J. nr.	Title	Course leader	Learning outcomes	Offered in Semester
			Graduate School Health course offer 2026	
			NB: The course list is tentative and will be updated once a year every November	
Others, not in coorporation with a department				
A1000	Health - Welcome to the PhD study	Mia Maychrzak	A welcome event for all newly enrolled PhD students to the PhD programme to give them the opportunity to meet and interact with fellow PhD students and AU representatives from fields relevant during the PhD programme.	Twice or more per year
A1001	Project and Time Managment: Using Project Management Tools to Communicate with your Supervisor	Constance Kampf	At the end of the course, the participants will be able to revise their IPTO planning tool and integrate key decision points together with their supervisors. In addition, they will have learned how to make connections between the high-level planning in the IPTO, and more detailed planning in their daily work. Finally, they will build a vocabulary for discussing progress with their supervisors which allows for considering progress separately from content.	Twice or more per year

A1002	Project and Time Management: Risk & Coordinating with the Big Picture	Constance Kampf	At the end of the course, the participants will be able to reconsider their PhD completion plan, reflecting on how to use a two-level approach to planning and controlling progress and remove bottlenecks and risks in the second half of the PhD. Participants will also develop familiarity with Kanban boards as a means of documenting research progress and coordinating Kanban structure with research needs that change over time.	Twice or more per year
A1003	From PhD to PostDoc: Networking, Grantseeking & Interdisciplinarity for a research career after the PhD (both part-time & full-time research)	Constance Kampf	At the end of the course, the participants will be able to reconsider their PhD completion plan, recognizing opportunities that lay groundwork for a successful part-time or full-time research career. They will also have developed a strategic plan for changing their networks, engaging in interdisciplinarity, and laying groundwork for grant seeking as their career progresses.	Twice or more per year
A1004	Getting the most out of your PhD – a career perspective	Vibeke Broe	Understand why and how to work with the professional development. How to work with goal setting and how to achieve goals. Understand how to incorporate career thinking in your PhD. Workload: The full workload of the course is expected to be 3 hours	Twice or more per year
A1005	Preparing for Career Transitions	Vibeke Broe	Know how you can set direction for your future work life during your PhD Know how to explore your options Understand the factors that should influence your career decision process Remember that you should take control of your own career planning and development	Twice or more per year

A103	Basic Course in Written English	Morten Pilegaard	Knowledge about guidelines and conventions governing the structuring of clinical research papers. Knowledge of principles of cohesion and thematic structure in research papers. Knowledge of some of the main differences between English and Danish syntax and grammar. Ability to describe typical structural and linguistic features of poster, abstract and paper. Ability to trace errors of syntax and grammar in English-language texts.	Twice or more per year
A125	Advanced Course in Written English	Morten Pilegaard	Ability to use existing guidelines and conventions governing the structuring of clinical research papers. Ability to analyse and describe typical structural and linguistic features of poster, abstract and paper. Ability to apply principles of cohesion and thematic structuring in own texts. Ability to analyse and produce select text types. Ability to trace and correct errors of composition and grammar in English-language texts.	Twice or more per year

A137	Literature search in medical databases (Language English)	Annette Balle Sørensen	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 Copyright, Open Access, and Predatory Journals. 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.	Twice or more per year
A148	Qualitative Research: Phenomenology	Sanne Angel	The student will have engaged in critically evaluate literature and practice in phenomenological analysis. The student will have hands-on experience with analysis from analysing own (or another set) data with a phenomenological approach. The student will have discussed own and co-participants' choices and considerations. The student will describe a plan for analyzing own qualitative data/material with reference to the literature.	Once a year

A227	Research presenter - Educational Informatics	Rune Dall Jensen	By the end of the course, participants will be able to: • Apply key presentation techniques to structure and deliver engaging research presentations. • Utilise rhetorical strategies to enhance clarity, impact, and audience engagement. • Present scientific posters and oral research talks with confidence and professionalism. • Effectively use feedback to improve presentation skills.	Twice or more per year
A253	Prepare yourself on the movement from a PhD in Health to a career in non-academia	Vibeke Broe	Development of career skills to be able to make informed career decisions Identify transferable skills achieved during doctoral training Explain and communicate the value of these skills within as well as outside of academia Reflect on their own possible career directions Apply the different aspects of the course when marketing their skills in different situations The participants should gain an understanding of common career areas for researchers, and the requirements companies have when employing PhDs.	Once a year
A293	PhD-student as supervisor for undergraduate students – how and when?	Iris Maria Pedersen	Discuss and reflect on requirements and responsibilities of the different supervisor and co-supervisor roles, Provide feedback to undergraduate students' products in a way that facilitates the undergraduate students' learning process, Align expectations and interests with students and co-supervisors, and Take measures to balance supervisor control and undergraduate student independence.	Twice or more per year

A294	The Reflective Teacher	Peter Musaeus	Upon completion of the course, the participant will be able to: 1. Describe characteristics of student-centered teaching, active learning and constructive alignment. 2. Apply criteria specific peer-feedback to colleagues on teaching. 3. Design and teach a learning activity in a specific lesson. 4. Maintain a teaching logbook to capture and assess teaching experiences. 5. Identify practices that might increase motivation and sense of teacher identity at university.	Twice or more per year
A297	Advanced R	Tahereh Gholip-ourshahraki	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 visualize data with the tidyverse and R Markdown Produce efficient R code Develop an R package Nyt fra 2026: Configure RStudio to optimize coding efficiency. ● Use Git for version control and keep track of changes in the code. ● Apply advanced R programming concepts to write clearer and more maintainable code. ● Manipulate and visualize data using tidyverse and R Markdown. ● Develop, document, and share their own R package on GitHub.	Once a year

