# BB2255 Tillämpad genteknologi 7,5 hp

## Applied Gene Technology

När kurs inte längre ges har student möjlighet att examineras under ytterligare två läsår.

## Fastställande

Kursplan för BB2255 gäller från och med HT19

## Betygsskala

A, B, C, D, E, FX, F

## Utbildningsnivå

Avancerad nivå

## Huvudområden

Bioteknik

## Särskild behörighet

## Undervisningsspråk

Undervisningsspråk anges i kurstillfällesinformationen i kurs- och programkatalogen.

## Lärandemål

Following completion and passing the course you should be able to:

- Describe, illustrate and relate different techniques in the fields of genomics and transcriptomics
- Critically evaluate, select and apply the most appropriate technique(s) in different biological and medical studies.
- Discuss and suggest strategies to tackle and solve challenging problems in various research studies.
- Construct and create biologically relevant studies by employing one or more of the discussed tools.
- Explain the theory of state-of-the-art tools/algorithms for processing data from high-throughput molecular biology experiments in genomics and transcriptomics
- Choose and use appropriate methods and tools for processing data from high-throughput molecular biology experiments in genomics and transcriptomics.

## Kursinnehåll

The course will focuses on describing, applying and relating state of the art technologies and high throughput data analysis.

## Kursupplägg

The course includes a short introduction to conventional strategies for whole genome sequencing followed by description of different high throughput methods for typing of genetic variations, advanced techniques and platforms for DNA sequencing including whole genome sequencing, RNA-seq, single cell and single molecule transcript and protein (DNA-assisted) profiling.

The course also consists of a series of lectures and computer-based laboratory exercises including genome assembly, mapping of reads to reference genome, analysis of RNA-seq and ChIP-seq data.

In addition, the course involves a literature workshop of selected articles, which will be performed in groups. Each group presents one article and will oppose other groups' articles. This project aims to teach critical reading, interpretation and comparison of the most advanced techniques and platforms in the fields of genome sequencing, massively parallel genotyping and single cell profiling. The project requires teamwork and planning, and participation in planning and execution of plans as well as presence on the workshop days is compulsory.

## Kurslitteratur

Distributed handouts and articles

## Examination

- PRO1 - Litteraturseminarium, 1,0 hp, betygsskala: P, F

- PRO2 - Datorlaboration, 2,5 hp, betygsskala: P, F
- TEN1 - Skriftlig tentamen, 4,0 hp, betygsskala: A, B, C, D, E, FX, F

Examinator beslutar, baserat på rekommendation från KTH:s handläggare av stöd till studenter med funktionsnedsättning, om eventuell anpassad examination för studenter med dokumenterad, varaktig funktionsnedsättning.

Examinator får medge annan examinationsform vid omexamination av enstaka studenter.

## Etiskt förhållningssätt

- Vid grupparbete har alla i gruppen ansvar för gruppens arbete.
- Vid examination ska varje student ärligt redovisa hjälp som erhållits och källor som använts.
- Vid muntlig examination ska varje student kunna redogöra för hela uppgiften och hela lösningen.