B156/12	Understanding Neuroscience	Marco Capogna	2,2	1. The role of key brain areas such as the amygdala and cerebral cortex in brain function. This includes learning, spatial and fear memory, motor behaviour. 2. Neuronal development and connectivity. 3. Neuronal communication, synaptic transmission and plasticity. 4. Neuron types and in silico modelling of neuronal networks. 5. Altered neuronal function and connectivity in neurological and psychiatric disorders.
BPC250/40	Responsible Conduct of Research	Sebastian Frische	3	At the end of the course, the PhD student should: • Be familiar with the Danish Code of Conduct for Research Integrity as well as Aarhus University guidelines and Health standards of Responsible Conduct of Research • Be able to understand and discuss principles of research integrity and responsible conduct of research • Be able to identify, analyse and discuss cases of scientific misconduct and questionable research practices in the grey zone between misconduct and poor science • Know where to seek advice concerning responsible conduct of research
C85/20	Stereology	Jens Randel Nyengaard	3,5	Understand and be able to implement random sampling, systematic sampling and smooth systematic sampling Understand and be able to implement Cavalieri estimator and nucleator/rotator for volume estimation using section planes Understand and be able to implement disector and fractionator for number/connectivity estimation using section planes Understand and be able to implement length and surface estimation using isotropic or vertical section planes Understand the effect of tissue deformation, over- and under projection and ratios on final conclusions
C104/20	From Gene to Function – Molecular Analysis of Disease Genes	Peter Bross	2,9	• Theoretical assessment of effects of gene variations • Protein structure, folding and trafficking and their disturbances in diseases • Methods for experimental investigations of effects of gene variations • Design and interpretation of cellular and in vitro experiments • Exercising and developing skills for communicating scientific knowledge
C119/90	Datamanagement & Stata	Jakob Hjort	1,4	• Handle research data in a way that live up to legal- as well as basic scientific requirements • Relate to the basic principles of data documentation • Relate to Stata's user-interface and basic functionalities • Use Stata's build-in help system • Build well-structured command-files ("do-files") to enhance transparency and reproducibility

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C119/91	Datamanagement & Stata	Jakob Hjort	1,4	See previous course
C119/92	Datamanagement & Stata	Jakob Hjort	1,4	See previous course
P155/26	Epidemiology I - Basic Principles of Epidemiology	Bodil Hammer Bech	2,8	• The student should be able to define epidemiologic measures of occurrence and explain the difference between prevalence and incidence. • The student should be able to define the following epidemiologic measures of association; relative risk, risk ratio, odds ratio, and rate ratio, risk difference and excess risk, including attributable risk and population attributable risk. • The student should be able to define and describe strengths, weaknesses, and main applications of the designs; ecological, cross-sectional, follow up, case-control and intervention studies. • The student should be able to define selection bias, information bias and confounding and be aware that evaluating the direction and strength of a possible bias or confounding is essential. • The student should learn to think along the lines that, when faced with data from an analytic epidemiologic study showing an association (or no association), this might reflect; random error, bias (systematic error), including selection bias or information bias, or confounding, or, if all other possibilities seem unlikely, causality.
C171/12	Introduction MATLAB with examples from Health Science	Irene Klærke Mikkelsen	2,4	After completion of the course, the student should be able to understand and be able to use: 1. The MATLAB program in general including editor, command window, and help 2. MATLAB data structures including matrices, cells and structs 3. Generic programming principles including loops, conditions, functions 4. MATLAB graphics for plotting and vitalization of data 5. MATLAB Debugging capability
C189/11	Synthesising Evidence: Meta-Analyses and Systematic Reviews	Olaf Dekkers	1,4	• Understanding and evaluating meta-analyses • Conducting systematic reviews • Assessing heterogeneity between the studies included • Combining the results from individual studies in a pooled estimate
C190/05	Image diagnostic methods for evaluation of the musculosceletal system	Maiken Stilling	2,2	Understand the most common radiologic methods Understand the basic background for methods (physics, instruments) Characterize risks of the methods Understand the advantages and disadvantages/imitations of the methods Obtain inspiration to new methods in research projects
C204/11	From Gene to Function – Molecular Analysis of Disease Genes	Mette Bjerre	2,7	The participants obtain theoretical knowledge and practical skills required for development, troubleshoot, and validation of ELISA and TRIFMA assays.
