## Forslag til aktivitet (kursus, FP-kursus, FP-sommerskole mv.)

*Til opslag i ph.d.-skolens kursuskalender*

Nyt kursus  Markante ændringer siden sidste afholdelse

Valgfrit ph.d.-kursus

FP-kursus  FP-workshop  FP-seminarrække  FP-sommerskole  FP-årsmøde

Aktiviteten afholdes på engelsk  kun på dansk  (Ph.d.-kurser kan efter særlig aftale afholdes på dansk. Dette skal aftales forud med forskeruddannelsen)

**Title:** Foundations of data-driven health science  
  
**Reg.nr:** (PhD administration)

is being offered being offered by the Graduate School of Health, Aarhus University, XXX, 20XX

**Criteria for participation:**  
University degree in medicine, dentistry, nursing, or Master’s degree in other fields and/or postgraduate research fellows (PhD students and research-year medical students).

**Aim:**Medical professionals and other specialists now have the opportunity to gain insight into physiological mechanisms, both normal and pathological, using data driven analysis strategies that not long ago were only applicable to those with access to supercomputing services. With the proliferation of quantitative research tools, and the simultaneous commoditisation of computational power, comes a need for *all* researchers to understand the foundations on which scientific computing is based. Such an understanding is the basis for learning a programming language, and enables publication of documented and reproducible data analyses. The aim of the present course is to lay the conceptual foundation with which the student may begin to apply data-driven research practices, and to support her advancement to more specialised topics such as C119: "Stata and Datadocumentation" and C171: "Introduction to MATLAB in Neuroimaging".

**Learning outcomes:**   
Successful completion of the course will enable the student to:

* 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.*).

**Contents:**Teaching is in the form of "interactive lectures", where students follow instructions to complete specific learning tasks (hands-on), after introduction by the lecturers.

* Day 1: The anatomy of a computer and data
* Day 2: The anatomy and building blocks of a program
* Day 3: Programming as a means to gain insight into data

**Recommended knowledge for participation:**   
No prior knowledge on the topics covered is required. Participants must bring their own laptop with a hard drive (no Chromebooks or tablet-/surface-type devices are supported). Any reasonably modern (< 5-year-old) Windows, OS X or Linux operating system will do.

**Language:** English

**ECTS:** (PhD administration)

**Head of course:**Mads Jensen ([mads@cfin.au.dk](mailto:mads@cfin.au.dk))

**Instructors:**   
Mads Jensen (CFIN, AU)  
Christopher Bailey (CFIN, AU; [cjb@cfin.au.dk](mailto:cjb@cfin.au.dk))  
Teaching assistants: from CFIN PhD student pool

**Number of participants:** we are prepared to open this up to tens of participants, perhaps even up to about 50

**Dates and times:**

**Place:** Suitable venue will be determined after enrolment. Auditorium is fine, though flat teaching room slightly preferred.

**Course fee:** (PhD administration)

Participation in the course is without cost for:

* PhD students and research-year students from Aarhus University
* PhD students from University of Helsinki
* PhD students from other institutions in the open market agreement for PhD courses

**Application deadline:** (PhD administration)

**Application:** <https://service.health.au.dk/modules/Course/mypage/coursecalendar>.

**ECTS beregning**: Til udregning af ECTS har vi brug for et program med angivelse af:  
  
Antal dage: 3

Antal undervisningstimer: 9-16 (7 timer) hver dag

Pauser (der medregnes 1 times pause pr. dag): Sammenlagt 1 time per dag (2 x 15 min kaffepause, 30 min frokost)

*En undervisningstime udløser 0,1 ECTS-point, i det ph.d.-skolen forventer der samlet ligger 1,5 timers forberedelse og anden aktiv inddragelse udover de programsatte timer.*

Herudover har vi brug for en beskrivelse af aktiviteter udover forelæsninger, fx workshops, gruppearbejde, præsentation eller andet.

Beskriv:  
Mandatory assignment (pass/fail, internal examination)