

## DETAIL SYLLABUS

### 1. Course name: Molecular Biology Laboratory

- Course number : BB802C

- Number of credits : 01

- Distribution of credit hours: Laboratory hours: 30 hours

### 2. Academic unit responsibility for courses:

- Department: Molecular biotechnology

- Institute : Biotechnology Research and Development Institute

### 3. Course prerequisite: BB801C

### 4. Course objectives:

#### 4.1. Knowledge:

Student should be able to do the following:

- 4.1.1. Work safely in a molecular biology lab and properly manage laboratory waste
- 4.1.2. Set up laboratory equipment safely and efficiently
- 4.1.3. Relate the general knowledge of the techniques learned in the course to specific experimental studies
- 4.1.4. Isolate genomic DNA, plasmid DNA from bacteria, transformation of E. coli,
- 4.1.5. Design primers for PCR and perform PCR reactions.
- 4.1.6. Use bioinformatics to search data and techniques for molecular biology analysis
- 4.1.7. Understand the application of these techniques, and understand the type of information/data generated by these techniques.

#### 4.2. Skills:

- 4.2.1. Use appropriate laboratory skills and instrumentation to solve problems.
- 4.2.2. Train students in the aspects of modern chemical safety, recognize and minimize potential chemical and physical hazards in the laboratory, and know how to handle laboratory emergencies effectively.
- 4.2.3. Foster students' communication skills. Students should be able to present information in a clear and organized manner.
- 4.2.4. Hone students' team skills. Students should be able to work effectively in a group to solve scientific problems, be effective leaders as well as effective team members, and interact productively with a diverse group of peers.
- 4.2.5. Make clear written laboratory reports

#### 5. Attitudes:

Students should be developed attitudes relevant to molecular biology such as:

- Have a good appreciation of the importance of molecular biology techniques.
- Morality in molecular biotechnology research and have a good sense in environmental protection

## 5. Brief description of module content:

This course is designed as an upper level laboratory course in molecular biology. The laboratory course will be an intensive exposure to the principles and techniques used in molecular biology: Bioinformatics, DNA isolation, DNA cloning into bacterial cells, restriction endonuclease digestion, agarose gel electrophoresis, polymerase chain reaction, DNA analysis.

All laboratory protocols will be provided to students via their email box.

## 6. Structure of course content:

Day	Exercise	Hours	Objective
1	Transformation of E.coli cell – Selection of transformants	5	4.1.1 - 4.1.4
2	Plasmid DNA and Genomic DNA isolation	5	4.1.1 - 4.1.4
3	Rrestriction endonuclease digestion	5	4.1.1- 4.1.6
4	Polymerase chain reaction	5	4.1.2 - 4.1.5- 4.1.7
5	Agarose gel analysis of genomic DNA, plasmid DNA and PCR products	5	4.1.2 -4.1.6
6	Bioinformatics – analysis of the results	5	4.1.2 -4.1.6-4.1.7

## 7. Teaching methods:

- Explanation each step in the protocol
- Direction for student to carry out each step in the protocol, working group

## 8. Student's tasks:

- Students must attend all of the laboratory sections and to take good notes for each protocol.
- Students are required to come to lab. on time every session
- No food or drinks, including water bottles.
- Clean up your bench at the end of lab
- Obey all safety rules and regulations of lab activities

## 9. Evaluation of student learning outcomes:

### 9.1. Evaluation Methods:

The students are evaluated based on the following accumulation of points:

N°	Component grades	Define	Weight of grade	Goals
1	Exercise	solving problems – work in group	10%	4.2.3- 4.2.4
2	Exam	multiple choice	10%	4.1.1- 4.1.7
3	Final lab report	Obtained results, analysis of the results and discussion	80%	4.1.1-4.1.7

### 9.2. Grading policy

The final grade of the accumulated points will be computed on the following scale:

- 8.7 - 10: A
- 7.8- 8.6: B+
- 6.3 – 7.7: B
- 5.3 – 6.2: C+

4.3 – 5.2: C

4 – 4.2: F

**10. Textbook:**

- There are no formal textbooks for this course. All laboratory protocols will be provided to students before coming to the lab.

- The following additional book is recommended:

[1] **Molecular cloning**. Volume 1, Joseph Sambrook and David W. Russell. 2001. . Cold Spring Harbor Laboratory Press

[2] **Principles of Gene Manipulation**, Primrose, S.B., Twyman, R.M. & Old, R.W, 5th Edition, 1994. ISBN: 0-632-03712-1

[3] **Basic Laboratory Methods for Biotechnology: Textbook and Laboratory Reference**, Lisa A. Seidman, and Cynthia J. Moore. 2002. . Prentice-Hall, Inc

Can Tho, 20 February, 2014

**By order of the rector**  
**Director**

**Head of department**