C205/19	The Talented Researcher	Kamille Smidt Rasmussen	3	At the end of the course you should have learned about and strengthened your awareness of own strengths and challenges to enhance leadership in both work and your everyday life. You should have strengthened your project management skills in order to better control and plan your project and PhD-education with respect to deliverables, milestones and schedules. As a specific outcome all participants will have a plan with deliverables, milestones, and schedules for their PhD project.
C236/20	Introduction to Research Training in Health Sciences (Students enrolled in the Research Honours Programme and Research Year will be prioritised)	Kresten Keller	1,4	• Introduction to basic, clinical, qualitative and epidemiological research • Gain knowledge on writing research protocols • Gain knowledge on writing successful applications • Introduction to structured literature search • Reflections on student-supervisor relationships • Introduction to ethics and regulations in animal and clinical research

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C240/06	Mindfulness-based interventions in the clinic - background, methods, and applications	Karen Johanne Pallesen	1,4	• Describe the historical foundations of modern evidence-based mindfulness-based interventions • Describe the physiological stress-response and discuss its role in health and disease • Explain the role of neuroplasticity in psychological interventions • Describe and discuss the use of evidence-based mindfulness-based interventions in different clinical contexts • Discuss current findings of changes in brain structure and function • Debate the quality of a) current mindfulness research, b) formal mindfulness training standards, and c) mindfulness programs available to the public • Reflect on "best practice" strategies for future implementation of evidence-based mindfulness-based interventions in modern healthcare and society
C243/07	How to get published	Søren Dinesen Østergaard	3,9	After the course, the participants should • Have a basic knowledge of all aspects of the publication process • Have improved their writing abilities • Have learned how to perform peer-review Altogether, this will increase the participants' chances of publishing their scientific work.
CBP250/39	Responsible Conduct of Research	Henning Grønbæk	3	At the end of the course, the PhD student should: • Be familiar with the Danish Code of Conduct for Research Integrity as well as Aarhus University guidelines and Health standards of Responsible Conduct of Research • Be able to understand and discuss principles of research integrity and responsible conduct of research • Be able to identify, analyse and discuss cases of scientific misconduct and questionable research practices in the grey zone between misconduct and poor science • Know where to seek advice concerning responsible conduct of research
C253/06	Prepare yourself on the movement from a PhD in Health to a career in non-academia	Vibeke Broe	3,6	• Identify their transferable skills achieved during doctoral training • Explain the value of these skills within as well as outside of academia • Reflect on their own possible career path • Apply the different aspects of the course when marketing their skills in different situations • Furthermore, the participants should gain an understanding of common career areas for researchers, and the requirements companies have when employing PhDs.
C254/06	An introduction to Good Manufacturing Practice (GMP)	Dirk Bender and Anja P. Einholm	2,1	• Be familiar with basic principles and terms of GMP and its impact in Danish legislation • Be able to understand specific challenges arising from GMP • Know where to seek advice concerning further development of GMP skills
C262/13	Get ready to work with Biostatistics (Alm)	Eva Greibe	1,8	•How to test for assumptions for basic statistical tests •How to perform basic statistical tests •How to present results in tables •How to perform a sample size calculation
C268/04	Foundations of data-driven health science	Mads Jensen	2,6	• Summarize how the main components of a computer relate to, and constrain, the act of "computing". • Describe the basic organisation of a file system, and navigate it using commands in a "terminal". • Contrast textual and binary files in terms of their contents and find information in both using tools that can be automated. • Contrast local and non-local computing resources and file systems, and formulate use cases for both. • Use variables in a programming language (python) and perform simple operations (manipulations) on the information (data) they contain. • Write a program to extract, collate and preprocess "raw" data for further processing (statistics, visualisation, etc.).

