

Art of Gene Cloning, P000182

Subject: Biology

Credits: 3

Education cycle: Postgraduate level

Grading scale: Pass/fail

Language: English

Prior Knowledge

Prospective students should be enrolled as a PhD student in Biology or an equivalent subject. Prior theoretical knowledge of basic molecular biology or genetics is mandatory. This course is mainly intended for PhD students at SLU but postdoctoral researchers and PhD students from other universities are eligible to apply in case vacant seats are available.

Course Description

Modern molecular biology research relies on the ability to design, construct, and modify DNA precisely and efficiently. This advanced PhD-level course provides an in-depth conceptual understanding of molecular cloning strategies for experimental research in plants, algae, and microbial systems.

Through a combination of theory, practice, design and discussion sessions, participants will learn how to plan, execute, and troubleshoot cloning workflows—from gene amplification to vector construction and expression validation.

Emphasis will be placed on method selection, experimental design for publication-quality data, and applications relevant to agricultural and environmental biotechnology.

Intended Learning Outcomes

At the end of this course the student is expected to be able to

- Understand principles of molecular cloning (traditional and modern).
- Gain skills about plasmid restriction/ligation, Gibson assembly and Golden Gate.
- Apply cloning techniques in plants, algae, or microbial systems.

- Critically evaluate cloning strategies.

Assessment

Pass / Fail. In order to pass the course, participants will need to attend all of the group sessions as well as submitting an assignment.

Additional Information

The course is divided into practical work and theoretical work and invited lectures as detailed in the schedule. The course is organized by Yong Zou on behalf of the SLU graduate school Organism Biology. Maximum 15 students per course occasion. This course will require theoretical knowledge of basic molecular biology or genetics. In case students are unsure of their previous knowledge, they can contact the organizers for further clarification on the level required.

Course literature will be provided in the form of talk slides, articles, and protocol(s) for experimental design.