

SH03008: GENETIC ENGINEERING - PRINCIPLES AND APPLICATIONS (Kỹ THUẬT DI TRUYỀN – NGUYÊN LÝ VÀ ỨNG DỤNG) Credits: 3 credits (Lecture: 3 – Practice: 0)

EXPECTED LEARNING OUTCOMES

Course objectives		Expected learning outcomes of program
Knowledge		
CELO1	Understand the general knowledge of genetic engineering; Generalizing the biological systems used in genetic engineering;	ELO4
	Understand the principle of nucleic acid extraction; Distinguish the difference between gel electrophoresis techniques; Understand the principles of PCR techniques; Understanding and distinguishing between methods for DNA cloning and their application;	ELO4
	Analyze and compare molecular hybridization techniques; DNA sequencing techniques; DNA molecular marker techniques and their application;	ELO4
CELO4	Understand the principle of mutagenesis techniques and RNAi techniques and their application;	ELO4
CELO5	Analyze and compare methods and their main components needed to make a transgenic plant and their applications;	ELO4
Skills		
	Applying the studied knowledge and skills to explain the scientific basis of biotechnology in plant breeding, biotech crops and animals;	ELO6, ELO10
Personal autonomy and responsibility		
CELO/	Proactively propose, implement, and execute scientific research, applying advanced biotechnology techniques into practice.	ELO15

<u>CONTENT</u>

STUDENT TASKS

ASSESSMENT METHODS

- Chapter 1: General concept and history of
- Attendance: Students are required to attend
- Attendance: According to regulations of VNUA.

genetic engineering

- Chapter 2: Model organisms
- Chapter 3: Nucleic acid isolation
- Chapter 4: Gel electrophoresis
- Chapter 5: PCR technique
- Chapter 6: Cloning techniques
- Chapter 7: DNA sequencing techniques
- Chapter 8: Molecular hybridization techniques
- Chapter 9: Molecular marker techniques
- Chapter 10: RNAi technology and application
- Chapter 11: Oriented mutation techniques
- Chapter 12: Applications of genetic

at least 2/3 of the total theory lectures of the course.

- Preparation for the lecture: Students are required to read lecture notes, text books and references before attending the class.
- Group discussion and presentation:
 Students are required to engage in group discussion.
- Mid-term exam: Students miss a mid-term will be given a mark of zero.
- Final exam: Students must take the final exam and meet requirements.
- For online learning: Students need to install online learning software and fulfill the requirements for online learning.

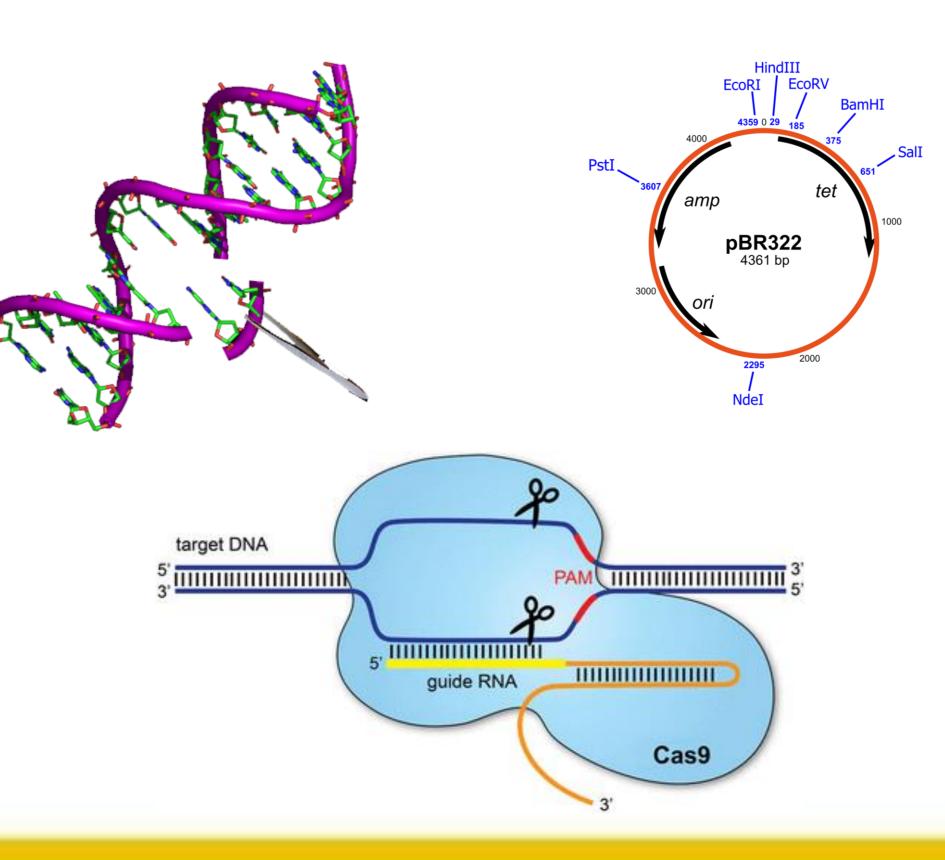
- Exercise and progress tests: Students must complete the exercises, 15-minute tests, group discussion and presentation with satisfied results.
- Mid-term exam: Midterm exam is 50 minutes long with a 50-question quiz.
- Final exam: Final exam is 75 minutes long with a 80-question quiz.
- For online evaluation: Students need to install software and fulfill the requirements for online evaluation.
- Grading: 10 marks
- Weighting:
 - ✓ Attendance: 10 %
 - ✓ Formative assessment: 40%
 - ✓ Final exam: 50%

LECTURERS

engineering

LEARNING METHODS

- Read lecture notes, books and references before attending the class.
- Students are required to listen to lectures in class and perform other learning activities such as solving practice problems after class.
- Prepare and actively participate in discussion.



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