A315	Introduction to managing Research Data, FAIR principles, and Open Access	Anne Vils Møller	will understand the basic principles of RDM will know the different aspects of the research data lifecycle will know what constitutes a data management plan and be familiar with templates and specific tools for writing their own data management plan will know about FAIR principles and how to make their own datasets as FAIR as possible will know various search strategies for finding research data	Twice or more per year
A325	How to Communicate your PhD research	Lise Wendel Eriksen	Insight into presentation techniques and communicative tools, to make complex knowledge understandable, interesting and relevant to the outside world. Experience in communicating and conveying their own PhD research. Knowledge of journalists' working methods and priorities as well as the researcher's own role and rights as an expert in a media context. Understanding of research communication using own social media platforms Knowledge of responsible research communication and insight into what can be communicated, to whom and when.	Twice or more per year
A330	PhD Course in Grant Writing	Emma Börgeson	Understanding of grant proposal structures and review processes, including alignment with funding priorities Knowledge about effective communication (clarity and precision) Knowledge about the importance of having a strong rationale and impact statement Knowledge about research design and methodology, including ethical considerations Insight into budgeting and financial statements Insight into the strength of networking and collaboration Professional development and progression towards independence in the research community	Once a year

A331	Artificial intelligence for scientific and academic writing	Morten Pilegaard	Knowledge about AI tools for enhancing academic writing in English Knowledge about common pitfalls in using AI for text generation and optimisation purposes Knowledge about ethical considerations and legal issues when using AI Ability to use a selection of AI tools for academic text production in conformity with current conventions, principles and practices in academic genres and particular scientific text types Ability to use AI tools to restructure sentences, optimise word choice, improve cohesion and coherence, and ensure grammatical correctness and fluency Ability to use AI tools for plagiarism detection.	Twice or more per year
A334	Become a productive and joyful researcher	Jens Larsen	• Learn how to create a more productive and joyful writing praxis. • Learn how to deal with stress related to writing your thesis • Learn how to create writing goals, and overcome writers block. • Learn how to use storytelling to develop your text. • Learn how to create your own academic writing group.	Twice or more per year

A337	AI for advanced scientific and academic writing	Morten Pilegaard	Apply advanced AI prompting strategies, including well-structured multi-step prompts, to complex scientific writing tasks. Use AI to effectively respond to reviewer critiques and resubmit their papers. AI-assist the synthesis of 3-4 published papers and other context materials into a cohesive PhD thesis, larger scientific work or grant applications. Efficiently draft and edit larger scientific texts, such as scientific papers and funding proposals. Perfect their writing through personalised feedback on their scientific work. Maintain academic integrity while engaging extensively in AI-assisted writing.	Twice or more per year
A340	Basic R	Tahereh Gholip-ourshahraki	Navigate RStudio and work efficiently with the Console, Script, and Environment panes. Install and manage R packages from CRAN. Set up a project directory and save reproducible scripts. Import, explore, and manipulate datasets in R. Understand and apply basic data structures (vectors, lists, data frames). Implement control structures, loops, and simple functions. Conduct descriptive analyses and create basic visualisations. Introduction to dplyr and the tidyverse for data wrangling.	Once a year
Department of Biomedicine				

B100	Laboratory Animal Science	Thea Thougaard Johansen	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	Twice or more per year

B112	Clinical assessment of insulin resistance and other metabolic parameters	Esben Søndergaard	Understanding for the use and limitations of state-of-the-art methods in metabolism research Insight into tissue-specific mechanisms underlying dysmetabolic conditions Understanding for the signaling mechanisms linking insulin receptor to glucose uptake Introduction into animal models and in vitro models for dysmetabolic condition Introduction into novel methods to assess substrate metabolism in humans	Once a year

B116	Advanced course in Laboratory Animal Science	Martin K. Thomsen	• Advanced insight into Danish and International legislation concerning animals used for scientific purposes, the ethical aspects of working with laboratory animals as well as the principles of the Three Rs. • Detailed knowledge of different aspects of ethics and the Three Rs in relation to both ethical and welfare issues raised by the use of animals in scientific procedures. • Knowledge of experimental design concepts, possible causes and elimination of bias, statistical analysis and information about where expertise can be found to assist with procedure, design, planning and the interpretation of results. • Insight into the use of animal models in biomedical research and their benefits and limitations. • Insight into the importance of standardization of environmental, microbiological factors and use of humane endpoints. • Knowledge about advanced experimental procedures such as microsurgery, anaesthesia, analgesia and euthanasia in rodent laboratory animals. • Write an application for a procedure to the Danish Ministry of Health.	Once a year
B226	Molecular Immunology	Thomas Vorup-Jensen	As there is no examination, the intention is really that the student picks topics of interest from the presented talks in the hope that some of these topics may be helpful in bringing the student further into understanding immunology as a possible. Past experiences suggest that a broad range of backgrounds permit the student to follow the course at a fully acceptable level.	Once a year

