**II.2.9 ANIMAL CELL BIOTECHNOLOGY**

* + 1. **Course description:**
1. **Credit points:** 4 ECTS
2. **Time commitment:**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Items | Lecture | Tutorial/Exercise | Practice/Assignment | Lab-work | **Total** |
| No. of hours | 22 | 6 | 0 | 12 | **40** |

1. **Prerequisites:**

Cell Biology, Molecular Biology, Biochemistry, Bioinformatics

1. **Recommended background knowledge:**

Physiology and Anatomy of Human and Animal

1. **Subject description:**

This course provides the scientific information and applicability of animal cell technology such as Laboratory design and Layout, Equipment, Defined media and supplements, Animal Cell Culture, Cryopreservation, Artificial Insemination, Embryo Transfer, *In vitro* Fertilization and Monoclonal Antibody

1. **Objectives & Outcome**

Accomplishment of this course, students could:

* Describe general principle of animal cell culture
* Describe the application of animal cell culture
1. **Assessment/ Evaluation**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Component | Attendance | Exercises | Practical | Reports | Midterm | Final |
| Percentage % | 10 | 10 | 20 | 0 | 30 | 30 |

1. **Prescribed Textbook(s)**

[1] Animal Cell technology: From Biopharmaceuticals to Gene Therapy, edited by Leda R. Castilho, Angela Maria Moraes, Elisabeth F.P. Augusto and Michael Butler. Taylor & Francis Group, 2008.

[2] Culture of Animal Cells: A Manual of Basic Technique, edited by R. Ian Freshney, 4th edition, Wiley-Liss, Inc., 2000..

* + 1. **Course content & schedule:**

1 Lecture 1. Introduction to animal cell technology

1.1 Type of animal cell culture

1.2 Applications

1.3 Advantages and limitation

1.4 Safety consideration

1.5 Equipment and laboratory

1.6 Sterilization and septic technique

2 Lecture 2. Basic method in animal cell culture

2.1 Culture media

2.2 Cell culture contamination

2.3 Maintaining cells in culture

2.4 Cryopreservation and thawing frozen cells

3 Lecture 3. Cytotoxicity

3.1 Cytotoxicity assay

3.2 Apoptosis assay

4 Lecture 4. Specialized techniques

4.1 DNA transfer

4.2 Reporter assay

4.3 Immunoblotting

4.4 Confocal microscopy

5 Lecture 5. Small RNA

5.1 siRNA

5.2 shRNA

5.3 miRNA

6 Lecture 6. Monoclonal Antibody

 6.1 Hybridoma cell production

6.2 Purification of monoclonal antibodies

7 Lecture 7. Good Laboratory practice (GLP) and problem in cell culture

7.1 GLP principle and objective

7.2 Common problem in cell culture

7.3 Q&AExcercises

Tutorial

1. **Reference Literature:**

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| --- |
| [1]. Animal Cell technology: From Biopharmaceuticals to Gene Therapy |
| [2]. Culture of Animal Cells: A Manual of Basic Technique |