

## Course Syllabus

1. Course Number: 3000751
2. Course Credit: 3(1-6-5)
3. Course Title: Research Skills in Biomedical Sciences and Biotechnology
4. Faculty / Department: Faculty of Medicine, Chulalongkorn University
5. Semester: First
6. Academic Year: 2021
7. Responsible Instructor / Academic Staff:

Assoc. Prof. Sunchai Payungporn

8. Condition:

8.1 Prerequisite: None

8.2 Corequisite: None

8.3 Concurrent: None

9. Status: Required

10. Curriculum: Doctor of Philosophy Program in Biomedical Sciences and Biotechnology

11. Degree: Ph.D.

12. Hours / Week

Lecture 1 hour/week

Laboratory 6 hours/week

13. Course Description

This course focused on fundamental research knowledge and skills such as research ethics, hypothesis, experimental design, research planning, research writing and application of novel technologies in Biomedical Sciences and Biotechnology.

14. Course Outline

14.1 Behavioral Objectives: Students should be able to

Understand research ethics

Propose hypothesis, design experiment and make a plan for a research

Write research data for publication

Apply novel technologies in Biomedical Sciences and Biotechnology Students

## 14.2 Learning Contents

### Schedule :

Time and venue : Thursday 10.00 – 12.00 Room 218, 2nd Floor, Pattayapat building,  
Faculty of Medicine or other arrangement by instructors

Week	Date	Topics	Instructor
1	19 Aug, 2021	Orientation & central dogma	Prof. Apiwat Mutirangura, M.D., Ph.D.
2	26 Aug, 2021	DNA extraction & amplifications	Assoc.Prof. Sunchai Payungporn, Ph.D.
3	2 Sep, 2021	DNA sequencing & high- throughput sequencing	Assoc.Prof. Sunchai Payungporn, Ph.D.
4	9 Sep, 2021	Metagenomics & microbiomes	Assoc.Prof. Sunchai Payungporn, Ph.D.
5	16 Sep, 2021	Epigenetics / Methylome&ChIP-Seq	Lect. Narisorn Kongruttanachok, Ph.D.
6	23 Sep, 2021	Microarray & Nanostring	Lect. Kanok Preativatanyou, M.D, Ph.D.
7	30 Sep, 2021	RNA-Seq	Lect. Kanok Preativatanyou, M.D, Ph.D.
8	7 Oct, 2021	RNA interference & quantitative real- time PCR	Assoc.Prof. Sunchai Payungporn, Ph.D.
9	14 Oct, 2021	Protein extraction & purification	Assoc. Prof. Alain Jacquet, Ph.D.
10	21 Oct, 2021	Proteomics & Mass spectrometry	Lect. Piriya Wongkongkathep, Ph.D.
11	28 Oct, 2021	Confocal / Super Resolution Microscope	Lect. Naphat Chantaravisoot, Ph.D.
12	4 Nov, 2021	Electron microscope: <b><u>the lecture will be at the EM Lab, Room 110 Aor Por Ror Building.</u></b>	Asst. Prof. Supang Meneesri le Grand, Ph.D.
13	11 Nov, 2021	genetic manipulation of cells and animals	Lect. Chureerat Phokaew, Ph.D.
14	28 Nov, 2021	Cell lines culture	Assoc. Prof. Alain Jacquet, Ph.D.
15	25 Nov, 2021	Flow cytometry	Lect.r Direkrit Chiewchengchol, M.D., Ph.D.
16	2 Dec, 2021	Common tools in computational Biology	Lect. Sira Sriswasdi, Ph.D.

### Method

- |  |                    |
|--|--------------------|
| <input checked="" type="checkbox"/> Lecture            | 1 hour /week (15%) |
| <input checked="" type="checkbox"/> Others: Laboratory | 6 hours/week (85%) |

### 14.3Media

- Transparencies and opaque sheets
- Powerpoint media
- Electronics and website media
- Others .....

## 15 Assignment through Network System

15.3.1 Assigning and Submitting Method: None

15.3.2 Learning Management System None

## 16 Evaluation: Letter Grade (A, B<sup>+</sup>, B, C<sup>+</sup>, C, D<sup>+</sup>, D, F)

16.3.1 Assessment of academic knowledge 30%

16.3.2 Assessment of work or classroom activities 30%

16.3.3 Assessment of the assigned tasks 40%

16.3.4 อื่นๆ (Others) .....

## 19. Reading List

19.1 Required Text: None

19.2 Supplementary Texts: None

19.3 Research Articles / Academic Articles:

International published research articles related to Biomedical Sciences and Biotechnology

19.4 Electronic Media or Websites

<http://www.ncbi.nlm.nih.gov/>

## 2.0 Teacher Evaluation

20.1 Teacher Evaluation: Form 3 of CU-CAS system

20.2 Changes made in accordance with the previous evaluation: None

20.3 Discussion or analysis which creates desirable qualifications of Chulalongkorn

University graduates

Knowledge

Morality

Critical thinking and creative (คิดอย่างมีวิจารณญาณ คิดริเริ่มสร้างสรรค์)

Skillful (solving problem, management and information technology)

Want to know / know how to learn more

Leadership