B244	Genome Engineering	Yonglun Luo	1. Acquire a systematic knowledge on CRISPR gene editing technology, progresses, and applications 2. Know how to design the CRISPR gRNA for gene knockout 3. Learn how to design the donors for gene knockin 4. Independently select the best CRISPR system and strategy for a gene editing project 5. Independently analyse and interpret CRISPR gene editing results 6. Carry CRISPR gene editing experiments 7. Know the concept, resources and potential of CRISPR data science 8. Understand the progresses, but also remaining challenges, in CRISPR gene therapy	Once a year
B246	Graduate Neuroscience Course -Aarhus Master-classes	Mai Marie Holm	Participants will develop a thorough theoretical knowledge within all areas of neuroscience. The course is structured according to the esteemed advanced level textbook entitled "Neuroscience" by Purves et al. (published by Sinauer Associates, Inc.) and all sections will be dealt with.	Once a year
B273	Advanced In-vivo Optical Imaging Techniques	Eugenio Gutierrez	The students should be able to understand the basis of different techniques, to learn their pitfalls, advantages and disadvantages, and to plan research projects applying these techniques. The participants should be able to identify which processing analysis is required for in-vivo imaging.	Once a year
B288	Host pathogen interactions – from basic microbiology and immunology to medicine	Trine Mogensen	Have achieved a theoretical background and ability to discuss current knowledge in some aspects of basic cell biology, immunology, microbiology and microbiome related to human host-microbe interactions, have obtained some insight into the methodologies used to investigate these and how to interpret data, and finally have gained perspectives on how these basic host-interacting mechanisms can have host-detrimental consequences, including the pathogenesis of infectious diseases and the medical implications hereof.	Once a year

B299	Advanced Flow Cyto-metry	Morten Nørgaard An-dersen	(i) how to design and optimize a flow cytometry experiment. (ii) how to select the optimal flow cytometry related methodology. (iii) which controls to include (e.g. data quality controls, negative/positive controls, compensation and FMO controls – and how to interpret the re-sults. (iv) how to analyze flow cytometry data including critically evaluation of the experimental results. (v) how to include high-dimensional data analysis tools (e.g. tSNE) (vi) how to present flow cytometry data for publication.	Once a year
B328	Cancer Research from bench to bedside	Martin K. Thomsen	• Broad understanding of cancer as a disease with a significant impact on public health. • Enable students to place their projects in the translation from bench to bedside. • Knowledge of common methods used in cancer research and how to apply new methods to progress their current research. • Insight into the progression from bench to bedside with a focus on an introduction to clinical trials. • How to present a research project and apply new methods and ideas to develop the project towards clinical application.	Once a year
B329	PhD course in Biomedi-cal Innovation	Jane Palsgaard Peder-sen	After the course, the students will know about different routes to take their innovative research projects, the steps necessary to form a spin-out company, how to communicate and pitch your project to investors or col-laborators, and basic concepts of making a business plan.	Once a year

B69	Flow cytometry	Charlotte Christie Petersen	Understanding the physics behind flow cytometry Understanding the applications and limitations of flow cytometry Practical knowledge and experience with flow cytometry experiment design Understanding essential flow cytometry controls Awareness of common (and not so common) pitfalls Hands-on, practical experience with data analysis Ability to critically evaluate flow cytometry results Requirements for publication of flow cytometry experiments	Twice or more per year
B320	Introduction to Single-Cell and Spatial OMICS: Principles, Technologies, and Basic Data Analysis	Lin Lin	Articulate and demonstrate systematic knowledge of single cell and spatial OMICS. Interpret and communicate new results within the field. Describe and critically evaluate data generated with single cell and spatial OMICS methodologies. Independently and properly select the right single cell and spatial OMICS technologies for specific research questions. Understand the basic pipelines and tools needed for single cell and spatial OMICS analysis. Understand the individual steps of the analysis pipeline for single cell RNA sequencing data.	Once a year
B321	Single Cell RNAseq data analysis	Lin Lin	Articulate and demonstrate systematic knowledge of the data analysis for single cell RNAseq data. Understand the principle of different computational tools in single cell data analysis. Comprehend and work on the individual steps of the analysis pipeline for single cell RNA sequencing data. Re-analyse the data from studies within the field of single cell RNAseq.	Once a year

B322	Principles of Neural Organization	Sadegh Nabavi	• Have a good grasp of the limitations and advantages of small and large nervous systems. • Know the constrains that nervous systems face and how they evolved within these constrains. • Perceive brain design and function as an information processing entity. •Describe the basic principles that the brain uses to achieve a superior computational power while keeping the energy consumption in check. • Identify some fundamental principles shared by all systems and circuits within the brain. • Analyze, review and constructively criticize papers in the relevant fields.	Once a year

Department of Clinical Medicine

C03	Biomedical Isotope Technique	Søren Baarsgaard Hansen	Explain the different types of radioactive decay, the properties of the emitted radiation, and the different mechanisms of interaction between radiation and matter. Explain common methods for production of artificial radionuclides and labeled substances for use in research or medicine. Explain the mode of operation and suitability of different types of detectors for measuring ionizing radiation and radioactivity under various circumstances, including conditions with significance for the measurement uncertainty. Explain basic dosimetry concepts as well as the most important biological processes at the cell and tissue level, which lead to radiation damage. Select and use appropriate equipment for measurement of ionizing radiation, both for analytical purposes, and for monitoring workplace radiation and contamination levels. Perform simple dose calculations for external and internal exposure to radioactive sources in various situations. Assess the need for appropriate radiation shielding and other safety measures.	Once a year
B C P250	Responsible Conduct of Research	Rikke Nørregaard, Christian Hvas, Thomas Damgaard Sandahl, Christina Dahm, Ask Vest Christiansen, Sebastian Frische	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	Twice or more per year