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C279/03	Personalised Medicine	Deirdre Cronin Fenton	2,4	1. Define "personalised medicine" in disease diagnosis and treatment 2. Enumerate "omics" and how "omics" can be utilized in routine clinics 3. Describe the role of epigenetics in personalized medicine 4. Understand molecular pathology approaches as a tool in personalised medicine 5. Compare and contrast clinical epidemiology approaches to personalised medicine 6. Describe "big data" approaches to assess the effectiveness of precision medicine 7. Identify ethical issues related to personalised medicine in clinical practice and in clinical epidemiologic research
C296/02	Applying clinical epidemiological methods and Danish databases to study chronic disease	Deirdre Cronin Fenton, Mette Nørgaard, Christian F. Christiansen, Reimar W. Thomsen	4,7	The course includes lectures, exercises and computer labs on the following: 1. Identify and design a clinical epidemiologic research study using the Danish databases and registries – comparing and contrasting study designs in order to suitably address a research question 2. Identifying and ascertaining data from the Danish databases and registries 3. Assessing study validity and implementing validity checks 4. Data analysis including data cleaning and implementing survival analysis using Stata 5. Evaluating study findings, interpreting and reporting study findings
C305/01	What is research? Ontology, epistemology and methodology	Rune Dall Jensen	2,4	At the end of the course, students should be able to: - Describe the fundamental concepts and positions in the philosophy of science - Articulate the research implications of the various philosophical positions on science - Position one's research project in a philosophy of science discourse - Formulate research questions, based on various epistemologies
P98/22	Epidemiology II	Christina C. Dahm	4,6	• Advanced insight into epidemiological study design • Advanced insight into design and evaluation of epidemiological studies • Insight into DAGs • Insight into strategies for analyzing epidemiological data • Practical experience with analyses of epidemiological data
P126/17 - 4 dage	Analysis of variance and repeated measurements	Bo Martin Bibby	3,3	1. Perform ANOVA, variance component analysis or repeated measurement analysis based on the chosen model. 2. Describe the results of the statistical analysis, and discuss the results in relation to the scientific question. 3. Be aware of the limitations of the statistical methods presented in the course.
P126/17 - 6 dage	Analysis of variance and repeated measurements	Bo Martin Bibby	3,6	1. Document and process data for a statistical analysis of repeated measurements. 2. Choose a relevant statistical model for a given research question and evaluate the assumptions behind the ANOVA or repeated measurement analysis. 3. Perform ANOVA, variance component analysis or repeated measurement analysis based on the chosen model. 4. Describe the results of the statistical analysis, and discuss the results in relation to the scientific question. 5. Be aware of the limitations of the statistical methods presented in the course.
P216/05	Nutritional epidemiology	Christina C. Dahm	1,8	• Insight into study designs in nutritional epidemiology • Insight into design and conduct of nutritional epidemiological studies • Insight into strategies for analyses of nutritional epidemiological data • Ability to evaluate nutritional epidemiological studies
P231/08	Developing and evaluating complex interventions addressing health behaviour change on multiple levels	Helle Terkildsen Maindal	2	• Insight into complex interventions based on the UK Medical Research Council Model • Insight in developing complex interventions addressing co-production • Insight in contextual elements that can influence successful behaviour change • Overview of different complex intervention valuation strategies

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P255/06	Introductory course in questionnaire technique and clinimetrics	Henrik Hein Lauridsen	2	• Have knowledge about conceptualisation and operationalisation • Know the most important concepts related to questionnaire research • Know the basics of how to design a questionnaire and write items • Know the requirements for a questionnaire validation • Have the skills to find and select the most appropriate outcome measure • Have the skills to translate an international questionnaire into Danish • Have basic knowledge of the COSMIN taxonomy, validity and reproducibility • Have basic knowledge in how to develop a new measurement instrument
PBC250/38	Responsible Conduct of Research	Ask Vest Christiansen	3	At the end of the course, the PhD student should: • Be familiar with the Danish Code of Conduct for Research Integrity as well as Aarhus University guidelines and Health standards of Responsible Conduct of Research • Be able to understand and discuss principles of research integrity and responsible conduct of research • Be able to identify, analyse and discuss cases of scientific misconduct and questionable research practices in the grey zone between misconduct and poor science • Know where to seek advice concerning responsible conduct of research
