BF2112 INTRODUCTION TO BIOTECHNOLOGY

1. Course name: Introduction to Biotechnology

2. Code: BF 2112

3. Number of credits: 2 (2-0-1-4)

- Lectures: 30 hours
- Tutorial/Seminar: 0
- Practical: 15 hours

4. Attendants: University's students of Bioengineering program

5. Course condition:

- Prerequisite course
- Previous course
- Parallel course

6. Course objectives and expected learning outcomes

Objectives

- Creating a communication, exchange environment and learning conditions for students to be more aware of the characteristics of careers and require for work later, self-discovering knowledge through practice, and training some minimum practical skills (replacing the previous practice / practice internship).

- Students get to know and learn about careers through lectures by lecturers and laboratory exercises.

Contribution of learning outcomes of the programme: GT: Introduction, GD: teaching or SD: utilization

Criteria	1.1	1.2	1.3	2.1	2.2	2.3	2.4	2.5	2.6	3.1	3.2	3.3	4.1	4.2	4.3	4.4	4.5
Level	SD	SD	SD	GD	GD	GD	GD	GD	GD	SD	SD	SD	GT	GT	GT	GT	GT

7. Brief description of the course:

PART I. Introduction to Biotechnology

- Content:

The course introduces students: industry concepts, biological engineering principles in the technology of producing biotechnology products

The course consists of three parts:

- Concepts and introduction of Biotechnology major
- Visit specialized facilities / visiting production facilities
- Group lab exercises designed by students
- Make topics in groups and report

PART II. THEORY (15 hours lecture)

CHAPTER I. CONCEPTS OF BIOTECHNOLOGY (3 lecture hours)

I.1. Definition of Biotechnology

I.2. Biotechnology and development

I.3. Introduction of Biotechnology sub-sectors

1.5 The situation of biotechnology development in the world and opportunities for Vietnam

I.4. The Programme in Biotechnology at Hanoi University of Science andTechnology

CHAPTER II. BASIS OF BIOLOGICAL TECHNOLOGY PROCESS (5 hours)

II.1 Biological agents and biological agent with gene-modifications

II.2 Fermentation by biological agents

II.3 Downstream process

CHAPTER III. THE BRANCHES OF BIOTECHNOLOGY (7 hours)

III.1 Industrial biotechnology (White Biotechnology)

III.2 Pharmaceutical and Medical Biotechnology (Red Biotechnology)

III.3 Agricultural Biotechnology (Green Biotechnology)

III.4 Marine Biotechnology (Blue Biotechnology)

III.5 Environmental Biotechnology

PART III. VISIT and PRACTICE (15 hours)

- Organizing visits to enterprises/ research institutions and introduce students to some bio-product research and production facilities in Vietnam.
- Organizing students to practice creating one product working in groups under the guidance of teachers, each group selects one of the following products:

✓ Fermentation and alcohol collection

- ✓ Rapid analysis of pathogenic microorganisms using molecular biology / immunology techniques
- ✓ Tissue culture
- ✓ Treatment of organic wastewater by biological engineering

PART III. SEMINAR (15 hours)

Teachers for the topic of discussion. Students learn materials in groups of 3-4 students and present in class on essay and group discussion topics.

8. Textbooks:

Reference:

John E. Smith. Biotechnology, Study on Biology. 5th edition, Cambridge University Press, 2004.

9. Student learning methods and tasks:

- Attend a full class according to regulations
- Exploiting materials, preparing essays in groups and presentations
- Attend full practice sessions

10. Evaluation of results: KT / BT (0.2) -T (TN / TL: 0.8)

Method for Midterm Evaluation

- Attend classes according to regulations
- Participate in a presentation of a problem (in groups) and attend all discussion sessions: 50%
- Practical points: 50%

KT/BT: Midterm test or Excercises

T(TN/TL): Final Examination (Multi-choice/ writing)

11. Content and detailed study plan

Week	Content	Materials
1.	Concepts of Biotechnology	- Lecture note, - References

2.	Biological agents and biological agent with gene-modifications	- Lecture note, - References
3.	Fermentation by biological agents and downstream process	- Lecture note, - References
4.	Biotechnology sub-sector	- Lecture note, - References
5.	Biotechnology sub-sector	- Lecture note, - References
6.	Visit: research institutions	Field trip
7.	Visit: production organization	Field trip
8.	Practical: research references and guides	Guided materials
9.	Practical: lab work preparation and practice	Guided materials
10.	Practical: practice and result evaluation	Guided materials
11.	Seminar	References
12.	Seminar	References
13.	Seminar	References
14.	Seminar	References
15.	Seminar	References

12.

Contents of sightseeing, practice, essays

- Sightseeing at the facilities

- Students do group practice in laboratory / workshop according to the content of Part II

- Teachers provide essay topics. Students prepare materials and present in front of the class in a group of essays.

SYLLABUS DEVELOPING GROUP

Prof. Hoang Đinh Hoa ***Prof. To Kim Anh***