C104	From Gene to Function - Molecular Analysis of Disease Genes	Rikke Olsen	Protein folding, trafficking, and biogenesis and their disturbances in diseases Methods for experimental investigations of effects of gene variations Design and interpretation of cellular and in vitro experiments Design and interpretation of energy metabolism assays (Seahorse)	Once a year
C116	Advanced course in Laboratory Animal Science – Porcine models in biomedical research	Birgitte Saima Kousholt	The course will, in unison with the basic course in laboratory animal science, qualify participants to apply for and obtain licence to perform animal experiments in Denmark.	Once a year
C142	Proteomics and protein profiling	Johan Palmfeldt	Understanding of the principles of proteomics and metabolomics methodologies, with focus on mass spectrometry (MS)45 based proteomics. Knowledge of the value of protein analysis in biomedical research, including advantages and limitations Acquired practical experience in 1) lab work in protein analysis and 2) software tools used to analyze proteomics data with regard to MS spectra, protein modifications, pathway analysis etc. To be able to interpret, discuss and critically assess proteomics data To be able to design studies on protein analysis and proteomics (type of sample, procedures, instruments etc.)	Once a year
C151	Clinical Research	Simon Winther	Enable to course participant to conduct clinical research	Once a year

C155	Epidemiology I - Basic Principles of Epidemiology	Ulrik Schiøler Kesmodel	By the end of the course the student should be able to: • Define epidemiologic measures of occurrence and explain the difference between prevalence and incidence • 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 • Define and describe strengths, weaknesses, and main applications of the designs; ecological, cross-sectional, follow up, case-control and intervention studies • Define selection bias, information bias and confounding and be aware that evaluating the direction and strength of a possible bias or confounding is essential. 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	Twice or more per year
C160	Investigator-initiated Clinical Trials and GCP	Birgitte Olrik Schlemmer	• Explain and implement the legal, regulatory and good practice framework – The principles of GCP, national regulations, application to the authorities • Illustrate and relate to the organization of the study - sponsor, investigator, contracts and agreements, delegation of responsibilities, training, internal and external communication • Discuss and assess on what's important in the conduct of the study including ethical issues – informed consent, enrolment, essential documents in Trial Master File, biological samples, study monitoring, End of trial issues • Explain and implement the process in safety monitoring and reporting • Explain and apply the data-management process from CRF preparation, data collection, data analysis, clinical study report and publication	Once a year

C171	Introduction MATLAB with examples from Health Science	Irene Klærke Mikkelsen	After completion of the course, the student should be able to understand and be able to use: • The MATLAB program in general including editor, command window, and help • MATLAB data structures including matrices, cells and structs • Generic programming principles including loops, conditions, functions • MATLAB graphics for plotting and vitalization of data • MATLAB Debugging capability	Once a year
C177	Introduction to Clinical Epidemiology	Deirdre Cronin Fenton	The course includes lectures and exercises on the following: 1) Providing a broad knowledge and understanding of clinical epidemiology 2) Designing a clinical epidemiology study 3) Understanding measures of disease frequency, effect and association, and which are appropriate to each study design 4) Assessing study validity, including identifying various biases and sources of error in epidemiological studies 5) Interpreting clinical epidemiology research papers	Once a year
C190	Image diagnostic methods for evaluation of the musculosceletal system	Emil Toft Petersen	Obtain knowledge about commonly used radiologic methods Understand the basic background for methods (physics, instruments) Characterize risks of the methods Understand the advantages and disadvantages/limitations of the methods Obtain inspiration to using imaging methods in research projects	Once a year
C204	Basic and practical course in quantitative immunoassays	Mette Bjerre	The participants obtain theoretical knowledge and practical skills required for development, troubleshoot, and validation of ELISA and TRIFMA assays.	Once a year

C205	The Talented Resear-cher	Kamille Smidt Ras-mussen	By the end of the course you should have learned about and strength-ened your awareness of your own strengths and challenges to enhance leadership in both work and your everyday life. You should have strengthened your project management skills 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. After the course, participants will also have the opportunity to attend a series of follow-up workshops aimed at supporting their individual pro-ject management and further development of their PhD project.	Twice or more per year
C214	Registries, databases and other electronic data sources in clinical research	Signe Sørup	After completion of this course, participants are expected to: List the Danish registries and other secondary data sources most often utilized in clinical research Identify relevant Danish registries and other secondary data sources based on the research question Describe the data structure as well as some specific pitfalls of working with Danish registries and other secondary data sources Compare the content of different Danish registers and other secondary data sources and evaluate their usefulness for clinical epidemiological re-search questions Assess the strength and weaknesses of the use of Danish registries and other secondary data sources in clinical epidemiology Design and execute a validation study of some of the content of a Danish Register or another secondary data source. Design a clinical epidemiological study using Danish registers and/or other secondary data sources	Once a year