P272/04	GIS in Health Sciences	Jörg Schullehner	2,6	Identify and describe the different types of spatial data Retrieve spatial data from open sources and own surveys and load them into a GIS program Design and apply simple spatial analyses Present spatial data in appropriate maps
P1050/36 - part 1	Basic Biostatistics Part 1 (Four days)	Erik Parner	2,6	1. Document and handle data needed for a statistical analysis 2. Chose a relevant statistical model for a given research question and evaluate the assumptions of the statistical analysis 3. Perform a statistical analysis based on the chosen model 4. Describe the results of the statistical analysis, and discuss the results in relation to the scientific question 5. Make simple calculations of sample sizes for the planning of a comparative study
P1050/36 - part 2	Basic Biostatistics Part 2 (Four days)	Erik Parner	6,4	1. Document and handle data needed for a statistical analysis 2. Chose a relevant statistical model for a given research question and evaluate the assumptions of the statistical analysis 3. Perform a statistical analysis based on the chosen model 4. Describe the results of the statistical analysis, and discuss the results in relation to the scientific question
P256/04	Advanced course in questionnaire technique and clinimetrics	Henrik Hein Lauridsen	2,1	Have the skills to complete the process of developing a new measurement instrument Have basic knowledge about item reduction and factor analysis Know how to perform a field test Be able to define, determine and interpret a) validity, b) reproducibility, c) responsiveness and d) interpretation Have an overview of the benefits of modern psychometric methods such as IRT and Rasch analyses Be able to explain the basics of Rasch analysis
P264/03	Patient and public involvement in health research	Annesofie Lunde Jensen	2,8	• Summarise the theory and practice of PPI in the research cycle • Assess different approaches of PPI relevance and applicability in various study designs • Take an analytical and critical view on the processes and potential outcomes of PPI. • Plan, apply, and evaluate PPI in own study.

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P265/06	Qualitative data analysis: Using NVivo 12	Annesofie Lunde Jensen	2,3	• Create projects • Describe units of analysis relevant for the students owns project • Critical identify element (sources and cases) as a foundation for making queries • Create memos, annotations and links • Know how to use NVivo 12 together with bibliographic software such as EndNote and RefWorks • Code data in relation to different types of qualitative data analysis techniques • Analyse data, visualise data analysis and make different kinds of queries • Be able to explain and visualise the data analysis the students use in their own Ph.D.-project • Know how to build models and make different kinds of graphic presentations and diagrams
P285/03	Introduction to register-based research	Natalie Momen og Oleguer Plana-Ripoll	3,6	• Describe commonly used Danish health registers and how they can be used in research • Identify different epidemiological designs used to investigate register data • Discuss strengths and limitations of register data • Describe how other sources of data, such as genetic data, cohort data and survey data can complement data in the registers • Perform simple data management tasks using artificial register data • Plan their own research using registers or to critically read publications from register-based studies
A132/22	PhD supervision (supervisors) + erstatningskurser fra F21	Mette Krogh Christensen (CESU)	2,2	• Describe and give reasons for own supervision practice. • Analyse and consider actual dilemmas in supervision. • Identify and argue for individual choices in managing one's own supervisor role. • Write a supervisory letter in order to explicate values and traditions in the researcher community. • Apply communicative methods that underpin progression in the supervision meeting. • Give constructive text feedback and thus promote the PhD-student's writing process. • Describe and give reasons for the ways in which talent identification and talent development takes place in the supervisor's research environment. • Adapt the rules and regulations of the Graduate School of Health. • Discuss responsible conduct of research.
A227/22	Research Presenter - Educational Informatics	Mads Ronald Dahl (CED)	2,8	Identify and apply methodologies in computer-based teaching. Apply rhetoric Skills for preparing and delivering research presentations. Use reflective skills in evaluating performance in presenting and teaching at university level. Produce and present effective scientific posters. Apply tools for giving and receiving feedback.
