



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	COURSE EXPECTED LEARNING OUTCOMES After successfully completing this course, students are able to	Expected learning outcomes of program
Knowledge		
CELO1	Understand the general knowledge of genetic engineering; Generalizing the biological systems used in genetic engineering;	ELO4
CELO2	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
CELO3	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		
CELO6	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		
CELO7	Proactively propose, implement, and execute scientific research, applying advanced biotechnology techniques into practice.	ELO15

CONTENT

- Chapter 1: General concept and history of 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 engineering

STUDENT TASKS

- Attendance: Students are required to attend 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.

ASSESSMENT METHODS

- Attendance: According to regulations of VNUA.
- 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

1. Dr. Đinh Trường Sơn, 0968.133.927, dtson@vnu.edu.vn
2. Dr. Đặng Thị Thanh Tâm, 0944.359.567, thanhtram17_01@yahoo.com
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5. Assc. Prof., Dr. Nguyễn Thanh Hải, 0914.598.399, haitver@yahoo.com

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.