C219	What is pain and how should it be measured?	Páll Karlsson	• Understand the classification of pain and apply in the context of clinical cases • Learn about the basic neurobiology and physiology of pain • Be knowledgeable and get hands on experience on methods for evaluation of pain • Be knowledgeable on evaluation of psychological factors influencing pain • Obtain knowledge on neurophysiological correlates of pain • Obtain knowledge on human experimental and animal pain models	Once a year
C229	Preparation and critical reading of meta-analysis	Inger Mechlenburg	After the course, the students will have competence to: • Carry out a meta-analysis based on the quantitative results of a systematic review, interpret the results and provide a clinical guideline based on the meta-analysis • Describe the statistical assumptions, the chosen methods and the results of the meta-analysis • Assess the quality of meta-analyses	Once a year
C240	Mindfulness-based interventions in the clinic - background, methods, and application	Lone Fjorback	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	Once a year

C243	How to get published	Søren Dinesen Øster-gaard	After the course, the participants should: 1. Have a basic knowledge of most aspects of the publication process in health research 2. Have improved their writing skills 3. Have learned how to perform peer-review	Once a year
C245	Cancer Epidemiology using the Danish Clinical Cancer Databases	Deirdre Cronin Fenton	1. Identify and design a clinical epidemiologic research study using the Danish Clinical Cancer Databases – compare and contrast study designs in order to suitably address a research question 2. Identifying and ascertaining data from the Clinical Cancer Databases 3. Assessing study validity and implementing validity checks 4. Data analysis including data cleaning and implementing survival analy-sis using Stata 5. Evaluating study findings, interpreting and reporting study findings	Once a year
C254	An introduction to Good Manufacturing Practice (GMP)	Dirk Bender	• 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	Once a year
C267	Introduction to Fluore-scence Microscopy	Lene Niemann Nejsum	• Explain the fundamental principles of key fluorescence microscopy techniques. •Perform hands-on preparation of cell and tissue samples suitable for fluorescence microscopy. • Understand how to choose appropriate microscope settings for specific imaging needs. • Interpret the main parameters involved in image acquisition and their impact on data quality. •Apply basic image analysis workflows and prepare figures for presenta-tion or publication.	Once a year

C279	Personalised Medicine	Deirdre Cronin Fenton	Define "personalised medicine" in disease diagnosis and treatment Enumerate "omics" and how "omics" can be utilized in routine clinics Describe the role of epigenetics in personalized medicine Understand molecular pathology approaches as a tool in personalised medicine Compare and contrast clinical epidemiology approaches to personalised medicine Describe "big data" approaches to assess the effectiveness of precision medicine Identify ethical issues related to personalised medicine in clinical practice and in clinical epidemiologic research	Once a year
C291	Introduction to psychiatric epidemiology	Katherine Musliner	Demonstrate knowledge of basic concepts psychiatric epidemiology and its relevance for public health. Discuss common study designs used in psychiatric epidemiology, including cohort, case-control and register-based designs, as well as methods for integrating biological and socio-demographic perspectives in psychiatric epidemiology. Describe the main type of data sources and measurements used in psychiatric epidemiology and explain their strengths and weaknesses. Explain the applications of these methods for the study of etiology, treatment, and outcome in psychiatric disorders. Describe, on a broad level, the current knowledge of the main adult and child psychiatric disorders based on psychiatric epidemiologic research and identify areas in need of further research. Independently evaluate psychiatric epidemiology studies from scientific literature.	Once a year

C295	Bayesian statistics with applications in ge-nomics	Jakob Skou Pedersen	To understand the principles and central concepts of Bayesian statistics Be able to translate and formalize simple scientific questions to Bayesian models Be able to perform Bayesian statistical analysis in R and Stan To understand and apply a range of inference methods	Once a year
C305	What is research? On-tology, epistemology and methodology	Rune Dall Jensen	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	Once a year
C307	Bacterial implant and bone infections	Mats Bue	Describe the aetiology of implant and bone infections Exemplify why bone infections are difficult to treat? Identify relevant preclinical models Describe basic pharmacokinetic/pharmacodynamic aspects of antibiotic treatment Acquire knowledge regarding state-of-the-art microbiological and histo-pathological analysis Plan, develop and present future relevant studies on bacterial infections in implants and bone	Once a year

C308	Applied Machine Learning in health Sciences	Peter Mondrup Rasmussen	A student who has met the objectives of the course will be able to: Describe main steps involved in typical machine learning analyses, including data preparation, data modeling, model evaluation, and result dissemination. Describe the mathematical and statistical principles in supervised- and unsupervised machine learning. Describe basic and advanced methods for predicting continuous- and discrete outcomes (regression and classification). Describe procedures for model building, model selection and model evaluation. Identify relevant machine learning techniques to solve research-based problems. Design and implement a solution strategy to solve research-based problems. Apply unsupervised- and supervised machine learning techniques to their own data. Disseminate the analysis result and account for the solution strategy and analysis results as necessary for publication in scientific journals.	Once a year

