SVERIGES LANTBRUKSUNIVERSITET

P000042, Analysis of Genomes, 7.5 Hp

Kursplan

Fastställd av: Fun-VH, 2023-04-18

Giltig från och med: 2023H

Utbildningsnivå:

Forskarnivå

Ämne:

- Bioinformatics
- Biology

Språk:

Svenska

Behörighetskrav:

Admitted to a postgraduate program in animal science, biology, veterinary medicine, food science, nutrition, nursing, or related subjects, or to a residency program in veterinary science.

Mål:

The course intends to provide advanced knowledge of theory and methods for analysis of eukaryotic genomes, including their organization and evolution. There is a focus on animal genomics, but theoretical and methodological aspects of the course are applicable on many different organisms.

On completion of the course, the student should be able to:

- navigate and utilise available genomic data,
- design PCR-primers and -probes, and optimize PCR,

- perform DNA sequencing and analyse obtained data,
- detect and analyse sequence variation,
- predict functional consequences of genomic variation,
- describe and explain state of the art and large-scale methods to analyse genetic variation (eg. whole genome sequencing), and gene expression analysis (eg. RNA-seq),
- apply and use basic molecular genetic laboratory and bioinformatics methods,
- efficiently and systematically plan a genomic laboratory project,
- independently search for, summarize, interpret, and critically assess scientific articles in genetics, molecular genetics, and genomics,
- integrate knowledge in molecular genetics, and laboratory methodology to solve complex problems of relevance for genome analysis,
- discuss how the content of the course is relevant to the student´s own research project.

Innehåll:

The course is based on lectures, group discussions, exercises, and wet laboratory. The contents build largely on animal genome research. Theoretical teaching is for the most part directly applicable also within for example human or plant genetics. Genome science is rapidly evolving, and the course is based on current state-of-the-art methodology and research.

A large part of the course involves wet laboratory training including exercises and a laboratory project.

Computer exercises and group discussions will cover:

- genome sequence variation,
- genome browsing,
- primer design,
- sequence analysis,
- high throughput sequencing methodology

The aim of the computer exercises is to give the students useful tools for basic genetic and genomic analyses. Therefore, the computer exercises use free and open-source software that the student can download and use on their own laptop. In addition to the written and the oral examination, compulsory components occur within eg. exercises, group assignments and laboratory sessions.

Examinationsformer och fordringar för godkänd kurs:

Passed participation including oral presentations and written reports in compulsory course modules. Written and oral examination. - Examinatorn har, om det finns skäl och är möjligt,

rätt att ge en kompletteringsuppgift till den student som inte blivit godkänd på en examination. - Om studenten har ett beslut från SLU om riktat pedagogiskt stöd på grund av funktionsnedsättning, kan examinatorn ge ett anpassat prov eller låta studenten genomföra provet på ett alternativt sätt. - Om denna kursplan läggs ned, ska SLU besluta om övergångsbestämmelser för examination av studenter, som antagits enligt denna kursplan och ännu inte blivit godkända. - För examination av självständigt arbete (examensarbete) gäller dessutom att examinatorn kan tillåta studenten att göra kompletteringar efter inlämningsdatum. Mer information finns i utbildningshandboken.

Ansvarig institution/motsvarande:

Institutionen för husdjursgenetik

Kompletterande uppgifter

Övrig information:

- Rätten att delta i undervisning och/eller handledning gäller endast det kurstillfälle, som studenten blivit antagen till och registrerad på.
- Om det finns särskilda skäl, har studenten rätt att delta i moment som kräver obligatorisk närvaro vid ett senare kurstillfälle. Mer information finns i utbildningshandboken.