A292/02	Future health professionals digital competences	Mads R. Dahl (CED)	2,8	Upon completion of the course, the participant will be able to: • Describe the theory and methodologies of digital competences • Describe introductory elements of Health and eHealth solutions for patients • Use tools to evaluate i.e. apps and web resources • Discuss staging and performing computational thinking at university level • Reflect on own knowledge, use and application of digital competences
A293/03	The PhD-student as supervisor for undergraduate students – how and when?	Mette Krogh Christensen (CED)	3	By the end of the course, the participants are able to • discuss and reflect on requirements and responsibilities of different supervisor and co-supervisor roles, • provide feedback to undergraduate students' written or oral presentation in a way that facilitate the undergraduate students' learning process, and • acquire knowledge about undergraduate students' expectations and interests in order to balance supervisor's control and undergraduate students' own control of their projects

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A294/03	The Reflective Teacher	Kamilla Pedersen Ny kl. fra CED kamilla@au.dk	2,4	The course is designed as a blended learning approach with a combination of out-of-class online learning and in-class face-to-face teaching. It is estimated to last about 60 hours distributed over five weeks (4x4 hours in-class seminars, approx. 20 hours preparation for in-class seminars, and approx. 24 hours structured online learning activities). The activities will consist of a mix of reading materials, watching videos, producing texts and models, participating in individual as well as group activities in-class and out-of-class, developing lesson plan and teaching portfolio as well as giving peer-feedback. To complete the course and receive ECTS credit and diploma it is mandatory to be active online, and complete all activities (including peer-feedback and portfolio) and respect the activity deadlines. Your learning outcome depends on active participation through peer feedback and discussions with each other. The course is student-centered, why participants will carry out tasks and exercises at in-class and out-of-class activities.
A88/79	Struktureret litteratursøgning (FÅ)	AU Library/ Janne Lytoft Simonsen	0,7	To enable the participants to assess the relevance, strengths and weaknesses of different search methods. To enable the participants to build a search strategy and select relevant information sources and search terms. To make the participants familiar with the concept of reference management software in general and EndNote in particular.
A103/85	Basic Course in Written English	Morten Pilegaard	2,6	1. Knowledge about guidelines and conventions governing the structuring of clinical research papers. 2. Knowledge of principles of cohesion and thematic structure in research papers. 3. Knowledge of some of the main differences between English and Danish syntax and grammar. 4. Ability to describe typical structural and linguistic features of poster, abstract and paper. 5. Ability to trace errors of syntax and grammar in English-language texts.
A103/86	Basic Course in Written English	Morten Pilegaard	2,6	See course description above
A103/87	Basic Course in Written English	Morten Pilegaard	2,6	See course description above
A125/48	Advanced Course in Written English	Morten Pilegaard	2,6	1. Ability to use existing guidelines and conventions governing the structuring of clinical research papers. 2. Ability to analyse and describe typical structural and linguistic features of poster, abstract and paper. 3. Ability to apply principles of cohesion and thematic structuring in own texts. 4. Ability to analyse and produce select text types. 5. Ability to trace and correct errors of composition and grammar in English-language texts.
A125/49	Advanced Course in Written English	Morten Pilegaard	2,6	See course description above
A127/15	Linear regression models for continuous and binary data	Morten Frydenberg	3,6	The participants should obtain a basic knowledge of linear normal and binary regression methods as applied within health science.
A137/38	Literature search in medical databases (PhD)	AU Library/Annette Balle Sørensen	0,7	• To enable the participants to perform qualified searches, systematic as well as citation searches, in relevant medical databases. • To introduce the participants to methods of scientific quality measurements, thus enabling them to understand the basic principles of research evaluation. • To present a brief overview of different aspects related to research publication such as ORCID, Forskerportalen.dk, Copyright etc. • To introduce the basic concept of reference management programs in general and – if requested – to make the participants familiar with the specific reference management program EndNote. The lessons will alternate between theory and exercises at the computer.
A297/02	Advanced R course	Florian Franck Privé	2,4	At the end of the course, participants should be able to: - Use RStudio with a better setup to be more efficient in their work - Version their code with Git to keep track of changes in their code - Understand more R as a programming language and write better, simpler code - Manipulate and visualise data with the tidyverse and R Markdown - Produce efficient R code - Develop an R package
A1000/80	Welcome to the PhD study	Forskeruddannelsen	0	The Graduate School of Health wishes to welcome all newly enrolled PhD students to the PhD programme by giving the students an introduction to practical matters related to the PhD study at Health, Aarhus University.

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A1000/81	Welcome to the PhD study	Forskeruddannelsen	0	The Graduate School of Health wishes to welcome all newly enrolled PhD students to the PhD programme by giving the students an introduction to practical matters related to the PhD study at Health, Aarhus University.