| C309 | The science of stress and resilience | Karen Johanne Palle-sen | • Present a neurobiological definition of stress, and make conceptual distinctions between stressors, stress and stress responses.
• Describe the following states:
o Restitution (rest-digest/breed-feed).
o Mobilization (fight-flight).
o Immobilization (freeze).
o Prosocial states (connect).
• Describe the signalling pathways of commonly experienced stress symptoms such as increased heart rate, sweaty palms and "the mind going blank".
• Place mobilization, immobilization and restitution and socially interactive states in the context of evolutionary theory.
• Describe processing modes in the nervous system that make mobilization "first choice".
• Relate stress processes to theories of energy-budgeting and survival.
• Describe the impact of predictive coding on stress reactions.
• Describe the theorized role of interoceptive networks in emotions and stress.
• Define "psychological safety" and describe how stressmobilization and immobilization affects psychological safety.
• Describe theorized interactions between neuronal systems underlying restitution and social behaviour (co-regulation).
• Explain how individual life experiences influence individual variation in stress sensitivity and resilience.
• Describe the impact of childhood trauma on life-long stress sensitivity.
• Explain the link between long-term stress and anxiety, depression, cardiovascular diseases, metabolic syndromes, and chronic pain disorders
• List common denominators of stress triggers, and particular features of modern societies that could be held responsible for producing excessive stress?
• Present arguments on how schools, workplaces and clinical practices could potentially benefit from insights into the science of stress and resilience. | Once a year |

C312	Retire statistical significance: a world beyond p<0.05	Morten Schmidt	• To define point estimates, confidence intervals, and p-values. • To identify mistaken inferences due to misinterpretations of significance tests. • To recognize the clinical context's importance in interpreting effect estimates. • To apply Apps to aid in the interpretation of effect estimates. • To evaluate treatment effects considering both systematic and random errors. • To reflect on the approach to data interpretation in your research environments.	Twice or more per year
C316	Patient reported outcomes (PRO) in clinical research	Annette De Thurah	• have received an overall introduction to the concept of PRO data, and the implications of using PRO data in clinical research • be able to select PRO instruments and evaluate their quality • be able to design, analyze, report and interpret PROs in clinical research	Once a year

C319	Introduction to neuro-degenerative diseases and disease models	Nathalie Van Den Berge and Caroline Cristiano Real Gregó-rio	(1) explain the pathophysiology of common neurodegenerative disorders (what cells and regions are affected and potential mechanisms of disease progression); (2) demonstrate a critical understanding of the methods of investigation and (differential) diagnosis; (3) critically evaluate the different in vivo and in vitro disease models available, be able to judge the advantages and disadvantages; (4) critically discuss the management options available for patients with neurodegenerative disorders, as well as potential future disease-modify-ing treatment options; (5) critically appraise the scientific literature on the clinical and research aspects of neurodegenerative diseases.	Once a year

| C326 | Mechanisms, Clinical Presentation, and Treatment of Neuropathic Pain (online) | Páll Karlsson | By the end of this course, students will have developed a comprehensive knowledge and conceptual understanding of the theoretical foundations of pain, including neuropathic pain, its classification, and the underlying mechanisms involved.
- Students will be able to describe different pain phenotypes. They will also gain skills in interpreting research data related to pain phenotypes.
- Students will acquire in-depth knowledge of the mechanisms involved in the generation, transmission, and modulation of pain signals, with a specific focus on neuropathic pain. Specifically, students will develop the ability to critically evaluate experimental and clinical research findings pertaining to pain mechanisms as part of research projects or ongoing studies.
- This course will enable students to design research studies aimed at investigating pain and neuropathic pain. Students will gain skills in formulating research questions, selecting appropriate methodologies, and analyzing and interpreting data.
- Students will develop a comprehensive understanding of current treatment approaches for pain, including both pharmacological and non-pharmacological interventions.
- Students will be able to critically appraise current controversial issues in the field of neuropathic pain research, and critically discuss them in an academic discourse. | Every second year |

C327	How to secure funding for your research	Morten Søndergaard Lindhard	At the end of this course, participants will have an improved understanding of how to secure funding for their research. Participants have strengthened their skills within the following themes: - Clarity and conciseness - Alignment with the Funder's objectives - Impact and outcomes - Budget transparency - Compelling narrative	Once a year
C332	The Cardiovascular Research Tool Box: From lab to clinical trial	Stephan Lange	The students should be able to reflect and discuss the critical aspects in designing and interpreting basic, epidemiological, and clinical studies within cardiovascular research. The students should get an overview of pre-clinical models for investigating cardiovascular disease, an overview of epidemiological research platforms, and clinical trial governance. The students should learn critical appraisal of scientific texts within basic, epidemiological and clinical cardiovascular research The students will gain knowledge and experience for conduct their own cardiovascular studies, and the course will provide an overview of available consulting services at the University.	Once a year

| C335 | Hemodynamics and assessment | Mads Dam Lyhne | Having completed the course, it is expected that the participants will have the knowledge to choose the optimal methods for their individual research projects based on the methods' strengths and weaknesses. The students are expected to achieve:
- Enhanced understanding of biophysics and cardiac and vascular function
- Understanding of ultrasound and how it can be used to assess cardiac function and large vessels including volume status
- Knowledge on invasive strategies (right heart catheterization and pressure-volume loop recordings) for cardiac and hemodynamic evaluation
- Knowledge on imaging techniques (especially MR) for cardiac and hemodynamic evaluation
- Knowledge on hemodynamic changes from mechanical ventilation
- For all methods mentioned, the ability to discuss pros and cons for each method; its potential use in humans and animal models; and interpretation of the data provided by each method
- Possibility to discuss both others' research projects and participants' own research projects' methodology
- Inputs to their own dissertation's part on hemodynamic methodology | Once a year |

| C336 | Measuring socioeconomic position in epidemiological and clinical research | Cathrine Fonnesbech Hjorth | • Demonstrate a broad understanding of social epidemiology, including key concepts and frameworks relevant to socioeconomic differences in health, diseases and disease outcomes.
• Identify and evaluate data sources and variables from the Danish registries, recognizing their strengths, limitations, and potential pitfalls in measuring socioeconomic position.
• Design a clinical epidemiologic research study addressing a specific research question, utilizing data from the Danish registries. This includes:
o Selection of appropriate data sources and variables.
o Outlining data cleaning processes and analytical strategies.
• Apply and interpret measures of socioeconomic differences, including total and direct associations, in the context of clinical epidemiological studies.
• Identify and assess potential sources of bias and error.
• Critically evaluate study findings, ensuring appropriate interpretation, reporting, and contextualization of results. | Once a year |

C338	Hands-on practical approach to Cochrane systematic reviews with focus on bias analysis	Alma Becic Pedersen	Day 1: Building and executing search strategy using Covidence software Be introduced to the Cochrane Handbook for Systematic reviews and the Cochrane Library Apply a predefined research question to develop and execute a search strategy in at least two relevant databases (e.g., PubMed and Embase) Learn to use Covidence software to manage the studies selection process Extract key data from individual studies Day 2: Risk of Bias Assessment Assess the risk of bias in individual study results using RoB2 tool Understand the seven domains of RoB2 tool, including: random sequence generation, allocation sequence concealment, blinding of participants and personnel, blinding of outcome assessment, incomplete outcome, selective outcome reporting, and other sources of bias. Present and interpret the results of the risk of bias assessment, including visual presentation using f.eks. forest plots	Once a year
C47	Magnetic Resonance	Lotte Bonde Bertelsen	• General overview of the principles of magnetic resonance imaging and spectroscopy for applications in biomedical research • Outline of magnetic resonance for assessing organ functionality and diseases. • General overview of hyperpolarized magnetic resonance imaging and spectroscopy applied in cells, animals, and humans.	Once a year
Department of Public Health				

P1050	Basic Biostatistics - part 1	Erik Thorlund Parner	Document and handle data needed for a statistical analysis Chose a relevant statistical model for a given research question and evaluate the assumptions of the statistical analysis Perform a statistical analysis based on the chosen model Describe the results of the statistical analysis, and discuss the results in relation to the scientific question Make simple calculations of sample sizes for the planning of a comparative study	Twice or more per year
P1050	Basic Biostatistics - part 2	Erik Thorlund Parner	Document and handle data needed for a statistical analysis Chose a relevant statistical model for a given research question and evaluate the assumptions of the statistical analysis Perform a statistical analysis based on the chosen model Describe the results of the statistical analysis, and discuss the results in relation to the scientific question	Twice or more per year
P126	Analysis of variance and repeated measurements (4 + 2 days course)	Bo Martin Bibby	Document and process data for a statistical analysis of repeated measurements. Choose a relevant statistical model for a given research question and evaluate the assumptions behind the ANOVA or repeated measurement analysis. Perform ANOVA, variance component analysis or repeated measurement analysis based on the chosen model. Describe the results of the statistical analysis, and discuss the results in relation to the scientific question. Be aware of the limitations of the statistical methods presented in the course.	Once a year

P155	Epidemiology I - Basic Principles of Epidemiology	Bodil Hammer Bech	By the end of the course the student should be able to: • Define epidemiologic measures of occurrence and explain the difference between prevalence and incidence • 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 • Define and describe strengths, weaknesses, and main applications of the designs; ecological, cross-sectional, follow up, case-control and intervention studies • Define selection bias, information bias and confounding and be aware that evaluating the direction and strength of a possible bias or confounding is essential • 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	Once a year
P169	Collecting qualitative research data	Sanne Angel	The student will have knowledge of principles of more qualitative approaches and qualitative methods in general The student will be able to judge the different methods' relevance to study designs The student will have knowledge about the different form of data collection The student will have collected data in form of field observation and interviews	Once a year

P231	Developing complex interventions in Public Health	Knud Ryom	• Insight into complex interventions based on the UK Medical Research Council Model • Skills for working with program theory and logic models • Insight in developing complex interventions addressing co-approaches (e.g. co-creation) • Insight in contextual elements that can influence successful change • Overview of different complex intervention evaluation strategies.	Once a year
P255	Introductory course in questionnaire technique and clinimetrics	Henrik Hein Lauridsen	At the end of the course the participants will: 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 Have basic knowledge in how to develop a new measurement instrument 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 Have basic knowledge of the measurement properties of validity, reliability, responsiveness and interpretation Know the requirements for a evaluating a questionnaire for risk of bias	Once a year

P256	Advanced course in questionnaire tech-nique and clinimetrics	Henrik Hein Lauridsen	At the end of the course the participants will: • Be able to develop a new measurement instrument from start to finish • Have basic knowledge of item reduction techniques and exploratory factor analysis • Understand how to design and conduct a field test • Be able to define, discuss and interpret the measurement properties of a) validity, b) reproducibility, c) responsiveness and d) interpretation • Have an overview of the advantages of modern psychometric methods, including Item Response Theory (IRT) and Rasch analysis	Once a year
P264	Public and patient in-volvement in health re-search	Jeanette Finderup	Summarise the theory and practice of patient and public involvement in health research in the research cycle Assess different approaches of patient and public involvement in health research relevance and applicability in various study designs Take an analytical and critical view on the processes and potential out-comes of patient and public involvement in health research Plan, apply, and evaluate patient and public involvement in health re-search in own study	Once a year

P265	Qualitative data analysis: Using NVivo	Annesofie Lunde Jensen	The students will learn how NVivo supports the qualitative study process from the beginning to the end. Having completed this course, the student will be able to use NVivo's most important functions: • Create projects. • Describe units of analysis relevant for the student's own project. • Critical identify element (sources and cases) as a foundation for making queries. • Create memos, annotations, and links. • Know how to use NVivo 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 PhD-project. • Know how to build models and make different kinds of graphic presentations and diagrams.	Once a year
P272	GIS in Health Sciences	Jörg Schullehner	• Describe the basic concepts of GIS • Identify 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 and evaluate their results • Present spatial data in appropriate maps	Once a year

P281	Causal Inference in Health Sciences	Cecilia Ramlau-Hansen	Introduction to the potential outcome framework and counterfactuals Assumptions for causal inference Introduction to and practical experience with g-methods Introduction to and practical experience with causal interaction analysis Introduction to and practical experience with causal mediation analysis	Once a year
P282	Introduction to Quantitative Bias Analysis for Epidemiologic Research	Oleguer Plana-Ripoll	Identify different sources of biases in epidemiological studies. Conduct simple, multidimensional and probabilistic bias analysis using summary data in Microsoft Excel and interpret the output. Conduct probabilistic bias analysis using individual level data (record level correction) in STATA and interpret the output. Discuss the strengths and limitations of each approach.	Once a year
P284	Methods for synthesizing quantitative and qualitative evidence	Merete Bjerrum	Having completed this course, the participants will have the methodological tools to conduct a meta-analysis, a meta-synthesis and an integrative review. This includes: Specify research topic using PICO and PICo Search strategy Assessing quantitative and qualitative studies using relevant tools Extract and pool extracted data Synthesize extracted data Assess summarized data Present a protocol for meta-analysis, meta-synthesis, and integrative review.	Once a year

P285	Introduction to register-based research	Julie Werenberg Dreier	• 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	Once a year
P301	How to Design, Conduct and Evaluate your PhD study to be Family-focused - Theory-driven Strategies and Clinical Excellence in Interprofessional Healthcare	Karin Piil	Understand the basic characteristics of a theory-driven family-focused research approach and dialogue based on the Calgary family assessment and intervention models. Gained individual and collective experiences and reflections of how to transform the theory and models into excellence in healthcare. Understand, discuss and argue for the central methodological considerations. Identify appropriate family-focused qualitative and quantitative data sources for research. Describe and argue for the choice of patient-reported outcome and caregiver-reported outcome. Identify strengths and limitations of a family-focused approach Understand and apply family-focused values across cultures and in vulnerable families Present the family-focused PhD study in a concise and structured format with attention to an interprofessional excellence in clinical healthcare.	Once a year

P302	Evaluating complex interventions in Public Health	Knud Ryom	• Insight into evaluation of complex interventions based on the UK Medical Research Council Model • Overview of different complex intervention evaluation strategies • Insight into evaluating complex interventions using quantitative research designs • Insight into evaluating complex interventions using qualitative and mixed methods research designs	Once a year
P310	How to design and conduct a qualitative content analysis in a qualitative study or a systematic review	Cecilie Nørby Lyhne	Knowledge on the background, theoretical foundation and the potential of content analysis. Describe the main steps in conducting a qualitative content analysis. Design a plan for using qualitative content analysis in your own study, including: formulate specific research questions, specify the plan of conduct including the analytical steps to be performed in your study, and discuss own and co-participants' choices and considerations focusing on the validity and reliability of the analysis. Apply strategies to strengthen the quality of studies using qualitative content analysis, focusing on validity, reliability, transparency, and transferability in conducting and presenting a qualitative content analysis. Discuss methodological issues in qualitative content analysis, including methodological reflections in relation to own project designs and plans for analyzing own data material.	Once a year

P324	Advanced GIS in Health Sciences	Jibran Khan	On completion of the course, the student should be able to: Understand and explain the basic methodologies and conceptual models of the contents of a geographic database Explain the different geographical data formats Explain the principles of transformation between different geodesic reference system Explain concepts and estimation methods within advanced spatial analysis and modelling Account for auto-correlation in geographic data	Once a year

| P339 | Implementation Science and Implementation Practice | Nanna Rolving | Gain knowledge on implementation science, including selected theories, models and frameworks, and the challenges in bridging implementation science and implementation practice.
Learn to critically apply selected theories, models, and framework, including how these can guide the design, implementation, and evaluation of their own projects.
Learn to specify the object being implemented, and critically reflect on how this specification influences the choice of implementation strategies, outcomes, and study design.
Learn to apply determinant frameworks that can be used to identify, categorize, and analyze determinants influencing the implementation process.
Gain knowledge on the importance of stakeholder involvement including learning practical methods for stakeholder involvement.
Learn how to tailor implementation strategies, linking specific types of strategies to identified barriers and facilitators and gain insight into various change mechanisms through which implementation strategies are expected to produce change.
Gain an understanding of key factors influencing successful implementation, including the role of implementation agents, relationship-building, and other contextual and interpersonal elements that facilitate effective implementation processes.
Gain knowledge and understanding of the concept of sustainability in implementation, and how to plan and apply sustainability strategies to ensure lasting change. | Once a year |

| P98 | Epidemiology II | Dorte Rytter | • 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 | Once a year |